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The Export Competitiveness of Mozambique's Cashew Nut Industry: Applying Porter's Diamond Model

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PHD Programme in Applied Business Management

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ABSTRACT

Export expansion propitiates scale economies, positive externalities, technological advancement, foreign currency earnings, and efficient resource use towards competitive advantage creation and consolidation. Fuelled by the export-driven economic growth hypothesis, some countries meet their export imperative through export promotion activities that enhance competitiveness. In this Thesis we analysed the factors influencing export competitiveness of the cashew nut industry in Mozambique. This industry is the main source of income for 1.4 million rural households. It reached in 1973 its peak global market share of 50%, having lost this position since 1975. International competitiveness analysis is needed to determine focus areas. We present results of the use of Porter's Model whose determinants (factor conditions, demand conditions, and related industries) plus government (jointly exogenous constructs) interact and stimulate firm strategy representing competitiveness (endogenous construct). We analysed a quantitative longitudinal 80-observation secondary dataset, and a qualitative primary 310-observation dataset, collected through a structured questionnaire. We used a partial least squares structural equation modelling (PLS-SEM) on both datasets, applying SmartPLS 3.3.9 statistical tool.

Results suggest all exogenous constructs influence positively competitiveness. Factor conditions' impact leads with highest β coefficient of 0.265. Around 89% of respondents highlighted in-shell cashew nut availability, while 82% emphasised quality. Study recommends strategies to improve in-shell cashew nut availability and quality, electricity reliability, physical infrastructure, adherence to international standards, "*Zambique*" brand, traceability, R&D. Strategies need to be extended to upgrading and updating of labour legislation, taxation, fiscal incentives, and tackling economy's informality, aiming to entice bigger and faster investments for Mozambique to regain market share.

***Keywords*:** cashew nut industry, export competitiveness, competitive advantage, Porter's model, partial least squares, structural equation modelling

JEL Classification Codes: M1 – Business Administration; **C1** – Econometric and Statistical Methods and Methodology.

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RESUMO

A expansão da exportação propicia economias de escala, externalidades positivas, avanço tecnológico, divisas e uso eficiente dos recursos para criação e consolidação da vantagem competitiva. Alimentados pela hipótese do crescimento económico induzido pela exportação, países realizam o imperativo de exportação realizando actividades de promoção da exportação que melhoram a competitividade. Nesta Tese analisamos os factores que influenciam a competitividade das exportações da indústria do caju em Moçambique. Esta indústria é a principal fonte de renda para 1.4 milhões de famílias rurais. Ela atingiu 50% da quota de mercado global, tendo perdido esta posição desde 1975. A análise da competitividade internacional é necessária para determinar as áreas de foco. Apresentamos resultados do uso do Modelo de Porter cujos determinantes (condições dos factores, condições da procura e indústrias relacionadas) mais governo (constructos exógenos) interagem e estimulam a estratégia da firma, representante da competitividade (constructo endógeno). Analisámos um conjunto de dados quantitativos secundários de 80 observações longitudinais e outro conjunto de dados qualitativos primários recolhidos via questionário estruturado. Usámos uma modelagem da equação estrutural dos mínimos quadrados parciais em ambos os conjuntos de dados, aplicando a ferramenta estatística SmartPLS 3.3.9.

Os resultados sugerem que todos os constructos exógenos influenciam positivamente a competitividade. O impacto das condições dos factores lidera com o mais alto coeficiente β=0.265. Cerca de 89% dos inquiridos destacaram a disponibilidade da castanha com casca, enquanto 82% enfatizaram a qualidade. O estudo recomenda estratégias para melhorar a disponibilidade e qualidade da castanha com casca, fiabilidade da electricidade, infra-estruturas físicas, adesão aos padrões internacionais, marca “*Zambique*”, rastreabilidade, pesquisa e desenvolvimento. As estratégias precisam ser extensivas ao melhoramento da legislação laboral, tributação, incentivos fiscais e combate à informalidade da economia, para atrair investimentos maiores e mais rápidos para Moçambique reconquistar a quota de mercado.

Palavras-chave: industria de castanha de caju, competitividade exportadora, vantagem competitiva, Modelo de Diamante de Porter, modelagem de equações estruturais, mínimos quadrados parciais

Códigos de Classificação do JEL: **M1** – Administração de Empresas; **C1** – Econometria, Métodos Estatísticos e Metodologia.

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ABBREVIATIONS AND ACRONYMS

ACA	African Cashew Alliance
ACAMOZ	Apoio à Cadeia de Valor do Caju em Moçambique
ACi	African Cashew Initiative
ACIANA	Associação Comercial, Industrial e Agrícola de Nampula
ADB	Asian Development Bank
AERC	African Economic Research Consortium
AICAJU	Associação dos Industriais de Caju
ALDC	Africa and Least Developed Countries
APIEX	Agência de Promoção do Investimento e Exportações
ASTM	American Society for Testing and Materials
AVE	Average Variance Extracted
BRC	British Retail Consortium
BTI	Bertelsmann Stiftung's Transformation Index
BTS	Bartlett Test of Sphericity
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditures
CBI	Centre for the Promotion of Imports from Developing Countries)
CBT	Cashew Board of Tanzania
CEPCI	Cashew Export Promotion Council of India
CEPR	Centre for Economic Policy Research
CFR	Cost and Freight
CGM	Compagnie Générale Maritime
CIF	Cost, Insurance & Freight
CMA	Compagnie Maritime d'Affrètement
CNSL	Cashew Nut Shell Liquid
CR	Composite Reliability
CRM	Constituição da República de Moçambique
CSR	Corporate Social Responsibility
CTA	Confederation of Private Sector Business Associations
DBA	Doctor of Business Administration
DEPZ	Dhaka Export Processing Zone
DUAT	Direito de Uso e Aproveitamento da Terra
E.S.R.C.	Economic and Social Research Council
EC	Export Competitiveness
EEG	Export Expansion Grant

EPD	Environmental Product Declaration
EPZ	Export Processing Zone
EU	European Union
FAO	United Nations Food and Agriculture Organisation
FAOSTAT	FAO Statistical Information System
FB	Fine Brokens
FCL	Full Container Load
FO	Farmers' Organisation
FOB	Free On Board
FS	Fancy Split
FSP	Financial Service Provider
GDP	Gross Domestic Product
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
GSP	Generalised System of Preferences
HACCP	Hazard Analysis Critical Control Point
HRM	Human Resource Management
HTMT	Heterotrait-Monotrait Ratio
IAM	Instituto de Amêndoas de Moçambique
ICT	Information and Communication Technology
IDE	Integrated Development Environment
IDS	Institute of Development Studies
IFAD	International Fund for Agricultural Development
IIAM	Instituto Nacional de Investigação Agronómica
IIMB	Indian Institute of Management Bangalore
IJRRAS	International Journal of Recent Research and Applied Studies
IMF	International Monetary Fund
INC	International Tree Nut Council
INCAJU	Instituto Nacional do Caju
INE	Instituto Nacional de Estatística
INNOQ	Instituto Nacional de Normalização e Qualidade
IPEME	Instituto para o Desenvolvimento das Pequenas e Médias Empresas
ISCTE	Instituto Superior de Ciências do Trabalho e da Empresa
ISO	International Standards Organisation
ISSN	International Standard Serial Number
IUL	Instituto Universitário de Lisboa
JAI	Journal of ASTM International
JETRO	Japan External Trade Organisation

KMO	Kaiser Meyer Olkin
KOR	Kernel Outturn Ratio
KW	Kilowatt
KWh	Kilowatt hour
Lbs	Pounds (unit of mass)
LDCs	Least Developed Countries
LISREL	Linear Structural Relations
LWP	Large White Pieces
MADER	Ministério da Agricultura e Desenvolvimento Rural
MASA	Ministério da Agricultura e Segurança Alimentar
MATEC	Materials science, Engineering and Chemistry
MEF	Ministério da Economia e Finanças
MIC	Ministério da Indústria e Comércio
MIS	Management Information Systems
MIT	Massachusetts Institute of Technology
MSME's	Micro, Small and Medium-Sized Enterprises
MT	Metric Tonnes
MW	Megawatt
MZN	Mozambican Metical (New family)
NAIP	National Agricultural Investment Plan
NBER	National Bureau of Economic Research
NDP	National Development Plan
NYC	New York City
OE	Orçamento do Estado
OECD	Organisation for Economic Cooperation & Development
ONDD	Office National Du Ducroire (Belgian Export Credit Agency)
OPEX	Operating Expenditures
PLS	Partial Least Squares
PLSc	Partial Least Squares Covariance
PO	Producer Organisation
PPP	Public-Private Partnership
QCD+F	Quality, Cost, Deliver, and Flexibility
R&D	Research and Development
RCN	Raw Cashew Nuts
ROFR	Right of First Refusal
SAIDI	System Average Interruption Duration Index
SDAE	District Services for Economic Activities

SEEP	Small Enterprise Education and Promotion
SEM	Structural Equation Model
SIPA	Software, Industry, Promotion Agency
SMEs	Small and Medium Enterprises
SWOT	Strengths, Weaknesses, Opportunities and Threats
TNS	Technoserve
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
USA	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VAR	Vector Autoregressive
VAT	Value Added Tax
VECM	Vector Error Correction Model
VIF	Variance Inflation Factor
VINACAS	Vietnam Cashew Association
VRI	Valuable, Rare, Inimitable Resources
VRIO	Valuable, Rare, Inimitable Resources and Organisations
WB	World Bank

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CHAPTER 1

INTRODUCTION

1.1. Mozambique, Geographical Location and Climate

The Republic of Mozambique, proclaimed as an independent State on June 25 1975, lies on the east coast of Africa, on the shores of the Indian Ocean, between 10°27 and 26°52 latitude South and 30°12 and 40°51 longitude East, sharing borders with Tanzania to the north, Malawi, Zambia and Zimbabwe to the west, South Africa and eSwatini to the south, and the Indian Ocean to the East, separating it from Madagascar through the Mozambique Channel (Figure 1.1).

Figure 1. 1 Mozambique: Location and Administrative Division

TERRITÓRIO E POPULAÇÃO DE MOÇAMBIQUE			
PROVÍNCIA	POPULAÇÃO PROJETADA (2020) (HABITANTES)	ÁREA TOTAL (km^2)	CIDADE CAPITAL
NIASSA	1,998,356	129,056	LICHINGA
CABO DELGADO	2,036,785	82,625	PEMBA
NAMPULA	5,618,332	81,606	NAMPULA
ZAMBÉZIA	5,406,486	105,008	QUELIMANE
TETE	3,049,800	100,724	TETE
MANICA	2,286,842	61,661	CHIMOIO
SOFALA	2,314,537	68,018	BEIRA
INHAMBANE	1,622,912	68,615	INHAMBANE
GAZA	1,549,407	75,709	XAI-XAI
MAPUTO (P)	2,106,543	26,058	MATOLA
MAPUTO (C)	1,320,474	300	MAPUTO
TOTAL	29,310,474	799,380	

Sources : INE (2021); www.repssi.org.mz (2022)

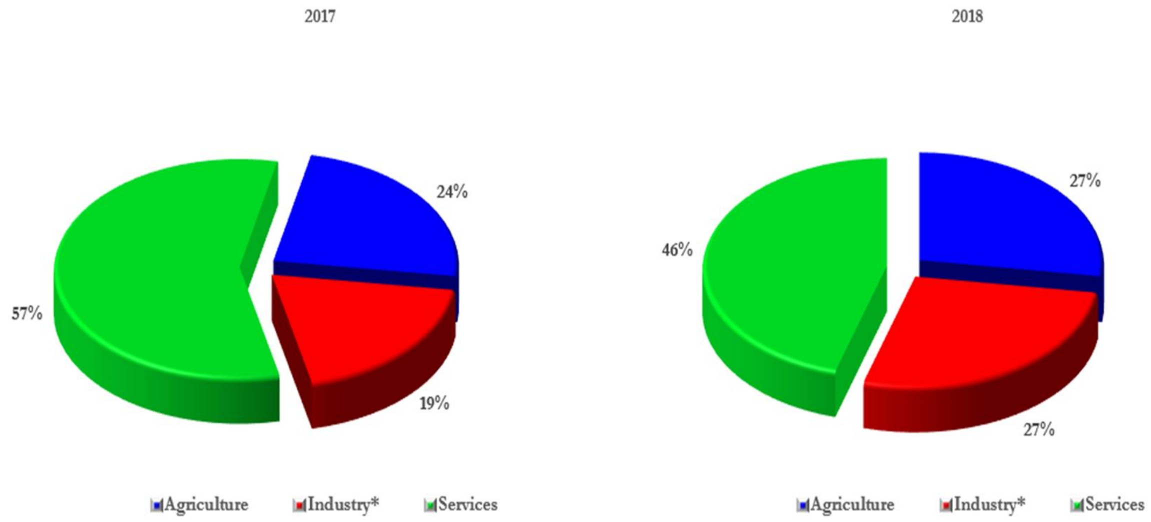
The country comprises two topographical regions separated by the Zambezi River, with the northern region comprising a long and narrow coastline that moves inland to hills and low plateaux and rugged highlands, which include the Niassa highlands, Namúli or Shire highlands, Angónia highlands, Tete highlands and the Makonde plateau, and the southern region consisting of the broader lowlands with the Mashonaland plateau and the Lebombo mountains. Five main rivers in length drain Mozambique, namely, Zambezi (2,703 km), Limpopo (1,840 km), Rovuma (840 km), Olifants (590 km), and Nkomati (504 km), plus a group of 6 not so long ones between 314 km and 422 km, and several smaller ones. There are four important lakes: Niassa, Chiúta, Cahora Bassa, and Shiruwa.

Mozambique has a total boundary length of 7,041 km, of which 2,470 km is the coastline. Its population is estimated (2020) at 31.3 million inhabitants, and its total land area is 801,590 km^2, of which land constitutes 784,090 km^2, and inland lakes and rivers account for 17,500 km^2. The maximum altitude is 2,436 metres on Monte Binga in Manica province in the central region, and the average temperatures range from 13 °C to 21 °C in July and from 22 °C to 31 °C in February.

1.2. Mozambique's Main Economic, Political, And Social Features

The country's GDP rose from 13.22 billion US$ to 14.85 billion US$ (Figure 1.2 and Table 1.2) and the GDP *per capita* from 445.2 US$ to 484.9 US$ between 2017 and 2018, respectively.

Figure 1. 2: Mozambique's GDP by Economic Sectors (2017 and 2018)



* Includes construction, mining, and manufacturing. Source: Statistica (2020)

Mozambique is endowed with a rich and extensive natural resource base, the bulk of which remains untapped. Thirty-six million hectares of arable land (IFAD, 2019), including 4.6 million hectares of timber in its forest and more than 60 rivers supporting agricultural activities, where almost everything can grow, accommodating more than 80% of the country's total employment. Over 400 thousand MT of fishery products are caught annually, with significant prospects for increase, particularly considering ongoing investment initiatives in shrimp aquaculture. Minerals, hydrocarbons, and energy resources also abound, including, in particular, the 190 TCF proven reserves of natural gas, equivalent to more than 1,500 times the country's annual consumption, as well as a potential of 18.6 gigawatts of clean and renewable energy, of which only 3 gigawatts are currently generated (INE, 2020). In manufacturing and tourism, all the potential remains equally untapped.

Inasmuch as the Constitution and Government are concerned, Mozambique was proclaimed as an independent State on June 25, 1975, by Samora Moisés Machel, President of Frente de Libertação de Moçambique (FRELIMO), under the single political party rule, who became the first President and Head of State of Mozambique. Following a national debate that took place a few years later on the people's views regarding various provisions, a new Constitution embracing a multi-party system of government was adopted and came into force on November 30, 1990. In this Constitution, the country's name was changed from “People’s Republic of Mozambique” to “The Republic of Mozambique”, which also meant a change from the centrally planned economy regime to a market-based economy and free elections once every five years. This designation remains as the official name of the country (article 1 of CRM)).

The Executive branch comprises the President who is the Head of State and Government (article 146, nº 1, article 201, nº 1 of CRM), a Prime Minister who assists and advises the President (article 205 of CRM), and the Council of Ministers (articles 200 to 210 of CRM). The Republic’s President symbolises the national unity, represents the Nation both domestically and internationally (article 146, nºs 1 to 3 of CRM) and is elected direct, equal, secret, personal, and periodical by universal suffrage (article 147, nº 1 of CRM), by citizens over 18 years of age (article 10 of Law nº 8/2013 of February 27th, reviewed and republished by Law nº 2/2019 of May 31st. Most Ministries have Deputy-Ministers, but these latter are not Cabinet members (article 201, nº 2, even though the President equally appoints them.

The legislative powers are exercised by the Republic Assembly (Parliament) (articles and it is composed by 250 Members of Parliament (articles 168 to 170 of CRM).

The Judiciary comprises the Supreme Court, the Administrative Tribunal, and Provincial and District Courts (article 223 of CRM). Other institutions form part of the Judicial System, such as the Constitutional Council, the Attorney General’s Office (article 234 of CRM), Fiscal Tribunals and the Customs Tribunal, among others (article 223, nº 2 of CRM).

Since the adoption of multi-party democracy in 1990, six presidential and legislative elections and five municipal elections have already taken place. FRELIMO and its presidential candidates have won all the presidential and legislative elections. The victory in municipal elections has been shared with the opposition parties in many municipalities. A series of de-centralisation initiatives, such as the election of provincial governors, are underway amid various implementation challenges.

In terms of land and climate, Mozambique has the ideal cashew growing conditions, and no foreign cashew nuts are competing in the domestic market, which places the country’s cashew nut industry in a unique position to become the most competitive global supplier of highly traceable, sustainable high-quality cashew kernels. The country reached its peak production of 240,000 tons of in-shell cashew nuts in 1973, turning itself into the largest producer globally, with the share of global production of approximately 50%, and a processing capacity above 100,000 MT annually, secured by 15 large factories. Its output and its share of the world cashew nut production dropped dramatically after 1975 for various reasons (APIEX Mozambique Profile, 2016).

The government has made significant progress in restoring peace with the aim of ending destabilisation in Mozambique. The remaining major challenge for the government is finding ways of effectively addressing the extreme violence brought about by insurgency in Cabo Delgado since 2017, that started off with attacks on police posts and rapidly spread into the central and northern regions of the province, mostly characterised by decapitations and the burning of villages by people who reject the State, advocate the boycott of State schools, establish mosques, and they seem to be a genuine extremist Islamist phenomenon in Mozambique with foreign connections to some African countries (Tanzania, Somalia, Kenya, Great Lakes Region), and operating independently (BTI, 2022). Their membership seems mainly comprised of socially marginalised youth without formal employment or education, with strong support coming out of the Kimwani ethnic group.

The establishment of the gas and oil industry seems to play an important role in this conflict, where there is a strong sense of marginalisation and exclusion of local people from the opportunities arising from the industry. The government’s response was initially reactive, and lately called on assistance from Southern African Development Community (SADC) neighbours and the Rwandan troops to help restore order, stop decapitations and killings, with a view to allowing the displaced populations to return to their villages and homes and rebuild their livelihoods.

Generally, basic administrative structures exist in Mozambique, and progress is taking place in public service delivery despite some difficulties. Access to justice is guaranteed, especially in the Capital City (Maputo) where 83% of the country’s lawyers reside and work, but it remains a challenge for the remainder of the country. The Government has managed to increase the amount of resources dedicated to education to about 10% of the State budget, and for the provision of primary health care, the main responsibility and area for Government intervention over the years, and it has managed to increase its share of financing through domestic resources to 85% in 2019, although investments in the health sector remain dependent on external financing, comprising, as of 2018, an inventory of 1,575 primary health care posts distributed along the 154 districts and 53 municipalities.

The reform of the public sector that was embarked upon with the approval and adoption of the public sector reform global strategy to cover the period of 2011 to 2025, and it is beginning to come to fruition. The government has developed an e-government strategy that includes an electronic government network, government portal, capacity-building, state financial administration system, Mozambique e-government communication infrastructure project, national system of civil registration, biometric driving license and motor registration systems, biometric ID card and passport and a criminal registration system.

The successive and multi-level lockdown measures as a result of COVID-19 pandemic affecting particularly the provision of services in the education sector, represented a clear and firm government position to minimise to the highest possible extent the spreading of the disease, despite the danger that those measures posed in terms of the possibility that girls would not return to school (BTI, 2022).

The 2004 Constitution of Mozambique guarantees fundamental rights and civil liberties for all its citizens, thus ensuring the right to elect and to be elected in a free and fully protecting political setting, through universal, direct, secret and periodic suffrage, and or national referenda on issues of national critical interest in a permanent democratic participation in government affairs (BTI, 2022).

Since the 1992 peace accord, Mozambique has been regularly organising presidential, parliamentary and provincial elections as well as elections in the independent municipalities (autarquias), and the constitutionally consecrated two five-year Presidential terms has been scrupulously respected over the years.

Despite the wide recognition of good governance and democratic procedures, there are concerns over the extremely high levels of criminal activities and medium to low corruption among public servants in key positions, allowing criminal activity against flora (indiscriminate cutting of trees for illegal timber trade), against wildlife (rhinoceros poaching, elephant poaching and rhino horn trafficking), the heroin trade, human smuggling and trafficking, and ivory trade, and the persistent occurrence of kidnappings. Constitutionally, every citizen has the right to assemble and associate freely, including establishing political parties. However, organisations pursuing xenophobic, racist or violent objectives are barred. The freedom of the press is equally assured as the public's right to information.

Despite a few implementation difficulties often interpreted as political interference, the country's Constitution provides for a separation of powers at different levels between the executive, legislative and judiciary.

Unlike in the two previous decades, since 2016, Mozambique's economy has gone through a substantial slowdown due to the falling market prices of natural resources, reduced foreign direct investment (FDI), suspension of direct budget assistance by donors and a depreciation of the national currency. But even in the previous decade of growth rates of 7% to 8%, the country experienced a very limited structural transformation and industrialisation of the economy, which remains dependent on the exploration of raw materials and the agricultural sector (BTI, 2022). This has resulted in a reduced economic growth, and persistent income inequality. In sub-Saharan Africa, Mozambique counts among the countries with the highest levels of inequality and a Gini index of 54.0, as displayed in Table 1.1. Disparities among the well-off and the most disadvantaged households are growing along with regional asymmetries (BTI, 2022).

Table 1. 1: Summary of Mozambique's Key Social and Economic Indicators (2022)

Population (10^6 Inhabitants)	31.3	Human Development Indicator (HDI)	0.456	GDPpc, PPP (US$)	1,297.0
Population Average Growth Rate (% p. a.)	2.9	HDI Rank of 189	181	Gini Index	54.0
Life Expentancy (years)	60.9	UN Education Index	0.395	Poverty (%)	82.4
Urban Population (% of Total)	37.1	Gender Inequality Index (GII)	0.523	Aid per Capita (US$)	62.8

Sources as of December 2021: The World Bank, World Development Indicators (2021), Huma Development Report 2020.

Over the past eight years, 46.1 % of Mozambicans lived below the poverty line[1], as shown in Table 1.1, and food insecurity was exacerbated by recurrent climate-related natural disasters (floods, droughts, cyclones).

The outbreak of COVID-19 forced the government to close its borders and to declare a state of emergency in April 2020 with schools, industrial and commercial facilities closed. These restrictions had a negative effect on income and affected particularly already vulnerable households, small and informal businesses in urban areas. According to the World Bank (2022), approximately 80% of the labour force is operating in the informal sector. Many informal retail firms are owned by women, who either lost their supply chains when travel to South Africa became impossible or lost customers due to shrinking consumption power. In the first months of the pandemic the government estimated that the unemployment rate could rise by 7% to 10% (at 20% in the beginning of 2020).

For the large share of Mozambicans in rural areas living off subsistence farming, the immediate effects had not been as harsh as for the informally employed or unemployed urban dwellers. Only 13% of smallholder farmers actually sell their products in markets. However, for them the main impact of COVID-19 relates to access and quality of health services, and disruption of remittances from relatives who suddenly lose employment (BTI, 2022).

Table 1. 2: Mozambique's Key Economic Indicators (2017 - 2020)

Indicator	2017	2018	2019	2020
Gross Domestic Product (GDP)	13,150.0	14,710.0	15,200.0	14,390.0
Annual GDP Growth Rate (%)	3.7	3.4	2.3	-0.5
Inflation (Consumer Price Index)	15.1	3.9	2.8	3.1
Unemployment (% Total Population)	3.3	3.2	3.2	3.8
Foreign Direct Investment (% of GDP)	17.5	11.3	14.2	22.7
Annual Export Growth Rate (%)	3.9	47.9	-10.7	-22.0
Annual Import Growth Rate (%)	-12.9	43.4	0.0	-12.6
Current Account Balance (US$ 10^6)	-3,585.5	-4,119.7	-3,022.3	-3,616.7
Public Domestic Debt (% of GDP)	99.6	107.1	105.4	122.2
External Debt (US$ 10^6)	15,821.7	18,678.7	20,110.3	20,932.3
Total Debt Service (US$ 10^6)	450.8	547.2	865.0	1,558.7
Net Lending/Borrowing (% of GDP)	1.5	-4.0	2.2	-5.4
Tax Revenue (% of GDP)	22.2	21.4	27.1	25.4
Government Consumptuon (% of GDP)	24.6	21.8	21.7	20.7
Public Education Spending (% of GDP)	5.5	5.5	6.2	6.8
Public Health Spending (% of GDP)	1.7	1.7	7.8	7.3
Military Expenditure (% of GDP)	1.0	1.3	1.4	1.1

Sources: The World Bank - WDI (2021); IMF - WEO (2021)
UNCTADSTAT (2021); Knoema (2022)

Major pieces of legislation have been adopted and implemented with a view to streamlining the market functioning of the megaprojects, public-private partnerships, the oil and gas projects in the entire value chain of this business, particularly in what concerns the exploration, production, transportation, trade, refinery and transformation of liquid hydrocarbons and their by-products. (BTI, 2022).

Despite these efforts, the economic informality seems to have been gaining strength and dominance, partially due to the Covid-19 pandemic. Before the pandemic, approximately 65% of GNP was generated by informal businesses. The formal sector accounted for 32% of employment opportunities (BTI, 2022).

In the World Bank's 2020 report on the Ease of Doing Business Mozambique lowered its ranking from 135 in 2019 to 138 out of 190 countries assessed. Although the government improved the process of getting a construction permit or access to electricity, there is still a lot of red tape to go through when starting a business (rank 176) or when trying to execute contracts (rank 168). Equally, the access to funding particularly for SMEs remains difficult, placing the country toward the tail end when compared to others (rank 165). In 2013, Mozambique passed a competition law that provides for a modern competition enforcement system, applying to both private companies and public or State-owned enterprises, and covering all productive economic activities, and prohibiting agreements and practices that restrict competition horizontally (cartel building) and vertically (between companies and suppliers of customers), as well as abusive practices by dominant market actors (BTI, 2022).

Inasmuch as trade policy is concerned, the country's main stated objective is to create competitiveness enhancing environment for domestic products internationally and in the region. Consequently, it has streamlined customs procedures to benefit foreign traders, ratified and is implementing the Trade Facilitation Agreement since 2016, as well as it has established a one-stop electronic window for customs operations to facilitate trade (BTI, 2022), despite some shortcomings in the predictability of its tariff regime often cited as an impediment. Mozambique is a member of the SADC Free Trade area; 99.6% of duties for goods from SADC countries are at zero. Since 2018 Mozambique has benefitted from the EU-SADC Economic Partnership, but this has been hampered by its limited export base and low level of manufactured goods. Under the EU- Economic Partnership Agreement (EPA) Mozambique has to exempt 74% of imports from the EU from tariffs within a ten-year framework. As these revenues so far have been substantial for the State budget, the country is allowed to maintain 26% of duties. Mozambique does not apply tariff quotas. Its Most Favoured Nation tariff rates have remained unchanged in recent years. Its simple average tariff rate is 10%, with slightly higher rates on agricultural products (13.4%) than on non-agricultural products (9.5%) (UNCTAD, 2022; BTI, 2022).

Mozambique has been able to increase the financial inclusion of its population substantially as a result of the digitalisation of banking services and financial platforms by mobile phone network operating companies such as M-Pesa by Vodacom, M-kesh by Mcel, and E-mola by Movitel. The vast coverage of Mozambique by telecommunication networks and the widespread use of mobile phones made it possible for functions of the banking sector such as transfers, payments of goods and services, deposits and withdrawals to be done far away from the next bank. Despite visible efforts undertaken by Banco de Mocambique (the Central Bank) within the context of its regulatory mandate, the banking sector resents the still very high level of vulnerability, volatility, and concentration to which is subject.

Following the divulgation of the undisclosed debts information in 2016, the country's economy experienced an unprecedented set back as a result of loss of donor support, which pushed the central bank into embarking on a tighter monetary policy with a view to curbing-in a rampant inflation rate that reached 25% in 2016 alone and a 50% national currency devaluation in relation to the US dollar.

The strict policies paid off and inflation dropped to 3.9% in 2018 and 3.5% in 2019, which allowed the central bank to ease lending interest rates that had peaked at 23.25% in 2016, *de facto*, depriving the private sector of financing solutions. End of 2019 interbank lending rates stood at 12.75%, and still remain among the highest in Africa (BTI, 2022).

The overall impact of natural disasters on inflation has been localised. In Beira, one of the cities most affected by cyclone Idai in 2019, which food prices increased by 10.3% as agricultural outputs were destroyed. However, due to the limited integration of the local economy into the national market, it did not affect the overall positive trend. The depreciation of the national currency metical against the US dollar continued. However, in comparison to other currencies in the SADC region, it remained at a fairly stable depreciation level of 5% in 2019. During the pandemic the depreciation of the metical against the US dollar increased by 10%. This is seen mainly as a result of economic uncertainties and risks within the national economy and the overall performance of the US dollar in the international market. Despite the difficult environment, the central bank managed to increase the international reserves, which by the end of January 2021 covered imports of goods and services of up to six months.

Mozambique's fiscal situation is still to fully recover from the negative impact of the undisclosed debts crisis to which both tropical cyclones, Idai and Kenneth added their mercilessly demolishing effects on the country's economy in 2019. FDI flows particularly to the resource-rich Northern provinces started coming in reluctantly as a result of a deteriorating security situation. In spite of this challenging context, the government has succeeded in maintaining macroeconomic and financial stability.

With additional demands for support to the economy after the natural disasters stroke, the country remains heavily indebted, as shown in Table 1.2. Public debt stood at 122.2% of GDP in 2020. With general loans from multilateral institutions and donor countries mainly blocked, and access to the private capital market almost non-existent, the government mainly relied on the domestic capital market issuing treasury bonds inter alia. Public domestic debt levels increased by 15.9% between 2019 and 2020, up from 7.5% between 2017 and 2018, with a 1.6% reduction between 2018 and 2019. Nevertheless, external debt still remains the largest part of public debt at 79%, of which 56% are loans from bilateral donors.

Property rights in relation to buildings and movable property are entirely protected by law, although the land ownership remains as an exclusive right of the Mozambican State. Land-use concessions are granted for periods of up to 50 years with the option to renew, and these concessions substitute land titles but are not accepted by financial institutions as collaterals. land is State property in the country, but land governance system in Mozambique is sound, allowing for strong protection of community-based land rights, community consultation with respect to partnerships with investors, and secure rights to land for investors. But as in many other cases, the *de jure* existing framework is insufficiently implemented, which results in as little as only about 10% of the communities have registered property rights.

Intellectual property rights are equally protected with the adoption of specific legislation since 2000, thus allowing for recourse to criminal or administrative tribunals in cases of alleged intellectual property right violations, but full enforcement of intellectual property rights legislation is still a serious challenge.

The legal and operational frameworks in the country appear to favour multinationals and megaprojects, and disfavour the ordinary private sector company, especially the SMEs. As a result, the private sector is dominated by individual entrepreneurs (93%) and micro-enterprises (6.6%), in spite of the recognition that FDI directed to SMEs creates far more employment than megaprojects, for the number of SMEs remains insignificant (0.02% of enterprises, employing between 50 and 100 workers), which is at odds with the rhetoric that the government supports SMEs.

Mozambique's Constitution prohibits discrimination based on race, sex, ethnic origin, place of birth, religion, educational level, social position and the legal status of parents or profession. , and legal and programmatic frameworks in support of women have been put in place, awareness-raising campaigns have been launched and gender parity in education and government has become an unsurmountable imperative, particularly taking into consideration that women make up 52.3% of the labour force, according to the 2017 population census. Women emancipation is a reality in the country, judging from the parity that has been achieved and continues to grow between men and women in decision-making positions, despite the inexistence of quota system in the country.

In 2020, a total of 94 members of parliament (37.6%) were women. Nine of the 22 cabinet members were women (ministers). At the provincial level, three of the 10 elected governors are women and 35% of the members of the Provincial Assemblies are women. In addition, the leadership of the Assembly of the Republic, the Attorney-General's Office, the Administrative Tribunal, and the Constitutional Council are held by women. In the Civil Service, women represent 39% of the staff. In 2019, the country ranked 127 out of 162 in Gender Inequality Index.

After the country' was pushed into the condition of seriously distressed economy, Mozambique experienced a slow GDP growth recovery of 3.7% in 2017 and 3.4% in 2018, with a reduction of 2.3% in 2019, and thrown into a negative GDP growth rate of -0.5% in 2020, as a result of being severely hit by two demolishing tropical cyclones in 2019 (IMF, 2021), as shown in Table 1.2. The Mozambican economy remains highly vulnerable to climate-related shocks as these disrupt supply chains for megaprojects, destroy infrastructure and destroy the output of subsistence agriculture. With FDI in mining contracting, FDI inflows decreased from $2.7 billion (17.5% of GDP) in 2017 to $2.2 billion (14.4%) in 2019). FDI continues to be hampered by an unstable political and security environment, inadequate transport and port infrastructure, vulnerability to natural disasters, and the current sovereign debt crisis (BTI, 2022.

In the fall of 2020, an estimated 43.578 workers lost their jobs in the formal economy as a result of the COVID-19 pandemic. Most of them had been employed by small and medium-sized enterprises. Mozambique's economic outlook is promising as offshore gas exploitation could lead to a diversification of the economy, the transformation of subsistence agriculture into agroindustry and could generate higher revenues along with enhanced macroeconomic stability, despite delays in the implementation of those megaprojects.

Table 1.2 shows that the current account deficit widened in 2020 to 25.8% of GDP (-$3617 billion), up from 19.8% in 2019 (-$3022 billion). Fiscal strains and tight monetary policies substantially decreased public investment apart from emergency measures in the context of natural disasters and COVID-19. Irrespective of the fact that the country is reducing its debt-to-GDP ratio, improving tax collection, and reaching debt restructuring agreements, Mozambique’s debt strength carrying capacity remains weak. Mozambique’s eligibility for the G20 initiative provided short-term debt service relief. However, in order to enhance its debt sustainability, the government would need to further diversify its economy, broadening its export base and applying a prudent borrowing strategy (BTI, 2022).

Resource use efficiency is another area of serious concern where, according to BTI (2022), the State expenditure for 2021 was set at 32% of GDP and was slightly lower than in 2020. The same source sates that it remains as a matter of concern the high percentage of operating costs (64.65%), of which 56.3% are staff expenditures, 22.59% of the State budgets are allocated to investment expenditures, and about 10.13% of the State expenditure is on goods and services especially dedicated to medical supplies for the National Health System to face the COVID-19 pandemic. The fiscal deficit has widened to 7.2% of GDP in 2020, and the financing picture remains tight as direct budget support has been suspended since the revelations on the unclosed debts.

The country’s immediate priorities can contemplate, among other things: full restoration of market confidence; public debt restructuring; restoration of the country’s attractiveness and investor confidence; effective tackling of corruption, organised crime, and the perception of impunity; addressing climate threats and increasing resilience; economic transformation by attaching primacy to sector and product diversification; export promotion of selected priority sectors and products; tackling the root causes of political instability, insurgency and violence, particularly in Cabo Delgado.

The recent approval of the International Monetary Fund (IMF) resumption of its support to Mozambique’s State Budget, in the amount of US$ 470 million for a period of 3 (three) years has come as a very good news at the right time, six years after its suspension, with the discovery of the unclosed debts. The implementation of the support programme is expected to improve the public debt management and the implementation of macro-economic, fiscal and structural reforms needed for the promotion of a better governance of public finances. The programme is also expected to provide for the improvement of the budgetary space for the financing of social protection programmes, covering over 30,000 households per year, with an impact on the lives of 150,000 people (Minister for the Economy and Finance, Max Tonela, 2022).

In IMF’s perspective, this programme should also aim at supporting the creation of Mozambique’s sovereign wealth fund, an instrument that will help manage revenues from the exploitation of mineral resources, especially of liquified natural gas (LNG), in the Rovuma basin, Cabo Delgado province, in the north of the country.

1.3. Research Intellectual Puzzle, Motivation, and the Research Question

The research domain is Strategic Management in terms of devising effective investment decisions in the cashew nut industry in Mozambique, aimed at taking advantage of the enormous potential identified in this sector, and strategically addressing the factors affecting its competitiveness. This should aim to achieve a maximum profitability of investment and maximum exports of Mozambican cashew nut kernels[2] in the international market, in particular with regard to: **i**) Productivity and price levels; **ii**) Quantity and quality of processing to ensure higher consumer satisfaction standards than those of the competitors; **iii**) Timelier order delivery than the competition; **iv**) Effective control over exogenous factors (exchange rates, foreign price, foreign funding, foreign demand, human resources, technology and innovation, quality and quantity of infrastructure, processing and export policies).

For over 30 years (1987-2019), Mozambique implemented an IMF assisted Structural Adjustment Programme (SAP) in which a series of macroeconomic, political and social reforms were implemented with the aim of creating or improving the country's export capacity that would allow it to generate its own foreign currency reserves in sufficient amounts to be able to sustain itself with less injections of "other's money", that is, minimising the need for foreign financial assistance. At end of that set of reforms, the country has not achieved its goals, it has not improved its export capacity. There is a *Xitshwa*[3] proverb that says: "*A xipfhaki xa ku nyikiwa a xi tati tshala*[4]", translating a time-honoured conventional wisdom that no country is sustainable or even viable without exporting goods and/or services, which can only be achieved through the expansion of its export capacity: the export imperative.

It is intellectually puzzling to be unable to understand what is lacking in terms of resources or resource management and strategic organisation, either domestic or international for the cashew nut industry investors to thrive and attract others to invest bigger in such a potentially rich natural environment and increase competition, to the benefit of both investors and consumers. This makes sense, considering that Mozambique has achieved that in the past, and in view of the need and urgency of crafting a strategy in which businesses and poor rural population can work together to conciliate the former's business aim of making money with the latter's aim of fighting poverty and improving their living standards. This is feasible by growing more cashew trees and producing and exporting more cashew nut kernels again, in a country where the uncultivated land abounds, and the climate is among the most adequate for the crop.

The purpose and motivation for studying the competitiveness of the Mozambique's cashew nut industry in the international market is the identification of the factors affecting it in any way to the point of discouraging investors. It is basically about searching for an explanation as to what is influencing the level of competitiveness, a topic that is very well-known, and it is at the heart of any business success in general. In the case of the cashew nut industry in Mozambique, this topic has been studied in several different angles.

The novelty about the choice of this topic is two-fold: i) Competitiveness *per se* is a very critical indicator of economic vitality of a country, and among many studies done on the topic in Mozambique, this is, to the best of our knowledge, the first one conducted under the supervision of an academic institution, with a proper validation; ii) It is equally the first one to be based on Porter's Diamond Model, in an attempt to take advantage of Porter's postulates on the competitive advantage of a country and their application to analyse the Export Competitiveness of Mozambique's Cashew Nut Industry. This fact raises expectations about possible new insights, taking also into account that technologies and management practices are gradually rendering the cashew nut industry not only more productive but equally more ethical and transparent, where the investors can rest assured of getting higher returns on their investments. Unfortunately, the transformation is not fast enough.

Research questions bring organisation and theme to the writing, and we decided to base the research approach on the verification of what the theory says about this topic or what has been written so far on it. The economic, social and technological changes imposed by the accelerating globalisation, fast-growing intensity of international trade relations, the quick development of communication and transportation infrastructures and technologies have proven the need, importance, and urgency of achieving high and sustainable levels of competitive advantage for companies to continue to thrive and successfully operate on today's high-velocity international market, to continuously obtain bigger market shares through competitiveness.

Competitiveness can be referred to as the company's capacity to produce goods or services with a favourable quality-price ratio that guarantees good profitability while achieving customer preference over other competitors, making sure that the company is sustainable and durable. Competitiveness' main pillars include institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development and efficiency, technological advancement and readiness, market size and efficiency, business sophistication, and innovation. This thesis' research question is *"What factors, if any, of Porter's Diamond Model have an Impact on the Export Competitiveness of Mozambique's Cashew Nut Industry?"*

For the identification of Porter's Diamond Model determinants that have an influence on the Export Competitiveness of Mozambique's Cashew Nut Industry, the research techniques used a sequential assessment of both *quantitative* and *qualitative* methods, starting with the quantitative procedure.

The *quantitative method* is based on the analysis of a longitudinal dataset covering the period of 2000 to 2019, composed by 26 elements (observable items), grouped around 5 constructs (unobservable data) defined in accordance with the four (4) Porter's Diamond Model determinants plus Government.

The *qualitative method* of analysis is based on a 5-point Likert scale, structured in a questionnaire built upon a set of 30 items, as contained in Table 5.1, later on grouped according to the four Porter's Diamond determinants plus Government. For the questionnaire design and conceptualisation, we took inspiration from the analysis contained in Section 3.6 of Chapter 3 of this research work ("Competitiveness of Cashew Nut Processing in Mozambique"). The questionnaire was targeted at 347 respondents (cashew nut sector stakeholders), of which 310 responses were effectively received and processed. A factor analysis was carried out on both the quantitative and qualitative samples with a view to checking for the reliability and validity of the research instrument. Thereafter, the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique was applied to assess the relationships among the constructs of the proposed model with the use of SmartPLS 3.3.9 software, on both quantitative and qualitative samples, based on the determinants of Porter's Diamond Model, and the data collected in accordance with the description contained in Section 5.2 of Chapter 5.

On the issue of combined quantitative and qualitative methods, Denzin and Lincoln (2005), Geven (2008), Tashakkari & Teddie (2003, 2009), Bryman (2012), Ritchie and Lewis (2013), and Klenke (2016) refer to the existence of three (3) communities of researchers one of which is qualitative-oriented constructivist methodologist, who embraced qualitative research method to construct the meaning of the phenomenon under investigation, the other one being quantitative-oriented positivist methodologist, who embraced the quantitative research method to state the reality in the world, believing that knowledge is universal and absolute. And there are the so-called mixed methodologists, who embraced a pragmatic combination of both in order to avoid either or view of positivism and constructivism. According to Erzberger and Prein (1977), as cited in Teddie and Tashakkari (2005), "*divergent findings are valuable in that they lead to a re-examination of the conceptual frameworks and the assumptions underlying each of the two components*" (pp. 35). The mixed-method research tradition is less well known than quantitative or qualitative traditions because it has emerged as a separate orientation only during the past 20 years. Mixed methodologists present an alternative to the quantitative and qualitative approaches by defending the application of any methodological tools are required to answer the research question under study. In fact, throughout the 20th century, social and behavioural scientists frequently employed mixed methods in their studies, and they continue to do so in the 21st century, as described in several sources (Brewer and Hunter, 2006), Maxwell and Loomis (2003), and Teddie and Tashakkari (2003). Despite all the challenges surrounding the combined approach such as the need to determine a balanced definition of weights to attach to each dataset, the sequence of data collection and analysis, at what stage the quantitative and qualitative approaches should be integrated (Creswell, 2003; 2011), and what happens if the quantitative and the qualitative components lead to two totally different conclusions (Teddie and

Tashakkari, 2005), we decided to embark on a combined quantitative and qualitative research approach.

The choice of PLS-SEM was based on the fact that it is well enhanced to be used as a research tool in strategic management, marketing and other social spheres (Hair, Ringle, & Sarstedt, 2011; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014: Reinartz, Haelein, & Henseler, 2009).

PLS-SEM is regarded as the most fully developed component of structural equation modelling (Henseler et al., 2016). Although the use of PLS-SEM was criticised by Rönkkö et al. (2015), other researchers (Hair et al., 2018; Henseler et al., 2014; Henseler et al., 2016) addressed these critics and argued that PLS-SEM is a valid SEM statistical technique which could be used to test hypotheses. Moreover, the literature stated that PLS-SEM could handle small sample sizes such as 21 (Garson, 2016), 30 (Hair et al., 2011) and 100 observations (Kante et al., 2018). Thus, the decision to use PLS-SEM to assess the conceptual model was substantiated by current literature. PLS-SEM helps to create path models to depict causal sequence (Garson, 2016). It consists of two subsequent models. The first model (inner model) is the structural model while the second model (the outer model) is the measurement model. The structural model displays the relationships among the constructs while the measurement model is used to evaluate the relationships among the indicator variables and their corresponding constructs. Table 6.9 in Chapter 6 provides some guidelines for PLS-SEM reflective model assessment.

1.4. Thesis Structure

This Thesis comprises seven chapters divided into sections and subsections. The first chapter starts with the country's geographical, political, economic, and social background, including an overview of how the Covid-19 pandemic affected the country, and how the Government went about handling such difficult and delicate situation. It then moves on to introducing the subject matter of the Thesis, outlining the researcher's intellectual puzzle, motivation, and the research question, research design and methods. At the end of the chapter, a snapshot of the results and policy and managerial implications vis-à-vis the need to provide an answer to the research question, as well as its academic and empirical contribution, and recommendations.

Motivated by the fact that the cashew nut industry (processing) is an activity not easily found worldwide (only 10 countries), the second chapter is dedicated to a broad information sharing and discussion about the whole value chain of this industry globally and in Africa, from the cashew trees to cashew kernel trade and consumption, including its features, segments, financing problems and policies.

The third chapter provides an analysis of competitiveness context in the Mozambique, including in particular issues like doing business ranking, taxation issues, labour costs, gender issues, cashew processing competitiveness, and a SWOT analysis.

Chapter four is dedicated to the empirical and theoretical background on competitiveness, consisting of a review of extant literature, including the role of exports in an economy, and the need to continue improving the understanding and convergence promotion, given the prevailing researcher disagreement with regard to the true meaning of competitiveness. It then moves on to introduce the conceptual framework of Porter's Diamond Model whose postulates and determinants are the main ingredients in the writing of this Thesis.

In chapter five the specific research methodology is introduced and explained, including the research hypotheses, thus explaining the research methodology used to test the hypotheses. The explanation and discussion of the steps that were developed concerning research philosophies and approaches, the survey instrument, sampling, administration, and data collection.

Chapter six covers the research findings, results and discussion and the extent to which the initially assumed hypotheses are confirmed or not.

Finally, chapter seven deals with the conclusions and recommendations, and analyses the contribution to the theory and practice, as well as with policy and managerial implications from the perspective of the cashew nut industry, including limitations and suggestions for further research.

1.5. Originality

I declare that I am the sole author of this thesis document, and except otherwise stated thereof, I produced all the tables and figures included herein. Whenever a figure, table, diagram or photograph was borrowed into this thesis document, such fact has been promptly referred to thereof, except in the case of involuntary omission, which I am ready to correct as soon as such shortcoming is pointed out to me. The discussion and analysis contained in chapter 2 were substantially borrowed from Costa & Delgado (2019), as mentioned in various points of this thesis document. In the same vein, a substantial amount of the discussion contained in chapter 3 is borrowed from Nitidae (2020), as indicated along the text in this chapter.

1.6. Summary of Research Results

Given the fact that the research was conducted using two methods (quantitative and qualitative), the answer to the research question was analysed initially with regard to each method, and in the end a joint analysis was undertaken.

The use of acronyms such as FC for Factor Conditions, DC for Demand Conditions, SR for Supporting and Related Industries, E.C. for Export Competitiveness (representative of Firm Strategy, Structure and Rivalry), and GR for Government Role in the quantitative method, and QFC for Factor Conditions, QDC for Demand Conditions, QSR for Supporting and Related Industries, QEC for

Export Competitiveness, and QGR for Government Role, in the qualitative method, were an adaptation from Bakan and Doğan (2012).

On the *quantitative method*, it has been possible to get results that are in line not only with our expectations but also with the economic rationality in only two exogenous constructs, namely Demand Conditions (DC), and Supporting and Related Industries (SR), which have positive path coefficients (βs) and are statistically significant at 5% significance level, while the other two exogenous constructs, namely Factor Conditions (FC), and Government Role (GR) are statistically insignificant, with negative path coefficient for FC, and a negative Pearson's correlation with EC In the meantime, GR, despite its statistical insignificance and its extremely low path coefficient, has a positive and strong correlation with EC, suggesting that the two constructs should not be separated. In short, this result means that only two exogenous constructs (DC and SR) from the quantitative method provide the desired answer to the research question. Nothing else can be said about the other two constructs (FC and GR), given their statistical insignificance.

On the *qualitative method*, we have been able to achieve results that are perfectly in line not only with our expectations but also with economic rationality, implying that we have reached a valuable information. All the exogenous constructs have a positive, strong and statistically significant influence on the endogenous construct at 0.05 significance level.

The results will have policy and managerial implications for the government as well as for managers of the firms, both operating in the abovementioned factories and also the ones who plan to join the sector, in terms of the competitiveness of the cashew nut industry in Mozambique. It will also render a valuable contribution for further studies on the topic. We would, therefore, say that the model results provide an answer to the research question, in the sense that all Porter's Diamond Model determinants plus government have a significant impact on the Export Competitiveness of Mozambique's Cashew Nut Industry, and therefore, they represent viable channels for revamping the competitiveness of Mozambique's cashew nut industry. The detailed analysis of these results can be found in chapter 6 of this thesis.

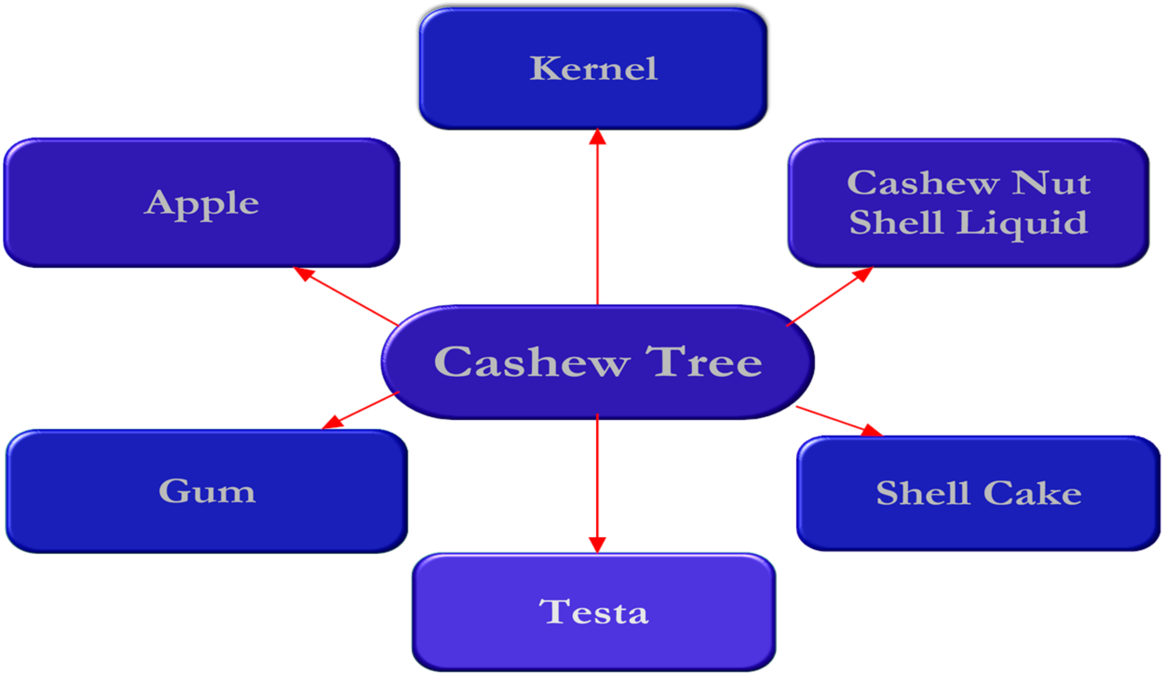
CHAPTER 2

GLOBAL AND AFRICAN CASHEW NUT PRODUCTION, PROCESSING, AND TRADE

2.1. Cashew Trees, Cashew Kernels, and By-Products

The cashew industry is based and focused on the production of cashew kernels. However, the cashew value chain contains a number of by-products that have the potential to add value to and diversify revenue from cashew production, as shown in Figure 2.1.

Figure 2. 1: Cashew Products



Source: UNCTAD (2021); author's adaptation

2.1.1. Cashew Trees

Cashew trees can grow in different climatic regions between the 27th parallel north and 28th parallel south, but most of the commercial plantations can be located between the 15th parallel north and 15th parallel south, where they thrive in moist tropical climates and succumb frosty climatic environments. The ideal climatic conditions for an optimal cashew tree growth includes an average monthly temperature of 26–28°C (Paull and Duarte, 2011), and a 1,000–2,000 mm of rainfall during a rainy season of 5–7 months (FAO, 1988), as well as an extended dry season during flowering and fruit set.

Cashew trees can grow in a broad range of soil types but they grow best on well-drained and deep sandy soils, and, like any other crop, their growth and yields depend on good orchard management, such as water and soil conservation (Indian Council of Agricultural Research-National Research Centre for Cashew, 2008), appropriate fertiliser use and supplementary irrigation, which have proven to have the potential to improve yields (Prabhakaran Nair, 2010).

Cashew trees, kernels and by-products yields are also linked to average tree age, which makes replantation and rejuvenation, pest and disease control, key aspects of orchard management. Cashew yields vary greatly between and within countries and fluctuate from season to season, and the large disparities and fluctuations in cashew yields are partially a result of the differences in soil and climatic conditions that cannot be controlled by growers but strengthening farm management practices and improving the genotypical composition of cashew orchards can contribute to higher and more stable cashew yields (Dadzie et al., 2014; Mangalassery et al., 2019; Nayak et al., 2018). In this context, the low average yields in many cashew-growing countries, including in many countries in Africa, point to a significant potential to boost productivity and increase revenues for cashew growers, which appears greatest among smallholding growers that grow the overwhelming majority of cashew nuts but have limited access to finance, quality seed material and technical know-how required to enhance productivity.

2.1.2. Cashew Kernels

Cashew kernels are the main product of the cashew industry, being consumed in various forms, including as a salty or sweet snack or an ingredient in desserts and savoury dishes, or are further processed as cashew butter or as an ingredient in a variety of spreads, sauces, bars and drinks. A cashew oil can also be extracted from cashew kernels.

De-shelling – With a view to extracting the kernel from the in-shell cashew nut, a number of processing steps must be undertaken, in which the *first step* consists of exposing the in-shell cashew nut to a thermal treatment in order to make the outer shells brittle or fragile, using one of the three main methods (steaming, roasting or immersing the in-shell cashew nut in a hot oil bath). The *second step* consists of de-shelling the in-shell cashew nuts, separating the kernels from their outer shells, a process that can be done manually, mechanically or in a fully automated manner. The *third step* involves drying the kernel, followed by peeling off the testa. The testa and cashew shell are by-products of the cashew-processing industry and can be further processed to generate other numerous products. Cashew kernels are often sold in bulk and typically undergo secondary processing, including roasting, frying and the addition of salt, sugar or flavouring, and may also be mixed with other nuts before being packaged for retail sale.

Grading In-Shell Cashew Nuts - The quality and, consequently, the price of in-shell cashew nuts depends on several factors that are typically determined through a sampling process. A key quality indicator for in-shell cashew nuts is their KOR, which is the weight in pounds of usable kernels per 80 kg of in-shell cashew nuts. A higher KOR yields a higher price since it means that more kernels can be extracted from the in-shell cashew nut. Another indicator for assessing the value of in-shell cashew nuts is the nut count, which measures the number of in-shell cashew nuts per kg. A smaller nut count corresponds to larger kernels, which generally yield a higher price. The defective rate, which measures the share of nuts that are not usable for various reasons, such as missing, stunted or moth-eaten kernels rate is an important indicator of in-shell cashew nut quality. Sampling also includes the measurement of the moisture content of in-shell cashew nuts using a moisture meter, which should not exceed 9%, in order to limit degradation during storage. Other indicators that determine the value of in-shell cashew nuts are the share of foreign matter and the float rate, that is, the share of in-shell cashew nuts that float in water, with a lower float rate corresponding to a higher quality. All the just described steps are part of a process known as the grading of the in-shell cashew nut.

Grading Cashew Kernels **-** There is a wide spectrum of cashew kernel qualities. The United Nations Economic Commission for Europe (2013) standards for the commercial quality of cashew kernels provide a system to categorize unprocessed kernels, and that is the grading of cashew kernels. The standards include a number of general quality requirements for commercial kernels, such as a maximum moisture content of 5%, the categorisation of cashew kernels into the three main quality classes of extra, class I and class II. Whole nuts are further classified into seven categories ranging from 150 to 500 according to the maximum number of kernels per pound. Broken nuts are classified according to the sizes of the pieces, ranging from large to baby bits or granules. In addition to the United Nations Economic Commission for Europe standards, there are other quality classification systems for cashew kernels, which include the industry standards of the Association of Food Industries applicable to the United States market, as well as standards developed by kernel exporting countries, such as Brazil and India. These systems generally also grade the quality of cashew kernels based on colour and size and whether the kernels are whole or broken.

2.1.3. By-Products

a. *Cashew Nut Shell Liquid (CNSL)* **-** Is a viscous liquid that represents 20–25% in weight of an in-shell cashew nut (ComCashew, 2019a) and is mainly composed of *anacardic acid*, *cardol* and *cardanol* (Kumar et al., 2009). CNSL-based polymers have numerous desirable properties such as low fade characteristics, water repellence, wear and electrical resistance, solubility in common organic solvents, compatibility with many other polymers and antimicrobial activity, which make them a suitable raw material for a range of industrial, chemical and pharmaceutical applications (Telascrêa et al., 2014).

One of the main uses of CNSL is in the manufacture of brake linings and clutch facings for the automobile industry (Lubi and Tchachil, 2000). CNSL is also used in the paint and coatings industries, in which it is a potential substitute for petroleum-based raw materials (Balgude and Sabnis, 2014). In addition to that, the potential use of CNSL as a biofuel or additive to biofuel has been demonstrated (Sanjeeva et al., 2014). It has also proven to have a range of applications in the production of rubber, adhesives and plastic materials. Last by not least, research has shown the potential of CNSL as a component of non-toxigenic insecticide (Vani et al., 2018).

There are various methods of extracting CNSL from the cashew shell. The two most widely used technologies are mechanical extraction with screw expellers and extraction through a hot oil bath before de-shelling. Other methods include solvent extraction (Tyman et al., 1989) and extraction through pyrolysis (Das et al., 2004). The chemical composition of CNSL depends on the extraction method (Srinivas and Anilkumar, 2017), which can yield CNSL with a high share of either *anarcadic* oil (natural CNSL) or cardanol (technical CNSL). The biggest producers of CNSL are Brazil, India and Vietnam. There is also some degree of commercialisation of CNSL in many countries that process cashew nuts, such as Benin, Burkina Faso, Côte d'Ivoire, Ghana, Indonesia and Mozambique.

b. *Cashew Shell Cake* **-** Cashew shell cake is the de-oiled cashew shell and thus a by-product of CNSL production that is a raw material for several products. In particular, shell cake can be carbonised and mixed with a binder to produce briquettes that can be used to fire industrial boilers (Sawadogo et al., 2018). Shell cake can also be processed into vermiculite, a product used in gardening and hydroponics.

c. *Cashew Apple* **-** The cashew apple is often referred to as the false fruit or pseudo fruit of the cashew tree. Botanically, the cashew apple is a swollen stalk, which carries the true fruit of the cashew tree: the cashew nut. Since the ripe cashew apple ferments and degrades quickly after falling from the tree, it is most of the time discarded at the time of cashew nut harvest, despite the fact that the in the cashew apple chemical composition it is rich in vitamin C and antioxidants. In addition to these products, the fibrous residues of the cashew apple juice-making process can be further processed to produce animal feed (Gomes et al., 2018) and research has shown the potential of juice residue as a source of carotenoids for food supplements or natural food colourants (Abreu et al., 2013).

A small share of cashew apples is consumed directly on orchards or processed into artisanal food products for local consumption in cashew-growing regions, yet commercial utilisation of the cashew apple remains low in most cashew-growing countries. Brazil has the highest cashew apple utilisation rate, estimated at 15% (Luciano et al., 2011). In Brazil, the majority of harvested cashew apples are processed into cashew apple juice, which is widely consumed domestically and also exported. Cashew apples are also sold as fresh fruit or processed into candy and cajuína, a clarified juice. In India, a small share of cashew apples is used to produce juices, candies, jams, pickles and chutneys. The fermented cashew apple produces an alcoholic beverage known as "*xikadju*" in parts of Mozambique, which can also be distilled into a very strong "brandy" known in parts of Mozambique as "*thonthontho*". In 2014, the Pepsi Company announced plans to add cashew apple juice to fruit juice blends for the market in India (Strom, 2014), which could increase the share of utilised cashew apples. Cashew apple juice production also takes place in Senegal and Vietnam, as well as in Ghana, where a brandy is also produced from cashew apples. Finally, several initiatives that aim to add value to cashew apples have recently emerged in other cashew-growing countries, including Benin and Nigeria.

d. *Cashew Testa* - The cashew testa (pellicle) or husk is the thin usually red skin covering the kernel, which contains a high concentration of tannins and can be used to produce tanning agents for the leather industry. There has also been research on the potential use of testa as animal feed (Fang et al., 2018).

e. *Cashew Gum* - Cashew gum, also known as *anacardium* gum, is an exudate from the bark of the cashew tree. It can be harvested from natural exudate or after tapping, that is, incision of the trunk or branch. Cashew gum is a complex polysaccharide that has a range of industrial applications, including in pharmaceuticals and the food industry (Kumar et al., 2012). It can be used as a pharmaceutical excipient in drug delivery systems (Ribeiro et al., 2016). Research has also shown the potential of cashew gum as an encapsulating agent, clarifying agent and emulsifying agent in the food and beverages industry (Porto and Cristianini, 2014).

We have just highlighted that there are several by-products in the cashew value chain which present themselves as having the potential to contribute to the diversification of the cashew-related economy and to value addition in communities involved in cashew production and/or processing (Figure 2.2). Overall, value addition to and utilisation of cashew by-products remains low, except in Brazil and India, two cashew nut producing countries that have actively promoted the development of cashew by-product industries. This stems from the fact that many cashew-growing countries such as most cashew producers in Africa export the bulk of their nuts in an unshelled state, which also limits the availability of raw materials for shell-based by-products. In these countries, the promotion of cashew by-product utilisation could go hand in hand with efforts to increase local processing. Being this the case of Mozambique, this research on the Export Competitiveness of the Cashew Nut Industry makes an enormous sense.

2.2. Cashew Nut Industry Policies and Development Opportunities

According to UNCTAD (2021), the cashew value chain is divided between the in-shell cashew nut producing countries, essentially for export, and those countries that have a processing capacity, with the former ones getting an extremely reduced amount of the value generated in the cashew industry, while the latter ones retain the lion share of it. This represents a significant potential for local value creation, employment and rural development that exists in all cashew-growing countries and regions, especially on the African continent.

Africa accounted for 53% of global in-shell cashew nut production in 2018, but it only processed 7.1% of this share, while Asia that produced 42.7% of global output of in-shell cashew nuts processed 87.5%. However, within the group of cashew nut producing Asian countries, there are countries that largely export in-shell cashew nuts, such as Cambodia (UNCTAD, 2021). Latin America essentially processed its own production of in-shell cashew nuts in 2018.

Since most of the global cashew production takes place in small farms in rural areas, local value retention can directly benefit the rural families through the achievement of the sustainable development goals by means of poverty reduction and various other channels, such as the case of Africa in 2018 where an estimated 3.06 million smallholding growers generated income from cashew production (ACA, 2019).

Figure 2. 2: The Cashew Nut and Cashew Apple

Source: UNCTAD, 2021)

Women play a critical role in cashew production and processing, which highlights the importance of the gender dimension in cashew value chain. In India, more than 90% of labourers employed in cashew processing are women who, consequently, bear the brunt of health hazards related to cashew processing (V. V. Giri National Labour Institute, 2014). In Africa, manual processing tasks such as peeling and cleaning are predominantly performed by women (AC*i*, 2012; Root Capital, 2018). But evidence shows that most cashew processing plants in Africa are headed by men (CBI, 2018) and that most cashew plantations are owned by men (AC*i*, 2010). These inequalities in the cashew value chain highlight that policy interventions in the cashew sector need to take a gender awareness approach and include measures to strengthen the role of women throughout the cashew value chain.

The processing of cashew nuts has a long history on the African continent. Mozambique was the first country in Africa to process cashew nuts on an industrial scale (UNCTAD, 2021). In the 1960s, Mozambique was the world's largest producer of cashew nuts, accounting for an average annual share of 35% of global production (FAOSTAT Database). In parallel, a local cashew-processing industry emerged. At its peak in 1973, Mozambique produced 240,000 MT and processed 100,000 MT. There were 14 large, mechanised cashew processing factories in Mozambique (Aksoy and Yağcı, 2012). In the same year, cashew kernel exports were 29,960 MT (FAOSTAT), an amount close to the 2018 total kernel export volume of the entire African continent, 21% of which were exported by Mozambique. From the mid-1970s onwards, a rapid decline in cashew production began as a result of the ageing of tree stock caused by a lack of replanting. Following independence in 1975, the Government established an export ban on in-shell cashew nuts, in order to support domestic cashew processors. However, the processing industry took a downturn during the destabilisation war (1977–1992) and struggled amid liberalisation policies that Mozambique undertook as part of IMF/World Bank Structural Adjustment Programmes (SAPs) from 1987 onwards (McMillan et al., 2003). Such policies included the privatisation of the cashew-processing industry and the removal of the export ban on in-shell cashew nuts and its replacement with a quota, which was subsequently eliminated, and an export tax that was gradually lowered, from 60% in 1991 to 14% in 1996. More recently, the cashew-processing industry in Mozambique has begun to re-emerge and, in 2018, ranked second in capacity and output in Africa, as shown in Table 2.1.

Côte d'Ivoire is the country with a seventy thousand MT installed cashew nut processing capacity per year, the largest cashew processing industry on the African continent. Other countries in Africa with significant cashew nut processing industries include Mozambique, Nigeria, Ghana, Tanzania, Benin, and Burkina Faso. However, the capacity of these countries is still much lower than their respective production of in-shell cashew nuts. The opposite is the case of India and Vietnam, which have the largest processing capacities in the world. In both countries, the domestic processing capacity is far larger than their in-shell cashew nut production, which gives rise to their strong import demand for in-shell cashew nuts from the international market. According to UNCTADStat (2021), a common feature of the cashew nut processing industries in Africa is the high level of disparity between installed capacity and capacity utilisation.

Among the main cashew-processing countries in Africa featured in Table 2.1., the average ratio of capacity utilisation was less than 50% in 2018, which indicates that they face difficulties in securing a stable and sufficient supply of raw materials to keep their operations going throughout the year. This suggests that policies aimed at increasing cashew processing in Africa need to focus not only on adding new processing sites but also, and above all, in increasing the utilisation rates of existing units.

Table 2. 1: Cashew Nut Processing Capacity Utilisations in MT (2018)

Country	Estimated Processing Capacity	Real Cashew Nut Processed	Capacity Utilisation Rate (%)
India	2,000,000	1,675,000	83.8
Vietnam	1,800,000	1,450,000	80.6
Cote d'Ivoire	140,100	68,000	48.5
Mozambique	105,000	53,517	51.0
Tanzania	42,073	10,000	23.8
Ghana	45,750	23,300	50.9
Nigeria	48,000	20,000	41.7
Benin	35,000	18,750	53.6
Burkina Faso	18,000	8,701	48.3

Sources: UNCTAD calculations; ComCashew, 2020

One way of highlighting the potential for value addition that is foregone if cashew nuts are exported in-shell is to consider the prices paid at different stages of the value chain. In-shell cashew nuts exported from Côte d'Ivoire (the largest exporter of in-shell cashew nuts in the world in 2018), processed in India (the largest importer of in-shell cashew nuts from Côte d'Ivoire in 2018) and roasted in the European Union (the largest market for cashew kernels in 2018). The farm gate price (the price paid to cashew nut tree growers) of in-shell cashew nuts in Côte d'Ivoire was $0.68 per kg, while the export price of cashew kernels from India to the European Union was $2.35 per kg of in-shell cashew nut equivalent. This means that cashew growers in Côte d'Ivoire received less than 30% of the price paid for processed cashew nuts exported from India. After secondary processing in the European Union, name-brand roasted and salted cashew kernels yielded retail prices in the vicinity of $25 per kg, corresponding to about $5.75 per kg of in-shell cashew nut equivalent.

Another important domain of the cashew value chain is that of *by-products*. Countries that export in-shell cashew nuts forego opportunities of adding value not only to cashew kernels, but also to cashew shells. Therefore, the development of cashew shell-based by-products can go together with the expansion of de-shelling operations. In addition, cashew apple-based products have a great potential for value addition and employment generation in cashew growing countries.

Cashew de-shelling consists of separating cashew kernels from their outer shell. The shell contains CNSL, which has a range of industrial applications. In addition, dried cashew shells can be directly used as fuel. However, it is estimated that only 5–25% of cashew shells are used in Africa, essentially as fuel to heat boilers on processing sites. The remaining 75– 95% of cashew shells are burnt in open pits or otherwise discarded as waste, which represents both a financial cost for cashew processors and an environmental cost in terms of greenhouse gas emissions and soil and surface water contamination (Technoserve, 2020). Increasing the share of cashew shells utilised for CNSL extraction and/or energy generation can *improve the competitiveness of cashew processing* businesses by reducing energy and waste disposal costs and generating additional revenue. In addition, cashew shell utilisation can contribute to mitigating the environmental footprint of cashew processing plants.

The shell represents about 70% – 75% of the cashew nut in weight. Based on an estimated 279,000 MT of in-shell cashew nuts shelled in Africa in 2018, de-shelling generated between 195,000 MT and 209,000 MT of cashew shells in Africa in that year alone. A study identified a number of examples of cashew shell utilisation in countries in Africa, including, in Burkina Faso, a cashew shell pyrolizer heating a boiler of a cottonseed oil factory and, in Guinea-Bissau, a power generator running on a steam turbine fed by cashew shells (Away4Africa, 2018).

The cashew shell utilisation on a larger scale is constrained by a number of challenges, such as the lack of a continuous supply of feedstock as a result of the seasonal nature of cashew nuts, as well as the limited access to technology and know-how, accurate market information and training. The prospects of increasing cashew nut production and processing on the African continent presents the potential of increased volume of cashew shells produced in Africa, which in turn increases the importance of addressing the challenges related to the wider utilisation of cashew shells.

The *cashew apple* is another cashew by-product with significant economic potential. Brazil is the only cashew-growing country that adds value to cashew apples on a large scale, whose processing is challenged by its high level of perishability and short shelf life of the cashew apple and its juice. This requires appropriate post-harvest practices and processing techniques, to make it possible and feasible to commercialise a range of cashew apple products, using a range of preservation methods, including thermal treatment, high-pressure processing and low temperature storage (Das and Arora, 2018).

A key challenge to the wider utilisation of cashew apples, apart from the inherent seasonal nature of the cashew market, is the lack of awareness among growers and potential processors about the economic value, processing technologies and marketing channels for cashew apple products. In many cashew-growing countries, consumers are not used to cashew apple products. Therefore, strategies to promote cashew apple processing need to include both capacity-building and market development. There are examples of areas in which these challenges have been addressed, often through donor-funded initiatives, which have led to the establishment of successful cashew apple processing businesses. According to CBI (2018), a company in Benin produced about 200,000 bottles of cashew apple juice in 2017.

Most cashew-growing countries have implemented policy measures aimed at promoting domestic cashew processing (UNCTAD, 2021). The major cashew-processing countries implemented a series of policy initiatives and measures that led to a successful establishment of a functioning cashew processing industry with special highlight to the following:

India started in the 1920s. Soon after independence in 1947, India began to promote cashew production, cashew processing and the export of processed cashew products through targeted policies and the establishment of dedicated agencies for the promotion of exports of cashew kernels and CNSL, and focused on domestic cashew production and processing. In 1971, the Indian government initiated a research programme on cashew nut cultivation, focused on improving productivity and quality in cashew cultivation, enhancing processing efficiency and increasing value addition in the cashew sector. India levies an import duty on cashew kernels, which supports the domestic cashew-processing industry. An import tariff on in-shell cashew nuts was introduced in 2006, to reduce the reliance on imported in-shell cashew nuts. Cashew kernel exporters have also benefited from an export incentive that was later recommended for withdrawal after a dispute at the WTO.

The cashew industry in Vietnam emerged later than in India. Commercial production and processing started in the late 1980s. The government support played an important role, and established VINACAS in 1990 to support cashew production, processing, trade and marketing in Vietnam which includes technical support and training for growers and businesses in the cashew sector, as well as the signing of agreements with trade associations of key in-shell cashew nut exporting countries.

The area under cashew cultivation has expanded by more than five-fold, from 79,000 hectares in 1992 to 407,000 hectares in 2008 (Vietnam statistical yearbooks), and the capacity of the cashew nut processing industry has increased rapidly. Vietnam exported in-shell cashew nuts to India in the early 1990s, since it could not process all of its domestic production. In 2007, Vietnam overtook India as the largest exporter of cashew kernels (Comtrade database). The cashew nut processing industry benefits from a reduced import tax of 5% on in-shell cashew nuts. The vision of the government for the cashew sector includes the expansion of cashew production through new plantations and higher levels of productivity, an increase in the domestic consumption of cashew kernels and the expansion of secondary processing of cashew kernels (roasting, salting and coating).

The paths of India and Vietnam to becoming major cashew exporters differed in many ways, but they both suggest that government support through well-designed, targeted policies can play an important role in promoting a cashew-processing industry. Policies need to take an all-encompassing view of the cashew industry, including cashew production and trade, and policies also need to be tailored to local circumstances, such as the availability of labour and investment costs. Finally, both India and Vietnam have supported their cashew industries in meeting quality and production standards that are needed to comply with requirements in the main cashew consumer markets, which is a precondition for a successful cashew-processing industry. Annex 8 talks eloquently about the differences in government support among the four major cashew kernel producing countries.

Cashew processors in Africa face a range of challenges that put them at a disadvantage vis-à-vis their counterparts in Asia and limit the continent's capacity to process a higher share of the cashew nuts it grows (UNCTAD, 2021). The one most important challenge is the difficulty in ensuring a continuous supply of quality raw materials and in bridging the supply gap between harvest seasons. The harvest season in Côte d'Ivoire lasts from February through early June, and there is no supply for the rest of the year, which leads to a situation where processors need to pre-finance and stockpile large volumes of in-shell cashew nuts to keep their plants running continuously, which implies a significant financial burden as a result of credit costs, the need to build and maintain storage facilities and the loss of quality and weight in stored in-shell cashew nuts. Processors in Asia are at an advantage since they import in-shell cashew nuts from different regions and therefore pre-finance and store in-shell cashew nuts over shorter periods. The high costs of doing business and investing in Africa, aggravated by the lack of adequate infrastructure, places a heavy burden on the competitiveness of cashew processors in Africa. While India and Vietnam rank at 63 and 70, respectively, in the ease of doing business, Côte d'Ivoire and Tanzania, the largest cashew producers in West Africa and East Africa, rank at 110 and 141, respectively (World Bank, 2020). The profitability of processors in Asia is also strengthened by their access to markets for broken and lower-grade cashew kernels. India has a significant domestic demand for broken and lower-grade kernels, which are used as ingredients in sweets and savoury dishes. Vietnam exports broken and lower-grade kernels to China. However, the main export markets for cashew kernels from Africa are the United States and the European Union, where cashews are largely consumed as snacks, so that most of the demand is for high-grade whole cashew kernels.

Meeting the prevailing quality standards required for entering OECD markets, especially the EU and the USA consumer markets for kernels, is another dauting challenge for African countries (UNCTAD, 2021). The majority of cashew kernel trade flows are destined to OECD member countries, in particular the United States and European Union member States. These countries generally have high food safety standards, which includes limits on pesticide residues, microbial contamination and the presence of aflatoxins and other mycotoxins. While food safety certification is not a legal requirement to enter European markets, it has become a *de facto* condition for market entry (CBI, 2020). Standards and requirements also apply to the packaging and labelling of cashew nuts. Capacity constraints in meeting such quality standards and certification requirements need to be addressed to enable the growth of the cashew processing industry in Africa.

Another area of critical importance in Africa is concerned with policies for the development of the cashew industry. Many cashew-growing countries in Africa have identified the cashew sector as a priority in the context of their agricultural or industrial development programmes. The development of the cashew value chain is part of the national development plans of most cashew producing African countries.

Export taxation and other restrictions on exports of in-shell cashew nuts are common in Africa. However, the domestic de-shelling industry did not have the capacity to process the full volume. In some countries, government were confronted with serious difficulties in finding buyers for the excess in-shell cashew nuts, and private traders were reallowed into the market for the 2019/2020 season.

The major aim of such export restrictions is to open a window of opportunity for domestic processors to scale up their level of processing, which lags far behind production across countries in Africa. However, achieving this objective is not a neutral exercise, since export taxation or export bans on in-shell cashew nuts can have a range of static and dynamic impacts that need to be considered. An export tax widens the gap between the domestic price and the FOB export price of in-shell cashew nuts, reducing the price of raw materials for domestic cashew processors and generating a revenue for the government. An export tax can also lead to a lower average producer price, which harms cashew growers. An outright ban on exports of in-shell cashew nuts is equivalent to a prohibitive export tax and is thus the most extreme form of export restriction. An export ban leads to an increase in the domestic availability of in-shell cashew nuts in the short term, which benefits the cashew-processing industry. However, an export ban, similar to an export tax, can depress producer prices, since it cuts foreign demand out of the market. This can not only cause hardship and an aggravation of poverty levels among cashew nut growers but also lead to the discouragement of investments and the replanting of new cashew orchards, and the adequate management of the existing ones. This can ultimately lead to lower productivity and declining production, which harms the processing industry. Therefore, export restrictions of any kind need to take into account impacts along the entire cashew value chain, to ensure that any unwanted effects are accounted for and preventively remedied beforehand.

Export restrictions need to be effective in order to be enforceable, in the sense that any trade restriction creates incentives for smuggling and informal trade that can undermine the objectives of the policy intervention. Benin and Côte d'Ivoire have banned exports of in-shell cashew nuts by land in order to limit informal trade seeking to avoid the payment of export taxes. Such a measure is only effective if trade across land borders can be adequately monitored. However, if land borders can be monitored, an export ban may be unnecessary, as the export tax could also be collected at such borders.

However, research appears to suggest that, despite the imposed restrictions, there was significant smuggling of in-shell cashew nuts out of Côte d'Ivoire and across several land borders in West Africa in 2018 (Nitidae, 2019). In terms of the African continent as a whole, export ban across land borders can have a regional limiting effect on the availability or access to raw materials by West African cashew nuts processors, which runs counter to the spirit of the African Continental Free Trade Area that was recently launched. Recently, we have been confronted with a shocking information on the existence of a cashew nut processing plant in Zimbabwe near the border with Mozambique that even exports kernels, when we all know that there is no single cashew tree in that neighbouring country!

McMillan et al. (2003) asserts that in the presence of other market imperfections, a reduction of export restrictions on in-shell cashew nuts does not automatically lead to significant gains for cashew growers. These researchers found that cashew market liberalisation in Mozambique in the in the mid to late 1990s only led to modest gains for cashew nut growers. A typical issue in cashew value chains in Africa is the presence of traders that intermediate growers on the one hand and processors or exporters on the other hand. Such brokers buy cashew nuts from growers or local collection centres and resell them with significant mark-ups. This absorbs some of the value created by growers, who could benefit from higher prices if they were better connected to processing and exporting sites. Another not less important segment of intervention in the cashew value chain is that of incentives to processors. Several in-shell cashew nut producing countries in Africa provide incentives to promote local processing, and the overwhelming majority of these are fiscal incentives that take the form of reductions of or exemptions from taxes, tariffs and fees, but there are also examples of regulatory measures and direct subsidies. Côte d'Ivoire appears to have the most comprehensive support programme for cashew processing in Africa.

Cashew processors are exempt from import duties for machinery and spare parts in Benin, Côte d'Ivoire, Ghana, Nigeria and Tanzania. Temporary profit and sales tax exemptions and reductions apply to new cashew processors in Côte d'Ivoire, Ghana and Nigeria. In Côte d'Ivoire, policies to support local processing also include a subsidy of 400 CFA Francs (US$ 0.69) per kilogram of cashew kernels exported, which is financed through the export tax on in-shell cashew nuts; a government guarantee fund that supports processors to pre-finance the purchase of in-shell cashew nuts; and a reduction of the fee for mandatory environmental and social impact assessments for new cashew processing plants. In several countries, including Ghana, Mozambique and Tanzania, cashew processors benefit from reduced or waived broad-based export taxes that otherwise apply to agricultural products. Togo plans to channel revenue from the export taxation on in-shell cashew nuts to a new fund for the management of the cashew sector.

Other policies that have been implemented in Africa include measures that prioritise local processors to purchase in-shell cashew nuts, and exports of in-shell cashew nuts can only be allowed after these domestic processors have been satisfied. In Côte d'Ivoire in 2018, exporters were required to reserve 15% of in-shell cashew nuts for local processors. In addition, Mozambique has preferential purchase windows for local processors at the beginning of the harvest season, within the context of the implementation of the right of first refusal (ROFR).

2.3. From Tree to Trade – The Production and Processing of Cashew Nuts

In many different places along the sandy soils and temperate climate of northern Mozambique we find the perfect growing conditions for cashew trees, and the main phases of cashew business development are summarised in Figure 2.3. Mozambique uses to have 50 million cashew trees in 1973, of which 30% were lost over time, bringing the country's population of cashew trees down to 35 million by early 1990s. According to IAM's (2021) estimates, the current population of cashew trees is 42 million, of which 30.6 million in productive phase (average age between 20 and 25 years), 5.6 million old (over 25 years), and 5.8 million in growth stage. The same source indicates that the productivity per tree is 12 kgs of in-shell cashew nuts per year when well treated, and only 3 kgs per year when not treated. Now and then, around 70% of the trees are located in the country's "cashew belt" that cuts across the northern provinces of Nampula and Cabo Delgado, with lesser production in the provinces of Zambezia, Inhambane, and Gaza. If the trees are taken proper attention and care, average yields can be 8 to 11 kgs of in-shell cashew nuts per tree per year, and the productive lifespan of a tree can reach upwards of 50 years and beyond. That is why, at these rates, cashew production is a business opportunity for smallholding rural families that lasts for generations (SPEED+ Project, 2018).

Figure 2. 3: The Cashew Nut Production Stages in Mozambique

Source: Adapted by author from Industry Reports

For many decades, cashew production has been the main source of income for over 1.4 million rural families in the country. It is a very reliable cash crop that growers can produce, functioning as the economic backbone of thousands of communities throughout Mozambique. Smallholder cashew growers own and manage small plantations of 10 to 20 cashew trees, alongside other crops. At the harvest, which occurs from October to February in Mozambique, the average cashew grower produces about 100 kgs of in-shell cashew nuts for sale to nearby processing facilities. In 2013, total production of in-shell cashew nuts was 83,000 MT, making Mozambique the 2nd largest cashew producing country in East and Southern Africa (after Tanzania), and the 12th largest producer globally (after Brazil).

One of the most daunting challenges for Mozambique's cashew nut industry throughout the past few years has been the declining productivity of the country's cashew trees. Since the end of the destabilisation war in 1992, and the demolishing cyclone Nadia which destroyed 40% of plantation areas in 1994, the rhythm of the badly needed re-plantation to replace those trees that were destroyed has diminished so dramatically. As a consequence, yearly yields in the country's cashew producing regions have been well below their potential, between 2 and 4 kgs of in-shell cashew nuts per tree per year, against the maximum between 8 and 11 kgs per tree per year. Production is now being revitalised, however, through new planting initiatives and distribution of seedlings, as well as grower extension programmes and improved input delivery systems.

Cashew Processing - Mozambique has 15 operating cashew processing factories, located primarily in rural communities. Together, these factories employ nearly 15,600 workers, thus contributing to the stabilisation of wage employment in areas where that is possible. All processing plants in Mozambique employ either manual or semi-mechanised processing models. In semi-mechanised factories, processing is supported by the use of calibration, cutting, and peeling machines, but manual labour remains crucial for a number of operations such as scooping, grading, among others. In spite of the fact that the quality and efficiency of machines have improved substantially over the past few years, there is still a lower breakage rate with manual processing, and many facility owners and managers remain loyal to manual processing, and therefore, they opt for processing the largest and most valuable nuts by hand as to ensure maximum kernel output and sales profitability.

Mozambique’s cashew processors have adhered to sustainable sourcing, implementation of traceability systems in their facilities, and compliance with food safety certification programmes. The current basic batch processing systems and paper-based tracking forms are rapidly shifting to higher-tech measures that are based on the use of bar codes and computer-based tracking systems to chart the kernels’ path from farm to table elsewhere in the world.

Processors acquire in-shell cashew nuts from growers during the harvesting season campaign (October through February), with the bulk of the purchases occurring in November and December. The infographic displayed in Figure 2.4 depicts clearly all the steps of cashew nut processing, starting with the arrival of raw cashew nuts at the factory gate through their commercialisation.

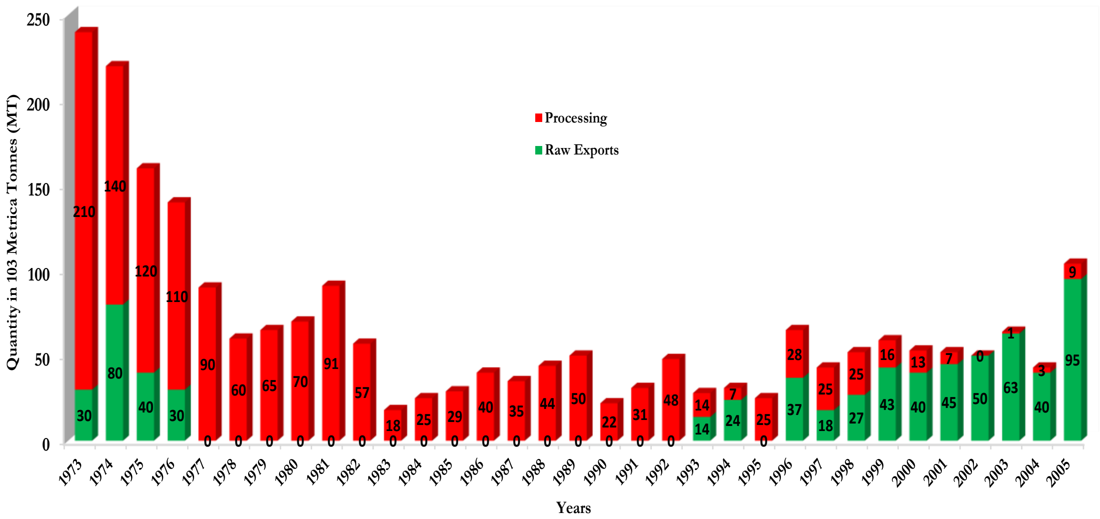
Figure 2. 4: From Tree to Trade - Cashew Nut Production and Processing

Source: SPEED+ Project, 2018

2.4. Evolution of Mozambique's Cashew Nut Industry (1970-2019)

The overwhelming majority of facts analysed in this section is based on data from Technoserve Database, FAOSTAT Database, supplemented by author's knowledge and experience, being one of the orchard owners in Mozambique. For a better understanding of the cashew nut industry in Mozambique, it is crucial to know that the country went from being the number one producer of in-shell cashew nuts and exporter of cashews kernels in the world during the early 1970's, having produced 240,000 MT in 1973, and supplied the equivalent to a 50% share of the whole cashew kernel international market, to the country's current condition of a small exporter of both in-shell cashew nuts and cashew kernels. In 2002, Mozambique's processing capacity had disappeared completely, when the country reached, for the first time in 32 years, zero MT processing level (Figure 2.5), as a consequence of a combination of factors during a long-lasting decline: destabilisation war, inappropriate price policies, the World Bank imposed trade liberalisation through the ban on raw cashew nut exports tax, the rapid spread of the powdery mildew disease (locally most known as *oídio*), the option for mechanised large plants technology. After such a devastating breakdown of the industry very few people believed in a possible comeback of cashew processing in Mozambique. However, today the industry has bounced back with production levels approaching 110,000 MT, of which roughly 45,000 MT domestically processed in 2019. In the evolution of the cashew nut industry in Mozambique, five (5) distinct periods can be considered.

Figure 2. 5: Mozambique Raw Cashew Nut Exports & Processing (1973 - 2005)



Source: Technoserve (AIA Business); author's adaptation and analysis

The first phase is the *pre-independence era* (prior to 1975), recalling that the cashew tree was introduced in Mozambique by Portuguese explorers in the 15th and 16th centuries. According to World Bank studies, it is a crop that grows easily on marginal lands, and around 97% of the world's in-shell cashew nut production come from wild growth and smallholding growers, while the remaining 3% come from planned orchards. Given the intensification of the relations between East Africa and India, at the end of the 19th century, some entrepreneurs from Goa developed the first industrial cashew nut de-shelling to add value to the crop (Ribeiro, 2008), and Indian processors started importing in-shell cashew nuts from Mozambique at the beginning of the 20th century. Around the mid-1950s, domestic processing and export of the cashew kernels to the international market started. By the early-1960s, the cashew nut de-shelling consolidated, and the country reached its golden period in this industry. As shown in Figure 2.4, the country reached its peak production of 240,000 MT of in-shell cashew nuts in 1973 of which 30,000 MT exported in raw format and 210,000 MT processed domestically, turning Mozambique into the largest producer globally, with an installed processing capacity of 100,000 MT secured by 15 large factories.

The phase that follows is the *immediately after independence era* (also classified by some researchers as the nationalisation period), basically characterised by a number of unfavourable developments, such as: a massive departure of Portuguese colonial settlers who were factory owners, the handing over of cashew processing plants to unexperienced and ill-manned administrative commissions made up young Mozambicans, the establishment of a national company, "Caju de Moçambique, EE", for the management of the entire cashew nut industry, the lack of qualified labourers to maintain and supervise the maintenance of the mechanical and electro-mechanical equipment, the persistence and deepening of the destabilisation war, and the lack of access to raw materials.

Despite all these encumbrances, the company was able to carry out its exports and survive, since USA (the largest market for the Mozambican kernels) and Mozambique were able to maintain marketing channels with higher prices, and some trade and cooperation agreements with Eastern European countries were signed to access these markets. The increasing difficulties in the implementation of the agreements with Eastern Europe, aggravated by the destabilisation war, rural exodus, and little investment in tree replantation and orchard maintenance, disrupted the entire productive chain, leading to a steep fall in productivity, and a gradual collapse of the cashew nut industry. In addition, the combined effects of a deficient orchard management, cashew tree aging, and uncontrolled wildfires accelerated the spread of pests (Helopetis spp) and diseases (*oidium anacardium*) resulting in a sharp production decline from 140,000 MT in 1976 to only 18,000 MT in 1983 (Figure 2.4), which rapidly led to serious financial difficulties and increasing inefficiencies with the nationalised companies, rapidly causing a deep weakening of the industry and a 30% drop in export earnings between 1978 and 1990 (Leite, 2000).

Following the deep weakening of the cashew nut processing industry, the country entered *the post-economic reforms era* (known by some as the liberalisation period), dominated by a growing accumulation of in-shell cashew nut stocks, given the collapse of the processing industry, which generated a domestic raw material surplus that pushed the government into lifting the ban on exports of in-shell cashew nuts policy in January 1992. Recall that the ban on exports of in-shell cashew nuts policy instituted by a Mozambican Government legal command established a maximum export share of 10,000 MT, with a 60% export tax.

Given the continuous worsening of the country's economic situation, the government of Mozambique commissioned a study that showed that Caju de Moçambique was not viable and had no future, and a political decision to privatise it was taken immediately, with the support of international institutions such as FAO and World Bank. These institutions imposed the liberalisation of exports of in-shell cashew nuts through the elimination of the in-shell cashew nut export tariff, in order to increase producer (grower) prices, and to stimulate greater investment in orchards and an increase in the supply of raw materials, the production recovery, the regaining of lost jobs through the increase in raw cashew nut production. These events that took place within the context of the cold war imprinted more pressure on the Government of Mozambique with a view to quickly organising the privatisation of the State's business sector, with the support of international institutions, a process whose major challenge was the inadequacy of managers, lack of technical staff, aggravated by the existence of a deep technological mix at the level of companies, requiring proper technical maintenance and spare parts imports, which resulted in the skyrocketing of maintenance costs.

It was the World Bank's assumption that the liberalisation of exports of in-shell cashew nuts through the elimination of the export tax on this product would lead to an increase in producer prices, and that would result in attraction of greater investments in orchards and an increase in the supply of the raw material. It was equally the Bank's belief that the jobs lost as a consequence of processing companies' bankruptcy would be absorbed by the increased production of in-shell cashew nuts. A conflict between processors and exporters was re-ignited, but the protracted discussions and negotiations that followed failed to lead to any compromise solution among the quarrelling groups, and the liberalisation followed its course.

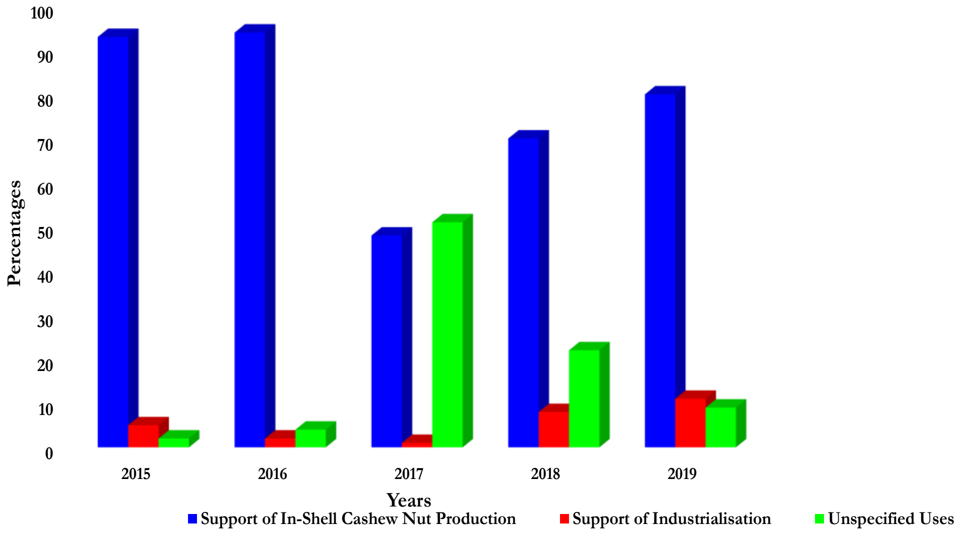
The ban on in-shell cashew nut export tariff led Mozambique to depend almost exclusively on India as the largest buyer of its in-shell cashew nuts, and it also meant the end of export licensing, which caused an increase in the number of exporters and intermediate traders, both formal and informal, thus turning the cashew nut economy into being based on the interests of intermediaries and storekeepers, and the creation of three layers of intervention between producers and the international market, namely: the small intermediaries, the wholesalers and exporters (in-shell cashew nuts) or processors (kernel), who rapidly fell under the pressure from the formal and informal intermediaries, who replaced the rural canteens which, for decades, functioned as the primary aggregators of in-shell cashew nuts. Traders had a greater interest in selling to Indians than to domestic processors, as a result of their economic situation and their inability to compete with Indian prices that stood at USD 689 per MT in the 1992/1993 marketing season, against the USD 271 offered by national processors. With the liberalisation, producers received minimum gains, the unemployment among industry workers skyrocketed and the economic fragility and rural poverty increased sharply.

From the *2000s onwards* new policies were embraced, at a time when cashew processing industry showed signs of recovery as new private investments in the country allowed the appearance and consolidation of small to medium-sized cashew processing plants, with semi-mechanised technology, which allowed the use of intensive labour, job creation, more income, and a boost in the rural economy. This model, based on small and medium-sized, semi-mechanised processing plants, owned by individual entrepreneurs in rural areas, especially in northern Mozambique, led to the re-emergence of Mozambique kernel exports in the market, but the recovery has been disappointingly slow for the product to regain or even surpass its past share of the international cashew kernel market. A faster recovery and production expansion, including exports, would also bring about the business contribution to the upgrading of the living standards of the small and medium-sized cashew growers in rural areas, through a better in-shell cashew nut producer price paid.

The income from the tariff on in-shell cashew nut exports was used by IAM's predecessor (INCAJU[5]) to support the development of this industry, observing the shares determined by law, that is, 80% to promote cashew nut production and 20% to promote industrialisation activities. However, according to the data provided by IAM, there are some management problems, and the income has not been used in accordance with the legal determination, with significant amounts being spent on unspecified uses particularly in 2017 and 2018, as shown in Figure 2.6.

IAM finds itself in a strait jacket, particularly considering that out of the meagre export tax income it has to ensure the implementation of a broad number of activities, namely the support to the promotion of production by improving the productivity of cashew trees and quality of the nuts, including the purchase of chemical inputs for the trees, the institutional training of IAM staff, as well as the monitoring of commercialisation activities and the coverage of the Guarantee Fund for the processors, which implies a seriously tough management of extremely scarce resources.

Figure 2. 6: In-Shell Cashew Nut Export Tax Income Distribution (%)



The main objective of the Guarantee Fund is to provide coverage to those who wish to get themselves involved in activities related to cashew nut industrialisation promotion at subsidised rates. Since its inception in 2001, as a result of an agreement between Banco Comercial de Investimento (BCI), and IAM, the Guarantee Fund was initially intended to have a five-year duration, but it has been extended until today, and one of its major problems is that the lion share of its amount goes to the small and medium-sized projects, leaving the larger cashew kernel processors and exporters out.

On the basis of a study undertaken in 2018 by SPEED+ Project on the cashew nut industry, analysing the current political regime, it was possible to reach the conclusion that *current policies* have impeded the competitiveness of cashew nuts in Mozambique and favoured the inefficiency of the industry, pointing out to the low prices paid to producers as a cause of the low quality of the nuts, the low productivity of the trees, and the lack of investment in orchards (phytosanitary measures and renovation).

The study proposed a series of measures that are believed to have an effect in increasing competition for in-shell cashew nuts and the prices paid to producers (growers) by transferring the in-shell cashew export tariff revenue to encourage greater investments by producers in their orchards, and ultimately improve the industry's competitiveness. These are: **i**) The gradual elimination of the tariff on in-shell cashew nut exports, starting with an immediate reduction from 18% to 14%, and then decreasing it continuously to get to 0% over five years; **ii**) To allow in-shell cashew nut exports during the period from October to January, when global prices are the highest; **iii**) Improve the competitiveness of processors through investment in efficiency and reductions in business costs (transport, logistics, corruption, among others); **iv**) IAM's transition to play a regulatory and policy orientation role, while the private sector meets the demand for input supply and extension services.

In spite of all the management problems, the tariff on in-shell cashew nut exports remains the major advantage for processors. Therefore, its elimination generates direct negative impacts on the processors, putting the producers' activities at risk. The chemical treatment of trees is still the full responsibility of IAM and is funded from the tariff revenue, but it is overshadowed because its financing is not secured without that revenue. There is clearly a need for a greater transparency in the use of the tariff revenue and new reflections and proposals on its use are necessary for this measure to be more efficient, and for processors to not be totally dependent on this policy for proper functioning of their activities.

In 2019, Mozambique was the 10th producer of in-shell cashew nuts in the world, with an IAM's estimated production of 110,400 MT, about 3.0% of the world total production (13th position), and about 5.4% of total African countries' production (7th position). With regard to in-shell cashew nut exports, it holds the 14th position in the world ranking, with 24,670 MT exported and in terms of cashew kernels exports, it holds the 4th position in the world, with 17,270 MT of exported cashew kernels, in the same year. The 2015 National Agricultural Census shows that 1.4 million Mozambican agricultural households own cashew trees, and the production is carried out mainly by small producers with a wide variety of agricultural fields, where many small producers have only up to ten old trees. There are several tens of thousands of them who own hundreds of cashew trees. Cashew nut production has been highly concentrated in the northern region of the country, especially in Nampula and Cabo Delgado provinces, jointly accounting for more than 80% of total cashew nut production. Inhambane and Gaza provinces in the south, traditionally came as the second largest production area, but that status has been lost as a result of a less dynamic planting of new cashew trees in recent years. A recent economic survey in Zambezia province shows that 81% of the 231 randomly selected growers own cashew trees, and on average, a cashew nut producer has 85 trees, of which 30 are over 15 years old and 55 are under 15 years old with an average yield of 3 kg per tree per year. Figures compiled by IAM from 2003 to 2020, and by MADER from 1974 to 2003 indicate that the production of cashew nuts in Mozambique has fallen substantially from 1982 to 2004. Since 2004, growth has been irregular, but tends to accelerate since 2014, in particular, given the great impetus for the creation of new plantations. According to Nitidae (2020), this increase in production can be attributed to a combination of a few factors such as: **a**) The end of the destabilisation war in 1992; **b**) An increase in the prices of in-shell cashew nuts paid to producers under the combined effect of an increase in world prices and, as of 2004, greater competition between exporters of in-shell cashew nuts and local processors for access to nuts; **c**) Increased support for producers such as supplies of plant seedlings, seeds and fungal treatments by IAM; **d**) Several major support programmes for the sector and, in particular, for producers financed by international technical cooperation, and numerous studies carried out in recent years are unanimous in considering cashew nuts as the main source of income for hundreds of thousands of cashew tree smallholders.

In the processing sector, the country has 26 small and medium-sized operating plants, but during the 2019/2020 season, only 11 of them were operating. The total capacity of the estimated processing sector is over 100,000 MT of in-shell cashew nuts. But during the 2018/2019 season, Mozambican factories bought just over 64,000 MT of in-shell cashew nuts and exported about 17,270 MT of cashew kernel in 2019. This shows that Mozambique was the 4th world cashew processor in 2019.

In view of the need to be relevant in this changing world, with the aim of obtaining a larger share of the growing markets, convert threats into opportunities and survive the competition, firm managers need to lead their companies within a strategy of transforming the world to a better one in which they can commercially survive by gaining a larger share of the high-velocity and transforming their dynamic capabilities into sustainable and long-lasting competitive advantages (Barney, 1991, 1995; Grant, 1998; Burke, 2005).

The transformation of dynamic capabilities into sustainable and durable competitive advantages requires strength and firmness on the part of managers in the implementation of strategies that will engender essential and structural changes in firms, driving them into a better competitive position in relation to those firms operating in a specific industry or business sector. When the companies are managed with these purposes in mind, they will certainly gain competitive advantage. However, to make this a sustainable achievement and to increase competitive advantage, firms must undertake an intense effort.

There has been a number of studies on the competitiveness of the cashew nut industry in Mozambique over the past 30 years or so, but this research follows a different path, given that it is academically motivated, supported, and supervised by a high reputation academic institution, and it is based on the application of one of the most prominent theories in strategic management of the past 30 years: Porter's Diamond Model, published in 1990.

The most recent and updated among those various studies is the one undertaken by a team of Nitidae (2020) experts hired by ACAMOZ, aimed at propitiating a deep understanding of the specific situation of the cashew processing industry in Mozambique. Given the lack of other lines of studies on this topic in the country, we have used extensively the information contained in this study.

The cashew processing sector is strategic for Mozambique, taking into account that it has been providing more than 15,000 jobs and participating in the industrialisation of the country, as well as in the increase of the value of cashew exports, an important step towards the improvement of the competitiveness of the cashew nut industry. In 2019, Mozambique was the 13th in-shell cashew nut producing country, and the 5th cashew processing country in the world. According to Nitidae (2020), Mozambique has advantages and disadvantages in cashew processing when compared to the other three major cashew processing countries, Vietnam, India and Côte d'Ivoire. This topic is more developed in Chapter 3, but a snapshot is dropped here to entice the reader's appetite.

Advantages: The procurement price for in-shell cashew nuts paid by the factories in Mozambique is lower than the price paid by the Vietnamese and Indian factories and equal to the price paid by Côte d'Ivoire factories, given the factories' proximity to production areas (import and export costs are reduced compared to Vietnam and India, where factories import most of the raw material they process) and a tariff on in-shell cashew nut exports, which aims to protect Mozambican processing factories from the strong competition of Asian processors. This advantage is the main reason that makes the Mozambican cashew processing sector able to compete against the Asian industry. The cost of unskilled labour is lower in Mozambique since the minimum wages in the country have been lower than in Vietnam, Côte d'Ivoire and most cashew processing States of India, following the depreciation of the Mozambican Metical between the late 2014 and early 2016. These low wages would have been a major advantage 15 years ago, when most of cashew processing was still manual, but today with the increasing mechanisation of cashew processing worldwide, its impact is rapidly getting eroded.

Disadvantages: The highest taxes are paid by Mozambican cashew processing companies when compared to Vietnam, India and Côte d'Ivoire, and the refund of the Value Added Tax (VAT) they pay for the inputs used in cashew processing this incentive, is a total nightmare, which worsens the loss of competitiveness. The processing companies in India and Côte d'Ivoire are somehow subsidised, and in Mozambique they are not. Higher cost of equipment, spare parts and inputs, since Mozambican processors need to import almost all processing machines, spare parts, most of their inputs and pay import duties, forcing them into creating large stocks of inputs and spare parts to avoid interruptions in supply while Asian processors can easily and quickly find these supplies locally when they need them. Higher financial cost, in spite of the fact that Mozambican factories pay a lower price for in-shell cashew nuts, but they end up losing that margin, because their procurement is concentrated in 2 to 3 months, and the interest rate they have to pay is higher than in Asia or even Côte d'Ivoire. Higher technical and administrative labour cost, as a result of a stronger demand and less offer of qualified and experienced professionals in Mozambique than in Asia, companies have to pay their technicians and managers higher wages than in Asia. Lower yields in terms of quantity and quality on which cashew processing is highly dependent, both in terms of quantity of tradable cashew kernels (KOR), and in terms of quality, i.e., quantity of whole cashew kernels, as a result of less experience in mechanisation, less know-how from workers and less organisational flow in the factory. Lower market prices, given the fact that Indian processors obtain much higher prices for whole cashew kernels and even more for the broken cashew kernel, thanks to a huge domestic market. Unlike in Mozambique where the most important market for kernels is the international market, in India the domestic market is extremely important, given the fact that this country is the first consumer of cashew kernels in the world. Little or no income from the sale of cashew by-products, meaning that few Mozambican factories are able to sell the by-products of cashew nut processing (shell, CNSL, oil-free cake, testa, damaged nut and powdered nut). For most Mozambican factories, these by-products are considered as waste and generate financial and environmental costs for their evacuation.

Finally, comparing the processing cost of the Mozambican automatic factories with that of the Vietnamese ones (the most competitive industry over the past 10 years), Mozambique remains relatively more competitive, thanks to the in-shell cashew nut export tariff, but this competitiveness is threatened by the country's exposure to higher country risks. All these advantages and disadvantages that Mozambican cashew nut processors are confronted with were perfectly captured by Porter's Diamond Model**.** Therefore, we have been able to confirm the positive, strong, and statistically significant impact of Porter's Diamond Model on the Export Competitiveness of Mozambique's Cashew Nut Industry with the results obtained from the use of a PLS-SEM on two datasets: a quantitative one covering a period of 20 years, from 2000 to 2019, and qualitative one developed on a 5-point Likert scale based on 310 questionnaire respondents, among cashew nut industry stakeholders in Mozambique in 2021, with SmartPLS 3.3.9 as the technical tool.

Even with the tariff on the in-shell cashew nut exports allowing Mozambican factories to be relatively competitive in comparison with the Vietnamese ones, a very important point to explain the difficulties faced by the Mozambican industry is the exposure to risk. All processors are very sensitive to the volatility of cashew prices, but given the short procurement period, Mozambican processors are even more exposed to this risk, with three major constraints (Nitidae, 2020): **a**) During the procurement period (December to February), if the difference between the in-shell cashew nut price and the price of the cashew kernel is very small and they decide not to buy, they will have to remain closed for the entire year. They cannot work on a "stop and go" scheme; **b**) If the in-shell cashew nut prices in the procurement period are particularly high, or if the cashew kernel prices fall after the procurement period, they can only decide to close the factory and export their remaining in-shell cashew nuts stocks and suffer heavy losses; **c**) Given the limited number of factories in the country, if they have difficulties with the trend to buy or sell prices, they will hardly be able to stop working on their own and start working as subcontractors to other factories that bought in-shell cashew nuts at lower prices or to obtain sales contracts at higher prices.

This strong exposure to price risk is today probably the major threat to the cashew nut industry in Mozambique. The tariff on in-shell cashew nut exports is not sufficient to ensure the sustainability of the industry, and many factories are likely to close permanently as they will not be able to withstand 3 successive years of losses.

2.5. Global Cashew Nut Value Chain

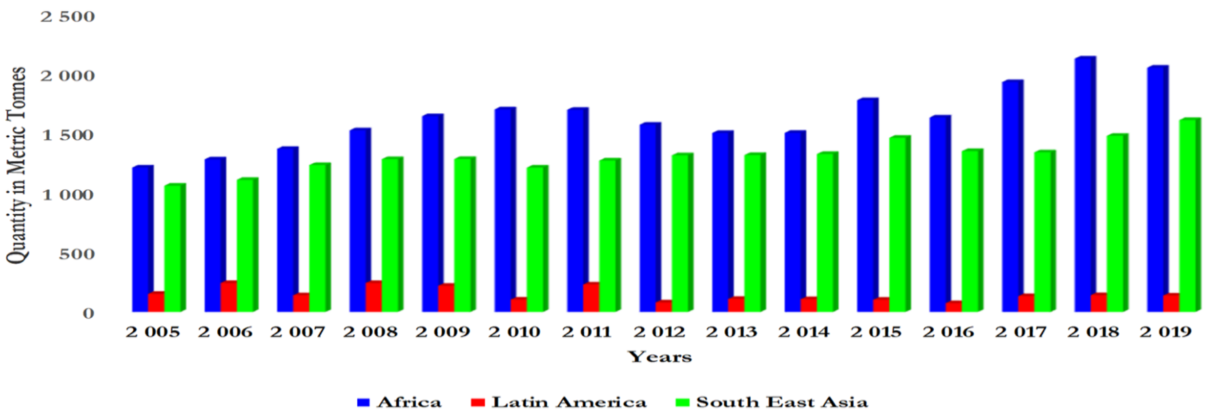
The world's in-shell cashew nut business has experienced an upward trend in recent decades, pushed by a favourable demand pattern. Technoserve and FAOSTAT Databases show that the world market for cashew nuts grew by nearly 8 times in four decades from 500 MT to around 3.8 million MT in

2019. Global in-shell cashew nut production continued to experience an average growth rate of 3.4% over the period of 2005-2019, as displayed in Table 2.2. The evolution of in-shell cashew production across the world is displayed in Figure 2.7, where the supervenience and rapid growth of the African continent became very obvious, over that 15-year period, surpassing Asia and Latin America combined together.

FAOSTAT Database (2020) shows, however, that, at the same time, in-shell cashew nut production declined in Southeast Asian and Latin American main producing countries, with negative growth rates of -1.7% for Vietnam, -2.82% in Indonesia, and -4.91% in Brazil, while India managed to survive the trend by a stagnation suggesting tiny growth margin of 1.34%. In fact, some African countries, namely: Tanzania, Côte d´Ivoire, Guinea-Bissau and Nigeria have experienced huge growth in production, making Africa today the most important world in-shell cashew nut producer.

For Technoserve (2020), the main reasons for this trend can be summarised as follows: **i**) India - Agricultural investments such as for new technologies and agriculture diversification, limited labour availability, minimum salary increases, competition from other crops, and competitive pricing of crops increased relative costs. Cashew industry profitability depended in part on low labour costs and easy access to affordable in-shell cashew nuts. These trends have changed the structure of the Indian cashew nut industry, which is today facing difficulties in supplying its huge processing capacity. To overcome this difficulties Indian companies have recently invested in large plantations and in the financing and management of processing facilities in Africa. **ii**) Vietnam – The problem originated in the scarcity of land for expanding crop production combined with the cost of the agriculture diversification strategy, the heavy investments in capital for cashew processing to become the main world in-shell cashew nut importer, the shortage of which (capital) has hampered the operation of many cashew factories in Vietnam, driving around 80% of them to closure since June 2018 as a result of lack of raw materials and capital for production, causing a major blow to the country's economy. As in India, Vietnam is also investing in large plantations and processing units in Africa.

Figure 2. 7: Evolution of African In-Shell Cashew Nut Production (MT)



Source: FAOSTAT (2020)

iii) Brazil - The country has suffered considerably from adverse climatic events such as consecutive years of drought, followed by a very heavy rainfall, causing severe decrease in cashew production in critical areas like Ceará and São Paulo provinces, which together account for over 80% of cultivated surfaces, preventing the country from maintaining its level of in-shell cashew production. As a way out, Brazil is also setting up processing units in West Africa.

India and Vietnam are by far the major cashew nut processors in the world (Technoserve 2020 Database). Vietnam is nowadays, the most efficient processor, followed by India. Brazil uses to be the third largest processor but has quickly lost market share to those two competitors. India and Vietnam are the leaders in both processing and in-shell cashew nut imports. India, the long-time most efficient processor and largest exporter of kernel, has also lost ground to Vietnam over the past few years, particularly with regard to processing efficiency (Technoserve 2020) database; FAOSTAT 2020). Brazil is known as having a broader diversity of cashew products and has developed not only the kernel industry but also CNSL, and the cashew apple for fresh consumption, juice processing, and spirits, among other cashew products. India has developed the false fruit processing industry, mainly to produce alcoholic beverages such as a spirit commonly known as *Feni*, a popular alcoholic beverage consumed in the 8 Southern States of India. However, most producers are far from being able to scale up the many possible cashew products. Processing in-shell cashew nuts into kernel is the most important and profitable segment of the cashew industry. It is very important for producing countries to have an efficient processing industry to be able to add value to their own production and help create jobs. With improved technology, opportunities for increasing local productivity are higher for several countries.

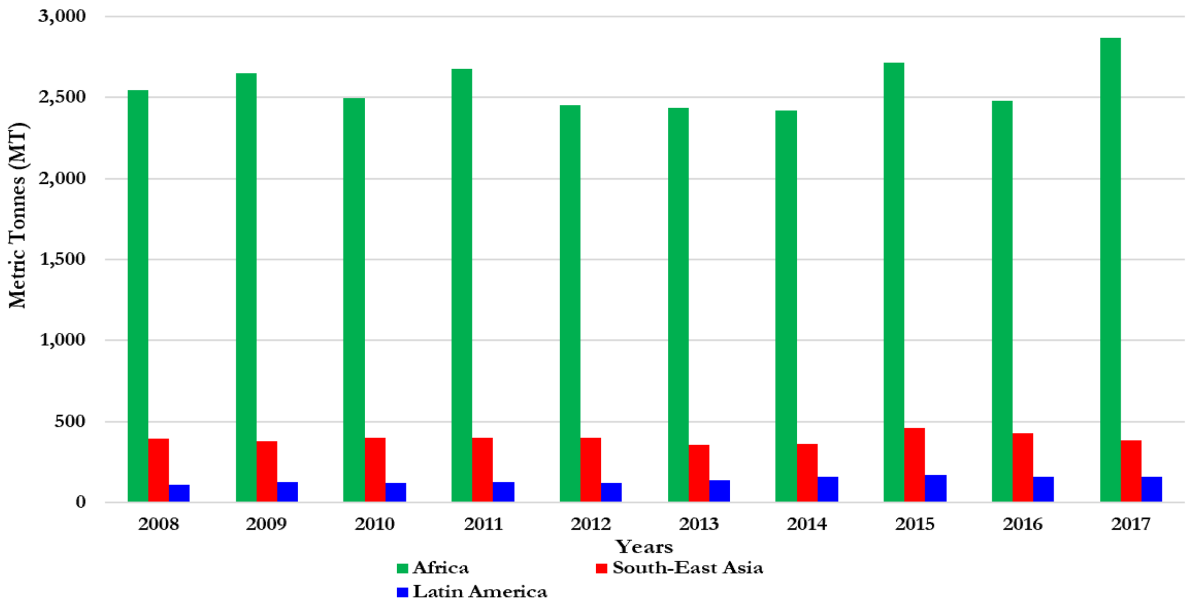
Inasmuch as kernel market trends are concerned, the world witnesses the dominance of markets with the highest quality and safety standards requirements, such as the EU and the USA absorbing a significant share of world’s kernel consumption. FAOSTAT (2020) projected a steady growth of these markets at 6%, as global demand reaches above 10^6 MT. As global demand outpaces supply, market kernel prices are expected to remain above US$5 per lb, ensuring a healthy price for African cashew producing countries. The same sources anticipate that countries located in Eastern Africa such as Mozambique, can fetch a price premium of up to 15-20% as a result of pricing seasonality (Mirsha & Martin, 2016). According to Technoserve (2015), Africa is the only region where cashew production is increasing fast enough to meet the growing demand, which is a context that provides good prospects for African countries to grow the cashew industry, add value to their domestic in-shell cashew nut production, and create jobs by investing in cashew tree orchards and in processing capacity. Most countries like Guinea-Bissau, Côte d’Ivoire, Mozambique and others have small-scale initiatives that stop and go typically with donor funding (Mishra, & Martin, 2016; Fitzpatrick, 2017).

According to Technoserve and FAOSTAT (2020), Africa is undoubtedly responsible for the in-shell cashew nut production’s rapid growth of recent years, as documented in Figure 2.8.

Geographical cashew production has favoured the African countries, particularly the ones located in the Western part of the Africa Continent, whose production increased sharply. Côte d´Ivoire is well positioned to consolidate its ranking and to surpass India by becoming the largest world cashew kernel producer, judging by the amount and depth of reforms it is introducing in the sector to build a value-adding processing industry.

Tanzania, the country with the highest in-shell cashew nut production growth, has positioned itself as a stiff challenger to Guinea-Bissau, which has been the second largest African cashew nut producer. Nevertheless, Tanzania has not so far been showing any muscles in terms of its ability to erect a new and strong processing infrastructure as it has made no new investments in cashew processing over the past few years, and neither has Guinea-Bissau.

Figure 2. 8: Evolution of World In-Shell Cashew Nut Production, in MT (2008 - 2017)



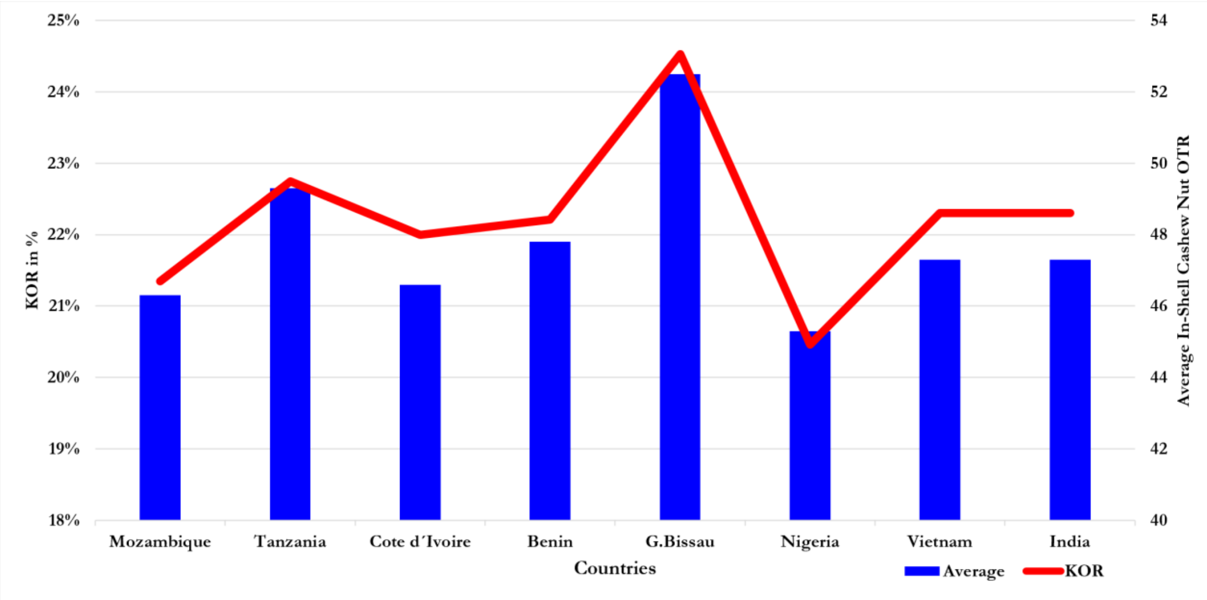
Source: Technoserve Database; FAOSTAT; Industry; author's analysis

Mozambique's in-shell cashew nut production growth for the period of 2008-2017 was modest when compared to other African cashew producing countries. Mozambique is still far from its peak production achieved in 1973. Nevertheless, in spite of its poor level of production, the country was able to revamp its processing industry by scaling up its installed capacity and partially replacing old labour-intensive technology with new semi-mechanised equipment, which increased its processing productivity, while also reducing harmful worker health effects related to the handling of CNSL (Fitzpatrick, 2017).

As stated earlier, Africa has become the world's largest producer of in-shell cashew nuts and has a great potential to continue to consolidate its leadership in terms of its share of world's cashew nut production. Tanzanian production grew faster as a result of the implementation of a well-structured cashew production development programme, but Côte d´Ivoire established itself by far as the largest cashew producer in Africa. Mozambique, the main World producer in 1973, was only the fifth African producer by volume in 2019 (FAOSTAT Database, 2020; Fitzpatrick, 2017).

Cashew nut processing in African countries continues to exhibit a totally different pattern when compared to that of in-shell cashew nut production. African countries process jointly less than 10% of their combined in-shell cashew nut production. Although some African countries have attempted to substantially increase their processing capacity over the past 15 years, it is still far below the main processors such as India, Vietnam, and Brazil. Mozambique has so far maintained its in-shell cashew nut processing leadership in Africa by achieving a higher rate of installed capacity use, measured in percentage terms. African countries face a stiff competition from Asian countries in cashew processing. India and Vietnam, by far the main world in-shell cashew nut processing nations, have the capability of handling more effectively the key determinants of efficient processing because they have easier access to: **a**) Good in-shell cashew nut quality and OTR, leading to a higher Kernel Output Ratio[6] (KOR), as displayed in Figure 2.9, and they have their own production and imports from other countries, essentially Africa; **b**) Higher labour productivity; **c**) Adequate working capital; **d**) Appropriate technology to the prevalent socio-economic context.

Figure 2. 9: Correlations of In-Shell Quality (ORT/KOR) by Country (KOR Coefficients %)



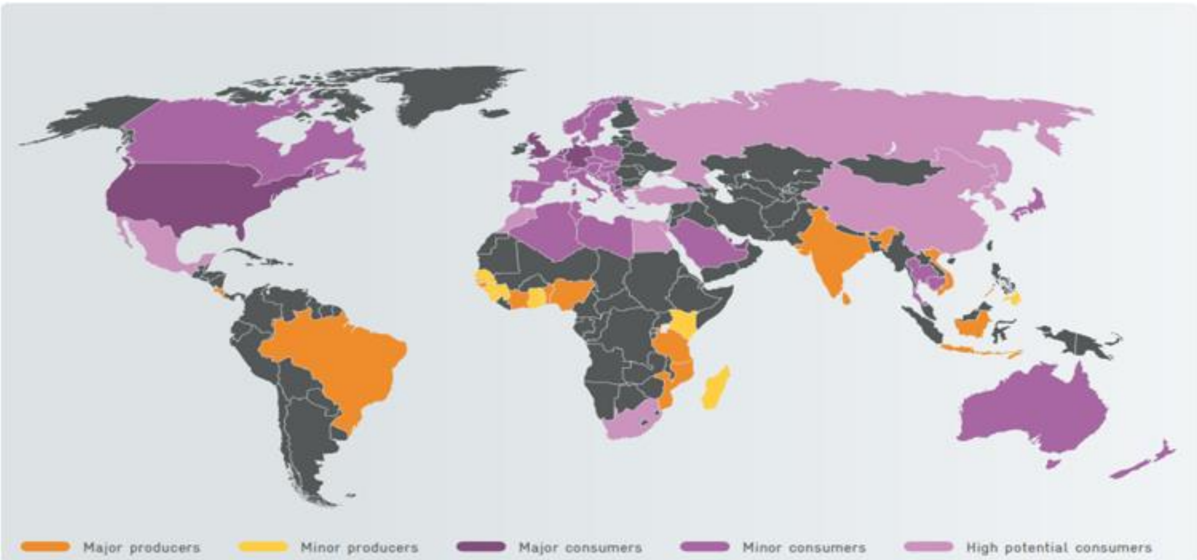
Source: Technoserve (2020) Database; FAOSTAT (2020); author's calculations

The adequate combination of these factors is undoubtedly of crucial importance to guarantee high processing yields. Indeed, the quality of in-shell cashew nuts is intrinsically linked to the obtainable processing yield. Figure 2.8 shows the correlation between the quality of in-shell cashew nuts and the potential processing yields for each of the 8 cashew nut producing countries. It is clear that the worse the in-shell cashew nut KOR, the lower the yield. Nigeria has the lowest KOR, and consequently the lowest potential processing yield of the countries analysed, while Guinea-Bissau has the highest quality in-shell cashew nuts for processing, but ironically it doesn't process (Technoserve, 2020; FAOSTAT, 2020).

Despite being leaders in in-shell cashew nut production, African countries are disadvantaged in tackling the key determinants of efficiency. It is a long-established fact that processing costs in African countries are not competitive, which turns into a negative factor hindering the efficient use of installed capacity and impeding the improvement of their value-added indexes. According to Mishra and Martin (2016), Mozambique could capture 49% of the value in the chain if it were to process its in-shell cashew nuts domestically. Additionally, the suitability of the general business environment also has an important influence on cashew industry efficiency, as analysed in Chapter 3.

Cashews are grown in 21 countries (Figure 2.9) in Africa, Latin America, and South-Eastern Asia. Recall that cashew cultivation takes place in regions dominated by tropical climate, and the cashew trees grow more easily in coastal regions of the main cashew nut producing countries. There is large scale production of cashew in 15 countries, in all the three continents, and concentrated in the four main production areas, signalled in dark and light yellow colours in Figure 2.10, namely: South-Eastern Asia, Central and Western Africa, Eastern Africa, and Brazil, with the trees widely cultivated in coastal regions of Eastern and Southern Africa (Mozambique, Tanzania, Kenya and Madagascar), Western and Central Africa (Côte d´Ivoire, Guinea-Bissau, Nigeria, Benin, and Burkina Faso), and South-Eastern Asia (Sri Lanka, The Philippines, India, Vietnam, and Indonesia), and Brazil in Latin America.

Figure 2. 10: The Cashew World

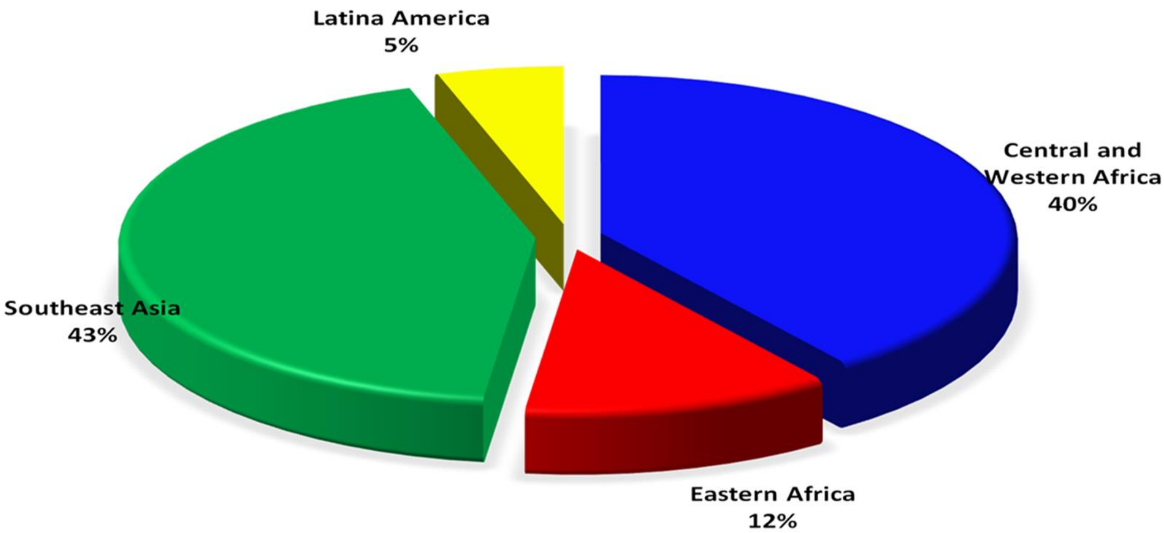


Source: ACi Report, 2016

Technoserve and FAOSTAT data indicate that over the past 15 years, Africa in-shell cashew nut production represented around 52% of world production, thus surpassing Asia and becoming the main production region, as testified by Figure 2.11, with Western and Central African countries representing 40%, followed by Eastern Africa with 12%.

In terms of cashew processing, India and Vietnam continue to be by far the rule setters in the world, since Africa is still in its infancy in this domain, thus forgoing the golden opportunity of adding value to its in-shell cashew nut production, while generating new jobs by focusing on building an efficient cashew nut processing industry.

Figure 2. 11: Share of World's In-Shell Cashew Nut Production (2007 - 2016)



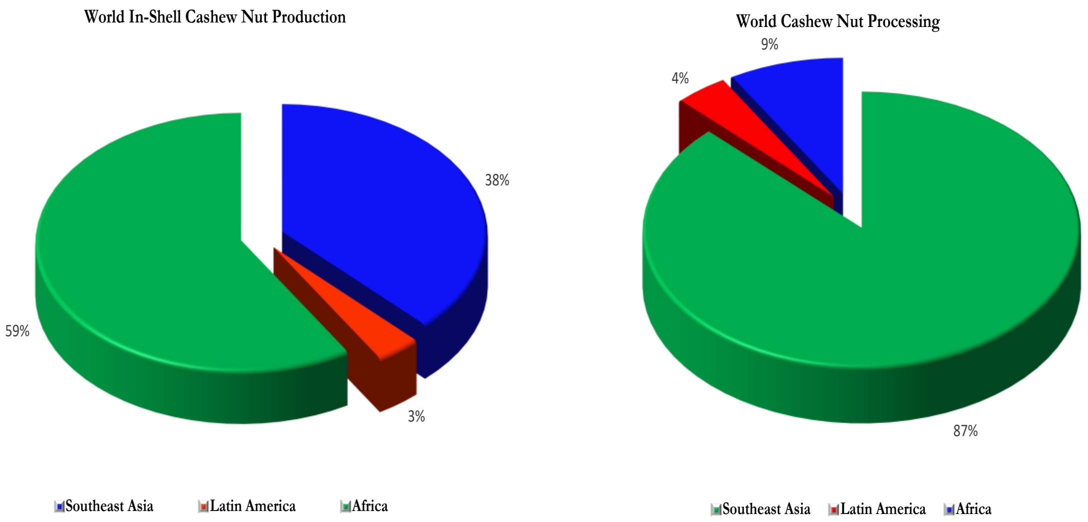
Sources: Technoserve (2020); FAOSTAT (2020)

Evidence shows that, while Africa has substantially increased its share of world in-shell cashew nut production (Figure 2.7), the processing domain not only remained in the hands of Asian countries, but this region has strengthened its control over the segment, as demonstrated in Figure 2.11.

The change is very obvious! Africa contributed in 2019, around 59% of the world's total in-shell cashew nut production, while Asia produced 38%, and Latin America 3%. In the same year, Asia processed 87% of the world's total cashew nut processing, followed by Africa with 9%, and Latin America with 4%. Considering that Latin America nearly remained the same, the lion share of that change has been between Africa and Asia, where the former tranferred the bulk of its in-shell cashew nut production to be processed by the latter. This is where the biggest challenge for African countries lies.

Based on facts compiled from the International Nut and Dried Fruit Council (INC), the Cashew Promotion Council of India (CEPCI), and the Vietnam Cashew Association (VINACAS), among other sources, and on our understanding that any facts about Mozambique's cashew nut industry will definitely be influenced by events in the other African in-shell cashew nut producing countries.

Figure 2. 12: World Production and Processing of Cashew Nuts, in Metric Tonnes (2019)



Source: Technoserve database; FAOSTAT database; Author's calculations

Over 71% of in-shell cashew nut producing countries in the world are located in Africa, that is 15 (fifteen) out of 21 (twenty-one), meaning that around 28.8% of the world's total in-shell cashew nut production in physical volume in the year 2000 originated in Africa, a figure that rose to 84% in 2005, and it has roughly remained at that level (82% in 2019). Mozambique's share of that quantity was 14.7% or 57,894 MT. In 2010, Africa generated around 76% of total world's production of in-shell cashew nuts, of which Mozambique contributed some 32% or 97,000 MT (Table 2.2)

Table 2. 2: The Evolution of the World Cashew Nut Production in 10^3 MT (2005 - 2019)

Countries	Years														
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Benin	53	55	60	86	117	102	163	163	198	202	225	126	157	220	204
Brazil	153	244	141	243	221	104	231	81	110	108	103	75	134	141	139
Burkina Faso	9	10	7	7	7	21	95	60	115	120	120	120	125	135	137
Cote d'Ivoire	185	235	280	330	350	380	393	450	513	550	703	650	711	743	793
Gambia	0	0	0	3	4	4	3	3	3	3	3	3	3	3	3
Ghana	29	34	32	22	27	33	36	40	42	50	50	78	90	103	86
Guinea-Conacry	6	7	7	7	7	7	8	9	9	12	14	20	16	25	21
Guniea-Bissau	89	95	98	111	123	121	125	118	137	159	169	155	158	162	166
India	544	573	620	665	695	613	675	725	753	753	745	671	745	817	743
Indonesia	135	149	146	157	147	115	115	117	116	131	138	137	136	148	134
Kenya	14	15	16	17	18	18	21	29	21	22	28	25	19	14	13
Madagascar	7	7	7	8	6	7	7	7	7	7	7	7	7	7	7
Mali	26	28	30	31	33	35	38	44	40	72	66	71	120	168	168
Mozambique	**104**	**63**	**74**	**85**	**64**	**97**	**113**	**65**	**83**	**63**	**81**	**104**	**139**	**115**	**107**
Nigeria	594	636	660	675	800	792	563	413	193	99	97	98	100	100	100
Philippines	117	113	113	112	112	135	133	133	146	171	206	216	223	229	243
Senegal	5	6	5	5	6	6	7	7	7	8	8	10	9	7	7
Tanzania	90	90	93	135	79	74	121	160	128	130	198	155	265	314	225
Thailand	61	46	43	41	38	38	29	28	27	26	22	21	22	20	18
Togo	1	1	1	2	4	5	7	7	7	7	9	10	11	11	12
Vietnam	204	227	312	309	292	312	320	313	275	245	352	305	216	266	283
Total Africa	**1,213**	**1,281**	**1,370**	**1,525**	**1,644**	**1,701**	**1,697**	**1,573**	**1,503**	**1,504**	**1,779**	**1,633**	**1,930**	**2,127**	**2,049**
Share of Africa (%)	**50**	**49**	**50**	**50**	**52**	**56**	**53**	**53**	**51**	**51**	**53**	**53**	**57**	**57**	**57**
Total Americas	**153**	**244**	**141**	**243**	**221**	**104**	**231**	**81**	**110**	**108**	**103**	**75**	**134**	**141**	**139**
Total Asia	**1,060**	**1,109**	**1,234**	**1,283**	**1,285**	**1,212**	**1,272**	**1,315**	**1,318**	**1,326**	**1,462**	**1,351**	**1,340**	**1,479**	**1,422**
Total World	**2,426**	**2,633**	**2,745**	**3,052**	**3,149**	**3,018**	**3,200**	**2,968**	**2,930**	**2,938**	**3,344**	**3,058**	**3,404**	**3,748**	**3,609**

Sources: KNOEMA 2020); FAOSTAT database 2021; author's calculations

Knoema and Technoserve Databases indicate that in the same year, a total of 743,500 MT of in-shell cashew nuts were exported globally, and Africa's share was 85,5% and Mozambique contributed 5.4%. In 2018, African in-shell cashew nut producing countries generated a total volume of 2,127,000 MT out of the world's total production of 3,748,000 MT, representing 57% of the world' total, and Mozambique's share was around 3.1%, down from 14.7% in 2000. The implication of this kind of Mozambique's trajectory is that most of the developments and events impacting on the African in-shell cashew nut market ought to necessarily have an influence on Mozambique, a country that is too far from being a rule setter. As a result, it tends to follow whatever route other African countries decide to choose. It is, therefore, an imperative to, at least, take a quick look at what happens to the African in-shell cashew nut in order to acquire a broader and more accurate and precise understanding of what happens to Mozambique's in-shell cashew market.

Table 2.2 shows that African in-shell cashew nut producing countries contributed an average of 52.8% of the total world in-shell cashew nut production for a period of 15 years (2005-2019), with a peak of 57% between 2017 and 2019. However, when it comes to cashew kernel exports recorded over the same period, as shown in Table 2.3, it is shocking to realise that the average share of cashew kernel producing countries in Africa doesn't go beyond the meagre 5.3%, with peaks of 9.7%, 7.4%, and 12.3% in 2013, 2017, and 2019, respectively.

Table 2. 3: Evolution of World Cashew Kernel Export, in MT (2005 - 2019)

ITEM	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
World	**324,232**	**240,140**	**391,065**	**404,609**	**412,513**	**403,055**	**416,425**	**416,751**	**429,119**	**533,428**	**555,246**	**557,641**	**583,157**	**488,932**	**688,850**
Africa	**9,254**	**9,836**	**12,028**	**18,539**	**17,092**	**12,004**	**26,062**	**20,160**	**41,675**	**18,305**	**19,289**	**25,429**	**43,120**	**30,294**	**84,839**
Benin	0	0	54	107	159	210	84	189	12	103	110	170	845	1,772	1,129
Burkina Faso	28	22	120	61	288	412	2,797	3,075	11,970	2,580	1,844	3,676	2,185	2,032	2,368
Cote d'Ivoire	0	0	0	0	0	0	1,490	2,514	4,440	5,921	6,661	8,182	8,141	9,736	11,223
Gambia	0	0	0	146	0	0	0	13	21	7	222	444	663	881	53
Ghana	0	0	0	0	3,821	1,471	222	6,777	15,347	1,669	2,939	4,208	19,355	1,678	40,723
Guinea-Bissau	0	0	0	0	0	0	0	0	0	116	323	471	111	803	739
Guinea-Conacry	227	42	48	100	100	100	0	0	208	351	2,388	316	87	86	76
Kenya	6,344	3,701	2,611	6,988	3,805	1,033	777	780	814	647	479	609	543	97	156
Madagascar	26	53	47	66	110	29	24	75	93	105	81	74	121	236	408
Mali	0	0	0	0	0	0	0	626	626	352	214	77	23	50	329
Mozambique	921	2,196	3,167	3,346	3,935	3,706	3,464	2,641	3,915	1,689	853	2,963	6,109	6,297	17,270
Nigeria	0	0	0	0	0	0	0	0	0	1,482	1,170	1,105	1,358	2,852	5,795
Senegal	0	0	0	0	0	0	0	0	103	0	196	7	50	14	193
Tanzania	1,708	3,822	5,981	7,725	4,874	5,043	17,158	3,355	3,821	2,912	1,331	2,178	1,561	2,466	1,466
Togo	0	0	0	0	0	0	46	115	305	371	478	949	1,968	1,294	2,911
Share of Africa (%)	**2.85**	**4.10**	**3.08**	**4.58**	**4.14**	**2.98**	**6.26**	**4.84**	**9.71**	**3.43**	**3.47**	**4.56**	**7.39**	**6.20**	**12.32**
Asia & Latin America	**279,707**	**240,140**	**328,873**	**332,243**	**349,993**	**336,545**	**342,287**	**348,996**	**338,960**	**435,958**	**453,229**	**443,164**	**445,823**	**371,926**	**506,671**
Brazil	41,856	43,231	51,556	35,410	47,760	42,174	26,302	25,334	20,464	17,023	12,957	15,588	11,424	12,469	17,086
India	124,966	121,124	110,815	125,486	117,362	92,598	133,400	101,866	126,170	116,571	103,170	83,093	88,419	66,794	68,222
Indonesia	3,456	6,850	11,745	10,403	7,628	7,109	4,054	3,667	4,798	8,372	18,289	9,762	5,745	5,968	9,285
Thailand	429	177	57	105	43	42	31	35	72	25	586	1,437	1,323	1,415	1,375
Vietnam	109,000	128,000	154,700	160,839	177,200	194,622	178,500	218,094	187,456	293,967	318,227	333,284	338,912	285,280	410,703
Af+A&AL	**288,961**	**309,218**	**340,901**	**350,782**	**367,085**	**348,549**	**368,349**	**369,156**	**380,635**	**454,263**	**472,518**	**468,593**	**488,943**	**402,220**	**591,510**
Others	**35,271**	**0**	**50,164**	**53,827**	**45,428**	**54,506**	**48,076**	**47,595**	**48,484**	**79,165**	**82,728**	**89,048**	**94,214**	**86,712**	**97,340**

Source: Knoema Database, 2021; FAOSTAT Database, 2021; Author's Calculations

Fitzpatrick’s 2011 research report[7] on the competitiveness of African cashew nuts, both in-shell and kernels, in the global market, covering 10 cashew nut producing countries, namely: Benin, Burkina Faso, Ghana, Guinea-Bissau, Côte d’Ivoire, Kenya, Mozambique, Senegal, Tanzania, and The Gambia (Figure 2.13), has been very instrumental for the understanding of the industry’s situation.

Notwithstanding the fact that this research’s target is cashew kernels, it is only logical and fair to recognise and take advantage of the fact that previous studies identified the intertwined nature of the two cashew chains in the market (the in-shell and the shelled one), before moving any further with the work.

After the lengthy discussion on a number of encumbrances, shortcomings, failings and weaknesses in the competitiveness of the African cashew sector, it would be a serious misjudgement to not recognise that every year 700,000 MT of in-shell cashew nuts are shipped from Africa to Asia for processing and consequent value addition (ACA, 2006). Every year, many hundreds of thousands of growers grow cashews using the very scarce inputs they have access to, and the rapid expansion of production over the past two decades or so is not only as a result of the fact that cashews grow on marginal land with low-cost inputs, but it also bears testimony to the fact that growers can make a living out of it as, in fact, a worthwhile cash crop.

Most of the serious difficulties that this chain faces are currently inherent in the economies of Africa, and particularly West Africa, such as inadequate infrastructure, insufficient and costly financial services, lack of entrepreneurial culture, limited transportation and energy supply services, and many other encumbrances pertaining to the business environment and its functioning.

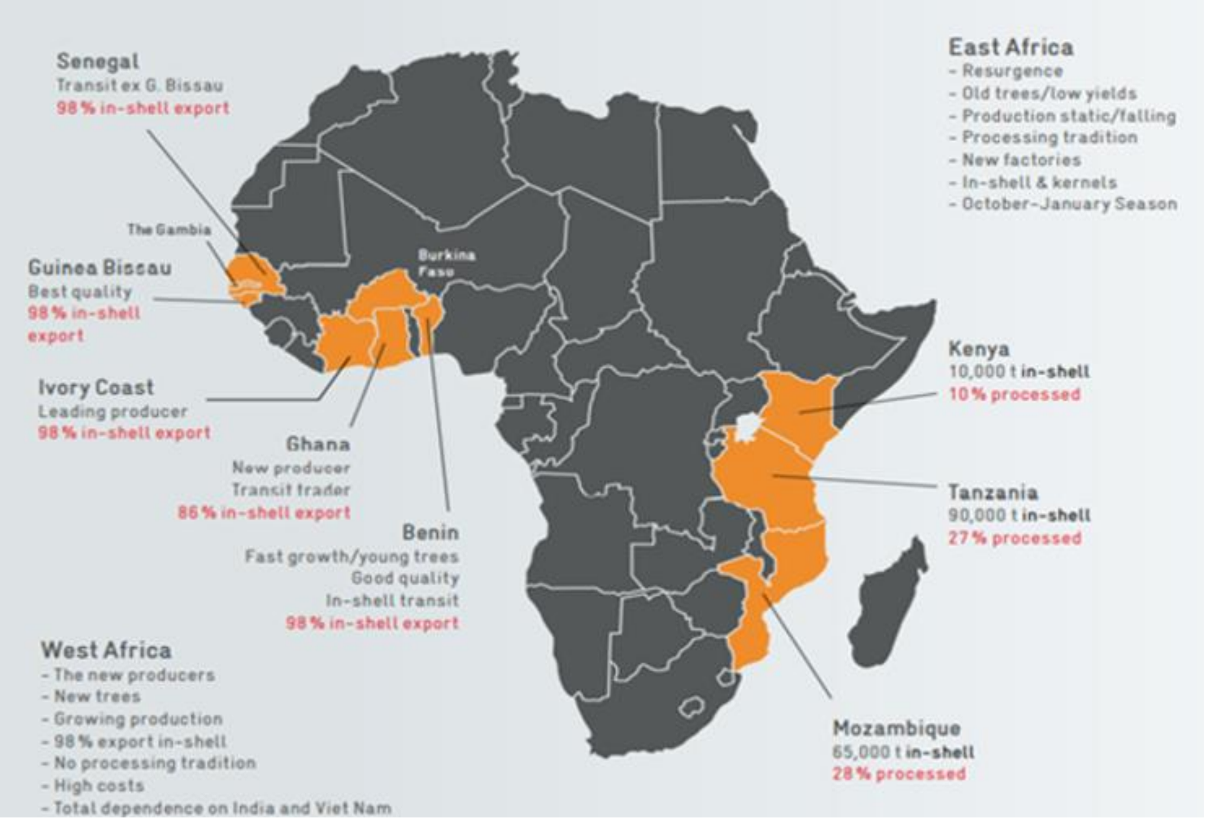
Fitzpatrick (2011) argues that there is evidence that some traders take unusually high margins, and also that they face a high level of risk, and considering the nature of the value chain, this gives rise to contract performance failure and price speculation, which ultimately affects the prices paid to growers, if not in the current season, then in the next.

The same report states that buyers of in-shell cashews complain that the post-harvest handling of the African product is poor, which makes de-shelling more difficult and reduces the kernel yields, and this has resulted in a system where the differences in quality between countries, or between regions are reflected in different prices paid, but where the better quality of one grower over another is not. As a consequence, the system evolution has been based on the lowest common denominator of quality, where the delivery of better quality is rewarded and the worse quality is penalised, but at the end of the day competitiveness is jeopardised, and growers are not incentivised to improve (ACi, 2011).

The dominance of traders, associated with other structural difficulties results in a price setting system that is operated from abroad, based on external factors such as the Indian and Vietnamese harvest or that from West Africa. Failures of infrastructure, information, price volatility, and finance limitations stifle competitiveness, and all members of the chain are exposed to high levels of risk, being the growers the worst affected. Fitzpatrick (2011) also found regional differences in both chains between West Africa and Eastern Africa, based on the ages of the trees, the amount of processing, the seasons, the costs, and the levels of government support, where, being East Africa a resurgent region, has an established processing industry, while West Africa is a large-scale grower, with a crop that arrives annually at around the same time as the Indian and Vietnamese crops, and which does little processing of its own.

East Africa is less exposed to overproduction elsewhere and has better controls over its quality, despite having much older trees. Countries within Africa compete on the quality of their product, the timing of their crop and the costs within their infrastructure. The buyers are limited to a small number of international traders and a few processors who buy direct, and dominate the market because their experience, their market access and their ability to raise short-term finance leave no room for alternatives.

Figure 2. 13: In- Shell Cashew Nut Production and Processing in Africa (2011)



Source: Compiled by Fitzpatrck (2011)

Fitzpatrick (2011) argues that the African cashew kernels chain is competitive, with a potential to hold on to its market share at the current low level. The various encumbrances inherent in the African in-shell cashew nut producing countries make the option to expand its capacity to a more sustainable level in the long run extremely uncertain. A number of specificities required for the business operation in the cashew kernel market, such as the kind of investments, processes and labour skills, levels of risks and rewards demanded, are mostly longer-term factors, and a processing company is more exposed to the kinds of risk that are prevalent in many African countries.

Competing with exporters for raw materials, with a cost advantage of not paying freight and the traders' margins, is usually cancelled out by higher costs and lower labour productivity. The researcher asserts that evidence shows that small-scale African processors need to source in-shell nuts at lower prices than do the in-shell exporters, which is eventually related to their small size and their lack of access to the kernels market (Fitzpatrick, 2011).

Experience shows that wherever the government and technical services have made strong interventions in favour of the processors, that course of action has proven successful. East African cashew producing countries also benefit from easier market access than the West Africans have, given that all the three countries continued processing cashews, and in the past the buyers often bought contracts which allowed their importer to supply them from African sources. On the other hand, cashew kernels from East Africa are of a very good quality to be used by buyers in all of the main consumer markets.

Based on the facts on the ground, Fitzpatrick (2011) observes that West Africa would be as successful as Eastern Africa in establishing profitable de-shelling facilities in their own countries, if they manage to overcome some of the prevailing cultural barriers in each country. Overall, the African processing sector has a potentially good product in a market in which conditions are the best of all times, although they are limited by the structure of the economies where they operate, and the entry difficulties are not unsurmountable.

Recalling that “competitiveness” is a relative concept that must be defined in relation to something else, African cashew producing countries must be judged against their Asian and Latin American competitors, inasmuch as cashew nut processing is concerned, and that comparison is done in the following few paragraphs.

When it comes to processing, its method and its suitability to the market and the economy are critical for its competitiveness. Low investment cost machinery is being used in India and Vietnam, in response to the rising costs of labour. The mechanised processing in Brazil, a high investment and a low labour model, causes the rise of the proportion of broken kernels, with negative results for the factory.

Another critically important dimension is *traceability*, where, for instance, the Brazilian industry has a few sophisticated and large companies that make traceability much easier down to the village or municipality level. India is not as good at tracing the product as batches are often amalgamated several times before they arrive at the processors. Vietnam does not currently have a traceability system, but the organisation of the chain and the Vietnamese society suggests that it would be possible to implement. Maintaining traceability in India and Vietnam is complicated by their reliance on imported in-shell cashews. African cashew-producing countries, including Mozambique, may have an advantage in this respect.

The major handicap for the African cashew nut producing countries is the absence or inadequacy of financial services. India has a well-developed financial service which lends money to growers, processors and traders against their inventory or assets. The government funds small-scale agriculture. Vietnam has no specific funding allocation for the cashew industry. Growers are funded using their land certificates as collateral, but these certificates are difficult to acquire. In Brazil the large companies that hold big assets they use them to raise funding. Small-scale growers in Brazil are in dire straits just like their African counterparts, since they do not hold inventory or assets.

In the markets and market access domains, clearly India, Brazil and Vietnam are well known players in the international market. Brazilian exporters are more reliable. India or Vietnam, not as much, but the existence of a domestic or a close regional market works to their advantage, allowing the rapid sale of partial lots to prevent inventory build-up and to enhance cash flow. African processing countries have small domestic markets, not large enough to make a difference. Brazil has the US market next door, a very large one, and that is why Brazil is called the cashew warehouse of America. West African processors would have an advantage for shipment to Europe, but a limited one, since the price of transporting cashew kernels is only 1% of the value of the cargo on a Cochin (India) to Rotterdam (Netherlands) ship.

Inasmuch as logistics and costs are concerned, India and Vietnam have advantages in certain cost areas. Trucking and port fees are expensive in Africa. A quote from Cochin port for delivery of a container of in-shell cashews to a processor in Kollam gives a rate of approximately US$ 16 per MT, but a similar journey for the same container to an African port ready for export ranges from US$ 25–US$ 35 per MT. In India, clearing a container of imported cashews at the port of Cochin will cost between US$ 10–12 per MT. Exporting them could have costed from US$ 21–US$ 57 per MT at the port of shipment in Africa.

African cashew-producing countries face a major challenge if they are to establish themselves as reliable suppliers. The countries already established hold a number of competitive advantages which cannot easily be tackled only using the cashew market mechanism. Aligned public and private efforts are needed.

2.6. Mozambique's Cashew Nut Value Chain Background

By the early 70s of the 20th century, Mozambique was the world's leading nation in the cashew nut sector, with a total in-shell cashew nut production of 240,000 MT at peak in 1973, a processing capacity of 100,000 MT secured by 15 processing plants, supplying about 50% of the world's kernel market, and having *hosted Africa's first industrial cashew processing plant that was established in 1960,* with the domestic processing industry starting to thrive soon thereafter. Mozambique rapidly gained a reputation for quality production and efficient processing, and by the early 1970s, the country stood side by side with India and Brazil as one of the main processors and kernel exporters in the world, taking advantage of its long coast and good cashew climate conditions ideal for producing the best-tasting cashews. Despite all the many challenges, the cashew industry today, is preparing itself to fight back in an attempt to regain the share of the international market it had during those old glorious days. The cashew nut industry can, like in the past, contribute greatly to the economic development of the country by earning foreign exchange and providing thousands of new jobs, especially in poor rural areas (Costa & Delgado, 2019).

The steering of the cashew nut value chain development has been entrusted by the Government of Mozambique to IAM that functions under the subordination and supervision of the Ministry of Agriculture and Rural Development (MADER), with the mandate to invigorate and boost the cashew value chain, promoting growth of in-shell cashew nut production through seedling production and distribution, cashew orchard renovation, cashew products commercialisation, and the restructuring of the in-shell cashew nut and cashew by-products processing industries (Costa & Delgado, 2019). In the discharge of its duties, IAM cooperates with private sector organisations militating in the cashew nut sector for the delivery of activities related to value chain governance, namely: Confederation of Private Sector Associations (CTA), the Cashew Industry Association (AICAJU) and the Commercial, Industrial, and Agricultural Association of Nampula (ACIANA). Their major role is to promote and sustain the dialogue with the Government and lobby in favour of the various value chain actors who seek improvements in the business environment (Costa & Delgado, 2019). AICAJU was established to promote the interests of processors, while the Commercial, Industrial, and Agricultural Association of Nampula (ACIANA) brings together private companies in Nampula province, including cashew exporters. Mozambique's cashew value chain has benefited from several specialised international organisations' help in many different ways, including through the allocation of substantial financial assistance to support the development programmes for some of the vital stages of cashew production, such as seedling production to replace unproductive old trees. NGOs and international cooperation organisations that have been supporting value chain development programmes for many years include USAID, USDA, EU, IFAD, WB, and ADB (Costa & Delgado, 2019).

In the institutional constraints domain, it is worth mentioning a few points challenging IAM in the delivery of its institutional mandate (Costa & Delgado, 2019), namely: **i**) Private sector reluctance in rendering extension services such as seedling production and spraying, and other producer support activities; **ii**) Deficient business environment, characterised by the lack of rural roads, electricity, and clean water; **iii**) Growers' ill-organised associations, with inadequate logistics and financial management, lack of transparency in benefit distribution among members, with the lion share ending up in the hands of a few leaders; **iv**)Virtually there are no grower associations in the cashew business, which results in little attention being dedicated to cashew production and commercialisation; **v**) Very weak agronomic research programmes in cashew production; **vi**) Weak institutional coordination, affecting in-shell cashew nut production and quality, resulting in relatively high intermediary transactions costs in the cashew value chain; **vii**) Poor monitoring and enforcement of existing policies, especially those related to the export tax, whose impacts need to be re-assessed; **viii**) Lack of consistent and reliable statistics.

2.7. Cashew Value Chain Features

For Costa & Delgado (2019), unlike in Brazil, India and Vietnam, the features of the cashew value chain in Mozambique are not so well developed, with the main cashew-related activities concentrated in exporting in-shell cashew nuts rather than processing into kernel exported for roasting abroad for final consumption. The three leading cashew processing countries absorb nearly their whole in-shell cashew nut production and imports from other countries, including Mozambique, to meet their full processing needs. They have developed their cashew value chain to exploit a broad range of cashew by-products. Value-added by-products comprise a wide and diversified variety of food, feedstock, and other industrial products such as kernels, cashew apple, juices and spirits, confectionery and bakery products, cashew flour and meal used in animal feed, residual cashew skin for tanning, cashew nut shell for fuel, and Cashew Nut Shell Liquid (CNSL) which is used in a diversity of industrial applications such as antioxidants, fungicides, and anti-termite treatment of timber (Costa & Delgado, 2019).

Mozambique's cashew industry develops two main activities: in-shell cashew nut production and cashew nut processing. Researchers assert that in-shell cashew nut processing consists of two steps. First, to produce white kernel to be exported to foreign roasters. Second to roast and flavour the kernel within the country for selling domestically or for selling outside of the country. Roasting activity is performed by very few small units, most of them exploring the tiny domestic market, still in its infancy. Mozambique has produced and exported CNSL, but the collapse of the international CNSL market had an extremely negative impact on this activity. Given that the market has shown new signs of attractiveness, processors have increased the capacity to the point that the level of production is now approaching the critical mass that will make the activity viable once again. With regard to cashew apple production, most of it is lost, although some rural households produce spirits for their own consumption and sometimes to pay for hired services, but this insignificant production is not widely commercialised, a situation that is aggravated by the absence of any legislation or regulation on this activity.

In Mozambique there is a coexistence of informal and formal flows through which cashew products circulate in the value chain, before reaching processed cashew nut end consumers in domestic and international markets, as well exporters of in-shell and processed cashew nuts. Formal trading is dominated by individual growers or growers' associations who sell their cashew nuts to small, medium, and large-sized traders, in-shell cashew nut exporters, or processing factories. The informal channel consists essentially of women, who use traditional home methods to process in-shell cashew nuts in very small processing units. They are essentially buyers who add some processing value and sell the cashew kernels directly to markets, bazaars, street vendors, or door-to-door. Once in a while some of the women also sell small quantities to neighbouring countries such as Malawi, Zimbabwe, South Africa, and even Zambia, through informal border trading, locally known as *mukhero*.

The three basic stages of the cashew value chain products flow comprise (Costa & Delgado, 2019): **i**) The value chain is characterised by smallholder producers, the overwhelming majority of which are the heads of rural families and households. Sometimes they organise themselves into associations and usually produce many different crops. Recall that cashew is grown along the coast in remote areas, making it difficult for producers to collect and sell their products. Most of the producers on various occasions largely do not have market price information, while buyers are better informed and have more bargaining power. Producers have no alternative but to sell the in-shell cashew nuts, irrespective of quality or size. Smallholder seller producers and collectors and buyers don't have control over the quality of the in-shell cashew nuts; **ii**) The cashew nuts are collected and transported for export either in-shell or processed by local industry or the informal sector. Cashew growers and simple collectors sell locally to retail and wholesale traders, processors, brokers, and the informal sector. At this stage there is some quality control: exporters must measure the OTR of each lot for export, and processors usually do the same to control kernel quality; **iii**) In-shell and shelled cashew nuts, crude or flavoured, are exported to international markets. It is an established fact that a considerable share of the marketed in-shell cashew nut surplus is exported without being processed (Costa & Delgado, 2019). Cashew nuts processed by the domestic processors are sold to both domestic and international markets.

There are twelve stakeholder groups, inasmuch as cashew nut value chain is concerned, namely: *Producers* - Rural families responsible for nearly all cashew production (Costa & Delgado, 2019). According to official statistics, about 1.4 million smallholding producers are involved in cashew production and trading. *Small Intermediate Traders* – They are very small, as a rule, but they play an important role in cashew marketing, and during the harvesting season they can number in the thousands. They are usually self-employed, and given the limited access to finance, they mostly work on behalf of others. *Wholesalers* - These are basically traders who export in-shell cashew nuts, but they can be intermediary suppliers to other exporters or processors. *Primary Processors* - These are the established processing industries, which process kernels in all stages like de-shelling, peeling, selecting, grading, and export in-shell kernel to the international market where further processing for final consumer markets takes place. *Cottage Processors* – These are agents, essentially women who buy or collect their own production to shell, peel, and roast cashew nuts manually in their respective backyards. *Secondary Processors (roasters)* – The practice of frying and adding flavours to kernel for final markets has not found favour or tradition in Mozambique. The domestic market for secondary processing products is small. *Transporters* – These are a few professional transporters who operate within the value chain, although usually the agents involved in trading cashew products (medium-to-large traders, wholesalers, processors, exporters, have their own transport capability. *Retailers* – Flavoured and unflavoured cashew nuts are available throughout the country at shop outlets, roadside stands, bazaars, mini markets, and larger supermarkets, despite the tiny domestic market for kernels. *Street Vendors* – These individuals trade in cashew kernels in urban areas along main roads and near traffic lights. *Brokers* – These are individuals who act as intermediary traders for exporters. *Exporters* - These six domestic and foreign operators buy nuts in the national market through a purchasing network—field agents, cantinas, warehouses, and others—established in areas where production takes place. They operate with their own funds or loans from credit institutions, but also act on behalf of financing importers. *International Market Buyers* – It is worth recalling that the market is divided into two vectors: **i**) In-shell cashew nuts are normally exported to India and Vietnam, and **ii**) Partially processed (primary processing) and processed (secondary processing) kernels are essentially sold to

European markets (Netherlands, France, Portugal, among others), and North American (US, Canada) markets.

2.8. Cashew Value Chain Major Segments

The cashew crop has been critical for Mozambique's economy, and crucial to poverty reduction. Cashew production involves around 1.4 million rural households, comprising about 6.5 million people (Costa & Delgado, 2019). The trees can grow easily on poor soils in coastal Mozambique, making the crop an important source of rural employment, including self-employment, source of income and fiscal revenue, a very powerful tool for fighting poverty, and a source of rural industrialisation. With this crop, thousands of jobs can be improved, and new ones created if several factors and main constraints influencing cashew production and harvesting are addressed to ensure a conducive business environment for growth throughout the value chain.

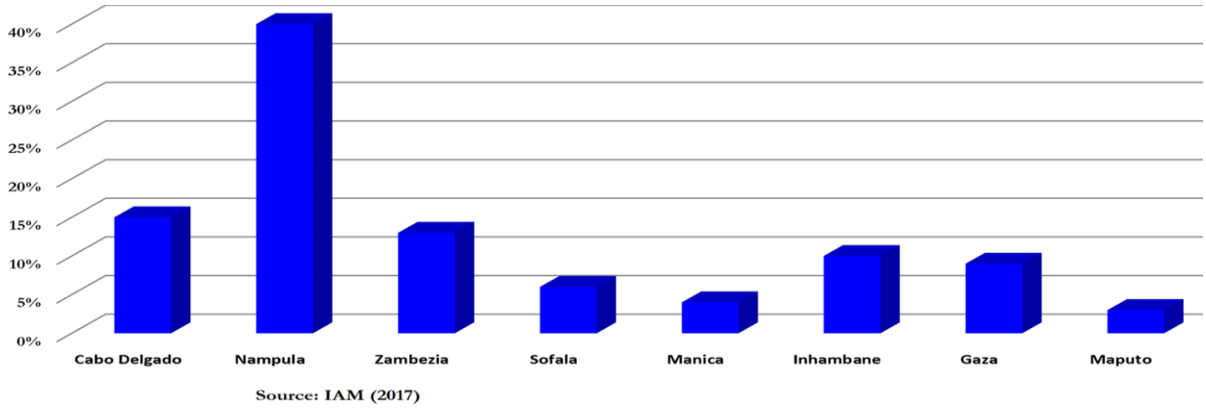
Cashew Nut Production Systems – According to Costa & Delgado (2019), cashew is produced in Mozambique along its extensive coastline spanning over 2,500 km, and stretching inland approximately 200 km, with the northern region (Cabo Delgado and Nampula) dominating, followed by Zambézia, Inhambane, and Gaza, as displayed in Figure 2.13.

The northern region of the country, especially Nampula and Cabo Delgado provinces produce the best quality in-shell cashew nuts, and together account for over 80% of total national production. Given the higher availability of in-shell cashew nuts, these Northern provinces are also the main processing regions. Nampula is the main processing region followed by Cabo Delgado, then Zambezia in the Central region and Inhambane, Gaza and Maputo, in the South.

Factors Influencing Cashew Production and Harvesting: **i)** *Cashew Tree Orchard Characteristics* **-** For Costa & Delgado (2019), cashew fields are difficult to maintain in a manner that keeps them productive with a controlled harvesting to ensure appropriate return on investment. It is challenging to establish and develop organised cashew farms in Mozambique and the few that existed before independence in 1975 were abandoned for various reasons, including, in particular, the 16-year destabilisation war that ended in 1992. Since then, the few attempts at organising them have not been as successful as desired. Researchers equally assert that the lack of organised plantations is one of the main obstacles to the development of the cashew apple processing in the country.

One way to control harvesting, supply, and processing of the highly perishable fresh cashew apple would be the concentration of production. The overwhelming majority of cashew trees in the country were planted before Mozambique's independence in 1975. The new trees were planted after independence by rural families in mono or mixed-crop farms (a combination of crops). Most growers and their families involved in production and collection also need to produce other food and cash crops to sustain their living, and they often pay more attention to crops like maize, cassava, groundnut, and beans, among others.

Figure 2. 14: In-Shell Cashew Nut Production by Province in 2016/2016 (%)



The fact that most growers inherited the trees reduces even further their dedication to caring for them since they did not invest in those trees, and they don't show any sense of ownership towards those orchards. They just collect the cashew nuts when the season arrives, acting just like collectors and not producers. Matters get worse when we realise that the cashew trees are dispersed around their fields and there is lack of relevant information on their age is often not known, making it difficult to plan for tree replacement. According to Technoserve, 8 in every 10 households have less than 100 trees. Currently, the average tree productivity without proper treatment is 2 kgs to 4 kgs per tree per year, giving around 200 kg to 400 kg per family, which provides between US$ 300 to US$ 600 per season, meaning that only part of family income needs is covered. The crop has an advantage for smallholders since it can grow in poor soils or in an environment with erratic rainfall.

Although the trees can survive with minimal maintenance by growers, they are still severely affected by adverse climatic events and conditions and are prone to fungal disease when humidity is high, which is a frequent condition in cashew nut growing areas. Cashew orchards in Mozambique consist essentially of a common tree variety that is less than six meters high has a large canopy, and whose gestation period lasts on average for five to six years. IAM attempted to introduce new varieties, especially the Brazilian dwarf variety with a view to gradually replacing old trees with more productive varieties and lower gestation periods, but the experiment was unsuccessful. Recently, IAM started encouraging the use of polyclonal seeds which are believed to be more effective than seedlings and conventional seeds (MozaCaju, 2017). **ii)** *Cashew Tree Yields and Productivity* – In more than 100 years of cashew growing in Mozambique, the total population of cashew trees in orchards reached its peak of about 50 million in the early 1970s and went down to about 35 million trees by early 1990s (Costa & Delgado, 2019). Untreated old trees bear low yields of between 2 kg and 4 kg per tree per year. The advent of independence in 1975 abruptly changed the social, political, and economic environment that caused significant changes in the type of ownership and control over the cashew trees. Consequently, three different kinds of ownership and control over cashew orchards emerged, namely: **a**) *The Un-registered Ownership*: Many cashew orchards scattered throughout the country were abandoned during the 1977 to 1992 destabilisation war. In official terms, these trees do not belong to anybody, despite some claims from community members living in those areas, and therefore uncared-for trees; **b**) *Family-Owned but Un-organised*: Some rural families planted their own trees on proprietary, unorganised land where trees are scattered all over their farms or near their houses. On average, families have between 10 and 20 productive trees. These families usually do not see cashew trees as something that needs to be cared about, as long as they harvest the fruits when the season comes, without taking measures to increase yield or improve nut quality (ACi, 2010). These trees remain equally without care for a long time, and there is no replanting; **c**) *Small-to-Medium-Sized Organised Farms*: These can be family-owned also, but growers spend a significant amount of time caring for the orchards, spraying, weeding, and pruning regularly. These trees are scattered throughout the farmland and are of different ages. They yield between 8 and 10 kg per tree per year. Some medium-sized orchards have hundreds of cashew trees. **iii**) *Post-Harvest Handling and Storage* - The quality of in-shell cashew nuts and cashew apple can be seriously influenced by postharvest handling and storage, resulting in high losses. In-shell cashew at the farm level is harvested over about 4 months. Normally, the in-shell nuts are dried in open space under the sun for a minimum of three days. In-shell cashew nut quality control in Mozambique is not very rigorous. Growers sell in-shell cashew nuts in bulk at the same price, no matter the product size or quality. There is no mechanism of price incentive for better quality. **iv**) *Technical Assistance and Input Use* - Employment generation can benefit greatly from this activity, since providing technical assistance to growers can be undertaken by private operators who can also provide the necessary and priority technical assistance on to implement the good agricultural practices. The lack of a competition environment with the public network to provide similar agricultural services and inputs to cashew growers presents itself as unique opportunity for new players to enter the sector. According to Ashimogo et al. (2008), a multiplicity of research works demonstrates that the most critical cost determinants in cashew production and yield increases relate to inputs, particularly fungicides, in addition to hired labour. Nevertheless, in Mozambique the use of inputs such as fertilisers and chemicals in agriculture is still not significant. **v**) *Constraints Hindering Development of Cashew Production* – According to Costa & Delgado (2019), the growth of cashew production in Mozambique is negatively affected by a number of factors that limit the sector's capacity to create new and stable jobs, which requires the attention of decision makers to address them, particularly orchard renovation, adequate spraying against fungal disease, proper tree pruning, budding, and grafting, proper harvesting techniques, control over wildfires, provision of good agronomic techniques and information, training of growers on different business issues, provision of financial assistance to growers, adoption of adequate technologies for processing by-products (in special the highly perishable false fruit), and the adoption of incentives to ensure the stability of maintenance workers, particularly in areas where there is a strong competition with other cash and food corps, including fishing. Recall Mozambique was the first country in Africa to process cashew nuts on an industrial scale (UNCTAD, 2021).

Contrary to the general public perception, cashew processing technology is not complex, and most operations are unskilled. Normally, men perform the initial steam-roasting and de-shelling. Women, who have better skills than men, are then called in for peeling and grading.

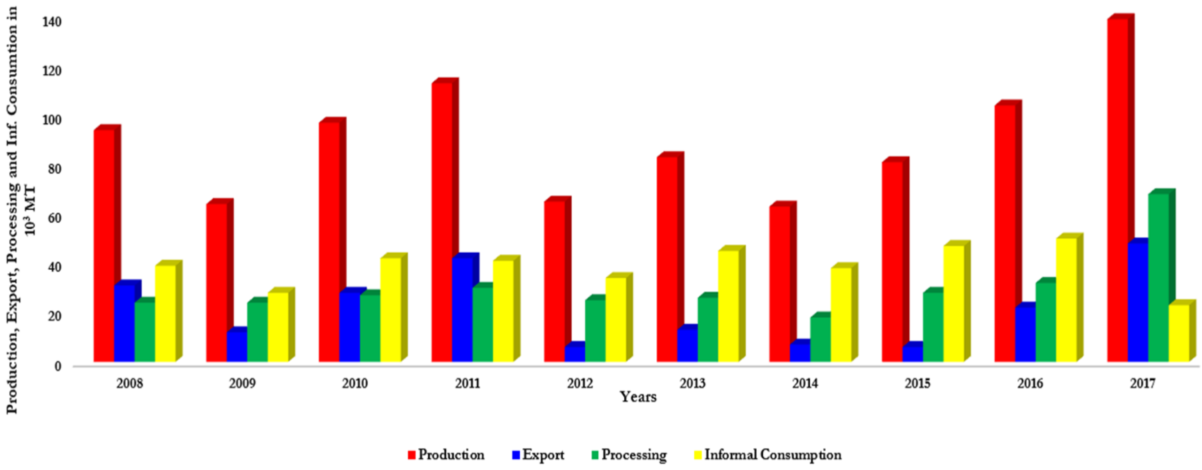
In the past, that is before independence, the processing industry in Mozambique was characterised by the use of semi-mechanical and mechanical technology (such as that from Otremare, Italy, or Sturtevant Engineering Ltd., Germany) in medium-to-large sized factories (3,000 MT to 12,000 MT per annum in-shell cashew nut capacity). These mechanical technologies were used until the second half of the 1980s when the industry began to transition to more labour-intensive technologies, deemed more appropriate for Mozambique's social and economic context. These transformations coincided with the phase in which the processing industry dramatically decreased its capacity to add value to in-shell cashew nuts through quality improvements and sale of by-products, and, therefore, to promote growth.

Since 2001, Mozambique has experienced significant changes in cashew business structure. The country adopted a new strategy, closing larger urban factories far from the in- shell cashew nuts sources and locating new, small (in-shell cashew nuts 500 MT to 2,000 MT capacity) manual processing plants away from the cities. The objective of these reforms is to push down raw material costs, a significant part of total processing costs, and to provide more jobs in rural areas. Cashew nut processing units located in the country-side have been helpful in terms of creating back-to-forth linkages to manufacturing and agro-processing, contributing to domestic investment, employment, and output.

Around 2014, the main processors realised the need to use more fully the existing processing capacity and scale up overall processing capacity to create economies of scale, as costs at small volumes limited profitability. Domestic supply of in-shell cashew nuts was increasing, and the kernel market had started to look promising. Processors decided to adopt a combination of manual and mechanical technologies to better balance job creation goals with increased capacity and cost reduction, based on a more stable workforce. They equally intended to gain a more sophisticated export market concerned with work conditions and fair-trade issues. The employment changes imposed by the changes in technology did not require the firing of workers, as increased production allowed transfer of excess labour to manual peeling and grading activities. But it did reduce the need for medium to long-term hiring of additional workers.

According to IAM (2017) and as displayed in Figure 2.15, the evolution of production and uses of in-shell cashew nuts in Mozambique over the period of 2008 to 2017 domestic processing is still operating under 50% of registered average annual capacity, suggesting the need for new investments to keep pace with the increasing production.

Figure 2. 15: Mozambique's Production, Exports, Processing of In-Shell Cashew Nuts, in 10^3 MT



Source: IAM (2017); authors' adaptation and analysis

Apart from the new processing units, investment to increase installed processing capacity to ensure a steady growth in overall processing capacity is not keeping pace with the increase in the availability of in-shell cashew nuts. We equally notice that processing is also gradually employing more workers, despite the introduction of new mechanised equipment for de-shelling and grading.

According to some operator estimates, mechanisation can reduce processing costs by US$30 per MT of processed cashew nuts (Costa & Delgado, 2019). Mechanisation has large advantages by reducing workplace safety risks and health hazards, when we compared it to hand processing. There is a significant presence of women workers in the processing industry whose rate is about 57%, which is high compared to other industries and cashew trading. On average, from 2008 to 2011, in-shell cashew nut exports were typically higher than domestic processing activity and estimates that include those exports that managed to evade the export tax on in-shell cashew nuts suggest that, as recently as 2015, in-shell cashew nut exports had nearly the same volume as home processing, according to Mishra and Martin (2016). From that time on, domestic processing volume has surpassed exports. This reality stems from the fact that the pressure from processors has been imposing the need to tighten export tax legislation enforcement and supporting intermediary measures such as the Right of First Refusal (ROFR) and the temporary ban on exports during the first months of the buying season (October to mid-December).

AICAJU, in its recent announcement, indicated that at the end of 2018 Mozambique had 15 factories in operation, as displayed in Table 2.4, located primarily in rural areas of three Provinces: Nampula, with 91% of installed processing capacity; Cabo Delgado, with 8,7%, and Gaza & Inhambane, with 0.3%. The combined number of jobs in these three factories would get close to seventeen thousand workers, which contributed to the stabilisation of wage employment in areas where few such opportunities exist.

Table 2. 4: Processing Units Capacity, Planned Production, and Number of Workers by Gender (2017/2018)

Nº	Processing Units	Installed Capacity	Planned Production	Nº of Workers		
				Males	Females	Total
Nampula Province (91% of Total Installed Capacity)						
1	Condor Nuts	10,000	10,000	760	990	1,750
2	Condor Caju	6,000	5,000	995	1,492	2,487
3	OLAM Ltd (4 Factories)	18,000	13,910	2,016	3,050	5,066
4	Caju Ilha Lumbo	4,500	2,460	800	800	1,600
5	Caju Ilha Angoche	4,500	2,605	800	800	1,600
6	Korosho Nampula	4,500	5,000	350	450	800
7	MOCAJU LTD	3,000	2,148	320	400	720
8	Indo Africa	1,000	350	320	480	800
9	Sunny Mozambique International	5,000	2,000	140	210	350
10	EMAJU	50	22	6	8	14
11	ADPP	40	14	8	8	16
12	DML CASHEW LTD	1,500	-	300	200	500
	Total	**58,090**	**43,509**	**6,815**	**8,888**	**15,703**
Cabo Delgado Province (8.7% of Total Installed Capacity)						
13	Korosho Cabo Delgado	5,500	4,000	320	480	800
Gaza and Inhambane Provinces (0.3% of Total Installed Capacity)						
14	JAB MOZ Morrumbene	200	-	15	30	45
15	Condor Macia	5,500	1,000	90	360	450
	Total	**69,290**	**48,509**	**7,240**	**9,758**	**16,998**
	% M/W			**43%**	**57%**	

Source: AICAJU (2018); Condor

Cashew Nut Processing Systems - Mozambique has two types of cashew processing systems: **i)** *Formal Legal Plants Licensed* to pursue this activity using either manual or semi-mechanised processing; **ii)** *Unlicensed Informal Processing* using precarious technology. As shown in Table 2.4, the formal sector can still be considered labour-intensive, despite the trend to use semi-mechanised and mechanised technologies. In semi-mechanised factories, processing is supported using calibration, cutting, and peeling machines, but manual labour is still required for subsequent processing stages of which we can highlight scooping and grading, among others. However, the quality and efficiency of machines have improved substantially, but breakage rates are still lower with manual processing than with the mechanised one. A substantial number of facilities choose to process the largest, most valuable nuts by hand to ensure maximum business profitability.

The international cashew kernel market has become characterised by more stringent demands and standards, considering the international concerns about food safety and hygiene. Therefore, Mozambique's cashew processors are much more committed to sustainable sourcing, implementation of *traceability* systems in facilities, and compliance with food safety certification programmes such as HACCP[8] and BRC Food Safety[9].

Some factories have agreed to adopt ACA[10] international certification for their products. Factories mainly use basic batch processing systems and paper-based tracking forms. But these practices are quickly being replaced by higher-tech solutions that use bar codes and computer-based tracing systems to chart the kernels' path from farm to final outlet. MozaCaju has also helped Mozambican processors to install batch-processing systems and become food safety certified by HACCP standards. As a result, five processing facilities in Mozambique have implemented batch processing systems, thus laying the groundwork to make processed kernels traceable down to the district level or beyond in the future.

Factories purchase in-shell cashew nuts from growers during the harvest season, which lasts from October to February, with most purchases occurring in November and December in the main producing northern region. Processors must buy all quantities needed to operate the entire year, meaning that large amounts of working capital are needed. This also increases storage and handling costs, a weakness in competing with main foreign processors in India and Vietnam who can buy supply throughout the year.

Constraints Hindering Development of Cashew Processing – Cashew nut processing costs are very high in Mozambique when compared to other processing countries, and the influencing factors are, among others: low quality of in-shell cashew nuts, low utilisation of installed productive capacity, high energy costs, low worker productivity, high absenteeism, and inefficient use of technologies, and sometimes inefficient management (Costa & Delgado, 2019).

Mozambique in-shell cashew nuts are clearly below average quality. Yields measured in KOR are between 42 and 46 lbs per 80 kgs bag of in-shell cashew nuts. Low quality in-shell cashew nuts garner lower prices in international markets, but also reduce processing yields, and consequently domestic processing revenue per MT.

In rural areas, workers for labour-intensive processing are not sufficiently and continuously available throughout the year. Processing in those areas competes with other sectors where work is easier or pay better, or even with seasonal farm activities that are important for family food security.

The reliable acquisition of raw material for increasing the scale of industrial processing operations is a daunting challenge. The export tax discourages cashew producers by lowering the price they receive even more than would be the case given the low quality. Mozambique has one of the lowest in-shell cashew nut producer prices anywhere (Mishra and Martin 2016).

High barriers to entry into small-scale cashew processing for local growers, either as individuals, or organised in associations or even cooperatives. They lack expertise and experience in critical processing business aspects and activities (technical know-how, administrative and marketing sills, as well as financial capacity). An added challenge for small and recently established processors is the compliance with hygiene standards in manual processing. The domestic cashew market is limited to the kernel, with no efficient value chain for producing and marketing various by-products such as cashew apples and CNSL, among others. As a result, most by-products remain commercially unexploited, leaving much of the job creating potential of the cashew tree unexploited.

Finally, processors' access to finance and financial service support is very limited. IAM's intention of allocating 20% of export tax revenue to start-up processors has not yet come into fruition. Some medium and larger processors have benefited, with limited impact, from development promoter schemes, such as through USAID. Small processors have no access to any loans to acquire in-shell cashew nuts during the favourable harvest time and then to stock enough quantity to maintain continuous processing throughout the year.

When it comes to cashew nut marketing, many cashew nut traders and buyers commercialise only the main product, the in-shell cashew nut, while the cashew apple is left out. There are two main in-shell cashew nut buyers: **i**) *Domestic Processors* (kernel exporters); **ii**) *Exporters* who ship the in-shell cashew nuts for processing abroad. In-shell cashew nut is totally processed either domestically or abroad. There are four types of in-shell cashew nut processors: **a**) *Factories* – Legal small, medium-sized or large, partially processing the in-shell cashew nuts to produce kernel to be roasted abroad. A few of them have begun to produce CNSL; **b**) *Roasters* - Formal small domestic who buy in-shell cashew nuts to supply flavoured kernel to domestic, foreign and neighbouring country's markets; **c**) *Informal Roasters* - These can be growers, intermediaries, or individuals who own small premises to roast kernel; **d**) *Foreign Roasters* – These import a substantial portion of Mozambique's in-shell cashew nut production to produce flavoured kernel for international markets, and most of them are multinationals with large commercial presence around the world. Cashew apple processing is still a very small activity with little involvement of large firms. Some small, informal processing units produce cashew wine (*xikadju*), and a spirit (*thonthontho*) for self-consumption and sale.

The major impediments affecting directly the cashew nut marketing process are: ♦ Too many unlicensed actors (nationals and foreigners) in the market, generating an aggressive climate that harms licensed actors; ♦Unclear legal rules on in-shell cashew nut commercialisation, leading to illicit activities; ♦Easy sales to third parties without contracts, which discourages industrial processors investment in producers; ♦Inconsistent marketing of by-products (mostly CNSL, testa and shells); ♦World price volatility; ♦Export tax and its regulation impose delays; ♦Low quality of the in-shell cashew nuts; ♦High port transaction costs.

2.9. Cashew Nut Value Chain Financing Issues

Lack of capital for investment in fixed assets and mainly for working capital is a critical issue throughout the cashew value chain, drastically reducing the sector's potential to create new jobs.

The ideal moment for the purchase of in-shell cashew nuts is the harvest season, the most appropriate moment for the efficient supply of raw material to processors for the entire year, but processors are severely constrained by the lack of financial support (Costa & Delgado, 2019), implying that they need to mobilise huge amounts of working capital, which is difficult.

Financing is critical for the cashew business as an agroindustry. Every segment needs financial support. No financial institution is willing to operate with smallholders, always seen as too costly and too risky (Costa & Delgado, 2019). Working capital is the key financial factor to ensure sound process management. Costs of in-shell cashew nuts can account for 75 to 90% of the total running costs.

The overwhelming majority of processors has been confronted with extreme difficulties in finding financial support. A few large processors have received commercial loans through financial schemes facilitated by development promoters such as USAID, AFD, and others. Research to ensure viable cashew tree replanting is crucial to support the whole value chain and allocated budgets are too small to support activities (Costa & Delgado, 2019).

2.10. Cashew Policy Environment in Africa

Africa has seen a tremendous change in cashew policies in recent years (Shakti Pal, 2017). At the beginning of the new millennium, East African cashew producers adopted some policies to govern the cashew value chain and formed dedicated state agencies to supervise their implementation. West African countries joined recently by introducing new policies and mechanisms to control regulatory implementation (Costa & Delgado, 2019). Policies intended to influence the development of each segment of the cashew value chain, from production and harvesting to processing and marketing, have had a positive effect on the African cashew value chain, which today has a visible and influential effect on the world cashew business. Some of the policies adopted in each segment by African countries competing with Mozambique on the international market are the following:

Production Policies - By the time Mozambique began to reformulate its cashew policies, Tanzania had already completed a large cashew research and rehabilitation programme that renewed the country's cashew orchards and improved the quality of in-shell cashew nuts. The country had also adopted cashew industry protection policies by introducing export tax levies on in-shell cashew nuts and kernel exports, later discontinued in exchange for increasing its export tax.

Until 2006, West African countries with no tradition in growing cashew trees, and no consistent cashew policies, also experienced fast growth in production (Côte d´Ivoire, Guinea-Bissau), in view of the need to diversify agricultural crops.

In 2006, the African Cashew Alliance (ACA) was created and based in Accra, Ghana. This association of African and international businesses has since promoted a globally competitive African cashew industry. With the support of ACA, West African countries began to adopt development programmes similar to those in Tanzania and Mozambique, creating new institutions to manage the cashew value chain. Meanwhile, Tanzania formed a Cashew Development Trust Fund (CDTF), through its 2009 Cashew Act to support the development of the cashew industry. Along with the establishment of the Fund, a 15% levy was adopted to be collected from the export of in-shell cashew nuts. The Melinda and Bill Gates Foundation funded the creation of the African Cashew Initiative (ACi), based in Ghana and managed by the Dutch development organisation, Gesellschaft für Internationale Zusammenarbeit (GIZ), to support development of the cashew sector throughout Africa.

In 2011/2012, IAM in Mozambique kept supporting seedlings production and spraying programmes and adopted a US$ 4 million programmes run by ACi to support farm organisations and cashew production by training growers through field school programmes. West Africa began to introduce new cashew policies to protect their industry and incentivise national production, such as subsidising some activities through cashew transaction levies. Côte d'Ivoire adopted sector reforms and a strategy to promote domestic cashew production and processing.

Processing Policies - Mozambique, which once had a sound industry equipped with the then most advanced cashew processing technologies, collapsed in 2006. Cashew processing changed from urban, capital-intensive to rural, labour-intensive processing units. At the same time, Tanzania, facing similar problems, privatised government-owned factories and increased installed capacity.

In 2006 and 2007, other cashew producing countries in West Africa, motivated by Mozambique's success, began to look strategically at cashew value-adding activities. Tanzania and Kenya enjoyed strong processing successes, and West Africa developed multiple cottage processing units. African processors started trying new technologies in a mix of capital and labour-intensive strategies.

Several cashew producing countries in 2008/2009 pursued private processing unit consolidation with the support of government policies, such as financing through guarantee funds supported by export tax revenues. Tanzania's warehouse receipt system was an example, as it started encouraging consolidation of processing.

However, most small-scale West Africa cottage industries[11] failed as the model did not ensure the critical economies of scale needed for the market. In 2010 and 2011, based on the failed experience with cottage industries, Ghana, Benin, Burkina, and Côte d'Ivoire embarked on new cashew processing investments using more adequate technology on units with installed capacity able to ensure economies of scale. West Africa shifted from cottage to commercial-scale processing, but limited access to finance and skills inhibited growth of most processors, preventing them from investing in medium-to-large scale processing units.

In the 2012/2013 season more of the same problem was experienced, with new processing start-ups from 2011 not succeeding. On the other hand, Asian countries began to modernise their industry. Almost all Vietnamese processors adopted 100% mechanisation and India has also started investing in mechanisation.

In Africa, Tanzanian processing almost collapsed as a consequence of scarcity of skilled labour, unavailability of capital lead to high interest, and difficulties for small units of 300 to 2,000 MT installed capacity to achieve viable economies of scale. Mozambique, betting on economies of scale to increase processing unit capacity, began adopting new semi-automatic technology.

New investments in West Africa processing continued (Benin, Ghana, Côte d'Ivoire) in 2014/2015. Market volatility highlighted the need for technical assistance and access to finance for new processors. New investments on cashew apple processing models were introduced, but proponents of this initiative made too little effort to promote the models. Vietnam and India intensified their in-shell cashew nut purchases from Africa, supported by favourable policies in India and competitive costs in Vietnam, a country that became the major in-shell cashew nut importer from Africa.

Pressed by the growing market quality demands, and supported by ACA, processors in Africa began to be concerned with hygiene and safety issues and decided to adopt quality systems such as Hazard Analysis Critical Control Point (HACCP) and the ACA seal.

In the season of 2016/2017 West African cashew industry experienced a great boom, and Côte d'Ivoire, Ghana, and Benin made multi-million-dollar investments. Other countries such as Guinea-Bissau, Burkina Faso, and Togo saw small to medium-scale plant establishment as drivers for cashew value chain development. Tanzania started the slow process of increasing utilisation rate, aiming to achieve better balance between in-shell cashew nut exports and processing. Processors throughout Africa experimented with various mechanisation models and began to understand the importance of management information systems and their use for decision making.

The government of Côte d'Ivoire recognised the need to expand domestic cashew processing given its potential of driving cashew value chain job creation and value addition, by singling out the cashew nut processing as national priorities in its National Development Plan.

Marketing Policies and Value Chain Organisation – Prior to 2006, the cashew industry was characterised by flat markets and falling kernel prices. African prices were often set at a discount in relation to global prices. Aware of the need to organise cashew value chain, producing countries started setting-up cashew bodies, like Mozambique's IAM, to supervise the cashew business.

In 2007, kernel prices began to recover, and global buyers showed more interest in African kernels. Mozambique Government increased sector salaries to the benefit of workers in the cashew business. The minimum wage for agriculture was increasingly attracting new employees and motivating the existing ones to keep their jobs. The African Cashew Alliance (ACA) created an information sharing system on best practices, prices, and opportunities, as well as to foster networking for those operating in the cashew sector in Africa.

In 2008 and 2009, kernel price continued moving upward. Buyers stopped signing forward contracts, and preferred to make spot purchases instead, because of market uncertainties and contract failures from major suppliers. The warehouse system was established in Tanzania. In West Africa, donors embarked on coordinated efforts in order to promote processing.

Prices recovered from a small fall in late 2009 over the following two years, when a short crop led to unmet demand, disturbing the world cashew market.

To reinforce its cashew value chain, Kenya imposed a ban on exports of in-shell cashew nuts and ACA became part of the International Nut and Dried Fruit Council (INC) to promote investment in the African cashew sector to the worldwide nuts industry.

In 2012/2013, kernel prices tumbled after a record high in 2011, stabilising at US$ 3.5 per lb. Côte d'Ivoire started discussing sector reforms to promote local processing and reinforce its cashew value chain.

The years of 2014/2015 were characterised by high price volatility associated with weather and political shocks in high-producing countries. African kernel prices reached parity with global prices.

Food Safety and Traceability Policies - Côte d'Ivoire announced multiple sectoral reforms, such as creating more traceable supply and organising sector players. The reforms were meant to reinforce the organisation of its cashew value chain in coordination with the cocoa and cotton value chains.

In 2016/2017 a significant production deficit as a result of changing weather patterns depressed crop production in the northern hemisphere. In-shell cashew nut price volatility continued, and kernel prices increased rapidly. Increased demand for broken cashew kernel became a new market trend.

To consolidate its cashew value chain, Côte d'Ivoire and Guinea-Bissau introduced new investment incentives. Nigerian processing, on the other hand, collapsed with the removal of its export expansion grants (EEG). Meanwhile, several knowledge-management platforms emerged in African cashew producing countries.

Over the past 20 years or so, Mozambique adopted a legislation aimed at facilitating industrial development through value-adding activities, increase export revenue, and create jobs in the cashew nut processing industry. That legislation brought about several changes in support of domestic processing: it established a tax of between 18 and 22% to be applied on exports of in-shell cashew nuts. It granted domestic processors the right of first refusal (ROFR) to purchase in-shell cashew nuts from domestic growers, and later established a temporary in-shell cashew nut export ban at the beginning of each season until processors were completely supplied. This later regulation was enacted after cashew processors complained about the ineffectiveness of the first two measures on their in-shell cashew nut supply.

The main intention of the legislation was to protect the cashew processing industry in Mozambique and enhance its competitiveness in the global marketplace. These goals were achieved to a certain extent. Despite some difficulties, the processing industry was able to re-establish itself and provide formal sector jobs. This strategy, expected to remain in place as long as needed for processing units to survive, created several restrictions still in force, namely the export tax, right of first refusal of in-shell cashew nuts by domestic processors, and the ban on export of in-shell cashew nuts during the peak harvesting season. The fact that in-shell cashew nut production in Mozambique did not grow as expected suggests that the current policy has a double negative impact. On the one hand it hinders Mozambique's global competitiveness by protecting inefficient cashew processing and, on the other hand, it discourages investment by producers, a side-effect of the export tax that gives processors access to in-shell cashew nuts at levels below international market prices that smallholding growers, who account for most cashew production, are forced to accept below-market prices. Failure to compensate producers has been contributing to declining quality and quantity of in-shell cashew nuts in Mozambique. Growers do not have the monetary incentive to invest in new trees or maintain the existing ones. In a recent attempt at correcting regional asymmetries in the value chain, the Government of Mozambique approved a new regulation contemplating new measures to control the quality of cashew products and by-products and introduce new rules for operators to be in the cashew business, such as mandatory registration, definition of operators who can export in-shell cashew nuts, and how to export to ensure the domestic processing industry will first be completely supplied. The new regulation makes it mandatory to set a farm gate reference price at the beginning of each harvesting season, to ensure fair remuneration of cashew nut producers.

The effectiveness of these policies has been debatable since effects on in-shell cashew nut production have not been as positive as desirable. Peak cashew production of 50 years ago is yet to be achieved. Seedling production and distribution to smallholder producers has not been effective despite IAM's efforts and the help of donors. Productivity in old and untreated orchards of 2 kg to 4 kg per tree per year is falling rapidly, notwithstanding IAM's pesticide spraying efforts.

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CHAPTER 3

GENERAL CONTEXT OF MOZAMBIQUE’S COMPETITIVENESS

3.1. Prospects for Export Competitiveness and Development in the Least Developed Countries (LDCs)

Mozambique’s export competitiveness in recent decades has been very much within the patterns observed in all other Least Developed Countries (LDCs). The rationale for analysing export competitiveness of LDCs for the period of 2005 to 2019 is founded on the fact that, as far as the cashew nut industry is concerned, 11 out of 15 cashew nut producing African countries are LDCs, that is, around 73%, as shown in Table 3.1. The group has been increasingly enjoying the benefits of its integration into the rapidly and irreversibly globalising world economy, thanks to export expansion and diversification partially engendered by the intensive and extensive export promotion activities that have been playing a critically important role through innovation, investment, and fight against poverty, on a bet to upgrade the economies from primary commodity exporters onto producers and exporters of manufactured goods (UNCTAD, 2008).

Table 3. 1: Share of LDCs in African and Global Production of Cashew Nuts, in 10^3 MT (2005 - 2019)

Countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Benin	53	55	60	86	117	102	163	163	198	202	225	126	157	220	204
Burkina Faso	9	10	7	7	7	21	95	60	115	120	120	120	125	135	137
Gambia	0	0	0	3	4	4	3	3	3	3	3	3	3	3	3
Guinea-Conacry	6	7	7	7	7	7	8	9	9	12	14	20	16	25	21
Gunea-Bissau	89	95	98	111	123	121	125	118	137	159	169	155	158	162	166
Madagascar	7	7	7	8	6	7	7	7	7	7	7	7	7	7	7
Mali	26	28	30	31	33	35	38	44	40	72	66	71	120	168	168
Mozambique	104	63	74	85	64	97	113	65	83	63	81	104	139	115	107
Senegal	5	6	5	5	6	6	7	7	7	8	8	10	9	7	7
Tanzania	90	90	93	135	79	74	121	160	128	130	198	155	265	314	225
Togo	1	1	1	2	4	5	7	7	7	7	9	10	11	11	12
Total African LDCs	**390**	**362**	**382**	**480**	**450**	**479**	**687**	**643**	**734**	**783**	**900**	**781**	**1,010**	**1,167**	**1,057**
Total Non-LDCs Africa*	1,646	1,909	1,981	2,092	2,249	2,060	1,826	1,682	1,462	1,372	1,544	1,496	1,384	1,414	1,495
Total Africa	2,036	2,271	2,363	2,572	2,699	2,539	2,513	2,325	2,196	2,155	2,444	2,277	2,394	2,581	2,552
Share of LDCs (% of Total Africa)	**19**	**16**	**16**	**19**	**17**	**19**	**27**	**28**	**33**	**36**	**37**	**34**	**42**	**45**	**41**
Total World	2,426	2,633	2,745	3,052	3,149	3,018	3,200	2,968	2,930	2,938	3,344	3,058	3,404	3,748	3,609
Share of LDCs (% of Total World)	**16**	**14**	**14**	**16**	**14**	**16**	**21**	**22**	**25**	**27**	**27**	**26**	**30**	**31**	**29**

Sources: KNOEMA (2020); FAOSTAT Database (2021); Author's Calculations

*** Non-LDC cashew nut producing countries include: Brazil, Cote d'Ivoire, India, Indonesia, Ghana,Kenya, Nigeria, Thailand, and Vietnam**

In terms of cashew nut production, Table 3.1 shows that the contribution of LDCs has been growing in importance, from an average of 17% for the period of 2005 to 2009, having risen to 28.7% for the period of 2010 to 2014, and to almost 40% for the period of 2015 to 2019, with a particularly higher share in 2017, 2018, and 2019, which is a strong reason to believe that Mozambique has the same pattern as the one displayed by the group.

Although these countries originate from different backgrounds in terms of their initial factor endowments, geographical and climate conditions, infrastructure development, export base, poverty levels, financing opportunities, options and scale, different intensities of structural adjustments, quality of governance, all as a group lagging behind other countries, LDCs embarked on the use of differentiated forms and approaches to export diversification and expansion through support or export promotion to achieve focused improvements in public services and the business environment (Biggs, 2007). According to Collier (2007), LDCs are small, very distant from rich markets, facing a shortage or inadequacy of physical infrastructure and skilled labour, high transaction costs for private businesses, which has been the major cause of decline in their economic growth and share of world exports, aggravated by severe hurdles to penetrate the wealthy and highly protected and subsidised developed countries' markets for their export products, resulting in about a billion people in the developing world being by-passed by the global economy.

The impact of natural resources in the determination of where to produce and with what comparative advantage structure is increased by the intensification of international capital mobility (Wood and Berge, 1997; Owens and Wood, 1997; and Jones, 1980). Hausmann, Hwang and Rodrik (2006) ague that exports of low-income developing countries are dominated by low productivity spill-overs, causing slow economic growth, which ends up in the deepening of the "natural resource curse" (Sachs and Warner, 2001).

Despite the severe hurdles that these countries face, they have been improving the institutional environment for private sector investment and addressing supply-side constraints (Collier, 2007; Collier and Venables, 2007). Additionally, Collier (2007), and Hausmann and Rodrik (2003) note that significant opportunities exist in horticulture, fishing, and tourism, and countries can benefit much more from exports of traditional agricultural crops such as cotton, cashew, coffee, and horticulture which have much more in common with manufacturing, in terms of income generation and dynamic gains in the form of technological upgrading, quality control and marketing connections.

Global trade has experienced a faster growth than GDP over the past sixty years, but LDCs experienced a slower pace on both, which resulted in their increased marginalisation (Bacchetta, 2007). This group's share of total merchandise trade never went beyond 0.46% for many years (UNCTAD, 2008), and export earnings cover roughly between half and 2/3 of the import bill in the overwhelming majority of LDCs, compared with 95% in other developing countries.

The World Bank and the IMF state that LDCs' particular sources of foreign exchange are foreign aid, foreign direct investment (FDI) and remittances, and concessional official finance remains extremely important, external debt stocks remain large relative to exports, and debt servicing accounts for roughly 10% of export revenue at the median.

Since 1968, a Generalised System of Preferences (GSP) has been granted to LDCs' exports into the developed countries, reinforced by the Lomé Convention (EU) in 1975, which jointly generate a resource transfer that rivals foreign aid (Kennan and Stevens, 1998), and serves as an export-promotion device, a function that is central to their developmental appeal. Since the late 1990s, the EU's Everything But Arms (EBA, 2001) and the United States' Africa Growth and Opportunity Act (AGOA, 2000), were instituted to broaden the preferences available to LDCs, but the rules of origin built into those preferential schemes ended up limiting preference effectiveness (UNCTAD, 2003; Hinkle and Newfarmer, 2006).

Collier and Venables (2007) argue that the impact of preferences on exports depends on the structural and policy determinants of export supply response and on the preference design. They equally argue that the supply elasticities are larger in manufacturing than in land-constrained traditional agriculture, and preferences are mainly relevant to a small number of labour-intensive manufactured goods and agricultural products facing relatively high import duties, which suggests that the avenues for export expansion by LDCs must include horticulture, fish and the traditional sector, where tariffs in developed countries are low and preferences are consequently of little significance.

The stringency of developed countries' quality standards makes compliance a truly daunting challenge requiring costly acquisition and installation of laboratories, safety and management systems, and technical expertise to the point of developed countries being often accused of disguised protectionism (Ignacio, 2007).

In Africa, there are some 30 regional trading groups, and on average each of the 54 countries is usually a member of four (typically overlapping), and yet official intra-African trade flows remain very low and continuously declining, accounting for less than 10% of total African exports and imports, if South Africa is excluded (Yang and Gupta, 2005), a clear reflection of the drawback of regional trade blocs, with the creation a "spaghetti bowl[12]" of rules of origin and discriminatory trade tariffs, which usually lead to trade diversion, among many other malefices of regional trading arrangements.

It is a very commonplace to hear statements that LDCs are handicapped by WTO rules on export subsidies and import barriers, preventing them from applying the infant-industry protection strategies employed successfully by the Asian tigers (Lall, 2002; Westphal, 2002). But LDCs are exempted from this ban, and in any case many other forms of assistance to exporters remain permissible, including subsidies other than those directly targeting exports, implying that domestic supply constraints and policies are the most important obstacles for LDCs' trade expansion and economic growth, and not trade barriers imposed from outside.

Paraphrasing Burke (2005), in today's modern world where business is becoming increasingly more integrated, rapidly globalising and more demanding, firm managers are pressurised to find more effective means of surviving the stiff and fierce competition by embracing creative, adequate and adaptive human resource selection, training and management strategies in their operations, firms are confronted with an enormous number of issues, the most critical of which are productivity increase, and increased participation in the global markets. Additionally, access to, acquisition, development and implementation of new technologies, organisational enhancement capabilities, the ability to provide a timeously, adjusted and tailor-made response to the needs, desires and aspirations of increasingly well-informed and more demanding 21st century customers, are equally critical. At the same time, attention is essential to the *modus operandi* of a high-velocity and extremely volatile marketplace where they operate, as well as to the fundamental objective of achieving increased revenue and lowered costs, attracting and retaining a high-performing and flexible workforce, introducing and managing relevant organisational changes, among other things, and firms can still choose where to locate their investments. Economic theory and empirical evidence indicate that internationally mobile factors of production, particularly foreign direct investment (FDI), look for the most favourable locations for production (Golub, Kierzkowski and Jones, 2007; and UNCTAD's World Investment Report 2005). More generally, countries in which doing business is difficult cannot compete in transactions-intensive industries such as manufacturing and horticulture (Collier, 1997; Lyakurwa, 2007). LDCs have made progress in eliminating the most severe distortions arising from fiscal deficits, exchange rate overvaluation, and high and variable import barriers, but it is still expected of these countries' governments to carry-on playing a crucial role in providing public goods and overcoming market failures.

The existence of a reliable and reasonably priced infrastructure consisting of transport (land, air and maritime), electricity and water, and telecommunications is one of the main pillars for export diversification and growth. Mbekeani (2007), and Bacchetta (2007) argue that poor transport and communications systems in many LDCs increase transaction costs and impede international trade, and land-locked countries face particularly high transport costs characterised by lack of investment and inadequate maintenance of facilities, being poor administration and extortion a commonplace in almost all LDCs, with transit times often far longer than elsewhere, which is aggravated by the high costs caused by the unreliability of electricity supply, given the endemic power outages. Mbeakeani (2007), Eifert, Gelb and Ramachandran (2005) have identified power outages as the single most important constraint on growth, with generators representing the bulk of investment for small manufacturing firms. In terms of donor assistance to LDCs for infrastructure provision and maintenance, it is worrisome to perceive that between 1992–1994 and 2002–2004, the share of official development assistance devoted to economic infrastructure and productive sectors declined from 48% of commitments to only 24% (UNCTAD, 2004).

In the economic development literature, it is common to note that a growing number of researchers appears to converge in the idea that the quality of institutions and policies is decisive in determining whether or not countries can derive benefits from globalisation (Acemoglu, Johnson and Robinson, 2004; Dollar and Kraay, 2003; and Hall and Jones, 1999). The institutional environment composed by macroeconomic stability, openness to trade, and the enabling environment for markets, can be severely affected by weak property rights, red tape and corruption that remain pervasive in LDCs, thus jeopardising the proper functioning of the legal and judiciary systems, financial system, taxation, labour relations, investment procedures, land tenure and customs administration.

Government support to exporters and investors is essential when coordination failures and information externalities justify it (Hausmann and Rodrik, 2006). However, the issue of selective industrial policies remains highly controversial (Bacchetta, 2007; Pack and Saggi, 2006). The problem arises in terms of how do governments identify and select areas of potential comparative advantage and effectively implement industrial policies? The presence of trade support or trade promotion institutions entrusted with the responsibility of providing services that consist of trade information, assistance in product adaptation and export marketing, assistance in the field of standards, quality management, packaging and labelling, provision of a national trade representation service abroad, participation in international fairs and exhibitions, training, legal assistance, and assistance in obtaining export financing, is a common practice in most countries. However, trade support and trade promotion institutions are, in practical terms, almost always ineffective in LDCs (Hogan, Keesing and Singer, 1991). A number of ill-funded agencies with unclear and overlapping mandates, both public and private, usually fail to provide efficacious services to exporters. According to Lederman, Olarrreaga and Payton (2007), export promotion can only be successful if support agencies are adequately funded, have a large private representation in their management and are consolidated into a single institution rather than a proliferation of small agencies. Unfortunately, those conditions are usually not met in the bulk of LDCs.

Many LDCs' exports, especially in Africa, are concentrated in a limited number of "traditional" primary mining or agricultural commodities such as oil, copper, cashew nuts, coffee, cocoa and cotton, among others. A long-standing concern is that specialisation in such products is unfavourable for development because of volatile and adverse terms of trade (Ng and Yeats, 2002), the "resource curse" and the absence of dynamic learning effects. Researchers equally argue that, while the case for diversification remains strong, there is also considerable scope for increasing gains from traditional exports, especially in agriculture, which is substantiated by the following three points: **a**) The resource curse is a daunting problem, but some countries have successfully deployed resource rents for development and poverty reduction; **b**) Traditional products can be a source of dynamic gains through technological upgrading; **c**) Relative to the US price index for manufactured goods (as opposed to the GDP deflator), primary product prices are highly volatile but do not show a clear downward trend. This is obviously the case for oil, but it is also true for a number of other commodities, especially other minerals whose prices have recently jumped because of a booming demand from China (Sachs and Warner, 2001; and Collier, 2007), and the recent war outbreak in Ukraine.

3.2. Context of Doing Business Classification

In a group of 190 countries assessed in 2019, and published in the World Bank's Doing Business Report, the Republic of Mozambique was ranked at 138, thus providing a relatively meaningful basis for the determination of comparison elements to be taken into consideration when it comes to judging upon the advantages and disadvantages of the country, in spite of the recognition that this assessment is not enough for a full and accurate evaluation of the export competitiveness of Mozambique's cashew nut industry. Even though this analysis is not sufficient to evaluate the competitiveness of the cashew nut industry in Mozambique when compared to other major cashew processing countries, the country appears to be below Vietnam, Indonesia, India, Brazil and Côte d'Ivoire, but in a better position than its neighbour Tanzania or the largest African economy, Nigeria.

In the World Bank Doing Business Report of 2020, which we have been using for the purpose of this analysis, among the many advantages and disadvantages studied, the Republic of Mozambique scores well in three points, namely: a) *International Trading* – Evaluates the time spent and costs incurred to import and export goods and services, which, in the case of Mozambique, the timing from and/or in the country is very good and almost half less than the average of sub-Saharan countries, but the cost is very close to the average of sub-Saharan countries.

Figure 3. 1: Map of Doing Business Classifications of the Largest Cashew Processing Countries

Source: ACAMOZ, 2020

Total export charges in Mozambique are higher than in India, Vietnam or Côte d'Ivoire, but import costs are lower than in Vietnam and Côte d'Ivoire. However, there is a need to be careful in performing this analysis, given that the numbers in use are from Maputo port. According to cashew nut exporters and processors, the costs and times of export and import are much higher in the port of Nacala, from where most of the in-shell cashew nuts and kernels are exported; b) *Dealing with Construction Permits* – Measures the procedural steps, time, formalities and costs to complete the construction of a warehouse and the quality control and safety mechanisms in the construction permitting. On these topics, Mozambique, although far from the OECD cost, has the lowest average cost when compared to most of the Sub-Saharan African countries and a shorter time to get a permit (118 days against an average of 145,7 days in Sub-Saharan African countries). But even so its score remains lower than those of Vietnam and India, the two main cashew processors worldwide; c) *Access to Electricity* – Given the existence of important hydroelectricity and natural gas fired electricity generation, as well as public subsidies to the electricity price, Mozambique has one of the cheapest electricity among developing countries. The time and cost of connection to the electricity network is also an advantage but the interruption frequency or SAIDI[13], is much higher than in India, Vietnam or even Côte d'Ivoire, which forces most of the industry players to rely on an autonomous generator to compensate for the power supply interruptions that increase substantially the costs for processors. On the following three points, Mozambique has very low scores compared to its major competitors in the cashew industry, namely: a) *Starting a Business* - The number of procedures and the time taken to start a business in Mozambique are quite similar to its competitors in the cashew industry, but the cost is much higher (120% of per capita income against 3 to 15% in competing countries); b) *Enforcing Contracts*: To enforce contracts, even though the timing of judgment and enforcement of sentences is quite correct, the average cost of the process is much higher than in Vietnam, India or Côte d'Ivoire; c) *Obtaining Credit* - Getting credit is also much more complicated in Mozambique, with very limited coverage of the country by private banks, higher interest rates and a less transparent and efficient banking system. According to World Bank macroeconomic data, average interest rates in Mozambique in 2017 were around 27.9% compared to 5.1% in Côte d'Ivoire, 7.4% in Vietnam and 9.5% in India.

Overall, from the doing business indicators, even though it is well positioned in Africa, Mozambique seems to have a much less favourable business environment than its main competitors in the cashew nut industry. Vietnam and India are two Asian countries that have invested heavily in recent decades in improving their business environment to attract foreign investors and promote local entrepreneurship. They took advantage of the experience of other Asian countries such as South Korea, China or Taiwan, whose governments created an attractive context for export industries similar to cashew processing.

It is worth recalling that "competitiveness" is at the heart of any business success. Most of the vast literature on "competitiveness" shares the view that a country's prosperity comes from four sources: the competitiveness of products, the competitiveness of individuals, the competitiveness of firms, and the competitiveness of the country. The analysis of the competitiveness of the product is of critical importance in this research, given that its major purpose is to understand the quantifiable and measurable factors militating behind Export Competitiveness of Mozambique's Cashew Nut Industry, among Porter's Diamond Model determinants, factors that may have an influence on the level of materialisation of that competitiveness in practical terms, in order to reveal the real possibilities of enhancing it. The contents of Table 3.2. speaks eloquently to what needs to be understood regarding the specific situation of the country in the period of 2002 – 2019, in terms of business environment.

Table 3.2. illustrates that, in terms of GDP growth rates, Mozambique was able to sustain relatively high levels of economic growth for the initial 14 years of the period under consideration. It was equally during that period that the country recorded four of its best rankings in terms of the ease of doing business, namely 146 in 2005, 142 in 2012, and 140 in 2007 and 2008, despite that the country's ranking was generally very far from the best in any given year of that series, especially in 2009 (-55), 2010 (-58), and 2014 (-62).

Table 3. 2: Mozambique GDP Growth (%) and Doing Business Ranking

Indicators	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDP Growth Rate (%)	9.3	6.9	7.9	6.6	9.7	7.7	7.3	6.3	6.5	7.4	7.3	7.0	7.4	6.7	3.8	3.7	3.4	2.3
Doing Business Ranking	138	138	138	146	137	140	140	135	132	139	142	139	128	134	137	138	135	135
Countries in the Sample	186	186	186	185	175	175	190	190	190	190	190	190	190	190	190	190	190	190
Distance From the Best	-48	-48	-48	-39	-38	-35	-50	-55	-58	-51	-48	-51	-62	-56	-53	-52	-55	-55

Sources: 1) World Bank (2020)
2) Author's calculations

A study conducted in 2020 by Nitidae[14] on behalf of ACAMOZ[15], asserts that although the information available on Mozambique's cashew nut industry is not sufficient to make a full judgement on the competitiveness of this industry, it provides an interesting basis for comparison with other cashew nut producing countries.

Table 3.3. summarises some key comparison indicators among the top eight (8) in-shell cashew nut producing countries in the world. From a thorough analysis of Table 3.3, a few striking facts emerge, namely: i) Total world in-shell cashew nut production in 2019 was 3,802,000 MT, which is just 20,000 MT below the total kernel processing of 3,822,000 MT (Table 3.4). This implies that 20,000 MT of the in-shell cashew nut production may have transited from previous years' unprocessed stocks; ii) African countries produced a total amount of 2,052,000 MT of in-shell cashew nuts, an amount that is higher than what Asian countries and Brazil combined produced, amounting to 1,751,000 MT, of which 139,000 MT from Brazil and 1,612,000 from Asia (India, Vietnam, and others), a clear indication that Africa, just like in previous years, dominated the production of in-shell cashew nuts in the world in 2019; iii) With regard to cashew kernel processing (Table 3.4), the most striking fact is to realise that seven (7) African countries[16] processed in 2019 only 327,000 MT, against 3,495,000 MT processed by the four (4) cashew nut producing countries outside of Africa, namely: Brazil (150), India (1,500,000), Vietnam (1,800,000), and Indonesia (45,000); iv) This means that cashew nut producing African countries process on average only 15.9% of the total in-shell cashew nuts they produce, and exported 1,725,000 MT to cover the 2,103,000 MT of combined production deficit of India (575,000), Vietnam (1,517,000), and Brazil (11,000);

Table 3. 3: The Evolution of World's In-Shell Cashew Nut Production in 10^3 MT (2005 - 2019)

Countries	Years														
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Benin	53	55	60	86	117	102	163	163	198	202	225	126	157	220	204
Brazil	153	244	141	243	221	104	231	81	110	108	103	75	134	141	139
Burkina Faso	9	10	7	7	7	21	95	60	115	120	120	120	125	135	137
Cote d'Ivoire	185	235	280	330	350	380	393	450	513	550	703	650	711	743	793
Gambia	0	0	0	3	4	4	3	3	3	3	3	3	3	3	3
Ghana	29	34	32	22	27	33	36	40	42	50	50	78	90	103	86
Guinea-Conacry	6	7	7	7	7	7	8	9	9	12	14	20	16	25	21
Guniea-Bissau	89	95	98	111	123	121	125	118	137	159	169	155	158	162	166
India	544	573	620	665	695	613	675	725	753	753	745	671	745	817	743
Indonesia	135	149	146	157	147	115	115	117	116	131	138	137	136	148	134
Kenya	14	15	16	17	18	18	21	29	21	22	28	25	19	14	13
Madagascar	7	7	7	8	6	7	7	7	7	7	7	7	7	7	7
Mali	26	28	30	31	33	35	38	44	40	72	66	71	120	168	168
Mozambique	104	63	74	85	64	97	113	65	83	63	81	104	139	115	110
Nigeria	594	636	660	675	800	792	563	413	193	99	97	98	100	100	100
Philippines	117	113	113	112	112	135	133	133	146	171	206	216	223	229	243
Senegal	5	6	5	5	6	6	7	7	7	8	8	10	9	7	7
Tanzania	90	90	93	135	79	74	121	160	128	130	198	155	265	314	225
Thailand	61	46	43	41	38	38	29	28	27	26	22	21	22	20	18
Togo	1	1	1	2	4	5	7	7	7	7	9	10	11	11	12
Vietnam	204	227	312	309	292	312	320	313	275	245	352	305	216	266	283
Total Africa	1,213	1,281	1,370	1,525	1,644	1,701	1,697	1,573	1,503	1,504	1,779	1,633	1,930	2,127	2,052
Share of Africa (%)	50	49	50	50	52	56	53	53	51	51	53	53	57	57	54
Total Americas	153	244	141	243	221	104	231	81	110	108	103	75	134	141	139
Total Asia	1,060	1,109	1,234	1,283	1,285	1,212	1,272	1,315	1,318	1,326	1,462	1,351	1,340	1,479	1,612
Total World	2,426	2,633	2,745	3,052	3,149	3,018	3,200	2,968	2,930	2,938	3,344	3,058	3,404	3,748	3,802
Annual Growth Rate (%)	-	8.6	4.2	11.2	3.2	-4.2	6.0	-7.2	-1.3	0.3	13.8	-8.6	11.3	10.1	1.5

Sources: KNOEMA; FAOSTAT database 2021; author's calculations

v) Non-African cashew nut producing countries (Brazil, India, Vietnam, and Indonesia) took in 2019 the lion share of the African countries in-shell cashew nut production, that is 1,725,000 MT;

Table 3. 4: World Cashew Nut Production and Processing in 10^3 Metric Tonnes (2019)

Country	2019		
	Production	Processing	% Processing
Asia	**1,421.00**	**3,345.00**	**235.4**
India	743.00	1,500.00	201.9
Vietnam	283.00	1,800.00	636.0
Philippines	243.00	0.00	0.0
Indonesia	134.00	45.00	33.6
Thailand	18.00	0.00	0.0
Latin America	**139.00**	**150.00**	**107.9**
Brazil	139.00	150.00	107.9
Africa	**2,052.00**	**327.00**	**15.9**
Cote d'Ivoire	793.00	70.00	8.8
Mozambique	110.00	45.00	40.9
Tanzania	225.00	164.00	72.9
Nigeria	100.00	15.00	15.0
Benin	204.00	13.00	6.4
Ghana	86.00	10.00	11.6
Burkina Faso	137.00	10.00	7.3
Guinea-Bissau	166.00	0.00	0.0
Guinea Conacry	21.00	0.00	0.0
Mali	168.00	0.00	0.0
Senegal	7.00	0.00	0.0
Togo	12.00	0.00	0.0
Madagascar	7.00	0.00	0.0
The Gambia	3.00	0.00	0.0
Kenya	13.00	0.00	0.0
Total	**3,612.00**	**3,822.00**	**105.8**

Sources: 1) Technoserve database; FAOSTAT
2) Author's calculations

vi) In 2019, the major cashew nut processing countries outside of the African continent depended heavily on imports of in-shell cashew nuts from Africa, namely: Brazil (7.9%), India (201.9%), and Vietnam (636%); **vii**) This is clearly a consequence of depressingly low levels of cashew nut processing in African countries in 2019, namely: Guinea-Bissau (0%), Nigeria (15%), Côte d'Ivoire (8.8%), Mozambique (42.1%), and Tanzania (72.9%); **viii**) It also reflects the need to realign economic policies and strategies, which is testified by a set of other unfavourable indicators like GDP *per capita*, doing business rankings and scores, global competitiveness index or even human development index, among many others, which are displayed in Table 3.5.

Table 3. 5: Top Cashew Producing Countries in the World: Some Key Indicators (2019)

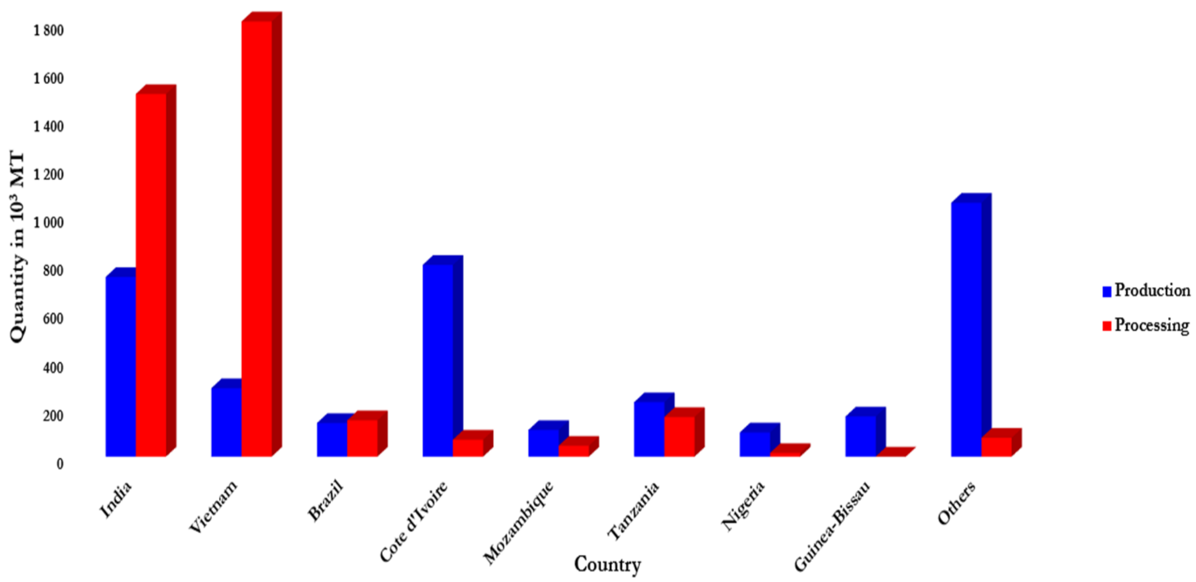
Indicator	Mozambique	Brazil	Cote d'Ivoire	India	Tanzania	Vietnam	G.-Bissau	Nigeria	Others[1)]
GDP_{mp} Growth (10^6 US$)	14,900	1,839,800	58,800	2,875,100	63,200	261,900	1,300	448,100	-
GDP Per Capita	492	8,719	2,286	2,104	1,122	2,715	698	2,230	-
Population (10^3 inhabitants)	30.4	211.0	25.7	1,366.4	58.0	96.5	1.9	201.0	-
Land Mass (km^2)	786,380	8,358,140	318,000	2,973,190	885,800	310,070	28,120	910,770	-
In-shell Production (10^3 MT)	138	140	900	743	225	425	205	275	860
Cashew Kernel Processing (10^3 MT)	45	150	70	1500	164	1800	0	15	78
Processing as % of Total)	33%	107%	8%	202%	73%	424%	0%	5%	-
Doing Business Ranking	138	124	110	63	141	70	174	131	-
As a % of the Best	0.7%	0.8%	0.9%	1.6%	0.7%	1.4%	0.6%	0.8%	-
Global Competitiveness Index	38.1	60.9	48.2	61.4	48.2	61.5	n. a.	48.3	-
Human Development Index	0.46	0.77	0.54	0.65	0.53	0.70	0.48	0.54	-

1) Include: Indonesia, Ghana, Benin, Burkina Faso, Guine-Conacry, Mali, Senegal, The Gambia, Madagascar, and Kenya

Sources: 1) Knoema (2020)
2) Author's calculations

Figure 3.2 displays a summary of world in-shell cashew nut production and processing for the period of 2005 to 2019, as follows:

Figure 3. 2: World Cashew Nut Production and Processing in 10^3 MT (2019)



Source: Knoema Database (2020); FAOSTAT Database (2021); Author's calculations

3.3. Taxation Regime for the Cashew Nut Industry in Mozambique Compared to the Other Cashew Nut Processing Countries

The favourable business environment in Vietnam, India and Côte d'Ivoire is strengthened by a series of tax incentives to attract and support domestic and foreign investment in the industrial sector, in general, and in the cashew nut industry, in particular (Nitidae, 2020). Mozambique has created several tax incentives for investors, namely: **a**) A 50% reduction of the tax on profit (IRPC: Corporate Income Tax) for new investments until 2025; **b**) A tax credit covering between 5 and 10% of the investment value during the first 5 years of the project); **c**) For export industries: a reimbursement of import taxes and VAT (Value Added Tax) on inputs applied in the production of the final exported product.

All questionnaire responding stakeholders, especially processors and traders, complained not only that this reimbursement stopped many years ago, but also about the deficient functioning of the whole taxation and incentives system. The incentives provided by the main competitors are more advantageous, than the ones in Mozambique, as shown in Figure 3.3.

Figure 3. 3: Comparison of Tax Incentives and Subsidies Between Mozambique, Côte d'Ivoire, India and Vietnam (2019)

Items	Mozambique	Côte d'Ivoire	India	Vietnam
Advantages for investors (in general)	1) IRPC reduced by 50% 2) Tax credit of 5 to 10% of the amount invested (depending on the investment area)	1) For investment in fruit and vegetable processing: No profit tax for 5 to 10 years. 2) Customs fees for imported equipment reduced by 50% during the first year of investment	1) For investment in fruit and vegetable processing: No profit tax for 5 to 10 years Note: All tax incentives in India are linked to sectors	1) Many tax reductions negotiated directly with the State (Possibly no profit tax up to 15 years 2) Priority investment areas with additional tax advantages + land provided at low cost + networks provided at low cost.
Advantages for export activities in particular	1) Without VAT on the export product 2) Refund of input taxes (actually not applied)	1) Without VAT on the export product	1) Without VAT on the export product 2) Refund of input taxes 3) No import tax for the first 5 years, 50% profit tax for the next 5 years 4) Duty drawback: tax credit equivalent to 0.15% of the FOB value of the exported product	1) Without VAT on the export product 2) Refund of input taxes 3) No import tax on imported inputs used to produce and export product
Advantages for the cashew sector in particular		1) Direct subsidy of 400 Francs CFA per MT of exported white cashew kernels (200 FCFA per kilo of shelled cashew kernels	1) Additional 5% drawbacks; 5% tax credit exported nuts, CNSL and cardanol. Others..	

Source: Nitidae (2020)

For a new cashew processing company around Nampula (Mozambique), compared with equivalent companies based around Bouaké (Côte d'Ivoire), Tuticorin (India) and Đồng Xoài (Vietnam), the cost of taxes in the first 11 years (1 year of plant establishment + 10 years of operation) would be around double (Nitidae, 2020). When adding the actual subsidies (direct subsidy to cashew kernel exports in Côte d'Ivoire and duty drawback of 5.15% in India), the incentive difference increases much more with a strong public support to the industry in both countries.

Finally, after the incentive during the "investment phase", the average "normal" tax level is also higher in Mozambique than in other competing countries.

Table 3. 6: Comparison of Taxes in Mozambique, Côte d'Ivoire, India, and Vietnam

Items	Mozambique	Cote d'Ivoire	India	Vietnam
Profit Taxes After the Investment Phase	32%	25%	31 to 42%	20%
Dividend Taxes Paid to National Shareholders	10%	10%	10%	5%
Dividend Taxes Paid to Foreign Shareholders	20%	15%	10%	5%
VAT on Inputs for Cashew Processing	17%	18%	12 to 18%	10%
Taxes on the Payment of Wages (%)	4%	15.45 to 18.45%	17%	22%
Minimum Wage (USD per Month	75	100	75 to 140	125
Payroll Taxes (USD per Month	3	15.45	13 to 24	27.50

Source: Price Waterhouse Coopers

Table 3.6 shows that Vietnam has the lowest tax rate in the world, but there is a specific point in terms of public taxes and levies for which Mozambique has the most competitive structure: the level of taxes on the payment of wages. These taxes are much lower in Mozambique than in competing countries.

Added to the minimum wage level, which is also much lower in Mozambique than in the other three countries, the cost of taxes to employ unskilled labour in Mozambique is much lower than those from Côte d'Ivoire, India and Vietnam, which enhances more the competitiveness of manual processing in Mozambique than in other major cashew processing countries. As mentioned earlier, this can largely explain why the actual processing in Mozambique is less mechanised than in other countries.

Within the context of endeavours undertaken by the Government of Mozambique, it is worth highlighting the establishment of the Guarantee Fund in 2001, as one of the incentives to the cashew industry. This was made possible as a result of an agreement between Banco Comercial de Investimento (BCI) and IAM, to provide bank guarantees for projects in the field of cashew (Nitidae, 2020). Financing is directed to small and medium-sized companies at favourable rates of 10 to 15%, with a coverage level of 80% of the total amount. For projects to have access to this funding scheme, they should be involved in the promotion of cashew farming, investment in the cashew industry development, processing or marketing, or cashew nut and kernel production and quality improvement activities. The deposit in the guarantee fund is 50,000,000 MZN (±US$ 800,000.00). Financing can be: **i**) Short Term Financing, to support the cash needs in the cashew nut industry; **ii**) Medium- and

Long-Term Financing, for investment in the cashew nut industry and projects that promote the sustainable increase in production and the quality of cashew nuts and cashew kernels; **iii**) Long-Term Financing, for projects that promote cashew nut farming. Loan amounts vary: Small Company: from 600,000.00 MZN (±US$ 10,000.00) to 1,000,000.00 MZN (±US$ 16,000.00); Average amounts: from 3,500,000.00 (±US$ 55,000.00) to 7,000,000.00 MZN (±US$ 110,000.00). The Guarantee Fund signed contracts with BCI remain active, but with residual activities (Nitidae, 2020). IAM has recently embarked on a new Guarantee Fund with the National Investment Bank (BNI), with a deposit of 60,000,000 MZN (±US$ 1,000,000.00) from the in-shell cashew nut export tax revenue. The criteria are similar to the agreement with BCI, the same degree of coverage, targeting small and medium-sized companies, but with a maximum financing limit of 5,000,000 MZN (±US$ 80,000.00) and subsidised interest rates ranging from 10 to 27%.

Therefore, the Guarantee Fund is aimed at small and medium entrepreneurs who would like to invest in the cashew nut industry or expand their business and facilities. The impact of the projects to date contains a strong social component in employment generation in the areas of processing, women inclusion as the main labour in the companies opening and construction of bore holes for water supply to local populations, among others (Nitidae, 2020).

A group of central government institutions such the Ministry of Industry and Commerce (MIC), the National Investment Bank (BNI) and Confederation of Trade Associations of Mozambique (CTA), entered a partnership to establish another fund that was recently launched and is underway, known as the Industry Fund, aiming to assist micro to large companies in priority sectors, such as agroindustry, for which cashew nut processing companies are potential loan taking candidates.

The Agence Française du Développement (AfD) has a subsidiary known as PROPARCO, which participates in the financing and support to companies in many developing countries, including Mozambique. It covers agroindustry, and it has financing options through commercial banks which could benefit the cashew nut processing industry, namely: ARIZ and EURIZ, aiming to finance small or large companies in different sectors with an important development impact, such as agriculture, or projects and clients that belong to groups with difficulty accessing financing, such as women and the youth.

3.4. Labour Cost in Mozambique

After the cost of in-shell cashew nuts, the cost of unskilled labour comes certainly second as the best comparative advantage for cashew processing in Mozambique. A significant number of industry players is of the view that Mozambican workers in cashew factories have relatively good productivity. The number of kgs per hour in de-shelling stages is slightly less than that of Vietnamese workers, but very close to Indian workers and more productive than all the other African countries (Nitidae, 2020). This good productivity is a result of more than half a century of cashew nut processing history in

Mozambique. Many workers have several years of experience in peeling, unlike other African countries (Table 3.7).

Table 3. 7: Comparison of Productivity in Cashew Shelling, and Peeling

Countries	Quantity of RCN Shelled Per Worker in Kg			Quantity of Kernel Peeled Per Worker in Kg		
	Min	Max	Average	Min	Max	Average
Cote d'Ivoire	30	40	35	7	10	8.5
India	35	45	40	8	12	10
Mozambique	35	45	40	7	12	9.5
Vietnam	40	50	45	9	12	10.5

Source: Nitidae (2020); Industry sources

Added to this good productivity, the particularly low level of wages in Mozambique, when compared to its competitors, makes the cost of labour one of the cheapest in the world.

With the lowest minimum wage after the State of Tamil Nadu in India, and a worker productivity very similar to the one in India, Mozambique probably has the lowest cost of unskilled labour in the world, just after Tamil Nadu (Nitidae, 2020).

Table 3.8 displays the calculated minimum, maximum and average cost of labour for manual peeling and manual de-shelling in the 4 cashew nut processing countries. The cost of shelling in USD per MT of processed raw cashew nuts was estimated, as it is the most widely used unit in the cashew processing sector. The conversion rate is 1 kg of cashew kernel = 5 kg of in-shell cashew nuts.

Table 3. 8: Comparison of Costs in Cashew Shelling, and Peeling

Countries	Quantity of RCN Shelled Per Worker in Kg			Quantity of Kernel Peeled Per Worker in Kg		
	Min	Max	Average	Min	Max	Average
Cote d'Ivoire	30	40	35	7	10	8.5
India	35	45	40	8	12	10
Mozambique	35	45	40	7	12	9.5
Vietnam	40	50	45	9	12	10.5

Source: Nitidae (2020); Industry sources

Other cashew processing operations using unskilled labour (handling, de-shelling, classification) also benefit from these lower costs.

The main issue regarding this advantage is that, with the growing automation of cashew nut processing, its positive impact on the total competitiveness of the industry is decreasing. Even if unskilled labour is always necessary to treat the unshelled nuts and unpeeled kernels, the share of labour in total processing cost strongly decreased during last decade. According to Nitidae (2020), if labour (daily workers) represents around 60% of the processing cost in a 100% manual factory, then in a 100% automatic factory it represents only 15%, which is the process model that most of the new factories in the world are choosing. That is why this advantage in Mozambique is becoming less and less decisive and in the future it may even delay the mechanisation of cashew nut processing in the country.

3.5. Gender and Cashew Nut Processing in Mozambique

Around half of the 15,600 cashew nut industry workers are women (Nitidae, 2020). The industry represents an alternative income for rural households relying on agriculture for food consumption and some cash crops. Industries have been generally built close to the source of raw materials, the cashew nut producing areas in order to also benefit from access to local labour. The families living from agriculture and cashew nut production are the same ones that work in the industry for the processing of the cashew nut.

Cashew nut industry wage is defined by a specific sector agreement, therefore the minimum wage is different from the industrial or the agriculture sectors, since workers are dedicated to both activities. The wage was agreed by the National Union of Agricultural and Forestry Workers (SINTAF) and the cashew nut processing industry that signed an agreement for a minimum wage of 4,610 meticais (±US$72), established between the minimum wage in the agricultural of 4,390 MZN (±US$69) and the industrial sector one of 7,000 MZN (±US$110). However, in practical terms, companies pay the established minimum wage supplemented by an additional amount, depending on each employee's productivity. At the end of the day, each employee is paid in accordance with the quantity of nuts processed.

Given that from this salary, 150 MZN are discounted for absences from work per day, the overwhelming majority of employees never reach the minimum wage. Some companies reward the employees that reach their production goal, with a 100-120 MZN per week bonus, a strategy that aims to motivate workers to secure their attendance and increase their productivity (Nitidae, 2020).

The rural population relies on agriculture and gets their income from the *machamba* (agricultural field), and the industry still represents an alternative income. The opportunities offered by the industry do not yet provide enough stability for workers to dedicate themselves entirely or exclusively to this activity, and/or to turn it into the main source of income to ensure their own food security, an issue that affects in particular their attendance at workplace.

Employee absenteeism is one of the major challenges confronting processing companies, given that they are located in rural areas where the local labour are growers working only temporarily in such companies out of the agricultural calendar. When it's the planting and harvesting seasons, companies face the absence of employees for whom agriculture constitutes their priority. In some areas, employee turnover is not seen as a problem given the large supply of labour, but in other areas it can be seen as a problem as unexperienced workers have a much lower productivity than others who have been in the industry for years. The main reasons for absenteeism are health problems and death, which aggravates another not recognised problem or cause, the excessive workload of women, little economic incentive, and few guaranteed labour rights. One of women’s significant conquests is the right to go to work outside their homes, in companies, to help increase their families’ income, many found themselves with the obligation to get jobs that could provide a higher salary than their previous job or the agricultural revenues their field could provide them. However, this achievement did not exclude or dilute their other responsibilities with their partners, forcing them to accumulate work and end up doubling their workday. Women continue to be responsible for all activities related to their home and family, such as taking care of children and older relatives, cleaning the house, working in fields to produce food for subsistence, going to the market, among others (Nitidae, 2020).

This extensive and extenuating workload can cause physical and psychological exhaustion for women, who are usually ignored by the society. This is a consequence of their responsibility to carry out these jobs without any recognition and in precarious conditions. The responsibility for raising children also stays with the woman, but she does not always have the conditions or support to take care of the children and go to work. So, she relies on the day-care centres that processing companies provide, find another relative or neighbour who can take care of her children or leave them at home under the supervision of her eldest child.

The processing companies have facilities to receive their employees’ children (day care centres), simple facilities and mostly without the supervision of a responsible adult. For mothers who are still breastfeeding their children, companies allow breaks for them to breastfeed their children and offer food (breakfast and lunch) for all children and employees (Nitidae, 2020).

Most employees in the sub-sector do not have contracts signed with the cashew processing companies, and do not have access to their labour rights or even know them. In some cases, even if they have contracts with companies, it doesn’t mean that they have a social security record that guarantees remuneration during periods of illness, maternity leave or after work accidents. Therefore, the lack of contract means that these workers are seasonal, do not have economic stability or any fixed connection with the companies, so they do not dedicate themselves exclusively to the industry and are always primarily relying on their agricultural or fishing activities.

The precarious facilities where the processing companies welcome their employees’ children do not contribute to breaking the vicious cycle of poverty, as older children continue to be deprived of their right to attend school because they assume other domestic responsibilities, thus aggravating the problem of illiteracy in the country. Usually, this situation tends to be more serious for young girls who culturally inherit this domestic responsibility and tend to drop out of school earlier for the same reasons. Women are also at a disadvantage because they are responsible for the care of sick and older relatives, which forces them to miss work and suffer various salary cuts. They are not entitled to take maternity leave, which makes them dependent on relatives and husbands who have revenues, and they have difficulty going back to work after the birth of their children because of lack of support.

For these reasons, the regularisation of the cashew nut industry workers to secure them with a stable paid work, good working conditions and specific qualifications can bring better returns to cashew nut processing companies.

3.6. Cashew Nut Processing in Mozambique

The major reason for analysing this dimension in this research work is the fact that the design and conceptualisation of the survey questionnaire for the qualitative method, we were based on the elements described in this section of the work. According to Nitidae's (2020) analysis, land can be considered relatively cheaper in Africa, in general, and in Mozambique in particular, than in Asian cashew processing countries, as a consequence of lower population density and lower living cost. Researchers estimate the cost of land acquisition to build a cashew factory in industrial or rural area to be between 1 and 5 US$ per m² for a 50-year concession in Mozambique. An equivalent size of a piece of land for the same purpose would cost between 5 and 15 US$ per m² and between 10 and 20 US$ per m² in Vietnam and India, respectively. The cost of land provides a small advantage for Mozambique compared to Asian countries, as it can represent 2 to 6% of CAPEX in Mozambique against 12 to 24% of total CAPEX in Asia. The cost of land in other African cashew processing countries is almost the same, with the exception of Nigeria, where the cost of land is much higher.

Earthwork, construction of buildings and connection to networks (water and energy) are relatively more expensive in Mozambique than in Asia (Nitidae, 2020). The main influencing factor is the import of part of the building materials compared to Asia, given the reduced presence of construction material producing companies capable of and equipped to construct industrial buildings. Construction costs in Mozambique are estimated to be 20% higher than in Asia. For a cashew plant with a processing capacity of 5,000 MT of in-shell cashew nut per year (±50,000 m² of earthworks and ±5,000 m² of buildings), the construction price is estimated to be between 1.2 and 1.6 US$ million in Asia, while in Mozambique that is estimated at between 1.4 and 2 US$ million, depending on the choice of materials and optional buildings (extraction of cashew nut shell liquid - CNSL, day-care centres, restaurant, among others).

Almost every single piece of equipment for cashew processing is imported. Given the importation costs and negotiation disadvantage with foreign suppliers, the cost of processing equipment imported in Mozambique is estimated to be between 5 and 10% higher than in Asia. A fully automatic cashew plant with a processing capacity of 5,000 MT of in-shell cashew nut per year would cost, depending on the technology, organisation and chosen suppliers between 650,000 and 1,050,000 US$ per MT in Mozambique, while in Vietnam and India it costs between 550,000 and 950,000 US$ per MT.

The other initial costs (vehicles, stock of consumables and project design) are also higher by ±10% compared to Asia, as a result of higher import costs and less local offer from suppliers and service providers.

Finally, the cost of land, construction, and equipment would come to total CAPEX costs in Mozambique that are quite similar to those in India and slightly lower than in Vietnam, where the highest cost of land surpassed the lower costs of construction and equipment. But the CAPEX differences between Mozambique and its two main competitors are relatively limited and do not exceed 10% (Nitidae, 2020). The total CAPEX for a fully automatic cashew plant with a capacity of 5,000 MT can vary between 2 and 4 US$ million in any of the 4 countries under comparison, basically depending on the location, technology and organisation of the factory. The main cause of differences is the OPEX and the Risk assumed by the Mozambican industry.

In the domain of variable costs, the price of in-shell cashew nuts is the strongest advantage of the Mozambican industry (Nitidae, 2020). Thanks to the tax on in-shell cashew nut exports and the saving of the export costs, Mozambican processors theoretically benefit from a much lower price of raw material than Asian processors.

In February 2020, in-shell cashew nuts from Mozambique with an OTR of 46 lbs per 80 kgs bag delivered at an Asian processor's factory would cost around 1,300 US$ per MT, while it would cost a Mozambican processor around 750 US$ per MT (45 MZN per kg), nearly 73%.

In reality, for Nitidae (2020), this difference is generally much smaller for two reasons: **i)** The Mozambican industry makes its procurement during a low supply period in the international market. Around 80% of world production is concentrated in the northern hemisphere and available at the factories between March and September. The Mozambican cashew nut, generally available in Asian factories in January/February, pays on average a higher price than the same quality during the central season of the northern hemisphere. This peculiarity of the harvest schedule in Mozambique (also in Tanzania and Madagascar) considerably reduces the price difference between an Asian factory that buys only 10 to 20% of its annual needs during this period and a Mozambican factory that has to buy 100% of its raw material during this period of low-supply; **ii**) The average quality of Mozambican in-shell cashew nuts is relatively low. The quality of the cashew nut is expressed mainly through OTR, which is an evaluation through the analysis of a representative sample of the cashew nut yield of a batch of in-shell cashew nuts. In Asia, processing plants, mostly manual, are generally specialised in processing only batches of good quality cashew nuts. Other highly automated factories are only specialised in the processing of poor-quality nuts at low prices. In Mozambique, as companies only have access to local production, they have to process all types of quality and cannot specialize in a particular outturn. When, as in recent years, the average quality is less than 48 lbs per 80 kgs bag, they obtain very low processing yields (both in terms of daily yield, quantitative and qualitative yields). In addition, when processing is mostly manual, workers who have part of their wages indexed to the total yield of the whole cashew nut kernel are discouraged because they earn less by de-shelling empty nuts or containing damaged cashew nut kernels. Under these conditions, absenteeism rates tend to increase. The only solution for processors who want to retain their staff is to increase the variable salary rate, which greatly increases their variable salary costs.

For the supply of their factories Mozambican (and Ivorian) processors rely on local traders or cooperatives. For an efficient purchase of in-shell cashew nuts, they must fund those suppliers before the start and during the season, and every year, some traders disappear with the money without bringing the nuts. Other suppliers deliver in-shell cashew nuts with a much lower quality than what was initially contracted, but to continue getting the product, processors cannot ask them for quality compensation. Researchers estimate that these losses of money during the purchases cause a loss equivalent to between 1% and 1.5% of the money invested in raw cashew nut procurement. For Asian processors who import in-shell cashew nuts from Africa, this risk is much less, since the Letter of Credit used in international trade is a secure way of payment based on the exact quantity and quality control during the container filling. Even if some losses may occur on Asian processors, mainly in terms of contracted quality, they are much lower than those of African processors.

The location of cashew processing factories tends to vary. Some are located in peri-urban areas, in industrial areas or even close to the population to facilitate access to labour. As a result, the electricity supply may not be properly constant, and factories must use generators to avoid production interruptions, which incurs additional operating expenses in the energy category. Electricity costs increase rapidly as a result of the use of a generator set. Energy costs represent an average of 13.5 US$ per MT of processed cashew nut, if 100% of the electricity come from the national grid. These costs can increase to more than 20 US$ per MT with the use of generator sets. Proportionally, the basic cost of electricity represents 1.3% of the total production costs in factories but may weigh more in factories that use generator sets, which creates a comparative disadvantage for Mozambican processors.

However, it would not be accurate to conclude that energy costs are a vital component in competitiveness. The energy problem stems from the quality of the electricity supply, rather than the cost. This is especially true in the case of factories around the city of Nampula. In fact, processors experience unpredictable production shutdowns as a result of power outages. This has a negative impact on the rhythms of production, and sometimes with consequences of malfunctions of the machines, as a consequence of voltage fluctuation (Nitidae, 2020). Some factories have decided to invest in voltage regulators to protect the most delicate equipment.

Therefore, the effects of power cuts cannot be measured only in the energy cost budget line. The most critical element in these power fluctuations is their negative impact on the *power factor (cos φ)*, which can fall around 0.8. With a power factor of 0.8, only 80% of the electricity received by the factory is actually used, but the factory will be paying 100%. An electrical installation that took into account the contribution of rotating machines includes capacitor batteries to dampen their effects on the network, resulting in a correction of the power factor (values around 0.9 to 0.95). The investments associated with this energy efficiency measure are not very important.

In addition to the water and energy, most of the inputs used in cashew nut processing in Mozambique are imported, while in India and Vietnam, most of them are produced and available locally throughout the year in large quantities. The main ones are packaging (jute bags, boxes, plastic bags), spare parts and maintenance tools, packaging gas, clothing and tools for workers, and cleaning tools and products. The cost of inputs can vary from one factory to another, but it can lead to an additional cost between 5 and 10 US$ per MT of in-shell cashew nut processed in Mozambique, in comparison with Asian countries. In West Africa, some of these inputs are even more expensive, because the import cost is even higher, as they do not have the advantage of being able to buy them in South Africa, where their prices are very competitive.

The cost of unskilled labour is relatively lower in Mozambique than in Asia or Côte d'Ivoire. In an automatic factory, the difference of cost provides to Mozambique a slight advantage of ±5 US$ per MT of in-shell cashew nut processed in relation to Vietnam, by 15 US$ per MT in relation to India, and 20 US$ per MT in relation to Côte d'Ivoire.

The cost of export handling through Mozambican ports is one of the most expensive in the world (Nitidae, 2020). It is an advantage for local processors when competing with in-shell cashew nut exporters to purchase in-shell cashew nut, but it is a disadvantage when it comes to export cashew kernels exports in containers. The additional cost is about 25 US$ per MT of exported cashew kernels (5 US$ per MT of processed in-shell cashew nut), when compared to Vietnam, and about 20 US$ per MT of exported cashew kernels (5 US$ per MT of processed in-shell cashew nut), when compared to Côte d'Ivoire and India.

In Asia, cashew shells are a by-product that generates an additional income, but in most Mozambican factories, cashew shells are waste that costs money to be disposed of and burn them close to the factory or in a nearby area.

This cost may vary between 1 US$ and 5 US$ per MT of processed in-shell cashew nuts, depending on whether the factory can easily burn the shells within the plant area or have to transport them to another location, paying a service provider, or employing people and using their own trucks to move the shells. Most of the current processing in Mozambique has access to credit at an acceptable interest rate. However, all the financing is made at a higher interest rate than in Asia or Côte d'Ivoire. In Côte d'Ivoire, a cashew processing factory gets an interest rate between 9% and 12%, in India, between 6% and 8%, in Vietnam, between 5% and 7%, while in Mozambique few factories are able to get loans below 10% even when they can provide considerable assets as guarantee and with the support of IAM. But the bulk of them get interest rates that can go up to 28%. Another striking fact is that loans needed by cashew nut factories in Mozambique are much bigger than those needed by Asian or even West African processors as the procurement period is much shorter in Mozambique (Nitidae, 2020).

When a factory that processes 4,500 MT of in-shell cashew nut per year in Vietnam needs a loan equivalent to a maximum of 1,000 MT of in-shell cashew nut, a factory based in Mozambique will need a loan covering all 4,500 MT of in-shell cashew nut to be able to purchase this quantity in less than 2 months. Consequently, interest paid by Mozambican processors for the financing of the acquisition of in-shell cashew nuts they process represents between 10% and 20% of the total processing costs, while they are equivalent to between 5% and 10% of the processing costs in Asia and between 10% and 15% of the processing in West Africa where the procurement can be spread over 5 to 6 months.

Taxes on profits are much higher in Mozambique than in Asia. After the investment phase, they can reach around 20% of the processing cost, while they remain at around 8% in Vietnam and around 10% in India. The cost of highly trained and highly qualified and experienced labour is higher in Mozambique than in Vietnam and India, especially that of managers induced by the strong demand that accompany the growth of the extractive sector (mining and gas). This situation has led many factories to hire foreign managers and technicians to supervise the production.

Overall, the cost of qualified permanent staff is almost 50% higher in Mozambique than in Vietnam and 36% higher than in India. For an automatic cashew plant with a capacity of 5,000 MT per year, this cost represents 41%, 39%, 31%, and 28% of processing costs in Mozambique, Côte d'Ivoire, India and Vietnam, respectively (Nitidae, 2020).

The cost of maintenance and depreciation is also higher, given the need to import most equipment and spare parts. Most factories in Mozambique are forced to build up stocks of spares and even import additional machines that they will keep replacing the broken ones to avoid workflow interruption. In cashew processing areas of Vietnam and India there are many stores with spare parts and new machines are available and allow for a quick replacement of any broken equipment. As a result, the cost of maintenance in Mozambique is estimated at 40% higher than in Asia and it is comparable to that of Côte d'Ivoire, even though in this country, some stores of cashew equipment have recently opened to take advantage of the growing industry. Given their better knowledge, longer experience in the sector and continuous innovation in cashew processing equipment, Vietnamese and Indian processors are able to considerably decrease losses during the processing of in-shell cashew nuts.

The yield of the cashew nut processing is expressed through 4 important indices: **i**) Daily factory yield: Quantity of cashew nuts processed by the factory in one day of operation; **ii**) Daily income from work: Quantity of cashew nuts processed by a worker in an 8-hour workday; **iii**) Quantitative yield: Quantity of marketable cashew kernel obtained at the end of each processing step and at the end of the entire processing chain. This yield varies according to the quality of the in-shell cashew nut stock at the supply point (outturn and moisture content) and the ability of the entire processing chain to limit losses (degradation during storage, small pieces broken during processing, cashew kernels that remain hidden inside the shells, product contaminated by the blades of the peeling machines); **iv**) Qualitative performance: Proportion of whole white cashew kernels at the end of the process. Each time a cashew kernel is broken, split or burnt, it loses a significant part of its value. To be profitable the factory must try to obtain a maximum of whole white cashew kernels. This yield also depends both on the quality of the in-shell cashew nuts purchased and on the factory's ability to preserve as much as possible the whiteness and integrity of the cashew kernels.

Much of the profitability of a cashew processing plant depends on the optimisation of the above-mentioned 4 yield indices. It is recommended to process as much as possible, with the fewest possible personnel, losing the minimum possible weight, and obtaining the maximum possible quantity of whole white cashew kernels at the end of the process. Vietnamese and, to a lesser extent, Indian processors are, on average, better in all 4 yield indicators, given their more specialised, experienced and, more efficient labour force, and also as a result of its technological advancement, even if there are important differences within the Vietnamese and Indian industries (Nitidae, 2020). Consequently: **i**) They get a larger quantity of cashew kernels for the same processed in-shell cashew nut stock; **ii**) In a batch of cashew kernels, they get a higher rate of white whole (WW) grains, which is the most profitable product in the cashew industry. This leads to an optimisation process that reduces losses in quantity and quality, thus generating more value for the same processed in-shell cashew nut stock than any other processing countries.

In percentage terms, the difference may seem small: 1% or 2% more of the final amount and 3% - 4% more cashew kernels, White Whole (Full White), but these small optimisations substantially improve their income. With the same selling price, 1% more cashew kernels equal about 15 US$ per MT additional processed in-shell cashew nut, and 1% more white whole cashew kernels equals about 7 US$ per MT more processed in-shell cashew nut. It is these two accumulated advantages with better selling prices that provide the biggest advantage for the Asian industry. The sales prices of cashew kernels depend essentially on the certification obtained by the factory, and on the marketing strategy per position of the company. Most Mozambican factories already have the HACCP certification, but none of them has the BRC certification that allows to get good premium prices.

African cashew kernels' sales prices are generally similar or very slightly lower than those in Vietnam. However, Vietnamese factories still get slightly better prices than the Mozambican or Ivorian ones as a result of the longstanding relationship with their clients (Nitidae, 2020).

Generally, Indian factories get higher prices for cashew kernels, for a few reasons, namely: **i**) Local market - The main reason is that they have access to the largest cashew market, their domestic market, protected from the import of cashew kernels from other countries by a very high minimum import price system. This local market has much higher prices for broken cashew kernels than the international market and slightly higher prices for whole cashew kernels. When their international buyers offer low prices, they prefer to simply sell on the local market; **ii**) Better reputation - Indian suppliers are considered more reliable and respectful of their commitments, and better suppliers, because they do not try to renegotiate prices after signing a contract, and their exports are rarely delayed; **iii**) Long-term relationship with their clients – Given that India remained as the main cashew processor for over 50 years, several importers in the world have become used to working with the Indian companies and prefer to continue buying from them at a higher price than starting to buy from new unknown suppliers whose cashew quality and flavour may be different from what they get from Indian suppliers.

In the meantime, with the higher prices they offer to the international market and with their less competitive processing in relation to Vietnam, Indian kernel exporters have been losing market shares in the international market for many years and should probably continue in the following year as they get more and more protectionist with their local market, disconnecting it from the international market.

The trade balance of cashew in India is negative since 2006 and its deficit is growing rapidly, which means that India is already a net importer of cashew nuts and will probably cease to be the second largest exporter on the international market after Vietnam in the next decade or so.

Overall, one can consider that Mozambican (and Ivorian) processors obtain an average selling price 5 to 10% lower than Indian processors and, of up to 4 % lower than Vietnamese processors.

According to Nitidae (2020), the cashew industry has the potential to be a “zero waste” chain, meaning that all materials can be valued in different processes and at different stages of the process. It can be compared to the sugar industry, where all the residual materials in the process chain (bagasse, molasses) can be used, either in the same process, or to feed other processes and industries. However, in the Mozambican cashew processing chain, little added value is currently given to materials other than cashew kernels. Only the cashew kernels are valid for commercialisation and a small part of the shells are valued. The value of cashew nuts is 30.5% of the weight on average.

In India and Vietnam, almost all cashew shells are sold or used. The largest factories extract CNSL and sell it to the chemical industry and the liquid-free shell (cake) to the industries that use it as fuel. Smaller factories and also those located in clusters, common industrial zones, sell the shell to companies specialised in CNSL extraction. Studies suggest that competitors in India and Vietnam obtain a benefit from the sale of the shell and its derivatives, from between 30 US$ to 60 US$ per MT of processed in-shell cashew nut (African Cashew Alliance, 2018).

Even cashew pellicle (testa) is sold to industries that use it to make products as diverse as food or textile dyes, food antioxidants or animal bedding. Too much damaged cashew kernels (mouldy, rotten or contaminated by insects) are generally used as food for animals (chicken, pig, cows). These cashew by-product markets are providing small, but additional, revenues to factories in Asia.

In Mozambique, few factories (Condor, Indo Africa, CN Caju) already value cashew shell and, for those that export CNSL, the price they obtain is very low, as a result of transportation costs, compared to the price that Asian factories get. This represents a major loss of income for the Mozambican industry. Some processing partners even sell some quantities of shell for CNSL extraction, at 2 Meticais per kg (or 33 US$ per MT of shell, and 24 US$ per MT of in-shell cashew nut). Generally, neither the damaged testa nor the cashew kernels are valued in any way. Oilcake is minimally valued in the case of Condor, who sells part of the produce to a company that sells improved stoves adapted to this fuel.

The sale of shell by-products represents an opportunity for processors, which is only now beginning to be explored. Other by-products can also find a domestic market and create additional revenue. If these by-products were processed directly by the cashew processors, the benefit would be maximum for them, but that is generally not the case - nor is it for Asian competitors that can sell their testa and cashew residues to other actors for processing.

The commercialisation value of these products has been estimated in the Mozambican case. The by-products of the shell after extraction (CNSL and oilcake) represent on average 5% of the value of the cashew kernel. They can add a revenue of 36 to 113 US$ per MT of in-shell cashew nut equivalent. If the shell is not extracted by the factory itself, the revenues would be ± 24 US$ per MT of in-shell cashew nut, which is a lower profit, but does not require any shell processing costs. In sum, Vietnam is currently the most competitive cashew processor in the world. The advantages and disadvantages of cashew processing in Mozambique are assessed in comparison with Vietnam for 1MT of processed in-shell cashew nut.

All figures considered are based on costs and prices during the 2019/2020 marketing season. The green covered negative sign figures indicate the advantages obtained by Mozambican processors (lower cost or higher income), and the figures with positive sign indicate the disadvantages (higher costs and lower income), as displayed in Table 3.9.

If price volatility and the current tax on in-shell cashew nuts, cashew processing is, on average, more competitive in Mozambique than in Vietnam. The cost of processing is on average about 155 US$ per MT of in-shell cashew nut higher in Mozambique than in Vietnam. Better yields in kernels quantity and quality (larger quantities of white whole) and access to a slightly better market in terms of prices and ease of finding clients provide additional incomes to Vietnam processors around 170 US$ per MT of in-shell cashew nut processed.

A substantial amount of money in hard currency is expected by Mozambique's Government as revenue from the exploitation of natural gas deposits over the next 25 years and beyond (Nitidae, 2020). Within the context of those developments, the Government plans to establish a Sovereign Wealth Fund to manage future gas production revenues and allocate a fixed portion of the revenue to the State Budget to finance infrastructure development, poverty reduction and economic diversification.

The Government has also warned about the need for the Sovereign Wealth Fund to work as a buffer when gas prices are low and that funds should be managed to avoid effects such as Dutch Disease, referring to the phenomenon in which a commodity boom, such as gas exploration, makes the country's currency more expensive and its other products less competitive in the international market, gradually driving the country into a disadvantageous situation of a monoeconomy or a single-commodity dependent economy.

Table 3. 9: Detailed Cost and Incomes Comparison Between Mozambique and Vietnam, Based on an 80% Automatic Factory (2019/2020)

	For Same Quality RCN OTR	46	lbs per bag					Advantage &
	KOR After Process	19%	20.50%	19.80%	21.50%	22.50%	22.00%	Disadvantage of
		Mozambique			Vietnam			Mozambique (based on
		Min	Max	AVG	Min	Max	AVG	averages in US$ per MT
Variable expenses								
Raw material								
RCN procurement	Price of RCN at factory gate in US$ per MT	750	800	**775**	1200	1300	**1,250.0**	**-475**
Inputs								
Jute bags		16	18	**17**	10	12	**11.0**	**6.0**
Cartoon + plastic bags		22	24	**23**	18	20	**19.0**	**4.0**
Spares		25	28	**26.5**	15	16	**15.5**	**11.0**
Water		1	2	**1.5**	1	2	**1.5**	**0.0**
Power		13	14	**13.5**	16	17	**16.5**	**-3.0**
Gas for packaging		2	3	**2.5**	1	2	**1.5**	**1.0**
Diesel for generator		0	4	**2**	0	2	**1.0**	**1.0**
Wood		0	5	**2.5**	0	0	**0.0**	**2.5**
Worker clothes		1	3	**2**	1	2	**1.5**	**0.5**
Other supplies (office, cleaning, etc.)		2	3	**2.5**	1	2	**1.5**	**1.0**
Money								
Bank interest: Moz: 9 to 12% for 11 month; Vietnam 5 to 7% for 2 month		55	88	**71.5**	10	15	**12.5**	**59.0**
Other bank fees	Letter of Credit fees	3	4	**3.5**	2	3	**2.5**	**1.0**
Collateral management		0	10	**5**	0	8	**4.0**	**1.0**
Variable wages								
Handlers		1	2	**1.5**	1	3	**2.0**	**-0.5**
Cutting		15	20	**17.5**	16	22	**19.0**	**-1.5**
Peeling		15	18	**16.5**	15	21	**18.0**	**-1.5**
Grading		3	4	**3.5**	4	5	**4.5**	**-1.0**
Others								
Shipping expenses (fobbing)		18	19	**18.5**	12	13	**12.5**	**6.0**
Risk funding traders	Issues with funded suppliers	5	10	**7.5**	0	5	**2.5**	**5.0**
Waste management	Transportation and burning of shells	0	5	**2.5**	0	1	**0.5**	**2.0**
Employee premium of profit or profit sharing		0	10	**5**	0	10	**5.0**	**0.0**
Fixed expenses								
Depreciation (replacement of equipment)		55	60	**57.5**	45	50	**47.5**	**10.0**
Fixed wages	Management and technical staff	125	150	**137.5**	75	100	**87.5**	**50.0**
Fixed taxes		3	4	**3.5**	2	3	**2.5**	**1.0**
Other fixed expenses		17	22	**19.5**	15	20	**17.5**	**2.0**
Total expenses without taxes on profit								
Total without in-shell cashew nuts		397	530	**463.5**	260	354	**307.0**	**156.5**
Total including in-shell cashew nuts		1147	1330	**1,238.5**	1460	1654	**1,557.0**	**-318.5**

Source: Nitidae, 2020

Oil and gas prices fell in 2020 as a consequence of the global crisis caused by the Covid-19 pandemic, but that fall was also a result of commercial conflicts among the major oil and gas producers in the world. The traditional volatility of the oil and gas market is known to regularly put at risk the economies of oil and gas dependent countries (Nitidae, 2020). There are a few success stories in the establishment of a Sovereign Wealth Fund, very successfully managed, making sure that the resource revenue is shared with the population and finance the development of other economic sectors of the economy. The cases of Norway, Botswana and Chile can be considered as some of the best practices in this exercise. It is clear that this success depends on many factors, macroeconomic policy choices, but also on a strong political will to embrace good governance and transparency. All the above-mentioned three countries chose to invest in research and training, in addition to infrastructure.

In the case of Chile, a world champion in copper mining, a foundation created by the government to manage part of the copper revenues played a key role in creating the national wine sector, mainly through the development of know-how exchange programmes with the private wine sector in France.

The foundation has worked on other topics and led a strategic vision for agricultural diversification in the country, such as aquaculture development or water management, a key issue for agriculture adaptation to climate change.

Mozambique, where rural population accounts for some 68% of the country's total population, has on top of its national development agenda the objective of poverty eradication and economic diversification, and the natural gas revenue should include a strong national strategy for the development of the agricultural sector, including the agro-processing industries. The cashew sector, given its economic importance for the country and with an already established processing industry, represents a unique opportunity to change the fossil fuel revenue paradigm, investing part of the national income in a low-carbon agricultural value chain, based on agroforestry production systems, resilient to climate change and economically benefiting 1.4 million rural families.

In addition to their legal obligations, the oil and gas companies usually choose, within their CSR, to invest in natural resources, usually forest management or conservation projects, with carbon related (sequestration, reduction of emissions) and reputational associated benefits. However, finding long-term impacts on the ground and economic sustainability for this type of project is always challenging and its implementation may be associated with some reputational risks (green washing, local conflicts over land use). The direct support of oil and gas companies operating in Mozambique to the cashew sector within their CSR would be a very innovative scheme that would achieve economic results for the national economy and the rural households, as well as positive impacts in terms of climate change adaptation and small growers' resilience, through the promotion of a productive agroforestry system (Nitidae, 2020).

The level of support could follow any of the many available options, as pointed out in Nitidae's (2020) study. Among the various challenges, access to finance is crucial, especially for processors. The profitability of investing in gas for the banking sector in Mozambique could be an opportunity if planned properly, and the technical knowledge of gas companies, associated with service providers and supplier companies could offer an opportunity for the cashew sector, including potential strategic partnerships for the development of renewable energy production systems using cashew shells. Finally, the needs at producers' level are enormous: the structuring of associations and cooperatives, technical support, or support to a strong policy to secure cashew price stability to encourage growers' investment in cashew production, which could be covered by a well-managed Sovereign Wealth Fund (Nitidae, 2020).

3.7. Mozambique's Cashew Nut Industry SWOT Analysis

Recent developments in the cashew nut industry in Mozambique bear a visible and undeniable testimony of its extraordinary recovery. It has certainly been thanks to the execution of a well-planned market driven strategy, strongly led by private processors and supported by a committed and well-prepared international development organisation. This growth has been attained in a surprisingly short period of time and there is potential for the continuation of this trend looking forward in time. These rapid developments make it worth continuing to study the sector with a view to reaching a clear and accurate understanding on the critical factors that need to be dealt with, in order to revamp the competitiveness of such an important industry in Mozambique, an industry that is a very effective tool of fighting against poverty in the country, especially in the rural areas.

The sense of success in this phenomenal recovery is mixed with feelings of fragility and of the need to keep caring for the success of all these endeavours. Developments in areas such as access to credit and improvement of the quality of the nuts are definitely in need of further work. On the other hand, there is a clear vision in terms of invigorating its industry through marketing and branding. The establishments of AIA in 2004, followed by the creation of Zambique in 2005, are two positive steps that solidify the grounds for further development. In the end, the enforcement of proper regulatory mechanisms for the purpose of protecting and improving the quality of Mozambique's cashews will result in the possibility of commercialising the product at a higher price. In overall terms, the industry has a strong sense of direction. It is, therefore, under this backdrop that a SWOT analysis is performed.

SWOT is a strategic planning technique applied to assist managers or organisations in the identification of the best ways of dealing with strengths, weaknesses, opportunities, and threats related to business competition or project planning. It is a simple but useful framework for analysing an organisation's strengths, weaknesses, opportunities, and threats, helping it to build on what it does well, to address what it is needed to deal with risks, and to take the greatest possible advantage of chances for success. It is a vital process that helps a business to evaluate its internal and external environment by testing out its own ideas, identifying areas of business that are performing well, which are of critical importance for business success, and they give the business its competitive advantage. Identifying these strengths can help managers and decision makers to make sure they prevent losing competitive advantage. What is true for a business is also true for a product, an industry, a company, a sector, and a country. Considering that this thesis is about the Export Competitiveness of Mozambique's Cashew Nut Industry, an adaptation of the preceding analysis that has been made to suit the needs of evaluating an industry using this same technique, as shown in Table 3.10.

Table 3. 10: Mozambique's Cashew Nut industry SWOT Analysis

STRENGTHS	WEAKNESSES
1. A strong and fast increase in the processing capacity, over a few years; **2.** The successful introduction of a private sector-led strategy, despite the fact that additional measures are needed to ensure industry sustainability over the long term; **3.** Kernels price on the international market higher than that of in-shell cashew nuts; **4.** Most processing plants located in areas of concentrated production, cutting on costs of intermediation between processors and producers, thus reinforcing their links; **5.** Adoption of small and medium sized plants which: **5.1.** Are manageable without sophisticated managerial skills, which is good for the Mozambican reality; **5.2.** Require significantly smaller initial capital; **5.3.** Use manual cutting technology that results in a better-quality product; **5.4.** Are easily adaptable for expansion; **6.** Through their association (AIA), processors have gained scale and embarked on a dynamic collaboration; **7.** A strong institutional and legal framework established.	**1.** The need for a short-term solution to reverse the processing profitability erosion by improving the quality and efficiency of old trees through chemical or otherwise treatment; **2.** Limited availability of capital for processors to take advantage of the profitable use of cashew by-products (They don't extract CNSL and don't use the shell as fuel); **3.** The nature of investment and financing in the country is very shallow; **4.** Very poor physical infrastructure in the country, which impacts on the costs of product transfer to the ports; **5.** The processing capacity is very limited, which results in insufficient capacity to penetrate high consumption markets (demand of several containers a year, ex: USA); **6.** Inefficient public extension, given the loss of expertise over long years of no production; **7.** Climate prone to pests and diseases; **8.** Limited availability of highly trained and experienced professionals in the industry; **9.** Significant levels of bureaucracy, corruption and high operational costs.
OPPORTUNITIES	**THREATS**
1. SADC, especially South Africa, offers opportunity for market expansion, with excellent roads and large store chains; **2.** As a result of the rapid processing capacity increase, the government is paying attention to the sector, and Zambique was launched in Baltimore with the presence of Mozambique's Head of State; **3.** The industry provides a significant number of jobs and income, especially in rural areas, and local economic development takes place around the plants, with a tremendous social impact in improving rural population's living standards, and poverty alleviation; **4.** Because of the novelty of cashew processing in some areas, best practices that come with it in all areas of production can be more easily incorporated to the industry (quality supervision, technological developments, marketing, etc.)	**1.** The cashew nut industry will become unsustainable or even disappear if new trees are not planted at a massive scale; **2.** Given the inadequacy of finance and financial services in the country, processors are severely burdened by debts and face cash flow problems, due to the lack of working capital, resulting in: **2.1.** Their production being ultimately less competitive, at least at the level of pricing; **2.2.** Volatile commodity markets that heighten the chance of processors withdrawing their investment or closing their processing facilities; **3.** Recent history has shown the limited government ability to sustain public support to the cashew industry, which creates some degree of uncertainty among processors; **4.** The loan guarantee fund provided by some donors could be terminated at any time, making access to financing more difficult; **5.** Private entrepreneurs could find better attractions elsewhere and leave Mozambique with a higher unemployment rate; **6.** Increasing consumer standards requirements, severe climate shocks, and terrorist attacks.

Sources: Technoserve Database (2020); IAM Report (2005); Ali Deboua (2007); Author's adaptation and updating.

CHAPTER 4

EMPIRICAL AND THEORETICAL BACKGROUND ON COMPETITIVENESS AND THE DIAMOND MODEL

4.1. Literature Review

4.1.1. Competitiveness

The concept of "competitiveness" is present throughout this text, being the reason why the sharing of the debate about it is included in this chapter, albeit there is no consensus among researchers around its meaning and implications. This is puzzling, given the concept's intensive use over the years, including the recognition that no country is successful or sustainable without it.

Competitiveness is a complex subject that encompasses a wide diversity of studies at various levels, and it has been conceptualised, analysed, and measured at country, industry, firm and product levels. Even though not on a regular basis, it has been also measured at regional level (Dhingra et al., 2009; Peng et al., 2001). Moon and Peery (1995) argue that the depth of the concept can be much more easily apprehended or cognised by recalling that Porter, in his book titled *The Competitive Advantage of Nations*, resorted to the concept of "industry" to ease the understanding of "competition", while emphasising that firms, not nations, compete in international markets.

Siggel (2007) and Waheeduzzaman (2011) are of the view that "competitiveness" concept has two dimensions (macro and micro), where the former deals with the competition among countries, while the latter primarily involves the competition among firms within a country. Garelli (2012) clarifies the link between countries and enterprises in the conceptualisation, analysis, and measurement of competitiveness. The researcher equally argues that firms are responsible for creating economic value, while countries create the environment where firms operate in their endeavours to achieve that economic value.

Competitiveness can be seen as the relative position of an organisation against its competitors, with a distinctly different meaning at various levels of analysis - product, firm, industry, and country. Porter (1990, pp. 33) argues that "industry" is the basic unit of analysis for understanding competition", in spite of the fact that in his book he refers to "nations", adding that a firm can enhance its competitiveness by changing strategies, without any increase in productivity.

Recently, the concept of competitiveness has become excessively used, but the exhaustively accurate and in-depth knowledge of its true meaning still leaves much to be desired, as it also depends on the level of understanding of the concepts of wealth and its distribution. The Lisbon Agenda and Strategy, an action and development plan designed in 2000, for European Union economy, covering the period from 2000 to 2010, in which the Portuguese government played a catalyst role, had the major objective of transforming the European Union into the most competitive and dynamic knowledge-driven economy in terms of sustainable economic growth generation, including job creation, social cohesion, brought about the essential clarity to the concept of competitiveness at both micro and macro level, and in its all other dimensions and interpretations (Garelli, 2006).

Subsequently, the author argues that the shortcomings of the Lisbon Agenda forced in 2010 the launching of a new ten-year programme of initiatives to succeed it, and its results are under evaluation. How countries, firms, individuals, and products succeed in this globalisation-fuelled world of competitiveness has been met with the notoriously intriguing observation that the concept of competitiveness has been abusively used (Garelli, 2006).

Recalling the popular definition provided by the President of the Commission on Industrial Competitiveness (1985), national level competitiveness is the extent to which a country under free and fair market conditions, produces goods and services that meet the standards and requirements of international markets while simultaneously maintaining or expanding the real incomes of its citizen (Cited in Krugman, 1994; Waheeduzzaman, 2011; Waheeduzzaman and Ryans Jr, 1996). Porter (1990) argues that "the only meaningful definition of competitiveness at national level is national productivity". Krugman (1994, 1996) criticises the notion of national competitiveness, by arguing that competitiveness is rhetoric and a poetic way of saying productivity, a perspective in which the concept has absolutely nothing to do with countries' competition, and stressing that firms compete for market share, not the countries. Moon and Peery (1995) observe that competitiveness should not be confused with productivity as it is the relative position against competitors, while productivity is the internal capability of an organisation.

Moon, Rugman and Verbeke (1998) define national level competitiveness as "the capability of firms engaged in value adding activities in a specific industry in a particular country to sustain this value added over long periods of time, despite international competition". According to this definition, competitiveness comprises a number of entities such as policies, institutions, and factors that are determinant in terms of how much a country is productive of a country (*Global Competitiveness Report*, World Economic Forum, 2013). Considering all the preceding researcher definitions, it is only logical to infer that national competitiveness is the ability of a country to provide conducive environment to its firms, and hence industries, to prosper, with the objective of helping in value creation, profit generation and to raising the national prosperity at the same time.

Bhawsar and Chattopadhyay (2015) observe that the studies on national-level competitiveness attempt to suggest various policies and reforms, as well as several strategies for enhancing national competitiveness, including financial programmes to increase savings, managed exchange rates, tax policies and macroeconomic policies. In addition to financial strategies, programmes to enhance workers' skills, quality management, establishment of educational standards and moral standards are equally contemplated in a country's endeavour to boost competitiveness.

Amin and Hagen (1998) investigated, in the category of studies on competitiveness of developed countries, the reasons for the worsening competitiveness of the US economy, having identified that the major barriers causing the loss of US' competitiveness in international market are, among others:

challenged productivity, ineffective investment pattern in research and development (R&D), the widening trade deficit, technological development being caught by other nations, loss of ground in product quality, and lack of strong political and legal environment in favour of competitiveness development. Porter and Ketels (2003) reviewed the status of the United Kingdom's (UK's) competitiveness, using measures like prosperity, productivity, internationalisation, innovation and productivity growth. Kiggundu and Uruthirapathy (2010) compared Canada's competitiveness with its two strong traditional economic partners, the US and the UK, and two emerging nations, India and China, based on three broad factors, consisting of nine pillars of Global Competitiveness Index (GCI), on business competitiveness and on domestic competition and cluster development for a period of 9 years (1998–2006).

In the category of emerging economies, Pillania (2008) reviewed the competitiveness of India with both macro and micro aspects for a period of 8 years (1999–2006). A strong emphasis was placed on the manufacturing sector in shaping the competitiveness of the country. Adams, Gangnes and Shachmurove (2004) analysed the factors responsible for rising competitiveness of China relative to its East Asian rivals. Export performance was used as an empirical indicator of the Chinese competitiveness for a period of 5 years (2000–2004). Bhaumik and Banik (2006) investigated the reasons behind the failure of the Caribbean economies, unlike East Asian economies, in exploiting the opportunity of being geographically close to the highly developed economies of the world. Lack of FDI, limitation in the availability of skilled labours and the imbalance in domestic savings to the investment were reported as the primary reasons behind competitive disadvantages of the Caribbean economies.

Waheeduzzaman (2011) undertook a comparative study of the group of emerging countries versus advanced countries, exploring the competitiveness and convergence of the G7 countries[17], with the Big Emerging Markets (BEM)[18] countries, using longitudinal data and cross-sectional popular comparative indices. The comparative performance of the countries was measured using several economic, demographic, trade, investment, freedom, and governance criteria. Though BEM was found growing at a faster pace, they still lag behind G7 countries in competitiveness performance. Fagerberg, Srholec and Knell (2005) studied the reasons for the difference in trade performance between countries, applying an econometric model that illustrated competitiveness of a country as being dependent variable on the country's ability to compete in technology, capacity (delivery), price and demand. Country competitiveness was measured by growth of market share and GDP. The result underscores technology and capacity as the two major factors behind good growth performance of countries and undermines the importance of price and demand.

Anca (2012) observes that at micro level, competitiveness is seen as a concept that refers to a company's ability to compete, to develop and to generate profits, consisting in that firm's ability, vision, strength and flexibility to create products that are in line with open markets customer satisfaction demands and requirements, while at macro level, this concept is less accurately defined and understood, which tends to throw it into a sea of controversies, even though almost every country fights to achieve competitiveness as the central goal of any and every economic policy.

Anca (2012) argues that the definition of competitiveness remains dubious, although it is seen as the concept that encompasses most of the aspects that are essential for defining what a successful country should have. Competitiveness' main goal is translated by the levels of growth in well-being, wealth, and prosperity of a country's individuals, firms, and regions. At a national level, firms operating on the country's territory count for most of the competitiveness source, in the sense that it is their activity that adds value to the natural resources, and the State contributes its own share through the development of the necessary infrastructure, and the provision of business facilitation services.

Most of the vast literature on the concept of competitiveness share the view that a country's prosperity comes from four sources: the competitiveness of products, the competitiveness of individuals, the competitiveness of firms, and the competitiveness of the country. The analysis of the competitiveness of the product is of critical importance, given that this research aims at assessing the competitiveness of Mozambique's cashew nuts, a product and an industry, considering both quantitative and qualitative factors that may exert an influence on the level of materialisation of that competitiveness in practical terms, in order to reveal the real possibilities of enhancing it. We are particularly keen on the evaluation of the export and international dimensions of competitiveness, much more in its policy design and implementation perspective, rather than in Krugman's (1993) "dangerous obsession[19]" perspective, in view of the need to finding constructive approaches to solving development issues in Mozambique.

Krugman (1993) describes national "competitiveness" as being a "dangerous obsession" and raises that raises important issues such as "*this concept is very confusing*" and "*the analogy between the firm and the nation is incorrect*". This viewpoint is accepted by the supporters of the concept of macroeconomic competitiveness, that could be illustrated by the following definitions: "A country's competitiveness is represented by the degree to which in a free-market economy this can produce goods and services that meet the requirements of the international market, stimulating, at the same time, a real growth of the citizens incomes. At national level, competitiveness is based on economic performance and on an economy's ability to transform the results generated by the productive activities in raising the incomes. Competitiveness is often associated with raising the living standards, employment opportunities, and also in a country's ability to maintain its responsibilities at international level.

In spite of all the above, it seems obvious that there is a bigger danger of *having the baby thrown away with the dirty water* in adhering to the controversy than in taking advantage of the positive nuances in the debate and making headway. This perspective has served as the strong backing for moving on with the evaluation of the concept in the case of Export Competitiveness of Mozambique's Cashew Nut Industry.

The Report of the Commission on Competitiveness' President (1984) argued that "competitiveness" is not just a measure of a nation's ability to sell its goods at international level and to maintain a commercial equilibrium. According to the OECD Programme on Technology and the Economy (1992), competitiveness as being the extent to which a State may produce goods and services that should pass the test of international competition and, at the same time, maintain and develop its income at national level, in the conditions of market liberalisation. An economy is competitive if its population can benefit over higher living standards and a better employment degree, in a sustainable perspective (European Competitiveness Report, 2000). The preceding definitions have some common features regarding the macroeconomic perspective of competitiveness: the performance is expressed in improving the living standards and the real incomes; the liberalisation condition of markets for the goods and services produced by the country in charge, and in the short run, competitiveness should not generate imbalances.

According to the abovementioned report, competitiveness is difficult to define and measure, and it is generally influenced by two major factors: competitiveness on the surface and competitiveness in-depth, with the former referring to the visible part or interface, where consumers can visualise the product, partly as a result of the power of marketing messages displayed by the supplying firm to existing and potential consumers, especially using the 4 Ps of Marketing: product, price, promotion and place, which operate as a bridge between the manufacturing or supplying firm that sends the information and the consumer who receives the information. The latter, the in-depth factor, encompasses the elements stemming from the so-called (QCD+F) code[20], where C represents the production cost that is behind the price formation process, and can be decomposed into selling and administrative expenses, material cost (material productivity and prices), labour costs (labour productivity, wages and other stuff costs), equipment and tool depreciation (equipment productivity and price), product development cost (development productivity and R&D investment price), and other expenses; Q represents total quality (design quality and manufacturing quality or conformance quality); D for quantity delivery, represents the delivery period or date (planning and development period, production and procurement time, and distribution period), and production capacity, closely related to production quantity or prospective production capacity; and F for flexibility, representing the level of flexible correspondence to changes and or diversification in quantity and product.

The concept of competitiveness van be attributed many different meanings for the firm and for the national economy. A country's competitiveness is the extent to which that country can produce goods and services that satisfy the standards and requirements of international markets while simultaneously expanding the real incomes of its citizens. Paraphrasing the President of Commission on Competitiveness in his Report for the year 1984, the competitiveness at the country level is based on superior productivity performance.

Krugman (1994) showed an interesting view on a nation's competitiveness, by contending that trade between the U.S. and Japan is not like a win-lose game in the sense that the U.S. and its trading partners can both be winners through the dynamics of comparative advantage. However, when countries endowed with similar comparative advantages compete in a particular industry such as aerospace industry (Prestowitz, 1994, p. 187), the competition is largely a zero-sum trade situation. Krugman (1994) also insists that since trade is a relatively small part of GNP in the U.S., living standards are determined almost wholly by domestic productivity rather than by international performance. However, if the domestic economy is to succeed in moving to higher levels of productivity and income, it must first compete successfully in the global economy (Thurow, 1994, p. 190). There is no consensus among researchers regarding a clear-cut definition of or a satisfactory model for a nation's competitiveness.

In today's global business, in which national economies are interdependent, it is difficult to determine a nation's competitiveness with existing models. Natural resources (traditional production factors) and low-cost labour are no longer important in the national competitive equation. Traditional policy tools such as protectionism and currency devaluation do not work well. For example, Levinson (1987, p. 42) argues that today's protectionist solution is tomorrow's strategic problem. We do not actually know "Who Is Us?" (Reich, 1990).

Since a nation's economy cannot be separated in this interdependent world of global networks of suppliers, assemblers, logistic systems and markets, competitiveness researchers tend to emphasise investments in work force and education. For example, Reich (1990, p. 54) suggests that if we hope to revitalise our countries' competitiveness, we have to invest necessarily in people, not in nationally defined corporations. According to Thurow (1992, p. 6), the education and skills of the work force will be the most critical competitive tool of the twenty-first century. In a similar note, Vernon (1986, p. 102) argues that the ability of the U.S. to maintain a higher living standard than other countries will depend on the development of a literate and flexible labour force. Therefore, the issue of human resource development and education is essential to both the conceptualisation of innovation and its commercial use in the shop or office level.

The abovementioned researchers equally assert that the U.S. is one of the most extravagant spenders for education, any by all accounts, with only dismal consequences. American children rank at the bottom of various international tests. The most important reason for declining American competitiveness is probably the weakness of American K-12 education. In a recent report titled "Prisoners of Time," a national commission created by Congress said that the average American high school student uses less time studying than half the hours on core academic subjects as do contemporaries in Japan, France, and Germany (Broder, 1994). No wonder, the report says, "so many of our high school graduates have trouble reading, writing, and solving simple mathematics problems." Although American higher education is a source of competitiveness, there are enormous disparities of effectiveness at this level, too. The poorest colleges and universities produce graduates with competency levels that are often no higher than the entering capabilities of students in the "star" universities. The U.S. competitiveness has largely been dependent upon the graduates of these "star" universities. However, the issue of misallocation of resources — now drawing much attention with the school to work transition — certainly reveals that the U.S. is spending only $1 for post-secondary training relative to $55 spent for higher education. They carry-on to observe that in the past, the U.S. competed primarily in the introduction stage of the product life cycle where a highly skilled work force offers a strategic advantage. Today, the U.S. competes both in the introduction stage of the product life cycle, where a highly educated work force is important for innovation, and in the mature stage, where a lower-skilled, low-cost work force compete with low-cost manufacturing. As the product life cycle has shortened in many industries, the U.S. leadership in innovation has deteriorated.

In order to compete in manufacturing sectors in the mature stage of the product life cycle, U.S. blue-collar workers now need to be internationally competitive in terms of basic skills, knowledge, and discipline. Since most blue-collar workers do not go to college, K-12 education and on-the-job apprentice programs need to be strengthened for enhancing the U.S. competitiveness. What is more important for national competitiveness is that we need to educate workers to be more knowledgeable and disciplined, as well as creative. The basis of national competitiveness for an industrial profile dominated by mature industries is different from introduction stage industries. Further study is needed to explain different types of education, and how they affect a national-level competitiveness in a global economy.

Competitiveness today is as prominent as globalisation (Bhawsar and Chattopadhyay, 2015). It encompasses all the elements that can explain the success of a nation, and it originates from a Latin word, *competer*, that means involvement in business rivalry for markets, and after Porter's (1990) work, the concepts of competition and competitiveness were strengthened. Its historical roots stem from the international economic theories of Adam Smith and followers. This was only during the early 1980s, when the American economic dominance was emulated by Europe and Asia that the apprehension about international competitiveness gained a stronger momentum (Banwet et al., 2002; Waheeduzzaman, 2011).

Despite all this apparently significant role of competitiveness in the economy, Anca (2012) argues that the lack of a clear and unambiguously accepted definition or understanding of the concept is an undeniable source of intellectual disagreement or controversial positionings by different researchers. The bonne of contention is that some researchers consider it very perilous to design and build an economic policy founded on a concept that not only inaccurately defined but it is also prone to any kind of interpretation at researcher's will.

In a general perspective, the idea of a policy design can be retained, in which an expressive number of researchers and practitioners seem to have been contaminated either by Krugman's type of fear or by the general fear derived from the sense of peril of misusing the notion of international competitiveness in such a way that its meaning would be inconsistent with what is intended, thus jeopardising its legitimate use in more realistic contexts where there are positive and dynamic externalities such as scale economies (Anca, 2012). The researcher also argues that there is a considerable number of researchers who support the view that competitiveness can only be coherent in the presence of dynamic externalities, and its practical usefulness in the real world is very limited, although recognising that there is a prevailing and converging evidence that competitiveness strategies can work if they are the "right" kind for a given political configuration, thus militating along with Krugman's (1993) straight forward position that "competitiveness" is a "dangerous obsession".

Export and international dimensions of competitiveness are of particular interest in this research work in the sense that export expansion and development provide an excellent opportunity for any country to expand production, boost employment (including self-employment), reduce unit costs, increase factor productivity, and expand incomes, particularly in the rural areas in the case of developing countries (Spence and Hazard, 1988). Authors equally observe that export expansion and development enable a country to better reconfigure its comparative advantage into consolidated and long-lasting competitive advantage, thus generating an investment-conducive business environment that favour the attainment of higher income levels, the attraction of high-standard investments into the country, skill-developing R&D undertakings, high levels of capital inflows, and the essential technology transfer that is needed to enhance and achieve even higher and broader levels of competitiveness over time.

Export competitiveness and its association with economic integration and economic growth allows for a more efficient use of resources and exposes domestic producers to a larger, more competitive international market, and specialisation, concurrent with a country's comparative advantage (Vollrath, 1991; and Mayes, 1978). It is, therefore, extremely important to adopt an export-based outward-looking economic and business policy, because exporting makes any country better prepared to cope in a successful way with most of the ever-growing external shocks confronting all the countries in recent decades, a particularly important for developing countries and the Least Developed Countries (LDCs), especially those in Sub-Saharan Africa, of which Mozambique is part.

The international competitiveness of a country is usually associated with its export performance. Researchers in the scientific sphere tend to identify international competitiveness with exports, and Krugman (1994), despite his frequent controversial positionings, controversies, argued that, export is obviously important for the country competitiveness. The competitiveness of export causes the country to achieve higher international market shares, bigger and sustainable revenue accumulation, higher income levels, and employment creation in the various sectors of the economy. This comes together with increased international trade volumes via export expansion and diversification, sustaining higher export growth rates, upgrading the technology, and skill content of export activity and expanding the base of domestic firms to compete internationally (Nogami, 2008).

According to UN Economic Development in Africa Report (2019), when it comes to export competitiveness[21], a significant number of African countries (Mauritius, Côte d'Ivoire, Malawi, Kenya, Mozambique, Tanzania, and Ghana) are in the top third, while Cameroon, Benin, Botswana, Nigeria, Rwanda, Burkina Faso, and Burundi are in the bottom third. Mozambique, Tanzania, Uganda, and Kenya improved substantially their competitiveness rank between 2000 and 2010. Given the increasing size of international trade, the concept of export competitiveness plays a vital role in the international trading system, and it has been paid more attention in order to develop export portfolio of countries, with a view to promoting economic and social growth and development for a better positioning in the global competitive market. Export competitiveness is an essential component of a country's economy.

Moon et al. (1998) proposed a "Generalised Double Diamond Model" that incorporates both domestic and international diamond to analyse a country's international competitiveness. A country's competitiveness depends partly on both the diamonds. The outer diamond represents the global diamond, while the inner diamond depends on the country's size and its competitiveness. The difference between the two diamonds is represented by outbound and inbound foreign direct investment (FDI) of the country.

Moon and Cho (2000) proposed a "Nine-Factor Model", which, like previously mentioned models, is an extension of the diamond model. In addition to the four endogenous variables of the diamond model (factor conditions, demand conditions, supporting and related industries, and firm strategy, structure and rivalry) this model incorporates the role of four human resource variables, namely: workers, politicians and bureaucrats, entrepreneurs and professionals, and one external variable (chance). This model emphasises the role of human resource for achieving international competitiveness.

Cho, Moon and Kim (2009) introduced a more comprehensive model, the "Dual Double Diamond", to explain the competitiveness of countries with heterogeneous attributes by integrating international context of the Generalised Double Diamond Model and human factors of the Nine-Factor Model, and covering four dimensions (domestic physical factors, domestic human factors, international human factors, and international physical factors).

The extended diamond models consider the role of FDI, human resources and international factors that have applicability at national and industry levels. At the firm level, the concept of core competence that is central to the resource-based view of firm is an emerging theory in the field of competitiveness (Grant, 1991; Hamel and Prahalad, 1989; Prahalad and Hamel, 1990).

Momaya (1998) attempted to explore new approaches to evaluate international competitiveness at the industry level. He realised the drawback of Porter's theory being applicable only to high-tech industries and not to service industries like construction. The study involved the evaluation of competitiveness of construction industry of Canada, Japan, and the US for a period of 4 years (1990 to 1993). Construction export was used as the criterion for competitiveness evaluation. The Asset, Process, and Performance (APP) Framework, a model that considers the importance of core processes like strategic human resources and operations, was employed for the generation of criteria. Overall, Japan's construction industry was found to be the most competitive among the three countries because of better processes.

A comparison study was undertaken by Sardy and Fetscherin (2009) on the automotive industry of China, India and South Korea, using the Double Diamond Model, and found that the competitiveness index of the Chinese automobile industry was better in both domestic and international terms, than that of South Korea and India. A study done by Narayanan (1997) analysing the impact of deregulation policy in India during mid-1980s on the technology acquisition of automobile firms, concluded that the difference in technological acquisition is the major reason for the variance in competitiveness of Indian automobile firms.

With the use of the concept of Revealed Comparative Advantage (RCA), Shafaei and Shahriari (2009) investigated the competitive performance of leather value chain (LVC) of Iran and compared it with that of nine other major exporting countries, and Iran's competitive performance was found to be significantly low as compared to other nine countries. In the following year, Sun et al. (2010) evaluated the regional real estate industry competitiveness by studying Beijing and Tianjin in China, with the application of Diamond Model, and the evidence showed that Supporting and Related Industries, followed by the Demand Factors have significant influence on competitiveness of real estate industry. An attempt to measure the export competitiveness of alcoholic beverage industry across countries was made by Alon, Fetscherin and Johnson (2010), covering a period of 5 years (2001–2005), in which a two-by-two framework using export growth rate and industry specialisation was developed. In this study, the sample exporting firms were grouped into four categories: global dynamic, domestic dynamic, global static, and domestic static. Using the same framework, Fetscherin and Pillania (2012) analysed the export competitiveness of 97 Indian industries for the period of 6 years (2001–2006), and found that the majority of Indian industries are shifting to global dynamic category.

As competition lies at the heart of competitiveness, most of the research efforts have been on analysing competitiveness with respect to competition. Assessment of competitiveness at national level (Adams et al., 2004; Amin and Hagen, 1998; Kiggundu and Uruthirapathy, 2010; Liu and Hsu, 2009; Porter and Ketels, 2003; Waheeduzzaman, 2011), at industry level (Alon et al., 2010; Momaya, 1998, 2008; Sardy and Fetscherin, 2009; Shafaei and Shahriari, 2010; Sun et al., 2010) and at firm level has been made with focus on competition. (Milgate, 2001) argues that under the rapidly shifting dynamics of today's high-velocity markets, global competition and competitive advantage can be short lived. Therefore, firms must continuously look for new sources of competitive advantage, and for a firm to remain competitive in several areas, its managers must think and act lean. To compete, individual entities must cooperate by means of partnerships. At national level, partnership between countries may work through trading agreements like Free Trade Agreements (FTAs) or Preferential Trade Agreements (PTAs). FTAs or PTAs are more observed between countries that have complementary economic structures. In the case of firms, both cooperation and competition can coexist, which causes the emergence of the term "co-opetition" that combines both competition and cooperation. Co-opetition involves two or more competitive firms belonging to the same industry working together towards a mutual goal of achieving higher competitive advantage. Quite a few studies (Bengtsson and Kock, 1999; Brandenburger and Nalebuff, 1996; Gueguen et al., 2006; Osarenkhoe, 2010) have explored co-opetition via means of case studies.

According to Spence and Hazard (1988), over the past few decades, literature has been flooded with an enormous volume of alternative definitions and measures of international competitiveness, some of which are very confusing and contradicting. There is, however, a non-negligeable amount of convergence around four measures of international competitiveness, with a view to minimising confusion and engaging in a fruitful reflection over the subject, namely: **i**) A country's current account balance, which encompasses trade in goods and services plus foreign donations; **ii**) A country's sectoral trade balance, for example, in the area of high tech, how much the country is spending in R&D or how intensive is R&D in that country's products; **iii**) The world market share held by a country or by a country's firms, including its own multinational firms or foreign multinationals operating on its own soil; and **iv**) A country's average productivity, measured as the level of output per hour.

For Spence and Hazard (1988), after more than 200 years, the framework for analysis and discussion on the issue of international competitiveness remains basically the same as brought about by the classical international trade theorists (Smith and Ricardo) and the neoclassical (Heckscher-Ohlin), a system whereby a country's decision to embark on a specialisation in the production and export of that particular product is a function of that country's comparative cost advantage or, more precisely, its ex-ante or initial factor endowment in the basic factors of production. A clear demonstration of that fact is to note that Harvard University's Centre for Business and Government researchers, Spence and Hazard (1988), organised the collection of research for a conference on international competitiveness, focusing on goods trade balance, or the trade balance for one specific product or sector, with the aim of highlighting the distinction of each country. Along these lines, countries that have adopted outward-looking economic paradigms and strategies over the years have strongly benefitted from the acquisition and gain of fresh and development friendly new knowledge that usually comes along with the exposure to foreign competition, which helps in improving factor productivity and innovation in new and growth accelerating product lines. It is, therefore, extremely important to adopt export-based outward-looking economic and business policies, because exporting makes any country better prepare to cope in a successful way with most of the ever-growing external shocks confronting all the countries in recent decades, a particularly appealing condition for developing countries, and especially the Least Developed Countries (LDCs) like Mozambique.

Paraphrasing Bruneckiene and Paltanavicience (2012), the international competitiveness of a country is usually associated with its export performance and development, and the positioning of the national export on the international market. After so many extraordinary years of trading experience with the rest of the world, there is a vital need to analyse this export performance in the global competitive market, and to comparatively examine and identify its main challenges, learning lessons from past mistakes, and dealing with the factors affecting its export competitiveness.

Sachitra & Kumarasinghe (2012), emulating the experiences from small countries such as Mauritius and Singapore, support the view that a good indicator of a country's export competitiveness is its share in world exports of goods and services and how that share develops over time, even recognising the fact that a small economy could be very competitive in exports and still have a small world share, a situation that can be overcome by dividing world export shares by world GDP shares, and then compare the ratios. This ratio is equivalent to the exports-to-GDP ratio of a country divided by the exports-to-GDP ratio of the world. If this measure is greater than 1, the country is exporting a greater share of its GDP than the world average, so it is, in a sense, more competitive in exporting. And a rising trend in the ratio indicates rising export competitiveness. In the developing world, a large increase in the exports of extractives by a country may not indicate that the country's economy is transforming itself or developing. So, extractive industries products are removed from both exports and GDP when this measure is calculated. Trends in this measure of export competitiveness show a large gap between the African countries and the comparators. The share of non-extractive industry exports in non-extractive GDP rose between 1980 and 1985. Since then, there has been on a downward trend, revealing that the region's recent GDP growth has been in a mismatch with corresponding growth in exports outside the extractive industry sectors.

Considering the previously mentioned factors, export competitiveness is identified as the reflection of national reality that cannot be improved without identifying factors affecting on competitiveness paraphrasing the United Nations Economic Development in Africa Report (2019), when it comes to export competitiveness (here defined as the share of exports of goods and services in a country's GDP relative to the corresponding share for the world), 20 African countries (Mauritius, Côte d'Ivoire, Malawi, Kenya, Mozambique, Tanzania, and Ghana) are in the top third, while Cameroon, Benin, Botswana, Nigeria, Rwanda, Burkina Faso, and Burundi are in the bottom third. Mozambique, Tanzania, Uganda, and Kenya improved substantially their competitiveness rank between 2000 and 2010. Kenya made great strides in tea, coffee, horticulture, hides and skins, cement, tobacco, textiles, and fish. Medicinal and pharmaceutical products are also emerging as important opportunities for expanding export volumes and upgrading quality and value. Ghana, though still in the top third in competitiveness, experienced a steep fall in competitiveness between 2000 and 2010. Part of this fall reflects the 60% revaluation of the country's GDP in 2006. With exports not similarly revalued upward, the share of exports in GDP fell steeply. Botswana's steep fall reflects its struggle to develop exports outside diamonds, since extractives are excluded from the export competitiveness measure. This is one of the reasons why extractives have not been elected for this research on Mozambique.

McFetridge (1995) defines competitive industry as comprising inter-regionally or internationally competitive firms. A firm is inter-regionally or internationally competitive if it is consistently profitable in an open market”, and Momaya (1998) argues that “industry level competitiveness” is the degree to which an industry gratifies the needs of customers, with the peculiar combination of products/services, price, quality and innovation, and the needs of various stakeholders, like providing safe workplace to workers. It is equally logical to infer that an industry can be considered competitive if it comprises firms that yield lucrative returns on investment. Unlike at firm and country levels, competitiveness at industry level has not received sufficient attention, and public policies, trade agreements, among other actions, are all dependent on industry-level competitiveness, making it pivotal in a country’s competitiveness (Momaya, 1998). Regarding the need to understand that the basic unit of analysis is "industry", this argument is perfectly in line with Porter’s (1990) positioning.

In the extant literature on this topic, we find that most of the existing theories on strategic management convergence in views related to the competitiveness of a product or a firm. A critical question regarding the international competitiveness of a country's industry was raised by Porter (1990, pp. 18) by asking why firms based in particular nations achieve international success in distinct segments and industries. Porter (1990, pp. 25) defines international success by a nation’s industry as “possessing competitive advantage relative to the best worldwide competitors.” He chooses as the best measures of international competitive advantage either: **i)** the presence of substantial and sustained exports; and/or **ii)** significant outbound foreign investment. However, these two proxy variables have some limitations. First, as the business is being globalised through foreign investment and strategic alliances, export measure may not serve as the best variable in explaining a nation’s international competitiveness in a particular industry. Second, Porter neglects the possible contribution of inbound foreign investment (Rugman, 1991).

Porter’s determinants, namely: factor conditions, demand conditions, supporting industries, and firm rivalry, which form part of the diamond model, are useful in analysing the competitiveness of a nation’s industry. However, it should be noted that there are significant similarities between this Porter’s diamond model and his early industry model of five forces (Porter, 1980, 1985, also 1990, pp. 35). Comparing this industry model with the diamond model, suppliers are factor conditions; buyers are demand conditions; and the other three variables are similar to firm strategy, structure, and rivalry. In his diamond model, Porter adds just one more variable (supporting and related industries). Thus, Porter’s diamond model is an extension of his industry model. Despite the usefulness of the determinants of Porter’s diamond model, this model has a significant limitation in applying to a global business. It has been criticised because the original diamond model is home-country biased (Grant, 1991; Dunning, 1992; Cartwright, 1993; Rugman and D’Cruz, 1993). The original diamond model needs to be extended to incorporate the international or global scope of the determinants of industrial competitiveness.

Chikan (2008) defines firm competitiveness as the capability of a firm to sustainably fulfil its double purpose, which is, meeting customer requirements, and demands, and making profit. This capability can be realised by offering goods and services which customers value higher than those offered by competitors. For Cetindamar and Kilitcioglu (2013), “competitiveness is a capability, and its potency has to be realised in firm’s everyday operations”. From this formulation, it is so obvious to infer that a firm’s competitiveness rests in its adaptability and its ability to realise long-run profit. An analysis of the extant literature reveals that a wide variety of notions has been used for the three levels of competitiveness. There exists a paucity of all-encompassing conceptualisation.

Both firms and countries have their destiny intertwined because the country provides the environment for firms to grow (or hinder), while the firm creates economic value for the country (Garelli, 2012). A model to connect macro and micro-level research on competitiveness using Diamond Model has been developed by Chikan (2008). Literature has been enriched with the studies on various factors contributing to firm-level competitiveness, ranging from activities in the Porter’s (1985) value chain to a wide diversity of independent factors like leadership, learning, R&D, quality and labour productivity. A study by Chacko, Wacker and Asar (1997) found that cost, quality, delivery and flexibility are the goals a firm should strive for in order to achieve competitiveness. To meet these goals, enterprises should create techno-managerial practices, like automation, total quality management, benchmarking and JIT (just-in-time), sound human resource practices, like employee empowerment and training, among others.

Inspired by Burke (2005), it is our determined view that a proper analysis on product and industry competitiveness in today’s modern world in which business is becoming increasingly more integrated, rapidly globalising, and more demanding, in which firms are pressurised to find more effective means of surviving the and fiercer competition will not take effect without embarking on creative, adequate and adaptive human resource selection, training and management strategies in their operations. By reading intensively and extensively the extant literature on competitiveness in general, and competitiveness of a product and that of an industry, such as the cashew nut industry in Mozambique, it becomes obvious that firms are confronted with an enormous number of issues, the most critical of which are productivity increase, increased participation in the global markets, access, acquisition, development and implementation of new technologies, organisational enhancement capabilities, the ability to provide a timeously, adjusted and tailor-made response to the needs, desires and aspirations of increasingly well-informed and more demanding 21st century customers, at the same time they need to pay attention the modus operandi of a high-velocity and extremely volatile marketplace where they operate. Managers need to equally pay attention to the fundamental objective of achieving increased revenue and lowered costs, attracting and retaining a high-performing and flexible workforce, introducing and managing relevant organisational changes, which is basically the need to search for the most efficacious sources of competitive advantage, placing a special emphasis on the strategic nature of human resources and human resource management (HRM) for performance success of firms in their endeavours to achieve and sustain competitiveness (Burke, 2005).

At this point, it opportune to take a quick look at what has been written on the role of organisational resources as the source of competitive advantage, according to Barney (1991, 1995) and

Grant (1991, 1998), an area to which numerous efforts have been directed by both researchers and practitioners to external and internal environments of a firm, with particular emphasis on the external environment perspective, with the major strategic analysis focusing on the industry environment and competitive positioning of firms. Under this perspective, HRM was seen purely as a tool for reinforcing the firm's generic strategy (Schüler, Jackson, 1999; Boxall, 1999), or "support activity" in the value creation chain (Porter, 1998).

Inasmuch as the sources of competitive advantage are concerned, researchers and practitioners were placed under pressure in recent years by the need to devise and develop new strategic options (Pfeffer, 1994; Becker, Gerhart 1996), as a consequence of the gradual erosion of the traditional sources of competitive advantage, among which natural resource endowments, access to finance and financial services, access to and use of technology, protected markets and economies of scale, which have become increasingly easier to imitate and consequently lost their strategic power, as a pathway to achieve and sustain competitiveness.

Paraphrasing Barney (1991), and Grant (1998), this paradigm shift resulted in the development of what has come to be known as a resource-based view (RBV) of the firm, in which the focus of strategy specialists shifted from the external environment to the internal context of the organisation, and the greatest emphasis was laid on the crucial role of organisational resources and capabilities, which were understood as a strategic foundation of the firm and the primary source of competitive advantage. Colbert (2004) observes that firms should acquire, deploy, develop, and retain their resources rather than the competitive position in the market.

The resource-based view propitiated a business environment in which technological evolution was accelerated, and consumer preferences made the market-focused strategy too unstable for building a long-lasting strategy and, according to Grant (1991, 1998), the business strategy should be based on the deployment and development of the unique features of organisational resources or assets that do not have the potential to establish a competitive advantage in isolation (human resources, intellectual capital, equipment) and capabilities (use of resources in bundles or combinations that have potential of becoming a source of competitive advantage).

Prahalad and Hamel (1990) maintain a similar view that the establishment and sustainability of a competitive advantage rests on the organisation's ability to determine, develop and nurture "core competences", which they define as "collective learning in an organisation", while Lado and Wilson (1994) propose that the creation of competitive advantage necessitates organisational competencies which include all "firm-specific resources and capabilities that enable the organisation to choose, develop, and implement value-enhancing strategies".

Barney (1991) argues that the competitive advantage means the implementation of a strategy that is not followed by current or potential competitors, while the sustained competitive advantage means not only the possession of such a strategy, but also its inimitability. This implies that for a resource to have the potential of becoming a source of a sustained competitive advantage, it has to possess the following qualities: be valuable, rare, inimitable, and non-substitutable (Barney, 1991). It also has to be relevant (Grant, 1998) and dynamic (Johnson, Scholes, Whittington, 2005), being the relevance and dynamism emphasised taking into consideration the prevailing business environment characterised by high-velocity markets, extremely volatile consumer needs, aspirations, and expectations, clearly demanding dynamic competences on the part of firm managers. For the sake of abating possible terminology disparities and eventual confusion, the reference to other classifications of organisational resources (e.g. Barney, 1995; de Wit, Meyer, 2004), Grant (1998) typology was brought here, comprising three major kinds of resources: tangible (financial and physical), intangible (culture, reputation and technology), and human, with the human resources seen as the most critical in the attainment of organisational success (Ulrich, Lake, 1991; Pfeffer, 1994; Wright, McMahan, Me Williams, 1994; Becker, Gerhart, 1996; Kamoche, 1999; Wright, Dunford, Snell, 2001; Doorewaard, Benschop, 2003).

In the reality of today's global marketplace, firms need to increase productivity, expand their operations into the global markets, develop new technologies, respond to changes in the highly volatile consumer's needs, aspirations, and expectations, increase revenue and decrease costs, develop skilled and flexible workforce, and introduce changes (Burke, 2005), which accounts for most of the emphasises and significance placed on human resources, their capabilities, and management, when it comes to competitiveness analysis.

This is at the genesis of the paradigm change that led into the perception that human resources are a valuable, rare, inimitable resource having no substitutes that may lead to the establishment and sustainability of a competitive advantage, considering the two perspectives under which human resources can be classified, namely the generalist and the distinctive, where the former comprises mainly all people employed at a particular firm, and the latter lays emphasis on employee abilities, knowledge, attitudes and experience, which is rooted in the resource-based view, and sees human resources as a strategic asset of a firm, reflecting the HRM definition of human capital, according to which Dessler (2005) who considers human capital as the knowledge, education, training, skills, and expertise of a firm's workers. For Wright, McMahan, and McWilliams (1994), human resources can be considered rare, a value for the firm is usually created by individuals with high cognitive ability, which is distributed throughout the total labour population.

As far as the centrality of HRM is concerned, the resource-based view has strongly emphasised the critical role of human resources in establishing and sustaining competitive advantage, despite the ongoing debate as to whether the value to the firm comes from the human resources themselves or from human resource management, and a significant number of researchers and practitioners support the strong view that a sustained competitive advantage is created through HRM practices, a complex and inimitable system, and not only on the mere existence of human resources, as it does not suffice to hire best people to surpass the competition, and in order to build a firm capability, employee competencies need to be developed and retained through effective HRM (Ulrich, Lake, 1991; Pfeffer, 1994; Becker, Gerhart, 1996; Boxall, Purcell, 2003). To achieve a competitive advantage through human capital, firms need to possess human capital that is value adding, unique, inimitable and non-substitutable. Batt (2002) adds three distinct but self-reinforcing dimensions of HRM systems that lead to the acquisition and retention of the relevant human capital: first, the process of recruiting people irrespective of what skills they possess and investment in their initial training; second, work design that fosters discretion and continuous learning through cooperation with co-workers; third, performance-based incentives.

It is very interesting to realise that in this wholesome debate over what really constitutes the source of sustained competitive advantage another group of researchers has emerged suggesting the unification or combination of these two points of view arguing that both human resources and HRM play a critical role in the enhancement of organisational effectiveness and competitiveness, and they are essential in the development and sustainability of the competitive advantage, since on the one hand, human resources contribute to the development of competitive advantage through "behavioural manifestation of expertise", and on the other hand, HRM leads to the possession of organisational ability to align human resources with strategy, as well as retaining such human resources (Kamoche, 1999). A mere possession of individual resources does not lead to the establishment and sustainability of a competitive advantage, since the latter calls for building resources into a core competency, or organisational capability and, therefore, a high-quality human capital needs to be supported by an effective HRM to be of competitive value for the firm (Lado and Wilson, 1994: Grant, 1998; Prahalad and Hamel, 1990; Kamoche, 1999).

Muller (1996) came up with the interesting "social architecture" concept that managerial practices alone cannot turn human resources into a valuable strategic asset, because social patterns of a developmental process are difficult to replicate for competition, as a result of their lengthy and undefined evolutionary nature. He adds that human resources alone cannot qualify for a "resource mobility barrier" that would inhibit a resource imitation, at the same time that he defends the view that human resources may lead to a sustained competitive advantage when used in combination with other firm's strategic assets, emphasising the relevant role of tacit knowledge, and stating that explicitly defined and formalised HRM practices do not and cannot form basis for the development and sustainability of competitive advantage. Boxall (1999) proposes that a distinction should be made between "human capital advantage" and "human, or firm process advantage", where the former entails hiring and retaining high quality people with tacit knowledge, and the latter refers to processes, which are history-sensitive, socially complex, and causally ambiguous, and that each of these two advantages may propitiate value creation, but they work best in combination with each other (Boxall and Purcell, 2003). According to Wright, Dunford and Snell (2001), in order to acquire a sustainable competitive advantage, a firm has to be superior in all areas of strategic human resource management, namely: human capital pool (knowledge, skill, ability), employee relationships and behaviour (psychological contract), and staff management habits and culture (staff recruitment, training, rewards, appraisal, work design, participation, recognition, and communication).

The resource-based view on the role of human resources and their management being discussed so far, has propitiated a very enlightening understanding on the issue, but it has come under attack and criticism for neglecting the context specifics and "human" side of employees, which comprises their demographic characteristics and physical and psychological conditions, as all of these factors may have an impact on employee skills and competences (Doorewaard, Benschop, 2003). It is, therefore, important to mention that this view is supported by other theories, such as the knowledge-based view (Price, 2007), which emphasises the critical role of unique knowledge ownership; the role behaviour theory, which maintains the necessity of different role behaviours for different means of strategy implementation and views of HRM as a primary means of behaviour management; and the human capital theory, according to which the value of human resources, just as any other type of capital, lies in their ability to contribute to organisational productivity (Schüler, Jackson, 2005). Stavrou and Brewster (2005), came up with their own views that can be seen, to a certain extent, as extensions of the resource-based view, and they are summarised in the following four points that acknowledge the significance of HRM in the establishment of sustained competitive advantage: **i**) The organisational learning, comprising the creation of competitive advantage through innovation, change and rapid renewal; **ii**) The external and internal fit of organisational practices, resources, and capabilities; **iii**) The engagement in change processes, identification of threats and opportunities, and acting as an intermediary between stakeholders and the business; **iv**) The core competency development and deployment.

The sources of competitive advantage can be classified as internal and external environments of a firm (Barney, 1991, 1995: Grant, 1991, 1998). The preceding discussion seems to point to the need to accept that the critical role of human resources and that of HRM is mainly supported by the proponents of the internal source of competitive advantage, such as resource-based, competency-based, and knowledge-based views. Followers of the interactional approach to the competitive advantage source see human resources as a mediator between strategy and performance outcomes, or relationship builders in business networks and HRM as capability developer and performance stimulator. The least significance to both human resources and HRM is attributed by the competitive positioning view which supports the idea that the source of competitive advantage lies outside the firm and considers human resources not valuable *per se,* and HRM as a support activity, but current challenges of the business environment can no longer be met merely by the use of traditional, or external, sources, and a strong emphasis the need to be placed on searching for new effective combinations, within the context of dynamic capabilities analysis.

The use of human resources and HRM in bundles or combinations is seen to be value-creating for the firm as it faces the challenges posed by the need to sustainably surpass competition in today's high-velocity marketplace, with extremely volatile needs, demands and expectations of increasingly informed consumers, in line with the most recent approaches to sources of competitive advantage. The highest relevance to human resources attributed by approaches supporting the idea that the source of organisational competitiveness resides within the firm, that is, the internal sources of competitive advantage, such as resource-based view, knowledge-based view, or competency-based view.

When it comes to creation and sustainability of competitive advantage, human resources play a very critical role, although the interactional and external views to competitiveness do not attach such a strong emphasis to the critical role of human resources in the attainment and sustainability of competitive advantage. Human resources' contribution is evident and undeniable, because people form an integral and indispensable part of the organisation no matter how they are viewed (as a strategic asset, relationship builder and cultivator, or strategy implementer). The value of human resources is dependent not only on the firm or industry, but certain national factors such as political, economic and educational systems, among others (Boxall, Purcell, 2003). Consequently, HRM should be viewed as a strategic activity and thus carried out consistently with the overall business or corporate strategy.

Shee, van Gramberg and Foley (2010) examined the role of leadership in enabling firm values, capabilities, and practices to deliver exceptional value to customers that lead to firm competitiveness. Salazar, Vilchez and Pozo (2012) analysed the effectiveness of coaching, an extensively used technique for training and personal development, in enhancing business competitiveness. Similarly, Gronhaug and Stone (2012) found the influence of the learning process on firm competitiveness. In today's globalising and high-velocity world driven by technological advancements, the role of technology is the most prominent in delivering competitive advantage to a firm. Lollar, Bheshti and Whitlow (2010) reported that the use of integrative technologies reduces the cost of doing business and enhances the speed of response to today's high-velocity marketplace changes. To compete successfully, integration of firm's internal function with the external functions is required. Therefore, the supply chain management (SCM) practices influence competitiveness of firms. In a study undertaken by Agus (2011), the impact of the critical variables of SCM on product quality and business performance was measured. Results revealed that the variables of SCM, that is, lean production, new technology and innovation, strategic supplier partnership and postponement conformance, impact competitiveness of product and firm. The role of product is significant in boosting a firm's competitiveness.

Akroush (2012) proposed a model examining the effect exerted by firm capabilities, namely, technological, marketing mix and customer relational capabilities, over new product competitive advantage (NPCA) and the effect exerted by NPCA on customers and financial performance. The result revealed that among the three types of organisational capabilities, marketing mix capability affects both dimensions of NPCA, that is, new product quality and new product speed. Cetindamar and Kilitcioglu (2013) developed a comprehensive generic measurement model for firm competitiveness. Growth, exports, profits, customer, and society, together were used as outcome indicators. Under managerial process and system, leadership, ability to develop processes and systems and sustainability of strategies were measured. Technology, human resource and finance were the major resources used in the model.

Hamel and Prahalad (1989) view competitiveness in a competency perspective, where resource endowment creates competitive advantage for a firm. Prahalad and Hamel (1990) emphasise that in the short run, a firm's competitiveness is the outcome of price/performance attributes of its existing products, while in the long run, it is in the firm's ability to build products at lower cost and more speedily than competitors. Core competence is the consolidation of "corporate wise technologies" and "production skills", considering a firm as a bundle of resources and capabilities.

Proposed by Grant (1991), a framework for a resource-based approach to strategy formulation for gaining competitive advantage was consolidated in a model where Ambastha and Momaya (2004) bring out the importance of strategic processes in enhancing competitiveness of firms. While the resource-based view is restricted to assets and capabilities, the Asset, Process and Performance (APP) Model considers the importance of core processes like strategic, human resources and operations. Some researchers (Frain, 1992; Porter, 1998) considered mutual interdependence and networking among firms and related organisations, including government, educational and training institutions as significant players in competitiveness at the regional level.

Mitchell, Shaver and Yeung (1993), in a study on the transition of industries in US from local to global, studied the relationship between firm performances with the change in its international presence for a period of 12 years (1978–1989), having found that international expansion was deemed necessary for survival when foreign firms begin to capture domestic market, but firms with experience and considerable market share can only become successful. Chandra and Sastry (1998) evaluated the status, strategies, strength and weaknesses of firms in Indian manufacturing sector with the aim of helping firms benchmark their performance by disseminating best practices in industry, having used a sample of 56 medium and large-scale firms in that country. The study concluded that Indian firms do not attach so much importance to practices like just in time (JIT) or timely delivery, strategic outsourcing, customer and supplier partnership, use of statistical process control, value engineering, computer-aided design and product redesign. Chattopadhyay (2010) raised concerns regarding lagging contribution of India's manufacturing sector in country's competitiveness. Various reasons such as excessive protection to domestic units, higher customs duties, lower labour productivity and infrastructural bottlenecks, were found as factors crippling the manufacturing sector competitiveness. Unlike in developed countries, emerging countries lack commercial activities by small and medium-sized enterprises (SMEs). In the developing countries, SMEs may be significant in numbers, but in terms of industrial competitiveness, their contribution is rather low. This is seen to be caused by two major reasons: restrictive business environment and inadequate access to financing by these SMEs. This has now become a major concern in the world economy and is termed "the missing middle", given the potentially important role played by this business segment.

Following Hongphisavivat (2011), “market-based view” that focuses on customers to create competitive advantage and “resource-based view” that focuses on the strategic use of firm’s resources alone are not sufficient. Attention needs to be paid to an “emerging view” that looks for new ways of generating competitive advantages through means of cooperation among stakeholders. The stakeholders can range from investors, employees, customers to the society at large. The cooperation can range from intra-organisational network to partnership in the external business environment. The integration of the three views can only lead to the foundation of a sustainable competitive advantage. As networks influence firm level competitiveness, there is a need for undertaking more exhaustive studies incorporating various network partners (Centidamar and Kilitchioglu, 2013). Similarly, according to Feurer and Chaharbaghi (1994), shareholders are of extreme significance because of their financial contribution and influence over business decisions. A balance between shareholders, customers, along with the people and technology, is required for maintaining sustainable competitive advantage. These three together constitute the three dimensions of sustainable competitiveness. Flanagan et al. (2007) reports the lack of empirical evidence indicating linkages between competitiveness and stakeholders’ perspective. Although there could be difficulties associated with the quantification of stakeholders’ preferences, there is a need to define indicators in this direction and link them with measurement of competitiveness at firm and/or industry level.

Multiple factors have been taken into account as sources of competitive advantage in the studies on firm-level competitiveness, including Porter’s value chain elements (Cetindamar and Kilitcioglu, 2013; Chacko et al., 1997; Lollar et al., 2010) as well as various intangible dimensions like leadership (Shee et al., 2010) and learning (Gronhaug and Stone, 2012; Salazar et al., 2012). Bhawsar and Chattopadhyay (2015) argue that there is still enough space left for undertaking studies that highlight the role of less tangible factors, like culture and freedom, that have an impact on the competitiveness of countries and firms operating in those countries, considering that product life cycles have been dramatically shortened by the rapidly changing environment, which makes the role of increased flexibility a new source of competitive advantage sustainability. Paraphrasing Beach, Muhlemann, Price, Paterson and Sharp (2000), flexibility is found in firms’ ability to keep pace with the rapidly shifting environmental dynamics with minimum effort, time, and cost, which appears to suggest the extreme importance of carefully analysing whether flexibility itself can lead to competitive advantage or it is an unviable or costly way of dealing with environmental uncertainty.

Several studies undertaken in the past have revealed that research in competitiveness is more inclined towards the manufacturing sector, thus showing a tendency to ignore many services like tourism, health care, financial services, and commercial services, besides information technology services, which are among the upcoming sectors that can be considered significant for a country’s competitiveness (Bhawsar and Chattopadyay, 2015). Authors equally state that only a few studies on competitiveness-related issues have covered these increasingly important service sectors, and therefore, further initiatives are required in undertaking competitiveness research in other service sectors. Researchers emphasise that previous studies on competitiveness have considered only economic aspects, but economic growth can be an outcome of ignoring environmental and social aspects, meaning that, besides economic aspects, there is a need to incorporate social dimensions like freedom and equal opportunities, and environmental aspects like natural capital and resources.

Competitiveness has been in existence inevitably since the inception of international trade among countries. The concept has come a very long way since its birth by Adam Smith (1776) to Michael Porter and others (1980's and 1990s), who have been endeavouring to bring about new and continuously refreshed versions of the until today's Porter's Diamond Model. Bhawsar and Chattopadyay (2015) defend the view that the credit of stimulating a large-scale debate on "competitiveness" must go to Michael Porter. As time passes, the concept of competitiveness kept on varying, but the basic purpose of studying it has remained literally unchanged. The primary goal of achieving competitiveness is to strengthen a country's economy and to make it prosperous. The economic, social and technological changes imposed by the accelerating globalisation, the fast-growing intensity of international trade relations, including the removal of borders between countries, the quick development of communication and transportation infrastructures and technologies have proven the need, importance, and urgency of achieving high and sustainable levels of competitive advantage for firms to continue to thrive and successfully operate on the international market, to continuously obtain bigger shares of the growing international market through firm level competitiveness. As the world is undergoing rapid transformation, none of the existing models can be a perfect fit forever, but each model/theory has uncovered interesting insights in explaining a country's success in the international economic scene. It can be inferred that incessant globalisation is leading to the blossoming of newer theories on competitiveness. The horizon of competitiveness is expanding from economic to social aspects (Bhawsar and Chattophadyay, 2015).

The length and breadth of competitiveness analysis is not restricted to countries alone. It spans across industries, firms and occasionally, to smaller geographic regions. Scholars from various disciplines have added different perspectives in understanding the concept and have used heterogeneous indicators to measure it. Competitiveness as a subject is still perplexing and, on many occasions, becomes a topic for intense debate because of its different interpretations ranging from productivity to exports, market shares, technological capability, just to name but a few. The reviewed studies indicate that the three levels of competitiveness are closely interlinked. The country is responsible for providing a conducive environment. Industries are the targets for directing policies and other means to get benefited by the favourable environment. But it is the firms where the root or source of competitiveness lies. Ultimately, economic values created by the firms make industries competitive, which, in turn, contributes to national competitiveness. Competitiveness is a hot topic of interest for all, including academia, governments, and the business. Its implication, however, can be different for each of the interest groups. As globalisation has ushered in an era of incessant competition, competitiveness has become topical. At the macro level, it has its implications for policymakers, but its significance is critical at micro level. The business managers should attach due importance to competitiveness and apply it in their day-to-day operations for achieving higher levels of performance. Competitiveness is vital because it is the lifeline of a country's economy (Bhawsar and Chattopadyay, 2015).

The emerging theory is probably the most important model in explaining the competitiveness of a firm, the point of view on the firm based on resources, according to researchers such as Penrose, 1959; Conner, 1991; Mahoney and Pandian, 1992), a theory that views the firm as a bundle of resources and capabilities which can be strategically focused on: **a**) factor market imperfections; **b**) the heterogeneity of firms; **c**) varying degrees of specialisations; and **d**) the limited transferability of corporate resources. The firm's resources are defined as stocks of available factors that are owned or controlled by the firm, while capabilities refer to a firm's capacity to deploy resources (Amit and Schoemaker, 1993, pp. 35). This view sustains that the competitiveness of a firm depends on identifying its core competence and the capability to deploy it. The core competence or unique resource is closely related to ownership advantage (Dunning, 1988), and the capability to deploy the advantage is explained by the internalisation theory (Buckley and Casson, 1976; Rugman, 1981). In the literature we found that important insights into global competitiveness at the level of the firm can be provided by theories related to foreign direct investment, which are unavailable in other approaches.

An important firm strategy in a global competitiveness is the choice of standardisation (Levitt, 1983) or customisation (Quelch and Hoff, 1986). An important conceptualisation for examining these two international strategies has been the integration-responsiveness framework. Internalisation theory is more useful in explaining this kind of international strategy than the resource-based view of the firm. According to the internalisations approach, firm-specific advantages are either production-based (cost or innovation advantages) or marketing-based (customisations advantages). Through internalisations, the firm maximises the strategic benefits of the combination of firm specific advantages held by the firm and country specific advantages characterising the national economies in which the firm operates (Rugman and Gestrin, 1993, pp. 19). In other words, through internalisations, depending on the types of firm-specific ownership advantages, either in production or marketing, the firm will choose standardisation, customisation, or transnational solutions in a global business strategy.

The firm's ownership advantages may further exhibit complementarity in combining with other assets. Teece's (1986) notion of co-specialised assets, which are interdependent with each other is a typical example. In this vein, Moon and Roehl (1993) extend the internalisation theory to incorporate the interdependence of ownership advantages and disadvantages. While the internalisation approach focuses on ownership advantages, the approach of Moon and Roehl focuses on both advantages and disadvantages through the balance of strategic assets.

Bhawsar and Chattopadyay (2015) argue that the measurement of competitiveness is another complex issue, given the involvement of a wide range of disciplines and approaches to it, and the measurement technique varies with the unit of analysis (firm, industry or country). Researchers have widely selected productivity, product quality, balance of trade, technology indicators, market share, profitability and growth rate as the broad measures of competitiveness. Buckley, Christopher and Prescott (1988) have combined various measures into three groups (competitive performance, competitive potential and competitive process), termed as the “3P Framework”, which can only complete the integration of the measurement of competitiveness. For McFetridge (1995), the indicators of measurement, as summarised in Table 4.1, at country level, are *per capita* income, export composition and current account balance; at the industry level, they are total factor productivity and productivity growth; and, at firm level they are cost, profitability, productivity and market share.

The Global Competitiveness Review (GCR) is an important source for benchmarking country competitiveness (Bhawsar and Chattopadyay, 2015), as it uses Global Competitiveness Index (GCI) that captures both microeconomic and macroeconomic foundations of national competitiveness.

In today’s world dominated by increasingly stiffer and deeper business and entrepreneurial competition, mistrust, uncertainty, disequilibrium are factors that are taking predominance and conditioning market behaviour as the imbalances between the expected and the actual market realities, thus substantiating the relevance and strategic importance of the optimal directionality choice of sales activity. One of the main lines of business activity, the functioning of which should be complete, synchronous and complementary is the adequate choice of direction in market strategies. Researchers state that diversification is one of the powerful instruments to ensure the steady development of the sales activity of a company, advocating three sales models for activity diversification. First, based on unveiling the potential of sales channels; Second, founded on the optimal quantitative distribution of production between sales channels for maximum profit, but also providing the high profitability of each selection item and that of the whole firm, and; Third, grounded on the principle of the optimal distribution of production between sales channels, which accounts for the experience of collaboration between the enterprise and sales channels during the past period and ensures the minimal risk and appropriate profitability for each sales channel (Shpak et al., 2016). It also focuses on the need for managers and entrepreneurs in general to redirect their utmost attention to certain aspects, such as the case of corporate social responsibility (CSR) in their operations (Bhana, 2018; Sroka & Veinhardt, 2018; Kliestikova et al., 2018; Meyer, 2018), interorganisational cooperation, both bilateral and multilateral (Kozma, 2017, Šebestová et al., 2017), as well as coopetition, i.e. simultaneous cooperation and competition with competitors (Mohalajeng & Kroon, 2016; Cygler & Sroka, 2017; Cygler et al., 2018).

A product is competitive if its price is lower and it has a better differentiation than comparable products. Porter's (1980) generic strategies are thus relevant to the competitiveness of a product, but not always to a firm. Firm-level strategies should be more comprehensive than the original generic model. This is why generic strategies are criticised when they are applied to a firm-level analysis. In a similar note, Kogut (1985, pp. 16) argues that the generic strategies of low-cost and differentiation are useful for categorising competitive strategies but in themselves do not suggest where costs should be cut or how products should be differentiated.

Table 4. 1: Classification of Competitiveness Literature

Level	Definition	Theory	Measurement	Major Contributors
National	•Is the ability of a country to provide conducive environment to its firms and industries in order to raise the prosperity of the country	•Absolute advantage theory; •Comparative advantage theory; •Neoclassical theory; •Diamond model*; •Double diamond model*; •Generalised double diamond model*; •Nine-factor model; •Dual double diamond model*	•National productivity; •Balance of trade; •Labour productivity; •Foreign exchange rate; •Foreign direct investment	•Smith (1776); •Ricardo (1817); •Heckscher (1919); •Ohlin (1933); •Porter (1990); •Rugman and D'Cruz (1993); •Moon et al. (1998); •Moon and Cho (2000); •Cho et al. (2009)
Industry	•The extent to which a business sector offers potential for growth and attractive returns on investment	•APP model*	•Productivity; •Cost competitiveness •Export market share •Balance of trade •Export growth; •Profitability; •Technology indicators	•Momaya (1998); •Ambastha and Momaya (2004); •Fetscherin and Pillania (2012);
Firm & Product	•The ability of the firm to offer better products than competitors •The ability of a product to satisfy both existing and potential consumer demands better than the competing product	•Strategic intent, core competence; •Resource-based theory. •Supply Chain Management •New Product Competitive Advantage	•Cost; quality •Deliverability of products and services; •Core competences; •Market share; •Information technology applications •Human resources •Technology •Comprehensive generic measurement model	•Hamel and Prahalad (1989); •Prahalad and Hamel (1990); •Grant (1991). •Agus (2011) •Cetindamar and Kilitcioglu (2013) •Ambastha and Momaya (2004);

Source: Author's adaptation from Bhawser and Chattopadhyay (2015, pp. 670); * = multi-level of analysis

The generic model was designed to explain the strategies of domestic business, and is weak in explaining the strategies of global business. Scholars have pointed out that the generic strategies are not mutually exclusive (White, 1986; Miller, 1992). Additionally, Moon (1993) argues that the generic model is weak in a global business sense because few firms pursue a focus cost strategy, and major competitors frequently pursue both cost and differentiation strategies. Economists have sometimes complained that so much of what Porter offers is pretty much a reconstruction of price theory and industrial economics, with the proliferation of new labels to represent well-established components of the theory of the firm. Thinking of a firm advancing its competitive advantage with unique configurations of both product and process is possible. In the logic of price theory, distinctions in product output will twist demand schedules to a less elastic form, reducing the chances of the public capturing benefits of low cost, or the firm maximising profits where its average costs are lowest. This implies that if productivity is the core of competitiveness, it must be value productivity. With considerations of value, quality, durability, timely delivery, and post-sales services, must be dragged in, not just low cost.

A matter of utmost importance for businesses is the production of a strongly competitive product, bearing in mind that product competitiveness is a broad phenomenon being viewed from a number of different angles and related interdisciplinary areas, as different industry or business areas or branches tend to create specific working conditions, which significantly impacts product competitiveness, thus making it an imperative to focus research on a certain product. In this case, it is Mozambique's cashew nut, the product and the industry.

Making sure what kind of strategies investors and managers in the cashew industry need to adopt to enhance product exports and promote national trademarks in international markets is one of the most important underlying reasons for research on the competitiveness of a product (Meyer & Meyer, 2017; Meyer & De Jongh, 2018). The level of demand on the domestic market is very well-known to be limited. However, Mozambican companies are finding it too hard to successfully go on the global market with their cashew nuts. In some political and business segments of the Mozambican society, such lack of success is viewed as having its deep roots in the unfeasible level of product competitiveness for the national cashew trademark to be able penetrate the international cashew market and regain the international market share sizes of the past or even to achieve better ones. In view of this perspective, this research aims at investigating the relationship between the competitiveness of a product and numerous factors that affect that given product.

According to Oral & Kettani (2009), Roostika et al. (2015), Androniceanu (2017), Popp et al. (2018a and 2018b), product competitiveness discourse is the subject of heated debates by academics and practitioners, although many efforts are still needed in the scientific work pertaining to an evaluation of product competitiveness. The question of quantitative assessment of product competitiveness is always relevant for producers with a view to determining the best strategy to be applied to increase or expand their positions especially on foreign markets. A number of different analyses and scientific publications reveals the existence of numerous models and frameworks for the evaluation of product competitiveness, the most important of which can be summarised according to Pastushchyn (2013: pp. 232-240): Firstly, the evaluation of product competitiveness through calculating its rating that depends on product quality indicators (Kobilyatsky, 2003; Pomffyová et al., 2017; Dvorsky et al., 2018), which faces limitations because managers neglect other product characteristics and internal and external environmental conditions (Androniceanu & Popescu, 2017). Secondly, the evaluation of product competitiveness through the volume of sales, assuming that this volume reflects consumer demand, and focusing only on one narrow characteristic, when it is a very well-known fact that in this modern world, a high volume of sales might mean that there is no competitive environment or there are no similar products on the market. Thirdly, the evaluation of product competitiveness through a complex index with multiple focuses (Fatkhutdinov, 2000;

Chepurnoy, 2005), which should include a set of partial indicators that generalise the characteristics of the product competitiveness such as consumer requirements, technical requirements, enterprise expenses. Finally, a methodology of prediction index of competitive strength of alcohol brands based on Fuzzy logic (Shtovba, 2007), a fuzzy model of brand competitiveness index is based on expert knowledge foundations, among others.

Based on this literature, we can assume that today there is no one acknowledged approach to product competitiveness evaluation, when it is so evident that researchers, more often than not, use individual qualitative indicators which reflect different parameters of product competitiveness (e.g., Ivanenko, 2012; Stavenki & Zhurilo, 2009) The first models and frameworks developed for the evaluation of product competitiveness were separate for different industry branches. Such a variety of different approaches brought about specific peculiarities of each business area or market. As a result, it is hard to offer a unique model or framework that suits all peculiarities of a country’s domestic or external market that could be adopted by different companies. In contrast, different holistic approaches for the evaluation of product competitiveness have been proposed in the literature, such as the case of Fumio (1985) who introduced the scaling method based on rivalry comparison, and proposed the use of the maximum correlation ratio method for selecting the most significant characteristics of product competitiveness. In turn, the contribution by Chang & Yeh (2001) consisted of an approach to evaluating airline competitiveness based on the utilisation of the multi-attribute decision-making model. This approach has helped to addressed the issue of identifying five dimensions of competitiveness, including the development of proper performance evaluation procedures.

Inconsistency during the validation procedure was one of the issues that authors were confronted with, and decided to address using an additive combination of methods to allocate preferences according to similarity to the ideal result. This combination of methods helped to reveal the competitive advantage of a particular company in comparison to its competitors. Oral & Kettani (2009) proposed the industrial competitiveness model highlighting a number of key points. Firstly, adopting “scientific models” and “practical frameworks” in order to improve modelling of firm competitiveness for strategy formulation. Secondly, developing a formal model or an Integrated Competitiveness Model (ICM), which consists of four sub models and six indices. Thirdly, developing sub-models and indices: actual out-put sub-model, comparative actual sub-model, potential sub-model, actual output sub-model, mastery index, actual cost superiority index, potential industrial mastery index, potential cost superiority index, actual competitiveness index, and potential competitiveness index. Fourthly, forming a competitive strategy according to links between companies’ actual and potential competitiveness.

Shpak et al. (2019), are of the view that, in general terms, it can be concluded that many authors have highlighted the necessity of combining different methods in order to obtain a relevant evaluation of product competitiveness. However, the models or frameworks considered, whether taken separately or in combination, do not comprehensively reflect the characteristics of product competitiveness.

Based on what precedes, some researchers argue that an evaluation of product competitiveness should be based not only on assessing a set of metrics that reflect peculiar characteristics but should also include the internal and external environment of the particular companies.

The challenges that have just been described in terms of product competitiveness evaluation provide an extremely important opportunity to venture into further contributions to developing a model for its assessment, which might be applicable under changing environmental conditions. The literature analysis performed has confirmed that applying economic-mathematical and expert methods, separately or in combination, for the evaluation of product competitiveness limits researchers' ability to consider all product features and to get rid of the dependence of expert assessments on the subjective judgments of experts. It is, therefore, more logical to apply such a method that allows researchers to simulate complex systems under conditions of insufficient information and randomness of processes; solve problems of aggregation of ambiguous, subjective and inaccurate expert judgments about the state of a particular parameter; reflect a complex nature of the evaluation of product competitiveness; and consider numerous factors that affect product competitiveness.

Pedrycz (2011), Xianbo et al. (2012), Marcos Duarte Jr. (2018), and Moravcikova et al. (2017), noted that the fuzzy logic toolkit provides an opportunity to obtain a fairly objective assessment as it takes into account all factors (both quantitative and qualitative), as well as the level of confidence of the experts who carry out the evaluation. Given this fact, this method has been applied in many papers.

Although the concept of competitiveness is a new and independent field of research and study recently emerged, its roots lie in the economic theories of past centuries, starting with Adam Smith's (1776) "absolute advantage theory", a two-country and two-product model that emphasises specialisation and international labour division, concentrating trade on the goods in which a country has an absolute cost advantage (absolute advantage), and resting on a number of assumptions the bulk of which unrealistic, with particular prominence on labour being the only factor of production and cost.

Forty one years later (1817), David Ricardo introduced the "comparative advantage theory", a way out from the insufficiency of Smith's in explaining how his theory would work in the case where one of the two countries has absolute advantage in both goods, equally resorting to a two-country and two-product model, and demonstrating that a mutually beneficial trade is still possible if the advantageous country trades in the good where it has a greater absolute advantage (its comparative advantage good), and the country having absolute disadvantage in both products should trade in a product in which its absolute disadvantage is lesser (its comparative advantage good).

Ricardo's theory is also based on several restrictive assumptions, most of which unrealistic and, therefore, it is inadequate in explaining the reason for the difference in labour productivity between countries. Eli Philip Heckscher (1919) and Bertil Ohlin (1933) provide an attempt to answer to this shortcoming through their works that later became known as the Heckscher-Ohlin theory, in accordance with which comparative advantage is the result of differences in factor endowments, especially initial endowments (Samuelson, 1959), arguing that countries differ in natural endowments and factor endowments, and advising that a country should export that product for whose production it uses more intensively its most abundant factor. For Bhawsar and Chattopdyay (2015), this theory failed to stand the empirical test conducted by Leontief (1953) for the United States (US), which is known as Leontief paradox. In subsequent studies (Baldwin, 1971; Kravis, 1956) when capital was viewed separately as human capital (skilled labour) and physical capital, Leontief paradox was alleviated, but not totally eliminated.

Vernon (1966) introduced the "product life cycle theory" that contributed significantly in reconciling Leontief paradox by explaining the diffusion of technology from developed to developing countries. The underlying objective is to project the shift in comparative advantage with the flow of technology over time. In an investigation conducted by Stern and Maskus (1981) on US' foreign trade data for the years 1958–1976, Leontief paradox was no longer evident. Comparative cost theory has its limitation in explaining intra-industry trade. A model proposed by Krugman (1980) uncovers the reason behind trade between economies blessed with similar factor endowments. The model projects imperfect competition and relies on the assumption that consumers love product varieties. Thus, two imperfectly competitive economies can trade, each specialising in its variant of the same product. A country thus can be a net exporter in the product whose production has economies of scale. Melitz (2003) took up Krugman's model by bringing in the heterogeneity of firms in terms of their levels of productivity under perfect competition, suggesting that only the firms with higher productivity are capable of supplying both domestic and export markets, while the rest exit from the market. Bhawsar and Chattopadhyay (2015) argue that Ricardo's comparative advantage theory ruled the world for more than a century, but when it was observed that countries like Singapore and Hong Kong, which were devoid of natural resources, have succeeded in excelling international trade, the transition from the notion of comparative advantage to competitive advantage took place, and Michael Porter was the one who brought this issue to the forefront, observing that at the national level, comparative advantage and competitive advantage have been used interchangeably.

The two concepts, although related, are distinct in the sense that comparative advantage is the outcome of differences in cost of inputs such as labour or capital (Mondal, 2012), thus being at the heart of the specialisation theory, and it can be considered a microeconomic concept, with focus on industry-specific trade. It is an equilibrium concept that considers only prices and trade flows and lacks various other macroeconomic factors necessary to make a country successful. Bhawsar and Chattopadhyay (2015) equally observe that with the development of economies around the globe, many other factors like infrastructure and technology, have become crucial in the determination of countries' competitiveness. The authors carry-on observing that the "Diamond Model' brought about by Michael Porter (1990), and many other models developed by his contemporaneous researchers bring into play a wide diversity of new factors that contribute to economic competitiveness of countries. Porter's (1990) Diamond Model provides an explanation behind a country's global success in a particular industry, by illustrating the interaction of four country-specific factors and two external factors in making a country a successful home base for a particular industry.

Buckley, Pass, and Prescott (1988), share the view that there is a need to be able to retain a few ideas for reflection after this long discussion on the topic, namely:

a. *Competitiveness and efficiency* – Being efficiency the optimal allocation of resources to achieve desired goals, then competitiveness research involves the search for inefficiency and action or measures to eradicate inefficiency. However, there is an element in competitiveness that is absent from efficiency, which is the choice of the most appropriate policy and strategic objectives. Therefore, it is crucial to broaden the understanding of "competitiveness" in order to include both efficiency which is about reaching the defined objectives at the least possible cost, and effectiveness which is about choosing the most appropriate objectives, being the latter what matters most. There is a clear need to retain that competitiveness includes both the ends and the means towards those ends;

b. *Competitiveness as a relative concept* – Competitiveness must be defined in relation to something else, and the alternatives can be: **i**) With regard to the situation at a different historical point in time like, for example, a loss of competitiveness; **ii**) In relation to an existing comparator, be it at the firm level, perhaps paired groups of firms, either of different nationalities or pursuing different policies or two divisions of the same firm having made different choices; **iii**) Relative to a well-defined counter-factual position, that is the alternative position. Each of these alternatives has methodological implications for the empirical measurement of competitiveness, with the key factor being to make sure that the analysis occurs in a *ceteris paribus* setting, as far as competitiveness measurement is concerned, in order to raise substantially the level of accuracy by keeping strict control over all the elements of the constraints of the environment;

c. *The role of trade performance in competitiveness measurement* - Trade performance is seen sometimes as an inefficient proxy for industrial effectiveness, given that crude trade balance measures can account only for certain elements of competitiveness, in the sense that they are point of time measures at a given exchange rate and are the outcome of a complex set of factors, many of which with little to do with competitiveness, to the detriment of capital movements, which are often the cause of shifts in relative national industrial effectiveness are treated as balancing flows. More sophisticated measures that take into account the composition of exports and imports, carrying specifically the concerns about the declining market share in "sophisticated" products and the increasing market share in the unsophisticated. This gives rise to the argument that, because sophisticated products are technologically intensive and that the loss of their market share has detrimental social implications, such as the decline of employment of highly skilled people and the hiring of increasingly unskilled people, with negative effects on competitiveness;

d. *The efficiency and effectiveness of resource use* – The starting point is the definition of the type of resource that is not efficiently and effectively used. The best response to this issue is to concentrate on inefficiencies in its management, which is the key change factor. Under the perspective of industrial effectiveness, it may be necessary to specify incorrect objectives as a crucial problem of a loss of competitiveness. Consequently, issues such as the time discount rate of managers leading to excessive “short-termism”, a lack of an accurate cultural perception of the international environment, the excessive depletion of non-renewable resources, among others, may inhibit effectiveness, leading to the issue of how far industrial effectiveness is actually under management control. In the short run, management is heavily constrained, in the long run it is much less so. For instance, in the short run the poor quality of technical and/or managerial education is unalterable. In the long run training programmes can be instituted to relieve this constraint. However, it is also the role of government to play a part in providing the institutional and environmental conditions for the exercise of effective management.

e. *The level of analysis* (measured at the firm, industry or national level) - It is essential to specify clearly which level is implied and to set out the unavoidable constraints. The time horizon of the analysis also needs to be carefully specified because the unavoidable constraints in the short run become flexible in a longer time period. This perspective of industrial effectiveness considered at the management level enables the link between the concept of competitiveness and a model of market servicing, with a view to empirical investigation of the key issues.

4.1.2. The Role of Exports

We selected the thesis topic as a result of the keen interest we nurture in exports as a subject, and his long-term involvement in it for over 40 years, at many different levels of responsibility. Understanding Mozambique’s key export competitiveness factors, particularly in its cashew nut sector in order to act on them and be able to rapidly expand the quality and quantity of exports is a vitally important complement to researcher’s 4 decades of work dedicated to this industry. As a matter of fact, it is a conventional wisdom that no country is sustainable or even viable without exporting. Exports of cashew nut kernels are for Mozambique objectively the natural way of achieving competitiveness and economic inclusion, with the cashew nut industry development as a national goal, by also ensuring local communities’ access to the necessary resources and infrastructure to technically and financially support the plantation of new cashew tree orchards, since the cashew nut industry has the unique capability of adding value to the agrarian economic chain, and stimulating the revitalisation of the local economy, and economic segment that responsible for the income generation that sustain directly and indirectly over 1.4 million rural families (Correia, 2020). Regional economic integration, technology-fuelled global economic progress, and ultimately, globalisation, have brought new strengths to countries’ export expansion and development. As a result of the relatively successful implementation of export-oriented growth since the early 1980s on the part of a significant group of countries, especially in, but not confined to, Asia and Latin America, the expansion of national export trade has played an extremely critical role in promoting economic and social growth, progress and prosperity of countries.

The promotion of economic growth and development at the global scale needs to count on a sound and sustainable export expansion and development. In the not-so-distant past, Mozambique was the largest cashew nut producer and supplier globally from 15 large processing plants and 23 smaller ones, with a 50% international cashew kernel market share. Cashew nut production and exports were the major sources of employment, income, value chain developer, an economic and social growth contributor, and ultimately, a very powerful tool for the fight against poverty, particularly in rural areas.

Chenery and Strout (1966) demonstrated that the sustainable economic growth of a country is almost impossible unless a sustainable export growth is achieved and maintained, for there is no country in the entire world that has ever succeeded in achieving and maintaining for a long period of time an economic growth rate that is significantly higher that the export growth rate. The vast literature that has been published over the past few decades recognises that national exports play a critical role in the economic growth of the overwhelming majority of non-oil producing developing countries, and several policies aiming to expand export levels, as a means of dealing with Balance of Payment (BOP) difficulties. Many developing countries implemented IMF-assisted Structural Adjustment Programmes (SAP) during that period with a strong emphasis on the need to expand national exports in pursuit of a Current Account that is sustainable and compatible with an adequate and secure economic growth rate.

Various studies on the link between export expansion and economic growth have been undertaken over the years by Emery (1967), Syron and Walsh (1968), Stein (1971), Massel, Pearson and Fitch (1972), Haeley (1973), Balassa (1983) and Krueger (1983) all support the hypothesis that export expansion plays an important role in economic growth process by stimulating demand and encouraging savings and capital accumulation and, because exports increase the supply potential of an economy through increased import capacity.

Balassa (1985) analysed 43 developing countries for the period of 1973-78 in terms of the differentiated way in which they responded to external shocks, looking at economic growth rates, investment rates and labour force growth rate, the level of economic development and the product composition of exports, having concluded that an outward-oriented policy stance at the beginning of the period and reliance on export promotion in response to these shocks, appeared to have favourably affected growth performance, and therefore, low-income countries need to accelerate their economic growth through the application of appropriate and effective strategies that must rely on manufactured exports.

It has been proven that export expansion tends to accelerate the capital formation rate (Maizels, 1968 and Lee, 1971) and, given that capital formation plays a fundamental role in the economic growth process, exports may improve economic performance, even in cases where they no effect whatsoever on production factor productivity. In a 26 developing countries' sample for the period of 1963 to 1973, Michalopoulos and Jay (1973), Tyler (1981), Kavoussi (1984) and Moschos (1989), analysed the effect of foreign trade on economic development, on the investment efficiency and the industrialisation process under the alternative commercial strategies and under the hypothesis that the external trade is beneficial to developing countries, suggesting that forward-looking commercial strategies lead to a more efficient resource use. According to the same researchers, the addition of exports as another factor of the production function stems from the view that there is greater productivity in export production as a result of scale economies and positive externalities, in the sense of incentive neutrality in export-oriented production that, ceteris paribus, leads to three critically positive situations. Firstly, a better resource allocation and at a higher factor productivity level, given the fuller economies of scale exploration, a better installed capacity use and a lower Capital-Output Ratio (COR). Secondly, a higher technological innovation rate, and a more dynamic learning process from foreign sources. Finally, a reduction of difficulties in getting access to foreign currency and to a broader international capital market.

Further works by other researchers on the export-driven economic growth hypothesis found basically supporting results. Bagala and Urvashi (1998), found, in the case of Taiwan, that the development of total exports as well as primary and manufactured goods exports showed not only a strong positive relationship with GDP growth, but also displayed an absolutely clear evidence of a bidirectional causality flow, leading to the conclusion that export expansion and economic growth mutually reinforce each other.

Boriss and Herzer (2006) studied the Chilean economy, and concluded that, although the impact of export expansion on economic growth is differentiated between primary and manufactured products, there is a strong positive impact of export growth on economic growth.

Ilhan and Ali (2010) analysed the Turkish economy and observed that there is not only a strong and positive and statistically significant relationship between export expansion and economic growth, but also detected a unidirectional causality flowing from export development to economic growth.

The evaluation of the hypothesis in the case of the Chinese economy led Herrerias and Orts (2010) to conclude that both investment in physical capital and R&D, as well as exchange rate policy have had a strong positive impact on economic growth for over four decades.

In the case of Jordanian, Kuwaiti, and Egyptian economies, Hussam-Eldin and Basha (2015) found a strong export expansion impact on economic growth in the long-run for three economies, which can expand their limited domestic market by exporting more, in order to increase their economic growth, and additionally, in the case of Jordan, a bidirectional causality flow was also found.

Awokuse (2003) re-examined, for the Canadian economy, the export-led economic growth hypothesis, and the study rendered mixed and inconclusive results in past researches, by testing for Granger causality from exports to national output growth using recently developed time series modelling techniques and adding relevant variables22 presumably omitted in previous studies, and the empirical results suggested that a long-run strong and statistically significant positive association between real export expansion and real GDP growth at 1% significance level, and a Granger causation that flows unidirectionally from real exports to real GDP.

Balaguer and Cantavella-Jorda (2001) analysed the Spanish economy for the period of 1901 to 1999, particularly in terms of the relationship between real income and real exports, using annual data. Despite that the analysis of the Spanish economy in this period was a mixed one, a strong export-led economic growth relationship was found during the economic liberalisation period, whereas for the protectionist and autarkic period neither a long-run nor a short-run relationship was present. But for both periods, taken together as a whole, a strong and positive association between export expansion and economic growth is present, and a unidirectional Granger causality that flows from real income to real exports is displayed.

Marin (1992), in analysing the export-led growth hypothesis for four industrialised economies (USA, UK, Japan, and Germany), tries to establish whether a Granger-causality exists between exports and productivity, a perspective that assumes the existence of a positive and statistically significant association between the two variables, as a strategy to jettison problems encountered in previous researches, found that for outward-looking regimes, export expansion favours the productivity performance of both developed and developing countries, thus impacting positively and significantly on economic growth.

Medina-Smith (2001) re-examines the export-led growth hypothesis in the case of Costa Rica, using annual data for the period 1950-1997, and applied several procedures to test for cointegration, having found that a strong positive association between export expansion and economic growth in the short run, but physical investment has been a critically driving force behind Costa Rica's overall economic performance from 1950 onwards, suggesting that the positive effect of export expansion on economic growth could not be considered as an "engine of growth" because their impact was quantitatively relatively small, in both the short and the long-run. However, when more advanced modelling techniques are applied, the results show that export expansion impacts in a positive and statistically significant way the country's economic growth, both in the short and long-run.

Kónya (2004) used a time series data for the period of 1960 to 1998 to investigate the hypothesis of export-led growth and growth-driven export by testing for Granger causality between real exports and real GDP in twenty-five OECD countries, and found that there was no causality between exports and growth in Luxembourg; exports cause growth in the Netherlands; in Iceland, growth causes exports; and in Canada, Japan and Korea, and there was a two-way causality between exports and growth in Sweden and in the UK. Although with less certainty, researchers also concluded that there is no causality in Denmark, France, Greece, Hungary and Norway; export caused economic growth in Australia, Austria and Ireland; and growth caused exports in Finland, Portugal and the USA. Paul and Chowdhury (1995) analysed the export-led growth hypothesis by testing annual time series data for Australia, for the period of 1949 to 1991, and they found that there is a strong evidence of Granger causality running from exports to GDP growth, implying that expansion of exports promotes economic growth in Australia.

A number of researchers examined the export-led growth hypothesis for Mozambique in recent years, by testing the association between export expansion, GDP growth rate, gross capital formation (proxy for investment) as a percentage of GDP. Most of those studies reached a result that shows a strong, positive and statistically significant association among these variables. With regard to investment, it has been argued that a higher percentage of investments to GDP should ceteris paribus, lead to a higher real GDP, as the positive association between export expansion and economic growth tends to hold when investment is included, suggesting a robust and positive link between exports and investment. That is, the links between exports and economic growth seem to operate through improved resource accumulation rather than through resource allocation (Greenaway and Sapsford, 1993). As far as causality is concerned, most results indicate that export expansion does not Granger-cause investment expansion and vice-versa, but export and investment expansion jointly Granger-cause economic growth.

The major interest in undertaking such a literature review on the association and eventually significant causality between export expansion and economic growth stems from the fact that the process of economic integration, globalisation and technological progress tends to reinforce export development of the vast majority of countries today. Export expansion has become an extremely important engine of economic growth and development worldwide. Export development contributes to capital inflow attraction, mitigation and eventual elimination of trade balance deficits, and has the potential to generate a Balance of Payments (BOP) surplus, it plays an extremely positive role in galvanising the increase of production base, including the broadening of employment opportunities, through the expansion of the country's external trade volume.

The vast majority of the literature reviewed in the preceding paragraphs supports the export-led economic growth hypothesis and the unidirectional causation between export expansion and economic growth. There is a considerable number of studies and research works being undertaken worldwide on the importance of exports in economic performance of developing countries, in particular the Least Developed Countries (LDCs)23, including Mozambique. That evaluation is partially summarised in Chapter 3 of this research work.

The large number of studies undertaken over the years on this topic, especially the one undertaken by Shafaeddin, M. (2009) has allowed to establish as an undeniable fact that exports are the source of foreign currency earnings needed to facilitate external trade transactions, and they are one of the most important variables in the production function and in external trade. Research by Jan De Loecker (2007) on the impact of exports on productivity levels, using Slovenian economy for the period of 1994-2000, found that overall export entrants become more productive once they start exporting, and the productivity gap between exporters and their domestic market counterparts increases further over time. At industry level, as well as at firm level, these results not only hold but the productivity gains are higher for firms exporting towards high income regions. This is the reason why exports are commonly treated as one of the most important variables of the production function, and the justification is consolidated in the following five critical points. Firstly, export development allows a country to concentrate its investment in those sectors where it has comparative advantages, which results in specialisation with positive effects in terms of productivity increase and in competitive advantage creation (Schydlosk, 1982). Secondly, a broader international market allows the exploitation of scale economies and positive externalities that can be found at the level of the export sector (Balassa, 1975). Thirdly, the pressure resulting from competition at the global level tends to reduce inefficiencies in the export sector, leading to the adoption of more efficient techniques in the entire tradable goods sector (Porter, 1990 pp. 79). Fourthly, a larger export sector allows a better allocation of resources necessary for a timely importation of physical and human capital, including advanced production and management technologies that are indispensable for highly qualified human resources (Stewart and Ghani, 1991). Finally, if export promotion can be seen as the neutrality of incentives, it can generate a better resource allocation and a higher factor productivity (scale economies and positive externalities), and, complementarily, if the increase in investment can be treated as an improved resource accumulation, then a joint stimulation of exports and investment will generate higher rates of technological change and innovation, lower foreign currency access constraints, and broader access to international capital markets, with a great impact on the country's economic growth and development (Balassa, 1982).

These five critical points, based on combination of empirical evidence and conventional wisdom, suggest that, irrespective of whether or not the export-led economic growth hypothesis holds in those econometric evaluations, no country is sustainable economically without exports. Therefore, export development is an unsurmountable necessity. It is, however, always advisable that those evaluations be made so that in those cases like in Mozambique, where not only the export-led economic growth hypothesis holds, but also the Granger-causality tests generated a unidirectional causation flowing from export expansion to economic growth, a much easier political consensus is achieved vis-à-vis the implementation of the strategy. It has been under this backdrop that a decision to bring here a brief information sharing on the role of exports was made, since this DBA thesis is on Export Competitiveness of Mozambique's Cashew Nut Industry, an argument that, for such a poor country, any strategy to improve it can only make sense and be sustainable if it aims to recover the country's significant share of the international cashew kernel market, a position that the country achieved in a not-so-distant past, a peak production of 240,000 MT of in-shell cashew nuts, and a peak processing of 30,000 MT, both in 1973.

Export development plays a critical role as it promotes economic growth and development, particularly in the case of developing countries, despite the existence of a few exceptions. When export development policies are combined with investment promotion policies their impact on economic development is reinforced, as it contributes significantly to enhance capital inflow, reduce trade balance deficits, help generate foreign currency earnings that help improve the Balance of Payment (BOP) surplus, increase employment and expand the production base of any country. The concept of export competitiveness plays a pivotal role in the international trading system, as result of rapidly expanding size of international trade. For many years, export competitiveness has been paid more attention in order to develop export portfolio of nations. To promote economic development and survival in the global competitive market, export competitiveness is an essential component of a country's economy. This is the strong reason for the election of this topic for the DBA Thesis.

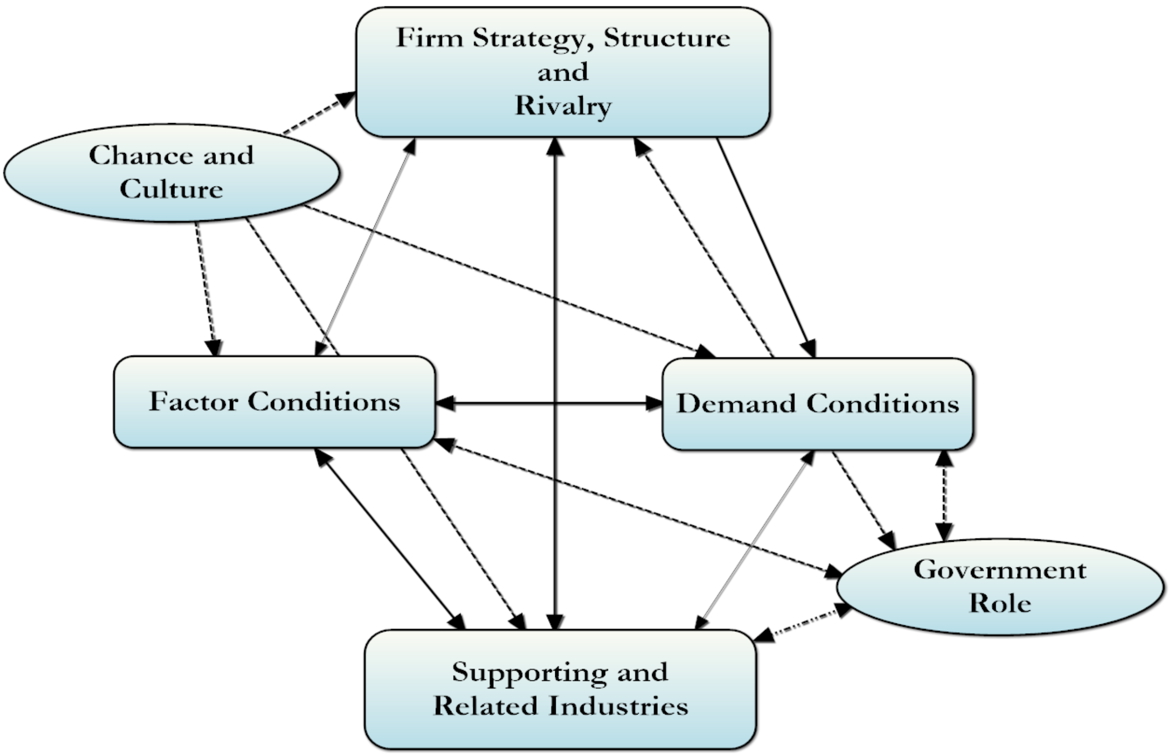
4.2. Porter's Diamond Model and Export Competitiveness of Mozambique's Cashew Nut Industry

4.2.1. Introduction

The foundations of strategic management can take various dimensions and shapes in practically every field of human activity. Therefore, the competitive strategies implemented by following the changes in firms, show the competitive position of the successful ones in the industry as an important topic for all the companies operating in the sector. Michael Porter (1990) developed a model that allows examining why some countries are more competitive than others, and why some industries within countries are more competitive than others. This model has come to be known as Michael Porter's Diamond Model, because of its diamond-shaped framework. According to Michael Porter, competitiveness ability by any company in the international arena must rely mainly on an inherent and interrelated set of location advantages that certain industries in different countries possess, namely: **i**) Firm Strategy, Structure and Rivalry; **ii**) Factor Conditions; **iii**) Demand Conditions; and **iv**) Related and Supporting Industries. If these conditions are favourable, they force domestic companies to continuously innovate and upgrade, thus generating a competitiveness that is helpful and necessary when facing competitors internationally. The model, which comprises 2 (two) other components, namely the government and the chance, and these 6 (six) factors, together, form "the complete system" (Porter, 1990, pp. 127). The aim of the research on the Export Competitiveness of Mozambique's Cashew Nut Industry is the identification of Porter's determinants that are favourable and in need of being worked upon, with a view to generating a competitiveness that is helpful for the industry to, at least, win back the country's international cashew kernel market share of 1973.

Michael E. Porter (1990) stressed that the understanding of national advantage starts with four (4) premises, namely: **i**) The nature of competition and sources of competitive advantage differ among industries and industry segments; **ii**) The home base is where the strategy is set for international success; **iii**) Competitive advantage is gained and sustained internationally through improvement, innovation, and upgrading both in technology and production methods, as well as in the accumulation of small steps; **iv**) The competitive advantage in an industry is gained by firms that move early and most aggressively to exploit a new market need or potential. Porter argued in favour of a new trade theory where competition is founded in segmented markets, differentiated products, technological differences and economies of scale, a theory able to define why firms from certain countries implement better strategies than others competing in certain sectors (Watchraverskingkan et al., 2010); why some regions are more competitive than others, and tried to clarify how firms gain prominent positions in sectors of the country on global competitiveness (Smith, 2010; Naserbakht, 2008; Bulu, 2006). Porter came up with the Diamond Model to identify factors of competitive advantage of countries and sectors (Barragan, 2005), and to create a structure that determines the rules of competition in a sector towards achieving a long-term competitiveness (Sun et al., 2010), associating the determinants of sectors that have competitive advantage with values of the four corners of the diamond, as indicated earlier, described as factors affecting competitiveness (Civi, 2001).

Figure 4. 1: The Determinants of National Competitive Advantage



Source: Author's Adaptation from Porter's "The Complete System", page 127

4.2.2. Factor Conditions

Factor conditions are natural, capital and human resources available, including firm's skill to supply those factors (Curran, 2001), the factors of production and infrastructure necessary to compete in a particular industry (Barragan, 2005). In addition to land, labour and capital, Porter (1990a) extends the definition to cover other resources such as human, physical, knowledge, capital, and infrastructure, and subdividing them into basic factors (unskilled labour, raw materials, climatic conditions and water resources), which are inherited, and advanced factors which are created and upgraded through reinvestment and innovation. These resources can be grouped into human (quantity, abilities and cost of staff), material (physical), natural (abundance, quality, approachability and cost of the country's land, water), knowledge (scientific, technical and market abilities), bearing on goods and services, information resources (universities, government research institutes, government statistical agencies, business and scientific literature, market research reports, databases), capital resources (the quantity and costs of capital available to fund the sector) and infrastructure (type, quality and user cost of infrastructure that are one way or another affecting the competition, including the transportation system, the communication system, mail and parcel delivery) (Tuna, 2006; Naserbakht et al., 2008).

4.2.3. Demand Conditions

Porter (1990) focuses more on demand differences than on similarities to explain the international competitiveness. Composition of the home demand together with the size of the home demand that matters, as well as the sophistication of home country consumers that shape how firms perceive, interpret and respond to buyers' needs, which forces home country firms to continually innovate and upgrade their competitive positions. According to Porter (1990a, 1998a), the critical conditions of demand consist of how home demand that foresees, anticipates and leads international demand, industry segments with a significant share of home demand, and sophisticated and demanding buyers. Demand conditions are the requisites based on buyers' requirements about quality, price, and services in a particular industry (Barragan, 2005). The presence of sophisticated demand requirements from local customers also pushes companies to grow, innovate and improve quality. In terms of home demand, countries achieve competitive advantage in sectors where the home demand takes the lead in providing native firms with a clearer or earlier picture of buyer demands than foreign competitors can have (Tuna, 2006: 8), which makes the industry ready to compete internationally (Barragan, 2005), and the sophistication of demand is much more significant than the size of demand (Porter, 1990). With regard to pattern, it is of crucial importance to note that the home market size stimulates investment and reinvestment or dynamism (Tasevska, 2006), the existence of several individual buyers in a country produces better surroundings for innovation (Tuna, 2006), the rate of growth of investments in a sector shows how quickly the home market is developing (Nilsson and Peterson, 2002). Mobile and transnational local consumers and influences of foreign need are also important, since buyers for goods or services are mobile or transnational firm, an advantage occurs for the country's companies as the home buyers also trade internationally (Tuna, 2006).

4.2.4. The Supporting and Related Industries

The existence of supporting or supplier and related industries in a country is argued as the third dimension of the Diamond Model (Nilsson and Peterson, 2002). The presence or absence in the country of supporting, related industries which interact with the specific and target sector is a basic factor (Tuna, 2006; Mehrizi and Pakneiat, 2008). Highly competitive supplier or related industries provide benefits such as innovation, technology upgrading, which would be unthinkable without strong and challenging supporting and related industries (Mehrizi and Pakneiat, 2008). To achieve success, it is crucial to have the relationships among these clusters of industries and a particular sector within a country as they operationalise learning, innovation and competitiveness, and they are believed to maximise synergies when all requisite institutions necessary are linked up (Rasiah, 2009; Watchravesringkan et al., 2010)

Those industries in which organisations can allocate activities in the value chain when competing, or those that produce complement goods are the related industries (Porter, 1998; Tasevska, 2006). The supplier industries create potentials for comparative advantage by producing inputs, providing new methodologies and opportunities to utilise new technology, knowledge transfer, and innovations (Tasevska, 2006). Competitive advantage takes place as result of close working relations among supplier and buyer industries (Porter, 1998; Nilsson and Peterson, 2002). Firms take advantage of more cost-efficient and innovative inputs when native supporting industries are competitive. In the case where the suppliers themselves are powerful and important global rivals, this effect (result) becomes more reinforced (Naserbakht et al., 2008).

A group of industries directly or indirectly related to a variety of many different sectors and a sector which encompasses all the players and are a clustering of the industry are called the Supporting and Related Industries. Clusters are interconnected companies and other firms that handle the competitiveness of a certain sector (private, associations, suppliers, customers, universities, banks, training and other business service providers, and other groups). Industries or sectors that are successful in a country are usually interconnected by vertical or horizontal ties. Vertically tied clusters create high quality, while the horizontal clusters create highly competitive firms. In Porter's (1990) view, the advantage of both supporting and related industries has a crucial importance on the remaining “Diamond”, and its systematic character (Barragan, 2005).

4.2.5. Firm Strategy, Structure and Rivalry

Strategies and structures of firms depend heavily the national environment, according to Porter (1990a). He further argues that systematic differences in a variety of business sectors in various countries that determine how firms compete in each country and ultimately their competitive advantage can be easily identified. Porter points to rivalry as the most critical driver of competitive advantage of a country's firms, because it forces firms to be cost competitive, to improve quality and to be innovative, since it is firms' goal to compete internationally, but it is ultimately the competitiveness of a country at international level that shapes the international competitive advantage of firms.

Situations like how a sector is originated, systematisation, management, and the nature of domestic competition that could support a country to achieve a sustainable competitive advantage are measured through the firms' strategy, structure and rivalry (Kuah and ve Dya; Coskun and Ve Geyik, 2002; Nilsson and Peterson, 2002; Tuna, 2006). According to Mehrizi and Paneat (2008), that measure includes some of the non-economic factors that such as culture, traditions and values that affect the motivation of company managers for getting into the sector and the impact of geographical and spatial proximity in this dimension. The aims, strategies, politics and methods of organising companies in sectors vary widely among countries. Advantages at the national level emerges from a good harmony between these selections and the sources of competitive advantage in a specific sector (Tuna, 2006). It is Porter's suggestion that domestic competition and the look for competitive advantage within a region can help supply organisations with bases for succeeding such advantage on a more global scale (Naserbakht et al., 2008).

If successful companies compete energetically companies compete energetically at home and force each other to develop and innovate (Porter, 1990; Tuna, 2006), they will find out that rivalry is crucial for their success. The pattern of rivalry has an effect on the process of innovation and the final plans for international achievement (Tasevska, 2006).

National conditions have a tremendous influence on the way in which firms are managed and prefer to compete and innovate. here we also see cultural aspects playing a critical role. Diversities in business practices and approaches can summarised into training, backstage and guidance by managers and leaders, following a certain hierarchic modus operandi, a decision-making process that will shape the relationship between workers and management, working morale, relationship with the consumers or interactions between companies. These national diversities create advantages and disadvantages in competing in different categories of sectors (Naserbakht et al., 2008; Tasevska, 2006). Typical aims and goals in corporate organisations regarding the relation to commitment models among employees and employers are of special unique character and importance, hardly affected by systems of ownership and control. Family-based business that is controlled and managed by owner-managers will act differently than publicly quoted ones (Naserbakht et al., 2008).

4.2.6. Government Role

Government role in Porter's Diamond Model is two-fold: "a facilitator and a contestant". Porter refuses to see a free market where the government leaves everything in the economy up to "the invisible hand", and he doesn't see the government as an essential helper and supporter of industries either, because governments cannot create competitive industries; only companies can do that. Rather, governments encourage and push companies to raise their aspirations and move to even higher levels of competitiveness, by stimulating early demand for advanced products. Putting an emphasis on factors like infrastructure, education health services (factor conditions); promoting domestic rivalry by enforcing anti-trust laws; and encouraging change, thus assisting the development of the four aforementioned factors in the way that should benefit the industries in a certain country.

Paraphrasing Barragan (2005), all government's and policy makers' actions like regulations can benefit or adversely affect the competitiveness of an entire country or a whole industry. It is, therefore, very logical that the government improves or damages the national competitive advantage and affects the competitiveness (Nilsson and Peterson, 2002). There a substantial number of policies that can impact each of the determinants in different ways, namely: subsidies, taxes, financial incentives, education policies, public procurement, antitrust laws, quality standards, capital market regulations etc. (Mehrizi and Pakneiat, 2008). Even antitrust policies and laws (meant to prevent companies' unfair business practices) have a damaging effect on domestic competition by changing demand conditions; investments in education can alter the factor condition; government acquisitions can encourage related and supporting industries (Tuna, 2006). A government that is working to eradicate bureaucracy and help the process of opening new businesses will be stimulating entrepreneurship, and needs to be supported and encouraged. Similarly, government support and stimulation to the establishment of joint ventures with foreign firms will help the transfer of technology (Barragan, 2005). It is absolutely obvious that the impact of the underlying determinants of national competitive advantage can be either positive or negative, and the national competitive advantage will fail if government policies remain the only source of competitiveness (Tuna, 2006). In this model, government has to avoid any direct treatment in the market system, but should seek to develop a competitive environment, and encourage companies to innovate (Mehrizi and Pakneiat, 2008).

4.2.7. Chance

The role of chance is the likelihood that external events such as war and natural disasters can negatively affect or benefit a country or industry, beyond the control of the government or individual companies. The discontinuities created by chance may lead to advantages for some and disadvantages for other companies. Some firms may gain competitive positions, while others may lose. Porter regards the chance events as matters that have little to do with situations in the country (Tasevska, 2006). Chance events are usually improvements outside the control of the companies (Nilsson and Peterson, 2002). Chance events are regarded by definition as beyond the control of firms (companies) but they may turn into forces that remould the sector structure, allowing shifts in competitive position.

4.3. Criticism of Porter's Diamond Theory

Extensive discussions have been taking place over the issue of a country's source of international competitiveness (Grant, 1991; Gray, 1991), ever since Michael Porter (1990) brought about his contribution on the competitive advantage of nations. According to certain researchers, the criticism of the "Diamond Theory" can be seen with the management school eyes (Rugman 1991; Dunning 1992, 1993; Cartwright 1993; Rugman & Verbeke 1993; Bellak & Weiss 1993; Rugman & D'Cruz 1993), or with the economics school eyes (Waverman 1995; Jegers 1995; Davies & Ellis 2000; Boltho 1996).

It is the management school's perspective that the home diamond dimension by Porter does not sufficiently accommodate the attributes of the home country's largest trading partner (Rugman 1990), and it will not work for most of the world's smaller nations (Bellak & Weiss 1993; Cartwright 1993), meaning that it overlooks the role of multinational organisations in influencing the competitive success of nations (Dunning 1992, 1993. It is, however, the economics school's view that the diamond is too general, and as it tries to explain the multiplicity of aspects involved in trade and competition it ends up explaining nothing (Waverman (1995). Porter's (2004) move to productivity at locations that improve the competitiveness of companies does not necessarily imply that the country thus becomes internationally competitive, even if the companies located there are internationally competitive, since productivity is purely a domestic matter and has nothing to do with the international competitiveness of a country (Krugman 1998).

Geographic or spatial proximity has been overstated in the model (Penttinen, 1994), because the geographical scale of production is not a constant but takes different magnitudes between industries and is often international (Jacobs, 1995). The fact that "competitiveness" is contingent upon the strength of the diamond in its "home base", does not provide clarification on the "strong diamond", as well as it does not tell the whole story about the required conditions for strength in each single corner of the diamond. Reich (1990a) argues that the four corners, together with the government and chance, are so broad that they include literally everything that might contribute to success, but they identify almost nothing significant. Porter denied the role of comparative advantage in achieving competitiveness, insisting that firms must produce up-graded products in order to compete. But Chalmers Johnson (1982) argued that the success of Japan, Taiwan, Singapore, South Korea, and China was best explained as "comparative-advantage-based" development. The idea that different demand conditions in different countries, lead to different demand structures, can drive us to a situation where location economies have increasing returns as a result of a specific set of demand conditions where comparative advantage is no longer determined by differences in factor conditions, but by differences in demand conditions. Quite a big innovation, but a very difficult one to explain and defend.

Countries do not compete internationally (Krugman, 1991.b), since they are not like firms, competing with rivals in the global marketplace. Daly (1993), Eilon (1990), Gray (1991) and

Waverman (1995) found evidence that exports are affected by labour costs and exchange rates, which is at odds with Porter's view according to which salaries and exchange rates are unimportant in the determination of competitiveness. Porter's theory asserts that outward looking foreign direct investment (FDI) is a manifestation of competitive strength in a nation's industry, while inward looking investment indicates that "the process of competitive up-grading is not entirely healthy" (Porter, 1990, pp. 671), but Lau (1994) found that capital flows towards the locations where it has a high productivity (inward and outward foreign direct investment) could be regarded as a positive indicator of competitiveness. Liu and Song (1997) studied China's recent development and concluded that the country's success has been attributed to inward FDI, and also credited China's success to the exploitation of its comparative advantage in labour-intensive sectors.

In sum, Porter's competitive advantage along with its four determinants of the diamond theory can be described as a general framework for analysing a country's causes of advantage that catapults its international competitive advantage. Most of the criticism against Porter's work was related to the role of government, location and culture. Nevertheless, the differences among developing countries are strong enough to believe that specific features of the diamond might be more important in one stage of a country's development than in another. Therefore, Porter's work should be used as a tool for analysing the sources of a country's competitive advantage, thus enhancing managers' ability to make informed decisions on how to configure the value chain, but not to rely entirely on Porter's study. That is why we decided to move forward with this research topic.

CHAPTER 5

THE RESEARCH METHODOLOGY AND HYPOTHESES TESTING

5.1. The Context of Analysis, Data, Sample and Collection

Porter (1980) stated that the competitive advantage of countries can be further analysed by assessing the resources and conditions in the national industrial environment, as he was aiming at establishing a link between the academic literature in strategic management and international economics and founding a basis for national policies on competitiveness. Porter (1990) developed the diamond model in which the factor endowment, market demand, relevant industry, and firm strategy and rivalry are important resources that support the national competitiveness in different industries. Porter proposed a better understanding of competitiveness (Aires, 2016). In view of this, it has been found relevant and appropriate to use in this research methodology the Porter´s Diamond Model to assess the factors exerting an influence on the Export Competitiveness of Mozambique's Cashew Nut Industry. Given that the topic is about export competitiveness, we have chosen to use two methods (quantitative and qualitative), in a sequential approach, starting with the quantitative evaluation followed by the qualitative assessment, and then by the combined analysis in the end.

5.2. Introduction to the Quantitative Method

The *quantitative method* is based on the analysis of a longitudinal dataset covering the period of 2000 to 2019, composed by 26 elements (observable items), grouped around 5 constructs (unobservable data) defined in accordance with the four (4) Porter's Diamond Model determinants plus Government, as contained in Table 5.1.

Considering that the main purpose of this research is to identify, in terms of Porter's Diamond Model determinants, the factors affecting the Export Competitiveness of Mozambique's Cashew Nut Industry's recovery and the prospects for its fast growth and development into a modern, vibrant and internationally competitive cashew nut economy, taking advantage of the rich and abundant business potential. With a view to effectively and successfully proceeding with this work, it was deemed crucial to recognise that a well-founded research project is needed, with a clearly and accurately defined scope and aim for the DBA Thesis. The research design was a vital component scope in terms of what we planned to do and how we planned to do it. A project that is practically feasible and capable of answering the research question had to be in place. A set of secondary data was used to proceed with this research project. At the end, we made a final decision to use both quantitative and qualitative research methods on the factors confronting the cashew nut industry in Mozambique. In fact, there are many contexts where qualitative and quantitative research methods have been used in conjunction to build and refine theory (Cialdini, 1980; Fine and Esbach, 2000; Jick, 1979; Weick, 1979). The secondary data collected for the quantitative method, consisted of a time series covering a period of 20 years (2000-2019), using quarterly data. The collection process was basically about getting information from the following sources:

i. Data available on the internet, given the current level of internet penetration in Mozambique, making it increasingly easy to undertake quantitative research using the internet, which tends to boost the validity of quantitative data as well as prove the relevance of previously collected data;

Table 5. 1: List of Items for the Quantitative Method Grouped by Porter's Determinants plus Government

№	
	Factor Conditions (FC)
1	FC_1: Growth rate of worker's wages in the cashew nut industry
2	FC_2: Growth rate of worker and labourers in the cashew nut industry
3	FC_3: Growth of labour productivity in the cashew nut industry
4	FC_4: Growth expenditure in tertiary education as a % of GDP
5	FC_5: Growth of inward investment flows in the cashew nut industry
	Demand Conditions (DC)
1	DC_1: Growth of total population in 10^6 inhabitants
2	DC_2: Growth of GDP
3	DC_3: Growth of employment
4	DC_4: Growth of GDP per capita
5	DC_5: Growth of education index
6	DC_6: Growth of total export value
7	DC_7: Growth of total export value of cashew nuts as a % of GDP
	Supporting and Related Industries (SR)
1	SR_1: Growth of in-shell cashew nuts exports
2	SR_2: Growth of container port traffic (TEU: 20 foot equivalent)
3	SR_3: Growth of ICT development index
4	SR_4: Growth of air transport (registered carrier departures worldwide)
5	SR_5: Growth of share of paved roads as a % of total roads
6	SR_6: Growth of volume of cargo transported by rail in 10^6 ton-km
7	SR_7: The growth of the number of cell phone subscribers per 102 inhabitants
	Competitiveness of the Cashew Nut Industry (Firm's Strategy, Structure and Rivalry) (EC)
1	EC_1: Growth of the intensity of local competition
2	EC_2: Growth of cashew nut industry market share as a % of global market
3	EC_3: Growth of average import tariff rate faced by the cashew nut industry (%)
	Government (GR)
1	GR_1: Growth of social security payments
2	GR_2: Growth of VAT collections
3	GR_3: Growth of corporate tax collections
4	GR_4: Growth of public service employee's costs

Sources: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorová (2010), Williams & Morgan (2010), and Son & Kenji (2013)

ii. Data available from government and non-government sources dealing with market research reports, a type of data that is highly reliable and in-depth and, consequently, could be used to increase the validity of quantitative research design. In Mozambique it was possible to get data from the following government institutions: National Institute of Statistics (INE), Instituto de Amêndoas de Moçambique, Ministry of Agriculture and Rural Development, Investment and Export Promotion Agency (APIEX), Institute for the Development of Small and Medium-Sized Enterprises (IPEME), Ministry of Industry and Trade (MIC), Ministry of Economy and Finance (MEF), and the Central Bank (Banco de Moçambique);

iii. Information available in public libraries such as Biblioteca Nacional, and Higher Education Institutions libraries;

iv. Information available in commercial sources such as factory archives, Chambers of Commerce and Industry, Commercial Associations, namely: Associação dos Industriais de Caju (AICAJU), Associação Comercial, Industrial e Agrícola de Nampula (ACIANA), among others;

v. Data collected from international organisations' data bases, such as the World Bank, IMF, UNCTAD, International Trade Centre (ITC), World Trade Organisation (WTO), International Labour Organisations (ILO), among others.

The use of acronyms such as FC for Factor Conditions, DC for Demand Conditions, SR for Supporting and Related Industries, EC for Export Competitiveness (representative of Firm Strategy, Structure and Rivalry), and GR for Government Role were an adaptation from Bakan and Doğan (2012). The competitive powers are analysed using Porter's Diamond Model. Revealing the competitiveness position of the variables affecting firms in the industry and making recommendations for what should be done to increase the strength of the cashew nut industry's international competitiveness are among the basic purposes of this research.

5.3. Selection of Indicators for the Quantitative Data Processing and Analysis

Vu & Pham (2016) in their research paper titled "*A Dynamic Approach to Assess International Competitiveness of Vietnam's Textile and Garment Industry*", stated that the key issue is the choice of indicators capable of capturing the five (5) attributes that are assessed in the model, as displayed in Table 5.1, that is, attributes that best capture international competitiveness of the studied industry, and they developed the variable selection and presentation structure which we adapted in this research, namely:

5.3.1. Factor Conditions (5 indicators)

For Porter (1990), the domestic Factor Conditions include both basic (natural resources, climate conditions, location, unskilled labour, and semiskilled labour, basically inherited with little or no upgrading), and advanced factors (highly skilled workers, highly educated personnel, and Research & Development, upgraded through reinvestment and innovation). Five labour-related indicators, since the cashew industry is labour-intensive industry, selected in indices, where 2000 = 100:

FC_1**:** The growth of workers' wages in the cashew nut industry (US$/h);

FC_2**:** The growth of the number of workers in the cashew nut industry;

FC_3**:** The labour productivity in the cashew nut industry;

FC_4**:** The growth of expenditures on R&D and Tertiary Education (% GDP);

FC_5**:** The growth of inward FDI. The first three are basic (low wages, more workers, cheap labour, may result in increased competitiveness (Brown and Sessions 2001; Pizer 2000; Sardy and Fetscherin 2009). High inward FDI and R&D mean investment and innovation for Competitiveness (Moon and Youn, 2010).

5.3.2. Demand Conditions (7 indicators)

Porter (1990) emphasised the size and sophistication of domestic demand in Competitiveness, as demand expands production, and sophistication drives continuous innovation (Smit 2010). Seven indicators in indices, where 2000 = 100:

DC_1: The growth of the total population (million people);

DC_2: The growth of GDP (US$ millions);

DC_3: The growth of the employment rate (% total population);

DC_4: The growth of GDP *per capita*;

DC_5: The sophistication, frequency of purchases, and the growth of employment rate represent the size of the domestic market (Son & Kenji, 2013); population and GDP growth represents domestic demand;

DC_6: The growth of educational index; e) and f) represent the sophistication of domestic demand;

DC_7: The growth of the total cashew nut export value; and the growth of the rate of cashew nut export value, they capture a higher growth of international market, equivalent to higher international competitiveness and ability to meet the requirements of an increasingly sophisticated international demand (Sardy and Fetscherin, 2009).

5.3.3. Supporting and Related Industries (7 indicators)

For Porter (1990), supporting and related industries refers to the presence or absence in the country of related and supplier industries that are internationally competitive as well as infrastructure like transportations and communication in the value chain. These are essential for competing internationally (Sardy and Fetscherin 2009). Seven indicators made up of indices, where 2000 = 100:

SR_1: The growth of in-shell cashew nut exports (1000 tons);

SR_2: The growth of volume of cargo transported by railway;

SR_3: The growth of container port traffics in TEU;

SR_4: The growth of ICT development index;

SR_5: The growth of air transport in carrier departures worldwide;

SR_6: The growth of share of paved roads (% total roads)

SR_7: The growth of the number of cell phone subscribers per 10^2 inhabitants. In globalised world, transportation and communication are essential for industrial competitiveness (Hult 2012; Son and Kenji 2013; Williams and Morgan 2010). The growth of transportation infrastructure improves international competitiveness, as it facilitates international trade transactions and the increase efficiency (Daniel, 2000 and ITS Global, 2008). The growth of container port traffics, and air transport represent an increased ability and efficiency to ship goods abroad.

5.3.4. Firm Strategy, Structure and Rivalry (EC) (3 indicators)

According to Porter (1990), this attribute symbolises the context in which firms come into existence, they are organised and managed, and the surrounding domestic competitive environment, being rivalry the most critical driver of competitive advantage of a country or an industry (Liu and Hsu 2009). Competition propels businesses to actively engage into cost saving initiatives, while they increase efficiency and encourage innovation, which translates into increased competitiveness (ITS Global 2008; Mitschke 2008). Three indicators made up of indices, where 2000=100:

EC_1: The growth of the intensity of local competition index[24], for domestic competition while the domestic business environment will be represented by the growth of DTF (Distance to Frontier) index of the World Bank in Doing Business Report, where zero (0) indicates the lowest performance and 100 shows that the performance is the highest .

EC_2: The growth of the market share of the country in cashew kernel global market, and the higher the market share and the lower the average import tariff, the higher the Competitiveness.

EC_3: The growth of average import tariff rate faced by the cashew kernel exporters.

5.3.5. Government (4 indicators)

All policy makers' and Government's regulations and decisions can benefit or adversely affect the competency of a country and an industry (Barragan, 2005). The government improves or damages the national competitive advantage and affects the Competitiveness (Nilsson and Peterson, 2002). Therefore, the government, as an important actor can play a crucial role in this diamond. Its role is recognised most clearly by analysing how policies effect each of the variables (Tuna, 2006). Four indicators made up of indices, where 2000 = 100:

GR_1: The growth of Social Security Payments (US$ million);

GR_2: The growth of VAT collections (US$ million);

GR_3: The growth of Corporate Tax Collections (US$ million);

GR_4**:** The growth of public service employees' costs (US$ million)

5.4. Factor Analysis on the Quantitative Method

Recall that factor analysis is a technique used to reduce a large number of variables into fewer numbers of factors, thus extracting the maximum common variance from all variables and putting them into a common score. The *Principal Component Analysis Method* is the most commonly used among many available, although in this case the sample is limited. Factor analysis enables the examination of multi-dimensional relationships, that is, relationships that exist between 3, 4, 6, 10 or more variables, and it works best with measures to which algebraic operations are applicable. Factor Analysis of Mixed Data (FAMD) is the factorial method that is used to analyse data tables in which a group of individuals is described both by quantitative and qualitative variables. In terms of minimum sample size for conducting Factor Analysis, suggestions include from 3 to 20 times the number of variables, or an absolute range from 100 to over 1,000. For an Exploratory Factor Analysis, generally regarded as a technique for large sample sizes, N=50 is seen as a reasonable absolute minimum, although there is little empirical evidence to support these recommendations. In spite of the fact that absolute minimums are not always presented, in general, minimum sample sizes tend to be smaller for higher levels of communality, and minimum sample are smaller for higher ratios of the number of variables to the number of factors. When the variables-to-factors ratio exceeds 6, the minimum sample size begins to stabilise, irrespective of the number of factors. With a sample size of 80 observations, it is feasible to run a Factor Analysis on this 80-observation time series that constitutes the *quantitative method*.

We performed a Factor Analysis on the 16 retained items resulting from the internal consistency analysis, as explained in the paragraphs ahead and contained in Table 5.4. We applied SPSS software to perform the Factor Analysis process. We equally performed a check on the accuracy of data entry, missing values, normality, extreme values (outliers), skewness and kurtosis. Another three important aspects were also taken into account in order to determine the appropriateness of the data factor analysis, namely: **i**) Sample size, in which, according to Hair et al. (2010), it must be 100 or bigger, but as argued before, 80 longitudinal data are more than enough to perform Factor Analysis; **ii**) The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy or Bartlett's Test of Sphericity (BTS), in which Hair et al. (2010), Pallant (2007), and Tabachnick and Fidell (2007) suggested that if the KMO is greater than 0.6, the BTS must be significant (BTS p-value <0.05); **iii**) The factorability of the correlation matrix is guaranteed. In other words, the KMO and BTS tests determine the sampling adequacy for Factor Analysis (Maat, Zakaria, Nordin, & Meerah, 2011). Additionally, we conducted a check on the anti-image correlation for all items, which must be above 0.5 in order to be acceptable (Coakes, Steed, Coakes & Steed, 2003; Hair et al., 2010) and also make sure that the results provided for all items have a communality not lower than 0.3 (Tabachnick & Fidell, 2007). In Tables 5.2 and 5.3 the results for KMO and BTS tests of the analysis, as well as the eigenvalue statistic induced factors, are presented.

Table 5. 2: KMO and Bartlett's Tests Results

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	0.828
Bartlett's Test of Sphericity = Approx. Chi-Square	2,347.2
df	136
p-value	0.000

Source: Author's Calculation using SPSS 28.

The KMO test is 82.8%, as shown in Table 5.2. Given that this value is greater than 50%, the variables are in an appropriate structure for the Factor Analysis. Bartlett's Test of Sphericity (BTS), being actually a measure of multivariate normality of the set of distribution, it also checks for the null hypothesis (H_0) that the original correlation matrix is an identity matrix, that is, all diagonal terms are 1 and all off-diagonal terms are zero, and the alternative hypothesis (H_A) that the original correlation matrix is not an identity matrix, at 0.05 significance level. The calculated BTS result with the approximate Chi-Square of 2,347.2 has a *p*-value of $0.000<0.05$, and therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_A) is accepted, meaning that at least one diagonal term is different from 1 and at least one off-diagonal term is different from zero. Therefore, these data do not produce an identity matrix, and there is a high correlation between variables and the sample is suitable for Factor Analysis.

Table 5. 3: Eigenvalues and Percentage of Variance Explained

Factors	Total	% of Varaince Explained	Cumulative %
DC	8.294	48.791	48.791
SR	4.194	24.669	73.460
EC	1.424	8.379	81.839
FC	1.049	6.169	88.008

Source: Author's calculation using SPSS 28.

The sum of variances of 4 factors with eigenvalues greater than 1, out of the 16 retained factors is higher than 50%, and this is a desirable result. The total percentage of variance obtained from the factor analysis of the study is found to be 88.01%, which is way greater than 50%, so it is valid for Factor Analysis.

The analysis of internal consistency indices obtained on the 26 items has led to the dropping of 8 items, and the analysis of discriminant validity by the cross-loadings criterion has led to the dropping of another two factors, resulting in the retention of 16 factors, thus significantly improving scale reliability. As part of the reflective measurement model analysis and evaluation, indicators with factor loadings lower than 0.6 were removed (Gefen and Straub, 2005). Taking inspiration from this, we have decided that all items on a sample whose factor loadings and the cross-loaded statements fell below the 0.6 cut-off level should be deleted, and only factors with eigenvalues greater than 1, or factors that explain a total of 70-80% of the variance were extracted and retained. Table 5.4 shows that the results meet this condition.

Table 5.4 displays the retained 16 items, as a result of the dropping of FC_4, FC_5, DC_5, DC_6, DC_7, SR_3, SR_6, SR_7, EC_3, and GR_1 from the contents of Table 5.1. The retained 16 items were grouped around the four Porter's Diamond Model determinants (FC, DC, SR, EC) plus Government (GR), as presented in tabular format in the said Table 5.4.

Reliability in Statistics refers to how consistently a method measures something. In the particular case of quantitative research, reliability means two situations: **i**) The consistency of a measure, despite repeated several times. There is internal consistency of a measure if by applying the same method or procedure under the same circumstances, the same result is consistently achieved. In this case, the measurement is considered reliable. Simply put, it is the probability that a product, system, or service will perform its intended function adequately.

Table 5. 4: Retained Indicators Grouped by Porter's Determinants (Quantitative Dataset)

№	Factor Conditions (FC)
1	FC_1: Growth rate of worker's wages in the cashew nut industry
2	FC_2: Growth rate of worker and labourers in the cashew nut industry
3	FC_3: Growth of labour productivity in the cashew nut industry
	Demand Conditions (DC)
1	DC_1: Growth of total population in 10^6 inhabitants
2	DC_2: Growth of GDP
3	DC_3: Growth of employment
4	DC_4: Growth of GDP per capita
	Supporting and Related Industries (SR)
1	SR_1: Growth of in-shell cashew nuts exports
2	SR_2: Growth of volume cargo transported by railway
4	SR_4: Growth of ICT development index
5	SR_5: Growth of air transport in terms of carrier departures worldwide
	Competitiveness of the Cashew Nut Industry (Firm's Strategy, Structure and Rivalry) (EC)
1	EC_1: Growth of the intensity of local competition
2	EC_2: Growth of market share of the country in cashew kernel global market
	Government (GR)
2	GR_2: Growth of VAT collections
3	GR_3: Growth of corporate tax collections
4	GR_4: Growth of public service employee's costs

Sources: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorová (2010), Williams & Morgan (2010), and Son & Kenji (2013)

ii) A measure of stability at all times (Kirk & Miller, 1986). The reliability of the measurement procedures can be defined as a measure of stability or consistency, meaning that the same result can be consistently achieved by using the same methods under the same circumstances. Reliability is measured using Cronbach's α (alpha). When α is 0.7 and above, it is good, above 0.8 is better, and above 0.9 is the best. But α between 0.5 and 0.7 is acceptable. Table 5.18 shows that all Cronbach's α coefficients, based on non-standardised items, range from 0.534 to 0.963, which is a good reliability.

5.5. Testing of Time Series Data

Before proceeding with any further analysis on the time series data, and considering their particular nature, literature refers to the importance of observing some common pre-requisite assumptions, otherwise the desired results will not be achieved, or any results obtained may render themselves meaningless or useless. These assumptions are:

- **a.** The dependent variable must be a scalar variable, that is, it must assume one value at a time;
- **b.** The independent variables could be scalar or categorical (nominal variables);
- **c.** In the dataset, the presence of extreme values (sometimes called outliers) must be avoided or prevented by all means, which can be checked by the use of histogram or boxplot techniques;
- **d.** The residuals should be normally distributed;
- **e.** The relationship between the dependent and independent variables must be linear, and the model must display stability;
- **f.** The dataset needs to showcase homoscedasticity, which means the variance around the line is same for all the values of the independent variables and should not contain serial correlation.

There is, therefore, a need to perform a number of tests prior to proceeding to any time series modelling, namely: time series stationarity, optimal lag selection, cointegration, linearity, multicollinearity, normality, stability, validity (autocorrelation and heteroskedasticity) and causality. After performing the necessary adjustment as suggested by test results, a decision was made concerning the research model to be used in both the quantitative and qualitative data. All these tests were performed using SPSS28 statistical software.

It is a common place in Academia to hear that PLS-SEM models do not base their functioning on the *assumption of normal distribution* of the data they process. However, we include the testing for normality in this series of tests, for a number of reasons. According to Curran, West, and Finch (1995, 1996) from the Centre of Statistical Training of the United States of America, continuous distributions are typically described by their mean (central tendency), variance (spread), skew (asymmetry), and kurtosis (thickness of tails), and a normal distribution assumes a skew and kurtosis of zero, but in the real-world normal distributions are very much of a mirage.

Regrettably, fitting standard PLS-SEMs to non-normal data can result in inflated model test statistics that may more often cause model rejection than they should, or under-estimated standard errors leading tests of individual parameters to a more often acceptance than they should be. This can be addressed by taking into account four issues in practical terms, especially: **i**) The assumption of normality is a characteristic of the *estimator* and not the model itself. So "the PLS-SEM" doesn't assume normality, but the widely-used normal-theory of maximum likelihood (ML) estimator does; **ii**) The assumption of normality applies to the *residuals* and is thus only relevant for dependent variables while, in contrast, the independent variables can take any distributional form at all (binary, count, bi-modal, long tail); **iii**) There are no well-defined numerical cut-offs for skew or kurtosis, when it comes to determining whether a sample distribution is sufficiently non-normal to introduce problems in estimation. The tests of multivariate skew and kurtosis tend to be over-powered (significant even when the departure from normality is too slight to matter). In practical terms, there is a tendency to examine histograms and scatter plots of the dependent variables to make a (somewhat subjective) determination of whether univariate and bivariate normality appear to be approximately satisfied.

Given that PLS-SEM estimates the parameters of a set of equations in a structural equation model by combining Principal Components Analysis (PCA) with regression-based path analysis (Mateos-Aparicio 2011), it is only logical to test for the normality of the time series being processed, because the PLS-SEM is a regression after all.

In any case, if normality is doubtful, remedial steps can be taken to help mitigate the problems associated with the violation of this assumption like applying non-linear transformations to the variables (natural log, square root). A second and often better option is to use a method of estimation that is less impacted by the deleterious effects of non-normality like robust maximum likelihood (widely available, with some variation, in many software packages). Above all, the most important aspect is that the distributions remain continuous, whether normal or non-normal.

With a view to determine whether, on the basis of the new model sketched in Figure 5.5, any relationship between Factor Conditions (FC), Demand Conditions (DC), the Supporting and Related Industries (SR), and Government (GR), with the Export Competitiveness of Mozambique's Cashew Nut Industry (EC) exists, a time series of quarterly data, as described earlier, was used for the *quantitative method*, covering the period of 2000 to 2019.

5.5.1. Unit Root Test for Stationarity

Among the most popular procedures when dealing with time series is the verification of whether or not the series are stationary, by determining the *unit root* test applying the *Augmented Dickey-Fuller* (ADF), (Dickey and Fuller, 1981) test. This is a test whose value resides in the fact that it allows us to know that if a series has a unit root, all statistical assumptions that the mean and variance are constant over time are meaningless and any estimates become spurious. Enders (2010) stated that a variable has unit root (non-stationary) when a shock causes a long-run or permanent effect on the dependent variable, and a variable does not have a unit root (stationary) when its shock generates only a temporary or short-run effect on the dependent variable. Our particular interest in this also stems from the fact that time series data represent the variables' historic performance, and it is based on the expectation that the said historic performance will not change in the future, which allows us to draw important lessons for the shaping of future strategic decisions.

Based on the preceding arguments, the time series where subject to ADF test for stationarity on *Eviews12*. The test results indicated that all the series were non-stationary in levels, but stationary in first differences. Therefore, all the series are integrated of order 1, that is I(1), as demonstrated in Table 5.5.

From the results summarised on Table 5.5, the calculated t-statistics are lower, in absolute terms, than their respective critical values, and they become higher than their critical values in *first differences*, at any significance level such as 1%, or 5%, or even 10%, and the respective probability (*p*-values) are higher than any of the significance levels, and they become lower than all the significance levels in first differences, corroborating the notion that all the series became stationary and integrated of order 1, that is I(1), after their first differencing. In view of that result, the possibility of these series being cointegrated cannot be ruled out, and therefore, they were subject to cointegration test.

Table 5. 5: Summary of Unit Root Test Results

Variables (Fixed Base Indices: 2000 = 100)	Test	Sample	In levels: Obs.	In levels: Constant with Trend	In first differences: Obs.	In first differences: Constant with Trend	Order of Integration
1% Significance Level							
EC = Competitiveness	ADF	2000IQ-2019IVQ	77	-2.808075 (-4.081666)	75	-7.039814 (-4.085092)	I(1)
FC = Factor Conditions	ADF	2000IQ-2019IVQ	76	-2.331915 (-4.083355)	78	-12.02280 (-4.080021)	I(1)
DC = Demand Conditions	ADF	2000IQ-2019IVQ	75	-2.897721 (-4.085092)	75	-7.589161 (-4.085092)	I(1)
SR = Supporting and Related Industries	ADF	2000IQ-2019IVQ	79	-2.075952 (-4.078420)	78	-9.147154 (-4.080021)	I(1)
GR = Government	ADF	2000IQ-2019IVQ	77	-1.369721(-4.081666)	77	-8.705960 (-4.081666)	I(1)
5% Significance Level							
EC = Competitiveness	ADF	2000IQ-2019IVQ	77	-2.808075 (-3.469235)	75	-7.039814 (-3.470851)	I(1)
FC = Factor Conditions	ADF	2000IQ-2019IVQ	76	-2.331915 (-3.470032)	78	-12.02280 (-3.468459)	I(1)
DC = Demand Conditions	ADF	2000IQ-2019IVQ	75	-2.897721 (-3.470851)	75	-7.589161 (-3.470851)	I(1)
SR = Supporting and Related Industries	ADF	2000IQ-2019IVQ	79	-2.075952 (-3.467703)	78	-9.147154 (-3.468459)	I(1)
GR = Government	ADF	2000IQ-2019IVQ	77	-1.369721(-3.469235)	77	-8.705960 (-3.469235)	I(1)
10% Significance Level							
EC = Competitiveness	ADF	2000IQ-2019IVQ	77	-2.331915 (-3.161518)	75	-7.039814 (-3.162458)	I(1)
FC = Factor Conditions	ADF	2000IQ-2019IVQ	76	-2.331915 (-3.161982)	78	-12.02280 (-3.161067)	I(1)
DC = Demand Conditions	ADF	2000IQ-2019IVQ	75	-2.897721 (-3.162458)	75	-7.589161 (-3.162458)	I(1)
SR = Supporting and Related Industries	ADF	2000IQ-2019IVQ	79	-2075952 (-3.160627)	78	-9.147154 (-3.161067)	I(1)
GR = Government	ADF	2000IQ-2019IVQ	77	-1.369721(-3.161518)	77	-8.705960(-3.161518)	I(1)

Notes: **1**. All variables are significant at 5% significance level;

2. Series logarithmized, and lag lengths automatically selected using Schwarz (SIC) for ADF test and include the constant (C) and the trend (T).

3. The ADF test critical values were obtained from MacKinnon (1996).

4. The critical values are: for **1% = -4.10** ; for **5% = -3.47** for **10% = -3.16**

5. The null hypothesis (**H_0**): Variable **i** does have a unit root (variable **i** is non-stationary)

Sources: Author's calculations using *Eviews12 software*

5.5.2. The Optimal Lag Selection

The bulk of extant literature, including by Enders (2010), suggests that in the previous modelling of I(1) time series and for their correct processing, a lagged dependent variable be included as one of the independent variables, which requires the determination of the *optimum lag length* to be considered, before testing for cointegration. The decision on the optimum lag length takes always into consideration that a very high lag length increases the possibility of obtaining biased estimators given the loss of degrees of freedom, and a very low lag length presents the risk of omitting relevant information, being the reason why it is always safer to follow the thrift or parsimony principle which, according to Bierens (2006), minimises the number of parameters employed. In this research, the following criteria were applied jointly: LogL (*Log-Likelihood Test*), LR (*Likelihood Ratio Test*), FPE (*Final Prediction Error*), AIC (*Akaike Information Criterion*), SC (*Schwarz Information Criterion*), and HQ (*Hannan-Quinn Information Criterion*), on *Eviews12* software. These six (6) methods are applied jointly, and they automatically generate the optimal lag length, which is the one suggested by the majority of criteria, and, in case of a draw (amodal number of lags), the thrift principle is applied by choosing the lowest lag length. In Table 5.6, the summary of the Results of the Optimal Lag Selection Process is presented, indicating clearly that five (5) out of six (6) criteria have "suggested" lag =1, shown by the association of some criteria with stars, pointing at the lag selected by each criterion, based on the lowest value principle (parsimony principle) for the best model. The decision criterion on which to base the choice of lag length should be the one "suggested" by the largest number of criteria, and this lag will be used for cointegration testing.

Table 5. 6: Summary of the Optimal Lag Selection Results

VAR Lag Order Selection Criteria
Endogenous Variables: **EC, DC, FC, GR, SR**
Exogenous Variables: **C**
Sample: **2000Q1 - 2019Q4**
Included Observations: **68**

Lag #	LogL	LR	FPE	AIC	SC	HQ
0	-64.85063	NA	4.32E-06	1.838175	1.9991512	1.899456
1	**247.6594**	**575.6764***	**2.24E-09***	**-5.727879***	**-4.807853***	**-5.360192***
2	263.9923	27.93793	2.84E-09	-5.499798	-3.813084	-4.825706
3	282.0343	28.48728	3.49E-09	-5.316692	-2.863288	-4.336193
4	300.3095	26.45093	4.34E-09	-5.139723	-1.919631	-3.852819

Source: Author's calculations using *Eviews12* software

***** indicates Lag Order Selected by the Criterion

LogL: Log-Likelihood Criterion

LR: Sequential Modified LR (Likelihood Ratio Test - each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan-Quinn Information Criterion

5.5.3. The Johansen Cointegration Test

In a scenario where the series are I(1), it is assumed that the variables are stationary in first differences, that is, they are integrated of order 1. It is a situation where, after performing a lag length selection, a cointegration test is required in order to establish a long-run relationship, either between or among variables, aiming a substantiating the assumption on a long-run relationship in the model, despite the fact that the series are drifting apart or trending upwards or downwards. In existing literature there are two prominent cointegration tests that can be performed, namely: **i**) The Engle-Granger Cointegration Test (1987); **ii**) The Johansen-Jeselius Cointegration Test (1995).

Cointegrated time series are those ones that share a long-run trend over time, that is, they have a long-run relationship. The cointegration test consists essentially of assessing whether or not there are cointegration vectors. When they do exist, then there is a long-run relationship between or among variables and, in the inexistence of cointegration vectors, there is no long-run relationship between or among variables. With a view to testing for the existence of a cointegration relationship the two previously referenced techniques were applied. The Johansen's is the most popular not only because it is the most accessible, but also because, once dominated, it becomes relatively easier to understand its limitations, and the limitations of the other alternative models. According to Johansen (1995), a cointegration relationship exists between or among variables if, at least, one cointegration equation (r) exists, such that ($0<r<k$), and he equally suggested that the number of cointegration vectors could be

obtained through two maximum likelihood tests: The Trace Statistic Test and the Maximum Eigenvalue Test.

Testing for cointegration is basically about testing for the null hypothesis (H_0) against the alternative hypothesis (H_A), where H_0 states that the number of cointegration vectors is equal to zero (H_0: r = 0), and the alternative hypothesis (H_A) states that the number of cointegration vectors is higher than r. When the calculated value of the Trace Statistic is greater than its critical value, we cannot reject the null hypothesis that the number of cointegration vectors is equal to zero, and, consequently, the alternative hypothesis (H_A) that the number of cointegration vectors is higher than r is rejected. This means that there is no cointegration relationship between or among variables and failing to reject the null hypothesis that the number of cointegration vectors is equal to 1 (H_0: r=1), then it means that there is cointegration between or among the variables. With regard to the Maximum Eigenvalue Test, it compares a null hypothesis (H_0) of r cointegration equations against the alternative hypothesis (H_A) of r+1 cointegration equations. Its main objective is to verify the significance of the greater eigenvalue, confronting it with the null hypothesis (H_0) that r cointegration vectors are significant against the alternative hypothesis (H_A) that the number of cointegration vectors is r+1, that is, r=0 against r=1; r=1 against r=2, and so on. The first (H_0: r=0) test corresponds to the null hypothesis that there are no cointegration vectors. If this hypothesis is rejected, there are cointegration vectors, and the test would be finished. However, failing to reject this null hypothesis, the following null hypothesis (H_0) would be tested, that is, (H_0: r=1) that 1 cointegration vector does not exist, and so on, until such point where the null hypothesis is no longer rejected. In the Maximum Eigenvalue, the null hypothesis (H_0) is also rejected if the statistic or the calculated value is greater than its critical value. All of this is processed automatically by *Eviews12* software, and the results are summarised in Table 5.7.

Since the cointegration test results suggest in terms of both the Trace and the Maximum Eigenvalue Statistics, that there is no cointegration at 5% significance level, which implies that there is no long-term relationship among the variables, meaning that only the short-run model can be estimated, applying the appropriate technique.

When the series under analysis are integrated of order 1, that is I(1), and cointegrated, it means that there is a long-run equilibrium relationship between them, even if a short-run disturbance exists. When the cointegration test suggests the existence of a stable long-run relationship between the variables, that is, when there is, at least, one cointegrating vector, the conditions are set for the estimation of the long-run elasticities allowing for the calculation of both the short-run and long-run elasticities.

Table 5. 7: Summary of the Johansen Cointegration Test Results

Sample (ajusted): **2001Q1 - 2019Q4**
Included Observations: 7**8** After Adjustments
Trend Assumption: Linear Deterministic Trend
Series: **EC, DC, FC, GR, SR**
Lags Interval (in first differences): 1 to 1

Unristricted Cointegration Rank Test (Trace)					**Unristricted Cointegration Rank Test (Maximum Eigenvalue)**				
Hypothesised Nº of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob****	**Hypothesised Nº of CE(s)**	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob****
None	0.33933	68.88155	69.81889	0.0592	None	0.33933	32.33127	33.87687	0.0756
At most 1	0.27071	36.55028	47.85613	0.3691	At most 1	0.27071	24.62285	27.58434	0.1144
At most 2	0.10286	11.92743	29.79707	0.9344	At most 2	0.10286	8.46673	21.13162	0.8729
At most 3	0.03890	3.46071	15.49471	0.9421	At most 3	0.03890	3.09505	14.26460	0.9402
At most 4	0.00468	0.36566	3.84147	0.5454	At most 4	0.00468	0.36566	3.84147	0.5454

Trace Test indicates no cointegration at the 5% level
* Denotes rejection of the hypothesis at 5% level
** MacKinnon-Haug-Michelis (1999) *p*-values
CE(s) = Cointegrating Equations

Max-eigenvalue test indicates cointegration at the 5% level
* Denotes rejection of the hypothesis at 5% level
** MacKinnon-Haug_Michelis (1999) *p*-values.

But when the series are not cointegrated, which is the case of the time series under consideration in this research, only the short-run model is estimated, applying the appropriate techniques.

The lag length (k) must be selected on an empirical basis, including the use of the one computed in Table 5.6, keeping always in mind that too many lags may lead to the loss of degrees of freedom, statistical insignificance of coefficients, and multicollinearity. But too few lags may lead to model specification errors. The interpretation of the meaning of the results (coefficients) is, like in any other models, based on "*ceteris paribus*" effects.

It is obvious that, after arriving at this point, where we note that the time series is I(1), but not cointegrated, it is only logical that the research model to be used is a Multiple Linear Regression Model, more precisely a Vector Autoregressive (VAR) Model to estimate the Multiple Linear Regression Model formulated as follows:

$$EC_t = \beta_0 + \beta_1 FC_t + \beta_2 DC_t + \beta_3 SR_t + \beta_4 GR_t + \varepsilon_t \quad (5.1)$$

$$EC_t = 3.87 - 0.03FC_t + 0.23DC_t + 0.04SR_t - 0.09GR_t \quad (5.2)$$

Where:

EC = Export Competitiveness of Mozambique's Cashew Nut Industry

FC = Factor Conditions

DC = Demand Conditions

SR = Supporting and Related Industries

GR = Government Role

ε = Error Term or Stochastic Disturbance

t = Time

β_0 = Intercept (Representing factors influencing Export Competitiveness of Mozambique's Cashew Nut Industry, but not captured by the econometric model).

β_1, β_2, β_3, β_4 = Coefficients associated with the three (3) Porter's Diamond Model factors plus Government, that we want to estimate, in order to determine which ones have a statistically significant influence on the Export Competitiveness of Mozambique's Cashew Nut Industry. Running this VAR Model is, to some extent, tantamount to testing the null hypothesis (H_0) that all the coefficients of the explanatory variables are equal to zero, that is $\beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$, against the alternative hypothesis (H_A) that, at least, one coefficient of the explanatory variables is not equal to zero. A few critical points about VAR before we proceed: **i**) *Autoregressive* is a concept that means the presence of lagged values of the dependent variable on the right-hand side of the equation; **ii**) Vector means that the system contains a vector of two or more variables; **iii**) The VAR Model is constructed only if the variables are I(1), that is, they become stationary after the first difference; **iv**) If the variables are cointegrated, we need to construct both short-run (VAR) and the long-run, the Vector Error Correction Model = VECM) models; **v**) If the variables are not cointegrated, we need to construct only the short-run (VAR) model; **vi**) All the variables in the VAR model are endogenous, and there are no exogenous variables; **vii**) Each dependent variable is a function of its lagged values, and the lagged values of other variables in the model; **viii**) Var model must be specified in levels (it could be the variables' natural logarithms, hence VAR in first differences is a mis-specification; **ix**) The ε_t are stochastic error terms, often called impulses, innovations or shocks; **x**) The VAR is estimated by Ordinary Least Squares (OLS); **xi**) The lag length (**k**) must be selected on an empirical basis, including the use of the one calculated in Table 5.6, keeping always in mind that too many lags may lead to the loss of degrees of freedom, statistical significance of coefficients, and multicollinearity, but woo few lags may lead to model mis-specifications or specification errors; **xii**) The interpretation of the meaning of the VAR model results (coefficients) is, like in any other model, based on *ceteris paribus* effects. Once observed all model assumptions, then a proper testing follows in the next few pages, to make sure that if the basic assumptions have not been violated. These are: **i**) *Linearity test*; **ii**) *Multicollinearity test*; **iii**) *Model stability test*; **iv**) *Model Validity test.*

5.5.4. Linearity Test

Based on Hansen's (1999) views, linearity is the assumption that the relationship between the independent variables and the dependent variable in the regression is linear. A formal hypothesis test for linearity is based on the Pearson Correlation Coefficient's calculated probabilities. The null hypothesis (H_0) states that the relationship is not linear, against the alternative hypothesis (H_A) that the relationship is linear. *Decision rule*: If the calculated *p*-value is less than the significance level, then (H_0) is rejected and the alternative hypothesis (H_A) is accepted, meaning that the relationship is linear. In our case, there is a linear relationship between EC with DC (*p*-value=0.000) and SR (*p*-value = 0.000), and a non-linear relationship between EC with GR (*p*-value = 0.08) and FC (*p*-value = 0.40).

5.5.5. Multicollinearity Test

Multicollinearity, according to Frost’s (2019) perspective, refers to when the independent variables are highly correlated with each other, an assumption that is only relevant for a multiple linear regression, which has multiple independent variables, and if we are dealing with a simple linear regression (one independent variable), that problem doesn't exist. Multicollinearity is an issue because the Multiple Linear Regression will not be able to accurately associate variance in the outcome variable with the correct independent variable, which may lead to muddled results and incorrect inferences. The Variance Inflation Factor (VIF) assesses how much the variance of an estimated multiple regression coefficient increases if the independent variables are correlated. We read *VIF centred values* in *Eviews12*. If the VIF values, for variable by variable, are less than 10, there is no multicollinearity in the model (Table 5.8). If the VIF values are equal or greater than 10 there is a severe multicollinearity that needs to be addressed, namely:

- ✓ If the VIF value is near or above 5, the solution may be relatively easy;
- ✓ If the VIF values are between 5 and 10, that indicates a high multicollinearity that may be problematic;
- ✓ If the VIF values go beyond 10, the regression coefficients are poorly estimated as a result of multicollinearity;
- ✓ If we have one or more independent variables, remove one of the correlated variables from the model, or use stepwise regression;
- ✓ Use Partial Least Squares Regression (PLS) or Principal Components Factor Analysis (PCA), which cut the number of independent variables to a smaller set of uncorrelated components.

The variance inflation factor (VIF) and Tolerance (T) are two closely related statistics for diagnosing collinearity in multiple regression. They are based on the R-squared value obtained by regressing a predictor on all of the other predictors in the analysis. Tolerance is the reciprocal of VIF, that is, VIF = 1/T or T = 1/VIF.

In our case, there is no multicollinearity problem, since all VIF centred values are below 10, meaning the absence of multicollinearity in the model.

Table 5. 8: The Multicollinearity Test Results

Dependent Variable: EC Method: Least Squares (Gauss-Newton/Marquardt Steps) Date: 05/06/2021 Time: 18:46 Sample (Adjusted): 2000Q2 2019Q4 Included Observations: 79 after adjustments					Collinearity Statistics	
	Coefficient	**Std. Error**	**t-Statistic**	**Prob.**	**Tolerance**	**VIF**
DC	0.228814	0.088880	2.574415	0.012	0.229	4.358
FC	0.030851	0.056577	0.545289	0.587	0.586	1.706
GR	-0.090485	0.037149	-2.435726	0.017	0.260	3.845
SR	0.043460	0.017774	2.445132	0.017	0.557	1.794

Source: Author's calculations, using *Eviews12*

5.5.6. Model Stability Test

During model development, the performance metrics of a model are calculated on a development sample, and then calculated for validation samples which could be another sample at the same timeframe or other time shifted samples. If the performance metrics are similar, the model is deemed stable or robust (Mills, 2014).

In all regression models there is an implicit assumption that their coefficients remain constant across all observations. What occurs regularly with time series data is that, if they are not, we then encounter the problem of structural change. Following the presentation of a simulation example of a typical structural break in a regression, some tests for such breaks are applied to find out whether at a known point in time or when the breakpoint is unknown. The use of dummy variables is also a common practice in this type of cases.

We say that a *statistical stability* holds if *statistical* conclusions are robust or *stable* to appropriate perturbations to *data*. That is, *statistical stability* is well defined relative to a particular aim and a particular perturbation to *data* (or *model*). Statistical stability can also be seen as how well the results hold up. More specifically, it's a measure of how well we control for random errors in our study. One way of testing for model stability is performing a *Cumulative Sum Test (CUSUM Test)* which identifies systematic changes in the regression coefficients, very often used to test the constancy of the coefficients in a model. Our model was subject to a Model Stability Test, whose detailed results are shown in Table 5.9.

It is basically about testing the null hypothesis (H_0) that the model is stable against the alternative hypothesis (H_A) that the model is not stable. The *decision rule* is: If the *p*-value of the F-statistic is greater that the significance level, we cannot reject the null hypothesis (H_0) that the model is stable, and we reject the alternative hypothesis (H_A) that the model is not stable. In this case, the value F-statistic is 5.87243 with a *p*-value of 0.000, that is, $F_{(2,77)} = 5.87[0.000<0.05]$. So, we fail to reject the null hypothesis (H_0) that the model is stable, and we reject the alternative hypothesis (H_A) that the model is not stable, at 5% significance level.

Table 5. 9: Model Stability Test

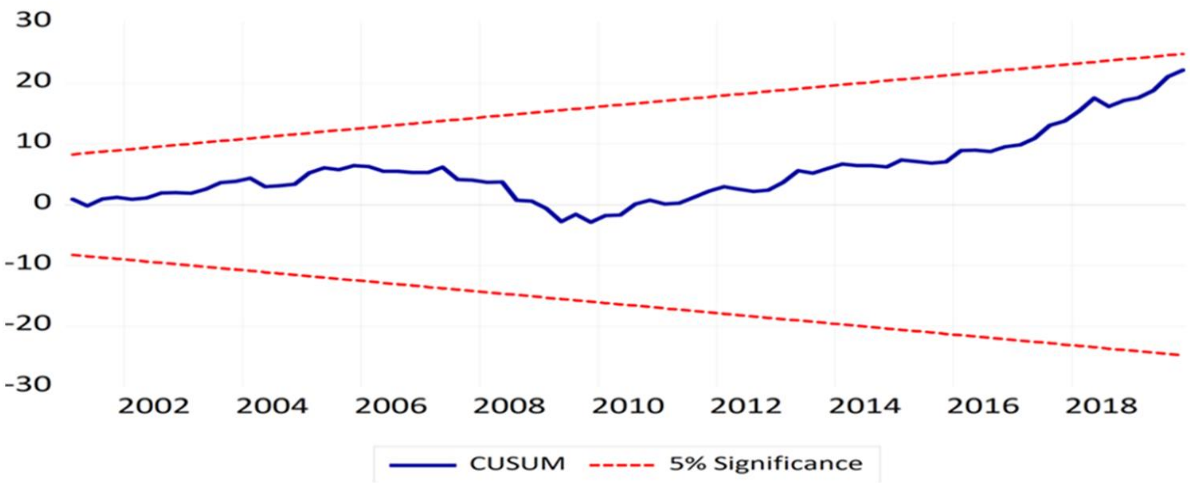
Dependent Variable: EC
Method: Least Squares (Gauss-Newton/Marquardt Steps)
Date: 07/13/2021 Time: 00:12
Sample: 2000Q1 2019Q4
Included Observations: 80 after adjustments
EC_t = 0.23DCt - 0.03*FCt -0.09*GRt + 0.04*SRt

	Coefficient	Std. Error	t-Statistic	Prob.
DC	0.229462	0.090357	2.539518	0.0132
FC	-0.030360	0.058185	-0.521788	0.6034
GR	-0.090197	0.038144	-2.364613	0.0206
SR	0.039002	0.017727	2.133923	0.0361
F-Statistic	5.87243	Durbin-Watson Statistic		1.836640
Prob (F-Statistic)	0.000363			

Source: Author's Calculations using *Eviews12* Software

There is also a graphical decision rule, that is taken on the basis of reading Figure 5.1.

Figure 5. 1: Model Stability Test Results



Source: Author's calculation using Eviews12 Software

The two red lines represent 5% significance level, and the blue line represents the CUSUM. If the blue line falls inside the two red lines, the model is stable. If the blue line falls outside the two red lines, the model is unstable. In this case, the model is absolutely stable. The reading of Figure 5.2 confirms the conclusion we had arrived at by reading the results in Table 5.9, that the model is absolutely stable at 5% significance level.

5.5.7. Model Validity Diagnostic Tests

The previous procedures relating to unit root test, optimal lag length selection, and cointegration test, aim to reach the final econometric model from the original time series datasets with surety that all relevant aspects have been thoroughly identified, analysed, and adequately addressed. Once at this point, it becomes fundamental and critical to perform other tests that are vital for the validation and certification of the regression results. It is this process that we call Model Validity Diagnostic Tests, which consist of examining the presence or absence of the *three main econometric problems* (Pedace, 2016), namely: *autocorrelation or serial correlation, normality and heteroscedasticity*, of the regression residuals. In the coming sub-topics, we will be performing those tests, namely:

a. Testing for Autocorrelation

Another particular factor that is worth analysing in this relationship between and among variables is the serial correlation or autocorrelation (Durbin, 1992), which can be defined as the correlation among elements integrating observation series ordered over time, such as time series, or ordered along the space, such as cross-sectional datasets. Within the context of econometric analysis, particularly in the classical linear regression model, it is assumed that this autocorrelation does not exist in the error term μ_i, that is, the classical model assumes that the error term related to any of the observations is not influenced by the error term of any other observation.

Economic time series have inertia and slowness as some of their main characteristics. Time series like GDP, price indices, production, employment and unemployment register economic cycles. Let's take, for example, the beginning of economic recovery after a great depression, where the majority of those series start rising. The value of a series at a certain point in time is greater than at the previous one and, in regressions that involve time series, successive observations tend to be interdependent. In very summarised terms, we have first order AR(1) autocorrelation or serial correlation among the residuals when: **i**) The residuals of a linear time series regression show signs of being correlated with their own lagged values, that is, they denote a serial correlation; **ii**) A serial correlation is a very frequent occurrence in time series because datasets are ordered over time and, therefore, it is not surprising that close observation error terms tend to be correlated; **iii**) A serial correlation violates the basic assumption of the regression theory, according to which error terms are uncorrelated.

The most commonly used test for the detection of autocorrelation or serial correlation is the Durbin-Watson, whose result is the d-statistic, and the result suggests that there is no autocorrelation in this model, since the calculated value of d is equal to 2. Additionally, a Breusch-Godfrey (BG) Test, also known as the LM (Lagrange Multiplier) Test was applied to test for serial correlation in this research, using *Eviews12* software, whose results were LM [1.081] Prob (0.5825). The essence here is about testing for the null hypothesis (H_0) that there is no first order or AR(1) autocorrelation or serial correlation among the variable's residuals under analysis, against the alternative hypothesis (H_A) that there is first order autocorrelation or serial correlation among the variables residuals. The *decision rule* is that when the *p*-values or probability of the calculated LM statistic is greater than the significance level, in this case 5%, we fail to reject the null hypothesis (H_0) that there is no serial correlation and reject the alternative hypothesis that there is serial correlation. In this case, the *p*-value of the computed LM statistic is equal to 0.58252 which is greater than the 5% significance level, and we fail to reject the null hypothesis, and reject the alternative hypothesis. By rejecting the alternative hypothesis (H_A) we are confirming that there is no autocorrelation among the variable's residuals of our model.

There are four (4) measures to cure serial correlation (Godfrey, 1973), namely: **i**) Verify if it is pure or caused by model misspecification; **ii**) In case of pure autocorrelation, we can transform the model by using the Generalised Least Squares Model (GLS); **iii**) In large samples, we can use the Newey-West Method to obtain OLS estimators' standard errors in which autocorrelation has already been corrected; **iv**) In certain situations, we can continue to use the Ordinary Least Squares (OLS) Method. When the first order correlation coefficient (ρ) is known, the autocorrelation problem can be relatively easily solved using, for example, the first differences method. Once $-1 \leq \rho \leq 1$ we can start from the two extreme positions, being $\rho=0$, where there is no first order AR(1) autocorrelation or serial correlation, and the other position at a point where $\rho=\pm1$, where there is positive or negative first order AR(1). Some authors like Maddala (2003), suggest that this process be utilised when the d-statistic is always lower than R^2, that is, $d<R^2$.

b. Testing for Normality

The assumption of normality means that we should make sure our data roughly fits a bell curve shape before running certain statistical tests or regression (Gujarati, 2002). In statistics, normality tests are used to determine if a data set is well-modelled by a normally distributed dataset, that is, to verify whether the sample in use was drawn from a normally distributed population. However, it is worth recalling that in this research we are using a PLS-SEM modelling that doesn't have normality as one of its assumptions, but we still do it for reasons explained in section 5.6. of this research report.

For Thadewald (2007), a practical approach to testing normality is to compare a histogram of the sample data to a normal probability curve. When the sample is too small, we might proceed by regressing the data against the quantiles of a normal distribution.

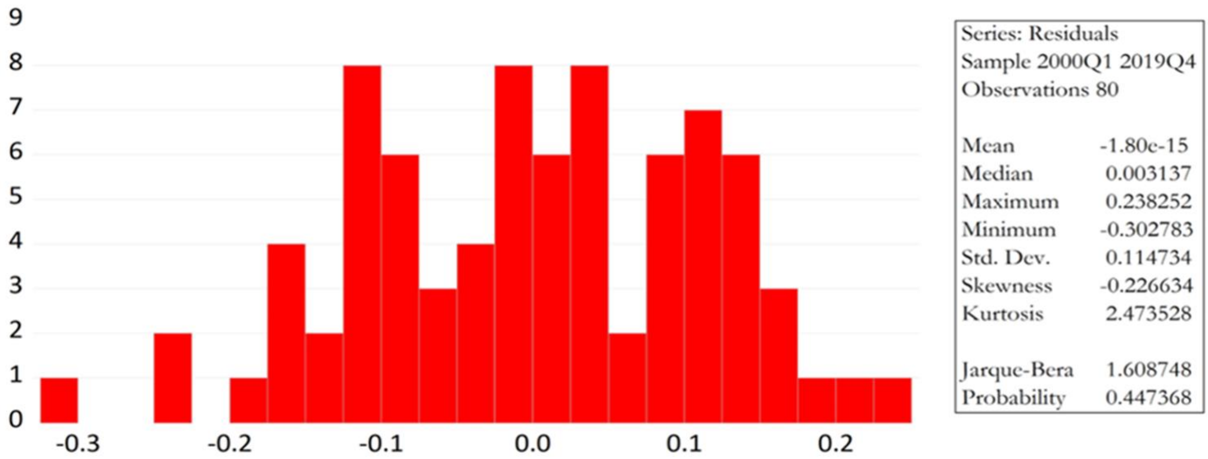
The t-statistic of a test named after Carlos Jarque and Anil K. Bera (1980), is always nonnegative. If it is far from zero, it signals the data do not have a normal distribution.

If the data comes from a normal distribution, the JB statistic asymptotically has a Chi-Squared distribution with two degrees of freedom, so the statistic can be used to test the hypothesis that the data are from a normal distribution. The null hypothesis is a joint hypothesis of the skewness being zero and the excess kurtosis being zero. Samples from a normal distribution have an expected skewness of 0 and an expected excess kurtosis of 0 (which is the same as a kurtosis of 3). As the definition of JB shows, any deviation from this increases the JB statistic.

For small samples the Chi-Squared approximation is overly sensitive, often rejecting the null hypothesis when it is true. Furthermore, the distribution of *p*-values departs from a uniform distribution and becomes a right-skewed unimodal distribution, especially for small *p*-values. This leads to a large Type I error rate.

Our sample was subject to a Normality Test, assessing the null hypothesis (H_0) that the time series variables' residuals have a normal distribution, the JB test, against the alternative hypothesis (H_A) that the residuals that the time series variables' residuals do not have a normal distribution. The test results are summarised in Figure 5.2.

Figure 5. 2: The Jarque-Bera Normality Test Results



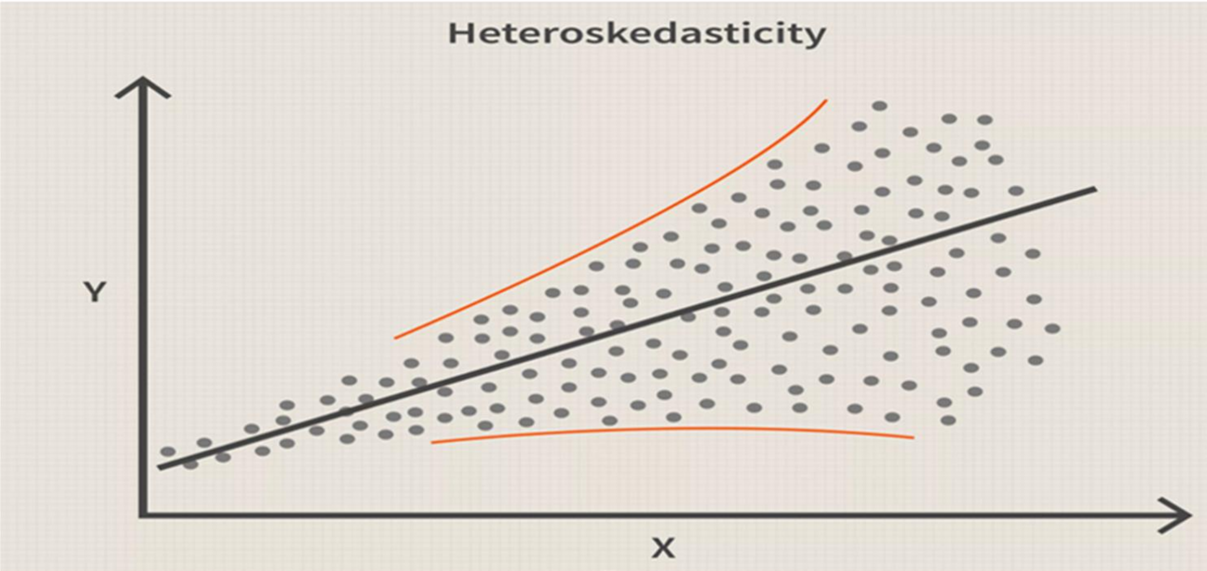
Source: Author's calculation using Eviews12 Software

The *decision rule* is: If the *p*-value of the estimated Jarque-Bera statistic is greater than the significance level, in this case 5%, we fail to reject the naull hypothesis (H_0) that the residuals are normally distributed, and accept the alternative hypothesis (H_A) that the residuals are not normally distributed. If the *p*-values of the estimated Jarque-Bera statistic is lower than 5%, we reject the null hypothesis (H_0), and we obviously accept the alternativa hypothesis (H_A). In this case, as visualised on Figure 5.2, the result is JB [1.61] Prob (0.45), meaning that 0.45>0.05. Therefore, we cannot reject the null hypothesis (H_0) that the residuals are normally distributed, and reject the alternative hypothesis (H_A) that the residuals are not normally distributed. So, all the time series in our model come from a normally distributed population.

c. Testing for Heteroskedasticity

Heteroskedasticity, in Statistics, is a phenomenon that takes place when the standard deviations of a predicted variable are non-constant (Long and Pravin Trived, 1993). Residual errors tend to fan out over time, as illustrated in Figure 5.3.

Figure 5. 3: Heteroskedasticity Test Results



Source: Trevor Breusch and Adrian Pagan (1979)

In Statistics, heteroskedasticity refers to the error variance, or dependence of scattering, within a minimum of one independent variable within a particular sample. These variations can be used to calculate the margin of error between datasets, such as expected results and actual results, thus providing a measure of the deviation of data points from the mean value. In Finance, conditional heteroskedasticity is often found in securities' prices, and the magnitude of volatility of these financial assets cannot be predicted over any period, while unconditional heteroscedasticity can be used when discussing variables that have identifiable seasonal variability, such as electricity usage.

We conducted a heteroscedasticity test under the null hypothesis (H_0) that the residuals are homoscedastic, that is, they have a constant variance, against the alternative hypothesis (H_A) that the residuals have a heteroscedastic variance. We had to check the values of "Observed" R^2 with the respective *p*-values (Prob. Chi-Square (2). The *decision rule* is: If the *p*-value of the observed Chi-Square is greater than the significance level, in this case 5%, we fail to reject the null hypothesis (H_0) that the residuals are homoscedastic and reject the alternative hypothesis (H_A) that the residuals are heteroscedastic. In our case the result is Chi-Square [3.33] Prob (0.50), where we clearly realise that 0.50>0.05, meaning that we fail to reject the null hypothesis (H_0) that the residuals are homoscedastic, and reject the alternative hypothesis (H_A) that the residuals are heteroscedastic. Therefore, our time series variables' residuals are homoscedastic, which implies that we have a good model.

In Table 5.10, a summary of results of the three Model Validity Diagnostic Tests can be found.

Table 5. 10: Summary of Results of the Model Validity Diagnostic Tests

Test name	Calculated Statistic value	Probability of Statistic	Significance Level	Test Outcome
Breusch-Pagan Serial Correlation LM Test	1.08	0.58	0.05	Residuals are not serially correlated
Jarque-Bera Normality Test	1.61	0.45	0.05	Residuals are normally distributed
Breusch-Pagan-Godfrey Heteroscedasticity Test	3.33	0.50	0.05	Residuals are homoscedastic

Source: Author's calculations

Table 5.10 shows that all the results of the Model Validity Diagnostic Tests are satisfactory, considering that the *p*-values of all estimated statistics are greater than the 5% significance level. Therefore, no null hypothesis (H_0) could be rejected, and all alternative hypotheses (H_A) were rejected.

5.5.8. The Granger Causality Test

The use of Granger causality is a way to investigate causality between two variables in a time series, being a probabilistic account method of causality that uses empirical datasets to find patterns of correlation. A variable X causes variable Y if X determines Y's existence or behaviour. However, with Granger causality, we aren't testing a true cause-and-effect relationship. What we want to know is if a particular variable comes before another in the time series. In other words, if we find Granger causality in our data there isn't a causal link in the true sense of the word. In econometricians, when we say "cause," what we mean is "Granger-cause," although a more appropriate word might be "precedence" (Leamer, 1985).

Granger causality we assume that the data-generating processes in any time series are independent variables. Then the data sets are analysed to see if they are correlated. The datasets are then analysed to see if they are generated independently from each other.

The null hypothesis (H_0) is that lagged X values do not explain the variation in Y, and the alternative hypothesis (H_A) is that lagged X values do explain the variation in Y. In other words, it assumes that X_t doesn't Granger-cause Y_t.

The Granger causality test is essentially a statistical hypothesis test for determining whether one time series can in anyway be used to forecast another, first proposed by Clive Granger in 1969. In general terms, regressions reflect "mere" correlations.

A series X is said to Granger-cause Y if it we can demonstrate through t-tests and F-tests on lagged values of X, that those X values provide statistically significant information about future values of Y.

Before running any Granger causality test, we had to make sure the time series is stationary, that is, it should not have unit roots in order to avoid or eliminate the possibility of autocorrelation and skewness of the test results.

The time series EC, FC, DC, GR and SR are integrated of order 1, that is I(1), because being non-stationary in levels, they became stationary in first differences. On the other hand, the Johansen Cointegration Test performed at the beginning of this analysis has revealed the existence of no cointegration vector, which implies that the Granger causality testing had to be based on the use of the VAR model, thus preventing the typical problems that arise when using OLS estimator in the presence of cointegrating equations. The Granger Causality Test, whose results are in Table 5.11 was performed using *Eviews12* software.

Table 5. 11: Extract of Granger Causality/Block Exogeneity Wald Tests

Date: 07/13/2021	Time: 18:12			
Sample: 2000Q1 2019Q4				
Included Observations: 79				
Lags: 1				
Null hypothesis	**Obs**	**df**	**Chi-Square**	**Prob**
DC does not Granger cause EC	79	1	5.08628	0.024
GR does not Granger cause EC	79	1	4.53724	0.033
SR does not Granger cause EC	79	1	4.70682	0.030
All		**3**	**20.37228**	**0.000**

Source: **Author's Calculations using *Eviews12* software**

Testing for Granger Causality is tantamount to testing the null hypothesis (H_0) that FC, DC, GR, and SR do not Granger-cause EC, against the alternative hypothesis (H_A) that FC, DC, GR, and SR do Granger-cause EC, at 5% significance level. All the explanatory variables, except FC, have a causal relationship flowing from each one of them individually or jointly to EC, meaning that they Granger-cause EC individually or jointly, at 5% significance level, since their calculated *p*-values are less than the significance level, implying that the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_A) that they Granger-cause EC is accepted.

5.6. Hypotheses Development (Quantitative Method)

The following four (4) groups of null hypotheses (H_0) that all of the three Porter's Diamond Model factors, namely Factor Conditions (FC), Demand Conditions (DC), Supporting and Related Industries (SR) plus Government (GR) have no relationship with the Export Competitiveness of Mozambique's Cashew Nut Industry, that is, all the path coefficients (βs)[25] are equal to zero ($\beta_1=\beta_2=\beta_3=\beta_4=0$), were tested against the alternative hypothesis (H_A) that at least one of Porter's Diamond Model factors plus Government has a relationship with the Export Competitiveness of Mozambique's Cashew Nut Industry. The PLS-SEM model results are presented in 4 groups of null hypotheses in *the quantitative* method as follows:

5.6.1. Group 1**:** *The Effect of Factor Conditions (FC) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (EC) - The null hypothesis (H_0), that Factor Conditions (FC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Factor Conditions (FC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC).

5.6.2. Group 2**:** *The Effect of Demand Conditions (DC) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (EC) - The null hypothesis (H_0), that Demand Conditions (DC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Demand Conditions (DC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC).

5.6.3. Group 3**:** *The Effect of Government Role (GR) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (EC) **-** The null hypothesis (H_0), that Government Role (GR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Government Role (GR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC).

5.6.4. Group 4**:** *The Effect of Supporting and Related Industries (SR) on the Export Competitiveness of Mozambique's Cashew Nut Industry*_(EC) **-** The null hypothesis (H_0), that Supporting and Related Industries (SR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Supporting and Related Industries (SR) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC).

5.7. Introduction to the Qualitative Method

The *qualitative method* consists of a cashew nut sector survey through a 30-element structured questionnaire, as contained in Table 5.12, measured on a 5-point Likert Scale. For the selection of the 30 indicators, we took inspiration from Porter's (1990) postulates by identifying factors that can fit in what he considers as important resources that support the national competitiveness in different industries like *factor endowment, market demand, relevant industry, and firm strategy and rivalry*, and also making use of the adaptation works done by other researchers such as Estêvão et al. (2018), Sun et al. (2010), Sachitra and Kamarasinghe (2016), Watchraversrinkan et al. (2010), Jin and Moon (2006), Prasad (2004), Dunning (1993), Aryawardana (2001), Olmenda and Varela (2012), among others who embraced the qualitative approach. The detailed list of indicators selected for each construct was an adaptation from Bakan & Doğan (2012), and Vu & Pham (2016). The tabular configuration and presentation were adapted from Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorvá (2010), William & Morgan (2010), and Son & Kenji (2013)**.** The questionnaire items, grouped in *5 constructs*, in accordance with the four (4) Porter's Diamond Model determinants plus Government, was designed and sent out to 347 potential respondents among different cashew sector stakeholders in Mozambique, especially in Maputo City, Maputo Province, Nampula province, and Nampula City.

Constructs are broad concepts for a study which can be abstract and do not need to be directly observable. Within the context of a survey research, a construct is the abstract idea, the underlying theme or subject matter that we wish to measure using survey questions. Intelligence, motivation, anxiety, fear, life, satisfaction, skill, attribute, or ability that is based on one or more established theories, are examples of constructs. For simplicity in the analysis, any variable that cannot be directly observed, but is used for the purpose of empirical testing of hypotheses that concern relationships between conceptual variables using models such as the Structural Equation Modelling (SEM) is a construct (Ringdon, 2012), and is conceptually defined in terms of the attribute and the object (MacKenzie, Podsakoff & Podsakoff, 2011). The attribute defines the general type of property to which the focal concept refers, such as an attitude.

Table 5. 12: List of Items for Qualitative Research Questionnaire (Grouped in 5 Constructs)

Factor Conditions (QFC)
QFC$_1$: Availability of raw materials
QFC$_2$: Quality of raw materials
QFC$_3$: Technology
QFC$_4$: Communication infrastructure
QFC$_5$: Energy
QFC$_6$: There are enough specialised professionals in the cashew nut sector
Demand Conditions (QDC)
QDC$_1$: Size of domestic market
QDC$_2$: Knowledge level of foreign customers about products
QDC$_3$: The changing level of total demand into the international demand
QDC$_4$: There is cooperation between public and private sectors in the cashew nut industry
QDC$_5$: The company contributes to the development of of the country
QDC$_6$: Service efficiency level after sales
Supporting and Related Industries (QSR)
QSR$_1$: Healthy Relations between cashew nut processors and governmental authorities
QSR$_2$: The general quality of life easily retains employees in the cashew nut sector
QSR$_3$: Relations with the higher education institutions
QSR$_4$: The labour legislation regulating the cashew nut sector proves motivating to the employees
QSR$_5$: Level of common marketing studies with the other organizations in the sector
QSR$_6$: Innovation levels is important for company success
Competitiveness of the Cashew Nut Industry (Firm Strategy, Structure, and Rivalry) (QEC
QEC$_1$:Qualification of suppliers
QEC$_2$: Competitiveness of suppliers
QEC$_3$: Level of competition between local competitors in the cashew nut industry
QEC$_4$: Level of quality standard certification is important
QEC$_5$: Companies openly share information
QEC$_6$: Ease access to financing for the cashew nut sector
Government Role (QGR)
QGR$_1$: Corporate Tax Rates - Taxes
QGR$_2$: Value-Added Tax
QGR$_3$: Incentives
QGR$_4$: Legislation(Bureaucracy And Control)
QGR$_5$: Informality (Informal Economy)
QGR$_6$: Promoting specialised training programmes to boost employees' skills and ability

Source: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorvá (2010), William & Morgan (2010), and Son & Kenji (2013).

The questionnaires were sent out by different means (email with a possibility of responding directly through this means of communication), faxed PDF forms, handing over of hard copies and physical collection at a later date or time, and via WhatsApp. Given the particularly difficult access to internet network in some areas, a combination of all the above-mentioned means became necessary. Around 75% of the questionnaires were targeted at Nampula province respondents, given the fact that over 50% of in-shell cashew nut production and processing takes place in this province.

For the identification of the qualitative method constructs and indicators we have used the same acronyms as in the quantitative method, but this time we have resorted to the apposition of the letter "Q" in order to differentiate them. For example, Factor Conditions in the quantitative method is referred to by the acronym FC, but in the qualitative method we have applied the acronym QFC. For Demand Conditions in the quantitative method the acronym is DC, but in the qualitative method we have used QDC, and this starts in Table 5.12.

We visited Nampula province from the 8th to the 12th of November 2021, and interviewed personally various stakeholders in the Cities of Nampula and Nacala, and the Districts of Meconta and Monapo, particularly the following cashew nut processing plants: Caju de Nacala in Nacala (Figure 5.4), Indo-Africa in Meconta, Korosho in Nampula City (Rex), and Sunny Mozambique in Nampula City.

Figure 5. 4: Visit to the Cashew Nut Processing Plant in Nacala City

Cashew Kernel Peeling and Grading

Of all the 347 questionnaires sent out, 30 were discarded because they were incomplete or incorrectly filled out, 7 were not returned, and 310 were correctly filled out, returned, dully processed. A sample of the questionnaires is attached to this research report as Annex 5.1. The selection of only 30 items or factors for the questionnaire was determined by our objective knowledge of the sector and guided by the pre-defined target interviewees, associated with the need to retain the potential respondents focused till the end of the questionnaire, by keeping it short and straight to the point.

5.7.1. Factor Analysis on the Qualitative Method

Parts of the questionnaires were derived from related literature, and questions in the questionnaire were designed as structured ones, as shown in Annex F. The structured questions were prepared in the light of basic factors and subfactors of the Diamond Model. The questionnaire was directed to the relevant people, including lower-to-mid-level managers and owners of the companies, as well as to government officials in sectors related to agriculture in general, and to the cashew nut industry in particular, the Ministries of Industry and Commerce, Economy and Finance, Agriculture and Rural Development, Transport and Communications, the Central Bank, among others. A sample of 310 responses was received, dully processed, and grouped in five (5) constructs, in accordance with Porter's Diamond Model's (1990) four (4) determinants plus Government, resulting in a questionnaire containing 30 items, as indicated in Table 5.12, which were measured on a 5-point Likert scale, where 1 means total disagreement, 2 means disagreement, 3 in the middle means neutral position or no opinion, 4 means agreement, and 5 means total agreement. These items evaluate aspects related to the determinants of the Diamond Model plus Government, namely: Factor Conditions (QFC), Demand Conditions (QDC), Firm Strategy, Structure and Rivalry (QEC), Supporting and Related Industries (QSR), and Government (QGR).

A Factor Analysis on the 30 items contained in Table 5.12 was undertaken. SPSS28 software was used to carry out the Factor Analysis process. Just like in the quantitative method, items on the sample whose factor loadings and the cross-loaded statements fell below the 0.6 cut-off level were deleted, and the greater-than-one eigenvalue rule proposed by Keiser in 1960 was adhered to. This is a commonly used criterion for the number of factors to rotate which states that there are as many reliable factors as there are eigenvalues greater than one, meaning that an eigenvalue that is less than one would imply that the scores on the component would have a negative reliability (Cliff, 1988). A check on the accuracy of data entry, missing values, normality, extreme values (outliers), skewness and kurtosis, was equally carried out.

Another three important aspects were also taken into account in order to determine the appropriateness of the data factor analysis, namely: **i**) Sample size in which, according to Hair et al. (2010), must be 100 or bigger. But Tabachnick and Fidell (2007) are of the view that at least 300 observations are required for a meaningful factor analysis, implying that our sample meets this requirement with 310 survey responses received and processed; **ii**) The KMO Measure of Sampling Adequacy or BTS, in which Hair et al. (2010), Pallant (2007), and Tabachnick and Fidell (2007) suggested that the KMO must be greater than 0.6 and the BTS must be significant (BTS *p*-value <0.05); **iii**) The factorability of the correlation matrix must be secured. In other words, the KMO and BTS tests determine whether the sampling is adequate to proceed with factor analysis (Maat, Zakaria, Nordin, & Meerah, 2011). Additionally, a check on the anti-image correlation for all items was conducted, which must be above 0.5 in order to be acceptable (Coakes, Steed, Coakes & Steed, 2003; Hair et al., 2010) and also make sure that the results provided for all items have a communality not lower than 0.3 (Tabachnick & Fidell, 2007). In Tables 5.13 and 5.14 the results for KMO and Bartlett's tests of the analysis, the eigenvalue statistic induced factors, the ratios of variance explained values are presented.

Table 5. 13: KMO and Bartlett's Tests Results (Qualitative Dataset)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.824
Bartlett's Test of Sphericity = Approx. Chi-Square	2,696.9
df	210
p-value	0.000

Source: Author's Calculation using SPSS 28.

The KMO test is 82.4%, as shown in Table 5.13. Given that this value is greater than 50%, the variables are in an appropriate structure for the Factor Analysis. The BTS test, being actually a measure of multivariate normality of the set of distribution, also checks for the null hypothesis (H_0), and the alternative hypothesis (H_A) on the original correlation matrix not being an identity matrix, at 0.05 significance level, as mentioned earlier. The BTS calculated result with the approximate Chi-Square of 2,696.9 has a *p*-value of 0.000<0.05. Therefore, the null hypothesis (H_0) that the original correlation matrix is an identity matrix, that is, all diagonal terms are 1 and all off-diagonal terms are zero is rejected, and the alternative hypothesis (H_A) that the original correlation matrix is not an identity matrix is accepted, at 5% significance level, meaning that at least one diagonal term is different from 1 and at least one off-diagonal term is different from zero, and therefore, these data do not produce an identity matrix, and there is a high correlation between variables and the sample is suitable for factor analysis.

Table 5. 14: Eigenvalues and Percentage of Variance

Factors	Total	% of Varaince Explained	Cumulative %
QGR	5.828	27.753	27.753
QDC	3.228	15.371	43.124
QEC	1.690	8.048	51.172
QFC	1.290	6.141	57.313
QEC	1.027	4.892	62.205

Source: Author's calculation using SPSS 28.

The sum of is higher than 50%, and this is a desirable result. The total percentage of variance obtained from the Factor Analysis of the study is found to be 62.2%, which is greater than 50%, so it is valid for Factor Analysis.

The 21 retained factors are a result of the analysis of internal consistency indices obtained on the 30 items, given that this process has led to the dropping of 9 items, thus significantly improving scale reliability. Items on the sample whose factor loadings and the cross-loaded statements fell below the 0.6 cut-off level were deleted, and only factors with eigenvalues greater than 1, or factors that explain a total of 70-80% of the variance were extracted and retained. Table 5.14 shows that the results meet this condition. Table 5.15 displays the retained 21 items, as a result of the dropping of QFC_3, QFC_4, QDC_1, QDC_2, QSR_1, QSR_6, QEC_4, QEC_6, and QGR_6 from the contents of Table 5.12, grouped around the four (4) Porter’s Diamond Model determinants (QFC, QDC, QSR, QEC) plus Government (QGR).

Table 5. 15: Retained Indicators, Grouped in 5 Constructs (Qualitative Dataset)

Nº	Factor Conditions (QFC)
1	QFC_1: Availability of Raw Materials
2	QFC_2: Quality of raw materials
5	QFC_5: Electricity supply
6	QFC_6: There are enough specialised professionals in the cashew nut sector
	Demand Conditions (QDC)
3	QDC_3: The changing level of total demand into the international demand
4	QDC_4: There is cooperation between public and private sectors in the cashew nut industry
5	QDC_5: The company contributes to the development of the country
6	QDC_6: Service efficiency level after sales
	Supporting and Related Industries (QSR)
2	QSR_2: The general quality of life easily retains employees in the cashew nut sector
3	QSR_3: Relations with higher education institutions
4	QSR_4: The labour legislation regulating the cashew nut sector proves motivating to the employees
5	QSR_5: Level of common marketing studies with the other organisations in the sector
	Competitiveness of the Cashew Nut Industry (Firm's Strategy, Structure and Rivalry) (QEC)
1	QEC_1: Qualifications of suppliers
2	QEC_2: Level of competitiveness of suppliers
3	QEC_3: Level of competition between local competitors in the cashew nut industry
5	QEC_5: Companies openly share information
	Government (QGR)
1	QGR_1: Corporate Tax Rates - Taxes
2	QGR_2: Value-Added Tax
3	QGR_3: Fiscal incentives
4	QGR_4: Legislation (bureaucracy and control)
5	QGR_5: Informality (Informal Economy)

Source: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorvá (2010), William & Morgan (2010), and Son & Kenji (2013).

5.8. Hypotheses Development (Qualitative Method)

5.8.1. Group 1: *The Effect of Factor Conditions (QFC) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (QEC) - The null hypothesis (H_0), that Factor Conditions (QFC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Factor Conditions (QFC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC).

5.8.2. Group 2: *The Effect of Demand Conditions (QDC) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (QEC) - The null hypothesis (H_0), that Demand Conditions (QDC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Demand Conditions (QDC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC).

5.8.3. Group 3: *The Effect of Government Role (QGR) on the Export Competitiveness of Mozambique's Cashew Nut Industry* (QEC) - The null hypothesis (H_0), that Government Role (QGR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Government Role (QGR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC).

5.8.4. Group 4: The Effect of Supporting and Related Industries (QSR) on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC) - The null hypothesis (H_0), that Supporting and Related Industries (QSR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Supporting and Related Industries (QSR) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC).

5.9. Sample Analysis and Descriptive Statistics

5.9.1. Sample Characteristics

It is worth recalling that the time series dataset used in the *quantitative method* was subject to a number of tests that led to a position where all the pre-requisite assumptions prior to performing any regression analysis were met. In spite of that result, we could not proceed with the use of a Multiple Linear Regression, neither for the *quantitative* nor for the *qualitative* methods, since our research model has for the endogenous and exogenous variables five (5) constructs made up from the sixteen (16) archival observable variables in growth format for a period of 20 years (2000-2019) for the *quantitative* method, and twenty-one (21) factors collected through 310 survey responded questionnaires, as explained earlier. The details of the 16 items can be found in Table 5.4, after the dropping of 10 elements from Table 5.1, eight (8) of which had factor loadings lower than the 0.6 cut-off level, namely: FC_4, FC_5, DC_5, DC_6, DC_7, SR_6, SR_7, and EC_3. The other two (2) factors were dropped because during the analysis of discriminant validity under the cross loadings' criterion, they were found to be loading better on other constructs than on their parent constructs, namely: SR_3 with GR (0.889) better than with SR (0.818), and GR_1 with DC (0.918) better than with GR (0.836). The details of the 21 retained factors after dropping 9 items from Table 5.12 whose factor loadings were below the 0.6 cut-off level, namely: QFC_3, QFC_4, QDC_1, QDC_2, QSR_1, QSR_6, QGR_6, QEC_4, and QEC_6, for the *qualitative method* can be found in Table 5.15. Of all the 347 questionnaires sent out, 30 were discarded because they were incomplete or incorrectly filled out, 7 were not returned, and 310 were correctly filled out, returned and dully processed, which means a response rate of 89.3%. Around 75% of the questionnaires were targeted at Nampula province respondents, given the fact that over 50% of in-shell cashew nut production and processing takes place in this province.

The initial part of the questionnaire gathers information about respondents' background. The characteristics of the respondents are described in terms of gender, age, education, workplace, time and experience in the organisation, and position held. The research sample consists of 223 males

(71.9%) and 87 females (28.1%). In terms of respondents' age, 33.1% are under 30 years of age, 16.7% between 31 and 39 years, 13.2% between 40 and 49 years, 16.1% between 50 and 64 years, 16.1% between 50 and 65 and finally 4.8% over 65 years. As far as workplace is concerned, 23.5% are civil servants, 65.9% are cashew nut processing plant employees, 5.5% are local traders or exporters, and 5.1% work for other private sector companies. Regarding education, the respondents are distributed as follows: 1.3% less than secondary school, 26.7% had secondary school, 33.4% had high school, and 38.6% achieved higher education. Inasmuch as time and work experience in the cashew sector are concerned, 33.4% have over 15 years, 24.8% between 10 and 15 years, and 41.8% under 10 years. As far as the respondents' position in the organisation, 50.2% are managers, 17.4% owners, 23.8% are technicians, and 8.7% basic employees. In the following few paragraphs, a construct-by-construct and item-by-item analysis is performed.

Factor Conditions (QFC) - On whether the *availability* of raw cashew nuts (QFC_1) for processing is fundamental for the cashew industry, 283 respondents (91%), of which 87 females (27%), agreed and totally agreed. Regarding the adequacy of the *quality* (QFC_2) of available in-shell cashew nuts, 270 respondents (87%), of which 29.6% females agreed and totally agreed. On the negative impact of energy supply conditions (QFC_5) on the quality of cashew kernels, 78 respondents (25.2%) agreed, 94 (26 females and 68 males) totally agreed, and 85 participants, of which 37 females (43.5%) disagreed and totally disagreed. As regards the *sufficiency of qualifications* of the cashew sector professionals (QFC_6), 175 respondents (52 females and 123 males) agreed and totally agreed, while seventy-four respondents (23.9%) were undecided. The *superiority of manual de-shelling* in comparison to the mechanised one (QFC_3) and the domestic supply of equipment, spare parts and services to the cashew industry (QFC_4) are not reported because they have been dropped, given their lower than required factor loadings.

Demand Conditions (QDC) - As to the impact of changes in the kernel demand international habits and standards (QDC_3) on the performance of processors and exporters of this product, 234 respondents (75%), of which 162 males (52%) agreed and totally agreed, while 38 respondents expressed their disagreement. On the existence of healthy cooperation between cashew nut processing companies and the IAM (QDC_4), 113 of the respondents (32 females and 81 males) totally agreed, while 90 participants (31 females and 59 males) simply agreed, fifty-two (9 females and 43 males) expressed indifference on to the issue, and 52 respondents (12 females and 40 males) disagreed and totally disagreed. Regarding the contribution of cashew nut processing companies to the development of the country (QDC_5), 264 respondents (85%), of which (77 females and 187 males) agreed and totally agreed. Concerning the adequacy of the level of efficiency of the kernel after-sales services (QDC_6), 166 respondents (53.5%), with 118 males (38%) agreed and totally agreed. The level of indifference to this question was expressive (26.1%). The dimension of domestic market (QDC_1) and the knowledge about the tastes and preferences of foreign customers (QDC_2) were dropped, given their lower than required factor loadings and, therefore, they are not reported.

Supporting and Related Industries (QSR) – On the issue of whether the level of incentives to workers is sufficient to ensure their retention in the cashew industry (QSR_2), 184 participants (59.3%) of which 57 females and 127 males, agreed and totally agreed. Sixty-two respondents were neutral, and 64 disagreed and totally disagreed. As to whether the cashew industry cooperates well with Higher Education Institutions (QSR_3), here we witness a slight inversion of response pattern, with 158 respondents (51%) of which 46 females and 112 males, expressing their disagreement and total disagreement, while 103 respondents (33.2%), of which 26 females and 77 males recording their agreement and total agreement. Forty-nine participants (15 females and 34 males) took a neutral stand, which is equivalent to 15.8%. On the question of whether labour legislation regulating the cashew industry is appropriate to motivate workers' performance (QSR_4), 131 respondents (42.3%), of which 39 females and 92 males, agreed and totally agreed, while 102 respondents (32.9%), of which 24 females and 78 males, manifested their disagreement and total disagreement. Seventy-seven respondents took a non-negligible neutral stand (24.8%). Concerning the issue of whether the cashew processors conduct joint market studies and marketing activities (QSR_5), a total of 144 respondents (46.5%), of which 40 females and 104 males, disagreed and totally disagreed to this issue, while 118 respondents (38.0%), of which 35 females and 83 males, agreed and totally agreed to the idea. The respondents who took a neutral position represented 15.5% of the participants, with 12 females and 36 males. The issue of healthy relationship between the cashew processors and the government authorities (QSR_1) and that of technological innovation as a fundamental factor for the development of the cashew kernel business (QSR_6) were dropped, given their lower than required factor loadings, and therefore, they are not reported.

Export Competitiveness of the Cashew Nut Industry (QEC) - On the question of whether the qualifications of workers of raw cashew nuts and service suppliers are at the desired levels (QEC_1), 111 participants (28 females and 83 males) totally agreed and 89 (22 females and 67 males) simply agreed. Sixty-one respondents (15 females and 46 males) simply disagreed, while 18 participants (5 females and 13 males) totally disagreed. On the competitiveness of the raw material and service supplier market (QEC_2), 236 participants (76.1%), of which 63 females and 173 males, totally agreed, while 114 (28 females and 86 males) simply agreed. Twenty-eight participants (13 females and 15 males) took a neutral position on the issue, while 25 (6 females and 19 males) disagreed, and lastly, 21 participants (5 females and 16 males) totally disagree. Regarding the issue of whether the level of competition between raw material trading companies and kernel processors is healthy (QEC_3), out of the 310 participants, of which 87 females (28.1%) and 223 males (71.9%), a total of 169 respondents (51 females and 118 males) agreed and totally agreed. Seventy participants (16 females and 54 males) were neutral. On the other hand, 71 respondents (21 females and 50 males) disagreed and totally disagreed. Regarding the question of the positive impact of quality standards certification on the kernel business (QEC_5), 243 respondents (78.4%), of which 72 females and 171 males, agreed and totally agreed, while 39 participants (12.6%), of which 8 females and 31 males took a neutral stand.

Nine percent of respondents disagreed and totally disagreed. The issues of whether there is an open information sharing among cashew nut processors (QEC_4) and that there is easy access to financing for the cashew nut industry (QEC_6) were dropped, given their lower than required factor loadings, and therefore, they are not reported.

Government Role (QGR) - With regard to the issue of whether the impact of the level of corporate income taxes favours the growth and consolidation of the national cashew industry (QGR_1), 121 participants (39.0%), of which (40 females and 81 males) agreed and totally agreed. Seventy-three respondents (23.5%), of which 23 females and 50 males, took a neutral position. On the other hand, 116 participants (37.4%), of which 24 females and 92 males disagreed and totally disagreed. On whether the magnitude of the Value Added Tax (VAT) rate favours the growth and consolidation of the cashew industry, 73 respondents (23.5%), of which 26 females and 47 males, agreed and totally agreed. Eighty-five respondents (27.4%), of which 20 females and 65 males, expressed a neutral stand. One hundred and fifty-two participants (49.0%), of which 41 females and 61 males, disagreed and totally disagreed. As to whether the incentives granted to the cashew industry stimulate investment and growth in the cashew industry (QGR_3), 112 respondents (36.1%), of which 39 females and 73 males, agreed and totally agreed, while 55 respondents (17.8%), of which 15 females and 40 males, took a neutral position, and on the other hand 143 participants (46.1%), of which 33 females and 110 males disagreed and totally disagreed. Regarding the issue of whether the current level of business environment in the country favours or not the attraction of new cashew nut processing companies (QGR_4), 119 participants (38.4%), of which 40 females and 79 males, agreed and totally agreed. Neutral was the opinion of 67 respondents (21.6%), of which 13 females and 54 males). One hundred and twenty-four respondents (40.0%), of which 35 females and 89 males, disagreed and totally disagreed. On whether the current level of the informal economy in the country is beneficial to the increase in cashew kernel sales (QGR_5), 113 respondents (36.5%), of whom 38 females and 75 males, agreed and totally agreed. Seventy-one participants (22.9%), of whom 15 females and 56 males, were neutral, while 126 respondents (40.1%), of whom 34 females and 92 males, disagreed and totally disagreed. The issue of the establishment and functioning of training programmes for technical staff and specialists for the cashew nut industrial sector (QGR_6) has been dropped, given its lower than required factor loading, and therefore, it is not reported.

5.9.2. Descriptive Statistics

According to Sarang Narkhede (2018), Statistics is a branch of mathematics that deals with collecting, organisation, and interpreting data. When we get data, it is usually in raw format. So, before applying any fancy algorithms and making any predictions, we first try to read and understand the data by applying statistical techniques, in order to make sure we figure out what type of distribution that data has. Descriptive statistics involves summarising and organising the data so they can be easily understood. Descriptive statistics seeks to describe the data but does not attempt to make inferences from the sample to the whole population, implying that descriptive statistics is not developed on the basis of probability theory. There are two categories of descriptive statistics, namely: *measures of central tendency* (mean or average, median, and mode; and *measures of variability, dispersion or spread* (standard deviation, range, skewness, and kurtosis). Some of these concepts have been analysed in other chapters of this study but listing them together here entails the idea of visualising the big picture of descriptive statistics in a more compact way before moving into specifics.

The introduction of this section at this point of the work is intended to complement the sample analysis that was carried-out in the previous section. Recall that we have two methods, the *quantitative* method and the *qualitative* method, each one supported by a different dataset, being one quantitative and longitudinal and the other one qualitative and cross-sectional. This situation brings about the imperative of doing two sets of descriptive statistics, starting with the quantitative one, as displayed in Table 5.16.

We are dealing with a longitudinal dataset covering a period of 20 years' quarterly data, meaning that we are working with a sample of 80 observations, and there are no missing data. When we observe Table 5.16, there appears to be no anomalous condition with the measures of central tendency, except the cases of the Government Role (GR) where all figures are expressively higher than the rest and considering that these are natural logarithms of growth rates with the year 2000 as the base year, these figures could translate very high growth values in the areas of taxation, fiscal incentives, and social security payments. But this phenomenon doesn't appear to be an alarming one. The maximum level observed in the growth of air transport (SR_4) bears testimony to the tremendous increase in air traffic as a result of the expressive expansion of air transport infrastructure and services in the country.

Table 5. 16: Descriptive Statistics of the Quantitative Dataset

Factor	N	Mean	Median	Mode	Minimum	Maximum	Standard Deviation	Excess Kurtosis	Skewness	Range	Outer VIF
DC_1	80	4.861	4.858	4.590	4.590	5.130	0.155	-1.109	-0.002	0.541	36
DC_2	80	5.007	5.095	4.605	4.321	6.007	0.367	-0.744	-0.015	1.686	5
DC_3	80	5.048	5.067	5.320	4.598	5.320	0.227	-1.121	-0.384	0.722	62
DC_4	80	4.961	5.027	4.982	4.399	5.133	0.163	0.923	-1.200	0.734	5
EC_1	80	4.793	4.804	4.723	4.472	5.117	0.155	-0.834	0.023	0.646	1
EC_2	80	4.640	4.671	4.671	3.739	5.046	0.250	2.117	-1.182	1.306	1
FC_1	80	4.406	4.452	3.344	3.344	5.443	0.538	-0.760	0.054	2.099	10
FC_2	80	4.438	4.487	3.887	3.887	4.944	0.282	-1.001	-0.146	1.056	10
FC_3	80	4.199	4.277	3.383	3.383	4.839	0.356	-1.035	-0.224	1.457	4
GR_1	80	6.177	6.652	6.445	4.487	7.275	0.948	-1.165	-0.806	2.788	2
GR_2	80	5.178	5.419	2.538	2.401	5.930	0.729	6.461	-2.367	3.529	2
GR_3	80	5.069	4.838	4.175	4.134	6.294	0.617	-1.221	0.321	2.161	2
GR_4	80	5.072	5.045	4.115	3.916	5.868	0.502	-0.739	-0.182	1.952	1
SR_1	80	4.140	4.192	2.681	2.681	5.346	0.702	-0.735	0.036	2.664	15
SR_2	80	4.550	4.584	3.001	3.001	5.525	0.677	-0.889	-0.284	2.524	7
SR_4	80	5.642	5.045	2.043	2.043	9.627	2.352	-1.148	0.394	7.584	3
SR_5	80	4.286	4.437	2.916	2.916	5.208	0.556	-0.746	-0.279	2.292	17

Source: Author's calculation using SmartPLS3.3

VIF = Variance Inflation Factor

Mindful of the fact that the standard deviation measures the amount of variation or dispersion of a set of values, its low values indicate that the variable's variation tends to be close to the mean of the dataset, while high values indicate a large spread out over a wider range, and it is calculated as the square root of the variance. In other words, it measures the absolute variability of a distribution. The higher the dispersion or variability, the greater is the standard deviation and greater will be the magnitude of the deviation of the value away from their mean. Statisticians have determined that values no greater than plus or minus 2 SD represent measurements that are closer to the true value than those that fall in the area greater than ± 2SD. On the basis of what has just been said, all the variables in our model have a variability that can be considered good or acceptable, except for SR_4 which is greater than 2, and can be treated as an outlier.

In probability theory and statistics, kurtosis is a measure of tailless of the probability distribution of a real-valued random variable. Positive excess kurtosis means that distribution has fatter tails than a normal distribution. Fat tails means there is a higher-than-normal probability of big positive and negative returns realisations. When calculating kurtosis, a result of +3.00 indicates the absence of kurtosis (distribution is mesokurtic). In other words, kurtosis measures the fatness of the tails of a distribution. For simplicity in its interpretation, some statisticians adjust this result to zero (kurtosis minus 3 equals zero), and then any reading other than zero is referred to as excess kurtosis. Negative numbers indicate a platykurtic distribution, and positive numbers indicate a leptokurtic distribution. An excess kurtosis above 0 indicates the tails are heavier than the normal distribution. An excess kurtosis below 0 indicates the tails are lighter than the normal distribution. An excess kurtosis value of 1 and above or -1 and below represents a sizable departure from normality. A standard normal distribution has kurtosis of 3 and is recognised as mesokurtic. An increased kurtosis (>3) can be visualised as a thin "bell" with a high peak whereas a decreased kurtosis corresponds to a broadening of the peak and "thickening" of the tails. Kurtosis is also a measure of the combined sizes of the two tails. If the kurtosis is greater than 3, then the dataset has heavier tails than a normal distribution (more in the tails). If the kurtosis is less than 3, then the dataset has lighter tails than a normal distribution (less in the tails).

The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010). Hair et al. (2010) and Bryne (2010) argued that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. For kurtosis, the general guideline is that if the number is greater than +1, the distribution is too peaked. Likewise, a kurtosis of less than –1 indicates a distribution that is too flat. Distributions exhibiting skewness and/or kurtosis that exceed these guidelines are considered nonnormal." (Hair et al., 2017). On the basis of these comments, our sample was drawn from a normally distributed population by both criteria.

In Statistics, the range of a set of data is the difference between the largest and smallest values, that means the result of subtracting the sample maximum and minimum. Being the difference between the largest value and the smallest value in a dataset, range is the simplest measure of variability in data, that is determined by only the two extreme data values. There is no known generalisable critical limit for range in statistics. A critical limit is a specific range of values for any biological, physical, or chemical parameter that is controlled by a Critical Control Point (CCP). In establishing a critical limit, we cannot just choose any value. Pre-requisite steps to establishing a critical limit must be accurately performed to ensure the effectiveness of each limit. Critical limits must be observable to ensure the detection of any deviation; monitorable in real time to ensure continuous compliance control; measurable by appropriate methods to ensure comparability with the desirable standards (Njunina, 2022). In our sample it is not possible to verify whether the ranges observe the critical limits, once they have not been established. All we know is that higher ranges indicate higher data variability, and the case of SR_5 is really worrisome.

In Table 5.16, we also have the opportunity to realise that our sample contains data which carry serious multicollinearity issues, in particular the outer VIF values such as for DC_1,=36.167, DC_3,=61.540, SR_1, =15.473, and SR_5, =17.051, given the magnitude of their respective VIF (Variance Inflation Factor). In terms of the inner VIF values, we notice that DC=7.372, FC=1.643, GR=6.640, and SR=1.621. The Variance Inflation Factor (VIF) assesses how much the variance of an estimated regression coefficient increases if the independent variables are correlated. We read *VIF centred values* in *Eviews12*. If the VIF values, for variable by variable, are equal or greater than 10 there is a severe multicollinearity that needs to be addressed. If the VIF values are less than 10, there is no multicollinearity in the model. In our case, there appears to be no multicollinearity problem if read on a construct-by-construct basis, since all the centred values are below 10, meaning that there is no multicollinearity problem in the model. The analysis of the descriptive statistics relating to the qualitative method was, as explained earlier, based on the reading of the contents of Table 5.17. Unlike in the previous case (*quantitative method*), here we are dealing with a cross-sectional data derived from a survey of 310 respondents, out of the 347 questionnaires sent out by different means targeting cashew nut industry stakeholders, developed on a 5-point Likert scale. In the sample, there are no missing data. By analysing the contents of Table 5.17, there appears to be no anomalous condition with the measures of central tendency, although in the case of QGR_5 mode = 1 indicates that most common response of the 310 participants totally disagreed to the idea that the current level of the informal economy in Mozambique is beneficial for the increase in cashew kernel sales.

Regarding the standard deviation as a measure of the amount of variation or dispersion of a set of values, its low levels indicate that the variables' variation tends to be close to the mean of the set, while high values indicate a large spread out over a wider range. It also measures the absolute variability of a distribution, and the higher the dispersion or variability, the greater is the standard deviation and greater will be the magnitude of the deviation of the value from their mean. Considering that statisticians have determined that values no greater than plus or minus 2 SD represent measurements that are closer to the true value than those that fall in the area greater than ± 2SD, all the variables in our model have a variability that can be considered good or acceptable.

Considering kurtosis as a measure of tailless of the probability distribution of a real-valued random variable, fat tails mean there is a higher-than-normal probability of big positive and negative returns, and a result of +3.00 indicates the absence of kurtosis (distribution is mesokurtic), and then any reading other than zero is referred to as excess kurtosis. Negative numbers indicate a platykurtic distribution, and positive numbers indicate a leptokurtic distribution. An excess kurtosis above 0 indicates the tails are heavier than the normal distribution. An excess kurtosis below 0 indicates the tails are lighter than the normal distribution. An excess kurtosis value of 1 and above or -1 and below represents a sizable departure from normality.

Just like it was mentioned earlier, values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010). Hair et al. (2010) and Bryne (2010) argued that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. For kurtosis, the general guideline is that if the number is greater than +1, the distribution is too peaked. Likewise, a kurtosis of less than –1 indicates a distribution that is too flat. Distributions exhibiting skewness and/or kurtosis that exceed these guidelines are considered nonnormal." (Hair et al., 2017). By reading Table 5.17, we conclude that our sample was drawn from a normally distributed population by both criteria.

Table 5. 17: Descriptive Statistics of the Qualitative Dataset

Factor	N	Mean	Median	Mode	Minimum	Maximum	Standard Deviation	Excess Kurtosis	Skewness	Range	Outer VIF
QFC_1	310	4.30	5.00	5.00	1.00	5.00	1.063	1.129	-1.453	4	1.491
QFC_2	310	3.81	4.00	5.00	1.00	5.00	1.298	-0.448	-0.870	4	1.990
QFC_5	310	3.34	4.00	4.00	1.00	5.00	1.395	-1.133	-0.384	4	1.336
QFC_6	310	3.34	3.00	3.00	1.00	5.00	1.240	-0.974	-0.218	4	1.200
QDC_3	310	3.66	4.00	5.00	1.00	5.00	1.392	-0.918	-0.672	4	1.377
QDC_4	310	3.34	4.00	4.00	1.00	5.00	1.348	-1.037	-0.364	4	1.437
QDC_5	310	3.94	4.00	5.00	1.00	5.00	1.322	-0.248	-1.012	4	1.716
QDC_6	310	3.29	3.00	3.00	1.00	5.00	1.231	-0.947	-0.177	4	1.361
QSR_2	310	3.06	3.00	4.00	1.00	5.00	1.324	-1.133	-0.138	4	1.298
QSR_3	310	2.56	2.50	2.00	1.00	5.00	1.283	-0.948	0.338	4	1.356
QSR_4	310	2.87	3.00	3.00	1.00	5.00	1.353	-1.151	0.069	4	1.614
QSR_5	310	2.77	3.00	2.00	1.00	5.00	1.386	-1.241	0.217	4	1.312
QEC_1	310	3.55	4.00	5.00	1.00	5.00	1.316	-1.027	-0.481	4	1.410
QEC_2	310	3.74	4.00	5.00	1.00	5.00	1.324	-0.382	-0.890	4	1.333
QEC_3	310	3.13	3.00	4.00	1.00	5.00	1.226	-0.872	-0.274	4	1.157
QEC_5	310	4.20	5.00	5.00	1.00	5.00	1.142	0.571	-1.297	4	1.352
QGR_1	310	2.97	3.00	3.00	1.00	5.00	1.267	-1.019	0.090	4	1.566
QGR_2	310	2.76	3.00	3.00	1.00	5.00	1.279	-1.006	0.187	4	1.738
QGR_3	310	2.87	3.00	2.00	1.00	5.00	1.362	-1.199	0.118	4	1.364
QGR_4	310	2.88	3.00	3.00	1.00	5.00	1.341	-1.182	0.039	4	1.631
QGR_5	310	2.94	3.00	1.00	1.00	5.00	1.475	-1.382	0.094	4	1.607

Source: Author's calculation using SmartPLS3.3

VIF Variance Inflation Factor

The range of a set of data is the difference between the largest and smallest values, that means the result of subtracting the sample maximum and minimum. Being the difference between the largest value and the smallest value in a dataset, range is the simplest measure of variability in data, that is determined by only the two extreme data values. All we know is that higher ranges indicate higher data variability. In this case, the range is the same for all variables. All the comments made with regard to the quantitative method remain valid here.

In Table 5.17, we also note that our sample contains no data with multicollinearity issues, since both outer and inner VIF values, that is, variable-by-variable and construct-by-construct remain below 3, the ideal limit for collinearity check.

5.10. Empirical Evidence on the Application of Porter's Diamond Model

Porter's Diamond Model creates a structure that determines the rules of competition. The examination of existing studies about the Model shows that by using Porter's Model, Sun et al. (2010) provided a new model, a slightly transformed Porter's Diamond Model, arguing that three (3) of the four (4) variables of the Diamond Model (Factor Conditions, Demand Conditions, Supporting and Related Industries), plus one of the exogenous factors (Government), have an influence in the competitiveness of a sector or industry, which is proxied by Firm Strategy, Structure and Rivalry.

The overwhelming majority of empirical studies on the determinants of a sector or industry competitiveness, such as Watchravesrinkan et al. (2010), Jin and Moon (2006), Prasad (2000), Prasad (2004), Dunning (1993), Ariyawardana (2001), Olmenda and Varela (2012), based their research work on the *qualitative approach*. The choice of qualitative research method stems from the fact that it is an *explanatory and unstructured methodology* based on the small samples that are meant to provide insights and understanding of the research problem situation (Malhorta & Dash, 2010).

There is also a non-negligible and growing number of studies, here represented by Shafaei (2009), Hoefer (2001), Sun et al. (2010), Mboya and Kazungu (2015), Bakan and Doğan (2012), and Dong and Zhang (2017), that based their research work on a *quantitative approach*.

Sun et al. (2010), and Hooper (2008) applied the Structural Equation Modelling (SEM), also called Simultaneous Equation Modelling (SEM), which is a multivariate or multi-equation regression model. Mboya and Kazungu (2015) applied a combination of Structural Equation Modelling (SEM) with the Linear Regression Analysis. Bakan and Doğan (2012), Dong and Zhang (2017), Shafaei (2009), and Sachitra and Kumarasinhe (2013) applied the Multiple Linear Regression Modelling.

After analysing all the pros and cons of each option of the research project, we decided to opt for the application of both *quantitative and qualitative methods in a sequential manner* to investigate the determinants of Export Competitiveness of Mozambique's Cashew Nut Industry. According to Amaratunga et al. (2002), the primary goal of a quantitative research project is to describe and understand the strength of the relationships in order to establish causal associations among objectively specified variables through testing hypotheses derived from predictive theories, find patterns or averages, test causal relationships, and generalise results, as contained and thoroughly explained therein.

In Sun et al.'s (2010) model, competitiveness is used as a representative of *Firm Strategy, Structure and Rivalry of the Diamond Model*. Thus, the major aim of this research is to test whether or not there is any influence of the variables (Factor Conditions, Demand Conditions, Supporting and Related Industries) in the Diamond Model developed by Porter plus Government, on competitiveness. The major source of inspiration for this work was Sun et al. (2010), who adapted Porter's Model, as displayed in Figure 5.5, which we borrowed and adapted to test its impact on the Export Competitiveness of Mozambique's Cashew Nut Industry.

According to Michael Porter (1980), a further analysis on the competitive advantage of countries can be achieved by assessing the resources and conditions in the national business setting where they operate, which links academic literatures in strategic management and international economics, thus laying the foundations for national policies on competitiveness, having later, in 1990, developed the Diamond Model in which he identifies four important resources for the national competitiveness, namely: factor endowment, market demand, relevant industry, and firm strategy and rivalry, which created a better understanding of competitiveness (Aires, 2016).

Given that the quantitative method, which we developed in the first place, is applied on a time series, as indicated earlier, there is a need to perform a number of tests prior to proceeding to any modelling, namely: time series stationarity, optimal lag selection, cointegration, linearity, multicollinearity, normality, stability, validity (autocorrelation and heteroskedasticity) and causality. After performing the necessary adjustments as suggested by test results, a decision was made concerning the research model to be used in both the quantitative and qualitative data. All these tests were performed using *Eviews12* statistical software.

5.11. The Research Model

The most critical contents of this section is the development of an integrative model that describes in the best possible way the relationship between the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), henceforth treated as the *endogenous construct*, a representation of Porter's Model determinant known as Firm Strategy, Structure and Rivalry with the other three Porter's Model determinants known as Factor Conditions (FC), Demand Conditions (DC), Supporting and Related Industries (SR) plus an exogenous factor, the Government (GR). These four variables are jointly treated as the *exogenous variables*.

After an extensive reading on regression models, and taking inspiration from: **i**) Bakan and Doğan (2012), in their paper "Competitiveness of the Industries Based on the Porter's Diamond Model: An Empirical Study", applied on textiles, food, kitchen equipment, and jewellery of Kahramanmaraş[26], Turkey, in which they used a Multiple Linear Regression Model; **ii**) Mboya and Kazungu (2015), in their paper entitled "Determinants of Competitive Advantage in the Textile and Apparel Industry in Tanzania: The Application of Porter's Diamond Model", in which they used a combination of a Linear Regression with PLS-SEM approach; **iii**) Vu and Pham (2016), in their paper called "A Dynamic Approach to Assess International Competitiveness of Vietnam's Garment and Textile Industry", in which they used a totally qualitative approach based on secondary data collected from various sources in Vietnam and internationally, and also combined a Multiple Linear Regression with PLS-SEM Models, we were inclined to apply a Multiple Linear Regression, one of the first generation techniques, such as regression-based approaches (multiple regression analysis, discriminant analysis, logistic regression, analysis of variance), and factor or cluster analysis, which belong to the core set of statistical instruments that can be used to either identify or confirm theoretical hypotheses based on the analysis of empirical data (Haenlein and Kaplan, 2004).

Many researchers in various disciplines have applied some of these methods to generate findings that have significantly shaped the way we see the world today, such as Spearman's (1904) work on general intelligence for psychology (factor analysis), Hofstede's (1983) publication on cross-cultural differences for sociology (factor and cluster analysis), and Altman's (1968) article on forecasting corporate bankruptcy for management research.

However, a common factor for all these methods is that they share three limitations, namely: **a**) The postulation of a simple model structure (at least in the case of regression-based approaches), with regard to which Jacoby (1978) stated that "we live in a complex, multivariate world, and studying the impact of one or two variables in isolation, would seem artificial and inconsequential" (p. 91). Although model building always implies omitting some aspect of reality (Shugan, 2002), this assumption of regression-based approaches may be too limiting for an analysis of more complex and more realistic situations, which becomes especially obvious when we want to investigate the potential effect of mediating or moderating variables[27] (Baron & Kenny, 1986); **b**) The assumption that all variables can be considered as observable in relation to which McDonald (1996) argued that a variable can be called observable "if and only if its value can be obtained by means of a real-world sampling experiment" (p. 239). Consequently, any variable that does not correspond directly to anything observable must be considered as unobservable (Dijkstra, 1983). This makes it obvious that only a handful of relevant variables, such as age and gender, can be considered as observable, whereas "the effects and properties of molecules, processes, genes, viruses, and bacteria are usually observed only indirectly" (S. Wold, 1993, p. 138); **c**) In view of the presumption on the existence of variables measured without error, we have to take into consideration that each observation of the reality is accompanied by a certain measurement error, which may comprise two parts (Bagozzi, Yi, & Philipps, 1991): a *random error* (e.g. caused by the order of items in a questionnaire or respondent fatigue; Heeler & Ray, 1972); and a *systematic error* (e.g. variance attributable to the measurement method rather than the construct of interest; Bagozzi et al., 1991). Because the observed score of an item is always the sum of three parts, namely, the true score of the variable, the random error, and the systematic error (Churchill, 1979), first-generation techniques are only applicable when there is neither a systematic nor a random error component, which is an extremely rare situation in the real world, in fact, a non-existent reality.

Recalling that the time series dataset used for estimating the *quantitative model* was subject to a number of tests, such as stationarity test (unit root test), optimal lag length selection, cointegration test leading us to conclude that the time series under consideration was non-stationary in levels, but it became stationary after first differencing, which implies that it is integrated of order 1, that is I(1), and that it did not have any cointegrating vector, meaning that we only needed to estimate the short-run model using an appropriate technique. A Multiple Linear Regression Model was considered the most appropriate. Since the Johansen cointegration test results detailed in Section 5.5.3 of Chapter 5 suggested, in terms of both the Trace and the Maximum Eigenvalue Statistics, that there was no cointegration at 0.05 significance level, meaning that there was no long-term relationship among the variables, implying that only the short-term model needed to be estimated using the most appropriate technique. In view of these facts, it became only obvious and logical that the research model to be used was a Vector Autoregressive (VAR) Model to estimate the Multiple Linear Regression. The Model was then formulated as Equations (1) and (2) in the same Section 5.5.3 of Chapter 5, and additional tests were carried out on the longitudinal dataset, which generated the expected satisfactory results, as detailed in Sections 5.5.4 to 5.5.8, namely: linearity test, multicollinearity test, model stability test, model validity diagnostic tests (autocorrelation, normality, heteroskedasticity) and Granger causality test, leading to a position where all the assumptions for the use of VAR Model were met.

In spite of this result, we could not take the liberty to proceed with the use of a Multiple Linear Regression, neither for the quantitative nor for the qualitative methods, taking into account that our model has for endogenous and exogenous variables five (5) constructs made up from a combination of sixteen (16) archival observable variables in growth index format for a period of 20 years (2000-2019) for the quantitative method, and twenty-one (21) factors collected through 310 survey responded questionnaires, all grouped around the four (4) Diamond Model determinants plus Government. The only possibility of proceeding with a Multiple Linear Regression Model would be by treating the 16 and the 21 factors as model variables, which would be not only an over specified model, but would also make it impossible to evaluate the impact of the Diamond Model determinants on the Export Competitiveness of Mozambique’s Cashew Nut Industry. We were, therefore, left with the only option of applying a Structural Equation Modelling (SEM), using Partial Least Squares (PLS) that many prominent researchers have acknowledged its value as an SEM technique (Petter, 2018), and additional reasons that substantiate this option can be found in the next few pages.

The data on the quantitative dataset are constructs, unobservable variables built upon a series of 16 observable ones grouped around Porter’s Diamond Model determinants and Government. This implies that a linear regression under these circumstances would yield meaningless results. Literature strongly suggested the use of the Partial Least Squares Structural Model (PLS-SEM), as it is more suitable for the complexity of the model in presence. Literature review on the model provided relevant information on two aspects: PLS-SEM can be used to process qualitative data, longitudinal data (Avkiran and Ringle, 2018), and constructs. PLS-SEM is very suitable for exploratory research with secondary data, because it offers the flexibility needed for the interplay between theory and data (Nitzl, 2016).

Recently, it has been possible to note that in the CBS-SEM vs PLS-SEM debate (Rigdon et al., 2017; Rigdon, 2012), researchers have taken some steps forward by establishing PLS-SEM as a distinct method for analysing composite-based models, and by recommending that PLS-SEM should always be selected and applied when: **i**) The analysis is concerned with testing a theoretical framework from a prediction perspective; **ii**) The structural model is complex and includes many constructs, indicators or model relationships; **iii**) The research objective is to better understand increasing complexity by exploring theoretical extensions of established theories (exploratory research for theory development); **iv**) The path model includes one or more formatively measured constructs; **v**) The research consists of financial ratios or similar types of data artifacts; **vi**) The research is based on secondary or archival data, which may lack a comprehensive substantiation on the grounds of measurement theory; **vii**) The population restricts the sample size, although we know that PLS-SEM also works very well with large sample sizes; **viii**) Distribution issues are a concern, such as lack of normality; **ix**) The research requires latent variables score for follow-up analyses.

The Structural Equation Modelling (SEM) is a vast and diversified set of methods used by scientists in both experimental and observational research across the sciences (Boslaugh and McNutt, 2008), business (Shelley, 2006) and other fields, particularly in social and behavioural sciences. Given its high technicality, it is very difficult to define, and there are no neatly delimiting frontiers as to what is and what is not SEM (Curran, 2003), since it generally involves path models (path analysis) and measurement models (factor analysis) and always employs statistical models and computer programmes to investigate the structural connections between latent variables underlying the actual variables taken from observed data (Kline, 2016).

The SEM toolkit includes confirmatory factor analysis, confirmatory composite analysis, path analysis, multi-group modelling, longitudinal modelling, partial least squares path modelling, latent growth modelling and hierarchical or multi-level modelling (Kline, 2016). The use of SEM is commonly justified in the social sciences because it is a way of identifying latent variables that are believed to exist, but cannot be directly observed in reality (Kline, 2016; Bollen, 1989; Kaplan, 2009).

Concepts like human intelligence cannot be measured directly in the way that one could measure height or weight, and researchers had to find a theory and conceptualisation of intelligence and then design measurement instruments such as a questionnaire or test that provides them with multiple indicators of intelligence. These indicators are then combined in a model to create a plausible way of measuring intelligence as a latent variable (circles) from the indicators (square boxes with scale) (Salkind, 2007). In SEM diagrams, latent variables are commonly shown as ovals or circles and observed variables as rectangles.

A great advantage of SEM is that all of these measurements and tests occur simultaneously in one statistical estimation procedure, where the errors throughout the model are calculated using all information from the model. This means the errors are more accurate than if a researcher were to calculate each part of the model separately. SEM, introduced by Jöreskog (1973), particularly suited to cases where we constructs are measured by a very big number of indicators and where maximum likelihood covariance-based SEM tools reach their limit.

These first-generation techniques limitations can be overcome by using the Structural Equation Modelling (SEM), which, compared to regression-based approaches that analyse only one layer of linkages between independent and dependent variables at the same time, SEM, as a second-generation technique, allows the simultaneous modelling of relationships among multiple independent and dependent constructs (Gefen, Straub, & Boudreau, 2000). Therefore, we no longer differentiate between dependent and independent variables but distinguish between the exogenous and endogenous latent variables, the former being variables which are not explained by the postulated model (i.e. act always as independent variables) and the latter being variables that are explained by the relationships contained in the model (Diamantopoulos, 1994, pp. 108).

SEM enables the researcher to construct unobservable variables measured by indicators (also called items, manifest variables, or observed measures) as well as to explicitly model measurement error for the observed variables (Chin, 1998a), and hence it overcomes the limitations of first-generation techniques. With it, the researcher gains the flexibility to "statistically test *a priori* substantive assumptions against empirical data (Chin, 1998a).

With SEM it is possible to construct a research model that represents a certain theory, simply by converting theoretical and derived concepts into unobservable (latent) variables, and empirical concepts into indicators, which are linked by a set of hypotheses (representing either non-observational hypotheses, theoretical definitions, or correspondence rules). This model can then be represented graphically by a path diagram (also called an arrow scheme), which shows how the various elements relate to one another (Diamantopoulos, 1994).

As Bagozzi (1984) emphasised, there are three different types of unobservable variables: **a**) Variables that are unobservable in principle; **b**) Variables that are unobservable in principle but either imply empirical concepts or can be inferred from observations (e.g. attitudes, which might be reflected in evaluations); **c**) Unobservable variables that are defined in terms of observables. Because none of these types can be measured directly, the researcher needs to measure indicators instead, which cover different facets of the unobservable variable. In general, indicators can be split into two groups: **a**) *Reflective* indicators that depend on the construct and **b**) *Formative* ones (also known as cause measures) that cause the formation of or changes in an unobservable variable (Bollen & Lennox, 1991).

The Partial Least Squares (PLS) technique was first introduced by H. Wold (1975), focusing on the maximisation of the variance of the dependent variables explained by the independent ones instead of reproducing the empirical covariance matrix. This model later evolved to Partial Least Squares Structural Equation Modelling (PLS-SEM; Hair et al. 2011).

PLS-SEM estimates the parameters of a set of equations in a structural equation model by combining Principal Components Analysis (PCA) with regression-based path analysis (Mateos-Aparicio, 2011). PLS-SEM enjoys a widespread popularity in a broad range of disciplines including accounting (Lee et al., 2011; Nitzl, 2016), group and organisation management (Sosik et al., 2009), hospitality management (Ali et al., 2017) international management (Richter et al., 2016a), operations management (Peng and Lai, 2012), management information systems (Hair et al., 2017a; Ringle et al., 2012), marketing (Hair et al., 2012b), strategic management (Hair et al., 2012a), supply chain management (Kauman and Gaeckler, 2015), and tourism (do Valle and Assaker, 2016). Our research can fit perfectly in the category of strategic management. The main reason for PLS-SEM's attractiveness is that the method allows researchers to estimate very complex models with many *constructs* and *indicator variables*, especially when prediction is the goal of the analysis. PLS-SEM generally allows for much flexibility in terms of data requirement and the specification of relationships between constructs and indicator variables. Another reason is the accessibility of easy-to-use software with graphical user interface such as PLS-Graph, SmartPLS, WarpPLS, and XLSTAT. We have chosen to use SmartPLS 3.3.9.

A path model is a diagram that displays the hypotheses and variable relationships to be estimated in an SEM analysis (Bollen, 2002). Constructs, also referred to as latent variables, are elements in statistical models that represent conceptual variables that researchers define in their theoretical models, and they are visualised in circles or ovals in path models, linked via single-headed arrows that represent predictive relationships. The indicators, often called manifest variables or items, are directly measured or observed variables that represent the raw data. They are indicated as rectangles in path models and are linked to their corresponding constructs through arrows.

A path model consists of two elements, namely: the structural model or inner model that represents the structural paths between the constructs; and the measurement model or outer model that represents the relationships between each construct and its associated indicators. The location and sequence of the constructs are based on theory and the researcher's experience and accumulated knowledge (Falk and Miller, 1992). When researchers develop path models, the sequence is typically from left to right. The latent variables on the left-hand-side of the model are independent variables, and any latent variable on the right-hand-side is the dependent variable (see Figure 5.6 for the quantitative method and Figure 5.10 for the qualitative method). Latent variables may also serve as both and independent and dependent variable in the model (Haenlein and Kaplan, 2004). When a latent variable only serves as an independent variable, it is called an exogenous latent variable (FC, DC, SR, and GR). When a latent variable only serves as a dependent (EC), it is called an endogenous latent variable. The strength of the relationships between latent variables is represented by path coefficients (βs) and, in the case of the quantitative method, it is (SR=>EC = 0.262; FC=>EC = -0.052; DC=>EC = 0.482; GR=>EC = 0.089), and in the case of the qualitative method they are (QSR=>QEC = 0.142; QGR=>QEC = 0.217; QFC=>QEC = 0.265; QDC=>QEC = 0.251). These path coefficients (βs) are the result of regressions of each endogenous latent variable on their direct predecessor constructs.

Inasmuch as measurement theory is concerned, researchers can choose between two different models (Diamantopoulos and Winklhlofer, 2001; Coltman et al., 2008), namely: reflective measurement model and formative measurement model where the former has direct relationships flowing from the construct to the indicators and treats the indicators as error-prone manifestations of the underlying construct (Bollen, 1989), while in the latter (formative), a linear combination of a set of indicators forms the construct, that is, the relationship flows from the indicators to the construct. PLS-SEM applies a series of Ordinary Least Squares regressions, which estimate the model parameters such that they maximise the endogenous constructs' explained variance (e.g, their R^2 values). Our models for this research are reflective, since the combination flows from the constructs to the elements in both models. We first defined the constructs and then the factors that could fit in each one of the constructs.

The PLS-SEM method is very appealing to many researchers as it enables them to estimate complex models with many constructs, indicator variables and structural paths without imposing any distributional assumptions on the data. PLS-SEM is a causal-predictive approach to SEM that emphasises prediction in estimating statistical models, whose structures are designed to provide causal explanations (Wold, 1992; Sarstedt et al., 2017a), unlike the first-generation regression analyses where we need to run a Granger type of causality tests.

Inasmuch as the statistical power is concerned, when using PLS-SEM, researchers benefit from the method's greater power compared to factor-based SEM, even when estimating data generated from a common factor model population. Given its greater statistical power, the PLS-SEM method is more likely to identify any effect as significant when it is indeed significant, which makes this method particularly suitable for exploratory research settings where theory is less developed, and the goal is to reveal strong effects (Chin, 2010).

PLS-SEM works efficiently with small sample sizes when models are complex (Fornell and Bookstein, 1982; Willaby et al., 2015). According to Reinartz et al. (2009), Henseler et al. (2014), and Sarstedt et al. (2016b), PLS-SEM provides helps find solutions when other methods are divergent, or develop inadmissible solutions, regardless of whether using common factor or composite model data. Hair et al. (2013, pp. 2) note that "some researchers abuse this advantage by relying on extremely small samples relative to the underlying population" and that "PLS-SEM has an erroneous reputation for offering special sampling capabilities that no other multivariate analysis tool has" (also see Marcoulides et al., 2009). No statistical method, including PLS-SEM, can offset a badly designed sample (Sarstedt et al., 2017).

To determine the necessary sample size, researchers should run power analyses that take into account the model structure expected effect sizes and significance level (e.g., Marcoulides and Chin, 2013) and provide power tables for a range of path model constellations. Kock and Hadaya (2017) suggest two new methods for determining the minimum sample size in PLS-SEM applications. Anyway, with sample sizes of 80 observations for the quantitative method, and 310 observations for the qualitative method it is possible to run a non-erroneous PLS-SEM, as explained before.

With regard to the goodness-of-fit, PLS-SEM doesn't have an established measure, which makes some researchers believe that the use of this method for theory testing or confirmation is limited (Westland, 2015).

In recent years, we notice a growing tendency towards re-examining goodness-of-fit measures proposed in the early days of PLS-SEM (Lohmöller 1989) or suggesting new ones, which results in the broadening of the method's applicability (Henseler et al., 2014; Dijkstra and Henseler, 2015a).

Several notes of caution are important regarding the use of goodness-of-fit measures in PLS-SEM, especially that literature casts doubt on whether measured fit is a relevant concept for PLS-SEM (Hair et al. 2017b; Rigdon 2012; Lohmöller 1989). Explanation and prediction are two distinct concepts of statistical modelling and estimation. "In explanatory modelling the focus is on minimising bias to obtain the most accurate representation of the underlying theory. Predictive modelling seeks to minimise the combination of bias and estimation variance, occasionally sacrificing theoretical accuracy for improved empirical precision" (Shmueli 2010, p. 293). Correspondingly, a grossly mis specified model can yield superior predictions whereas a correctly specified model can perform extremely poor in terms of prediction. Researchers using PLS-SEM overcome this seeming dichotomy between explanatory and predictive modelling since they expect their model to have high predictive accuracy, while also being grounded in well-developed causal explanations. Gregor (2006, pp. 626) refers to this interplay as explanation and prediction theory, noting that this approach "implies both understanding of underlying causes and prediction, as well as description of theoretical constructs and the relationships among them." Hence, validation using goodness-of-fit measures is also relevant in a PLS-SEM context but less so compared to factor-based SEM. Instead, researchers should primarily rely on criteria that assess the model's predictive performance (e.g., Rigdon 2012, 2014b).

After the acquaintance about the benefits of using PLS-SEM, new inspiration sources were sought for, in order to substantiate the decision, having read works done by a number of prominent researchers, namely: **i**) Estêvão et al. (2018), in their paper "Tourism Sector Competitiveness in Portugal: Applying Porter's Diamond", in which they used a quantitative approach based on qualitative data collected through a questionnaire survey, and applied PLS-SEM approach; **ii**) Sun et al. (2010), in their paper "Empirical Research on Competitiveness Factors: Analysis of Real Estate

Industry of Beijing and Tianjin", in which they used a Structural Equation Modelling option; **iii**) Sachitra and Kumarasinghe (2016) in their paper entitled "An Empirical Study on Tea Export Competitiveness in Sri Lanka, Based on Partial Least Squares – Structural Equation Model (PLS-SEM)".

Regression analysis, be it with the use of the first-generation techniques or the second-generation ones, helps in predicting the value of a dependent variable based on the values of the independent variables. In that process there are three critical concepts that seem to be kept off focus when we use PLS-SEM modelling, namely: the constant term, the coefficient of determination, and the F-test.

In the traditional regression models, the constant term, also known as the Y-intercept, seems to be such a simple concept or even a meaningless one, but it is paradoxically crucial to include it in most regression models. It is simply the value at which the fitted line crosses the ordinate axis (Y-axis). The constant term, intercept, or simply the constant is the expected mean value of the dependent variable (Y) when all the independent variables (Xs) are equal to zero. In some regression analyses, the regression model only becomes significant when the intercept is removed, despite some misconceptions that need to be avoided, such as that it is necessary to remove the intercept in order to improve model significance or to increase the value of R^2 or that of F-ratio. Simply put, the constant term is said to cover all factors impacting on the dependent variable that have not been covered by the selected independent or explanatory variables.

In PLS-SEM analysis the use of this concept is not so obvious, but that doesn't mean it is completely deleted neither from our reasoning nor from our models. In PLS-SEM modelling we use sofwares such as SmartPLS for processing, which work with standardised variables and, in this way, the constants are set to zero. One idea to clarify this would be to copy and paste the unstandardised latent variable scores to Excel or SPSS and compute the regression there. The standardised results (βs) would be slightly different from the path coefficients (βs) that we get from SmartPLS. If we copy the unstandardised latent variable scores from the IPMA (Importance Performance Map Analysis) into SPSS or Excel, or any other software that can run a traditional regression analysis, we should get the same results for the path coefficients (βs) as in IPMA, but this time, we also get the intercept or constant term (Beker, 2006). This concept cannot be ignored or forgotten in our regression analysis.

The coefficient of determination, denoted by R^2 and analysed in a more detailed way in Section 6.1.3 of Chapter 6, is the key output which any statistician or analyst sees after running the regression analysis.

The F value is the ratio of the mean regression sum of squares divided by the mean error sum of squares, whose value ranges from zero to an arbitrarily large number, and its *p*-value or the value of Prob (F) is the probability that the null hypothesis (H_0), that all of the model regression coefficients are equal to zero. This is basically like the F-test is comparing a model with zero predictor variables (the intercept-only model) and is deciding whether the addition of coefficients brings any improvement to the model.

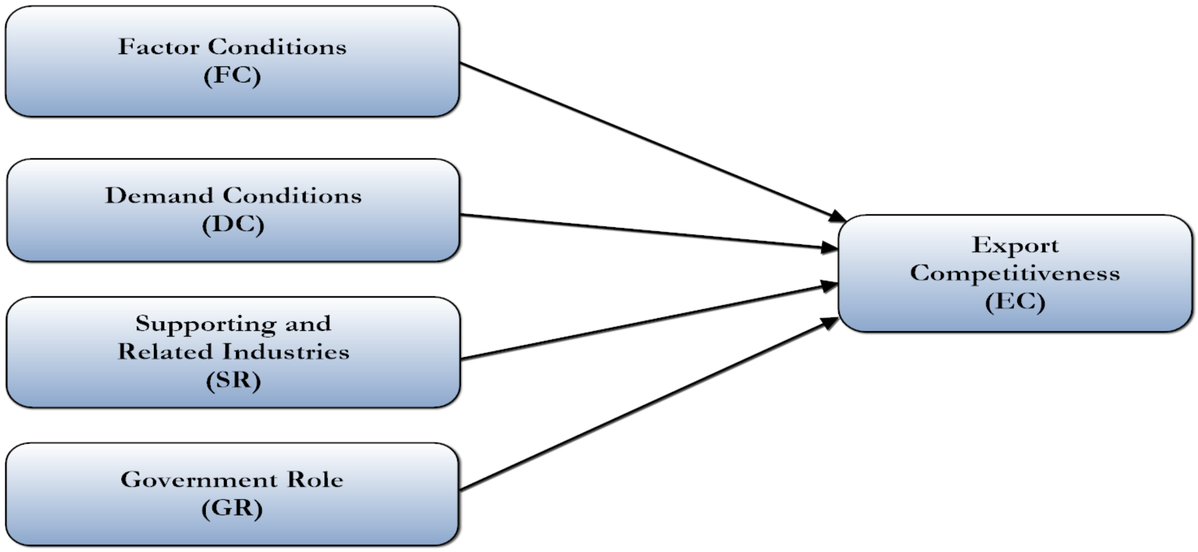
In general, an F-test in a regression compares the fits of different linear models. Unlike the t-tests that can assess only one regression coefficient at a time, the F-test can assess multiple coefficients simultaneously. The F-test of the overall model significance is a specific form of the F-test, in the sense that it compares an intercept-only model to the model that we decide to specify. The hypothesis testing for the F-test of the overall model significance is as follows: Null hypothesis (H_0) that the fit of the intercept-only model and that of our model are equal, against the alternative hypothesis (H_A) that the fit of the intercept-only model is significantly reduced compared to our model.

If the *p*-value for the F-test of overall model significance test is lower than our significance level, we do reject the null-hypothesis (H_0) and conclude that our model provides a better fit than the intercept-only model. In general, if we don't have any significant *p*-values for the individual coefficients in our model, the overall F-test won't be significant either. However, in a few cases, the tests could yield different results. For example, a significant overall F-test could determine that the coefficients are *jointly* not all equal to zero, while the tests for individual coefficients could determine that all of them are *individually* equal to zero.

In the intercept-only model, all of the fitted values equal the mean of the response or dependent variable. Therefore, if the *p*-value of the overall F-test is significant, our regression model predicts the response or dependent variable better than the mean of the response. While the R^2 provides an estimate of the strength of the relationship between our model and the response variable, it does not provide a formal hypothesis test for this relationship. The overall F-test determines whether this relationship is statistically significant. If the *p*-value for the overall F-test is lower than our significance level, we conclude that the R^2 value is significantly different from zero.

Inspired by Sun et al. (2010), the standard Porter's Diamond Model was slightly adjusted, as contained in Figure 5.5, where one of the four (4) determinants of Porter's Diamond Model has become the representative of Competitiveness and is treated as the dependent variable, and the Government, one of the exogenous factors in Porter's Diamond Model has become one of the independent variables, together with the other three Diamond Model factors, given that Government action is expected to have a very strong impact (positive or negative) on the level of Competitiveness in any country.

Figure 5. 5: The Modified Porter's Diamond Research Model



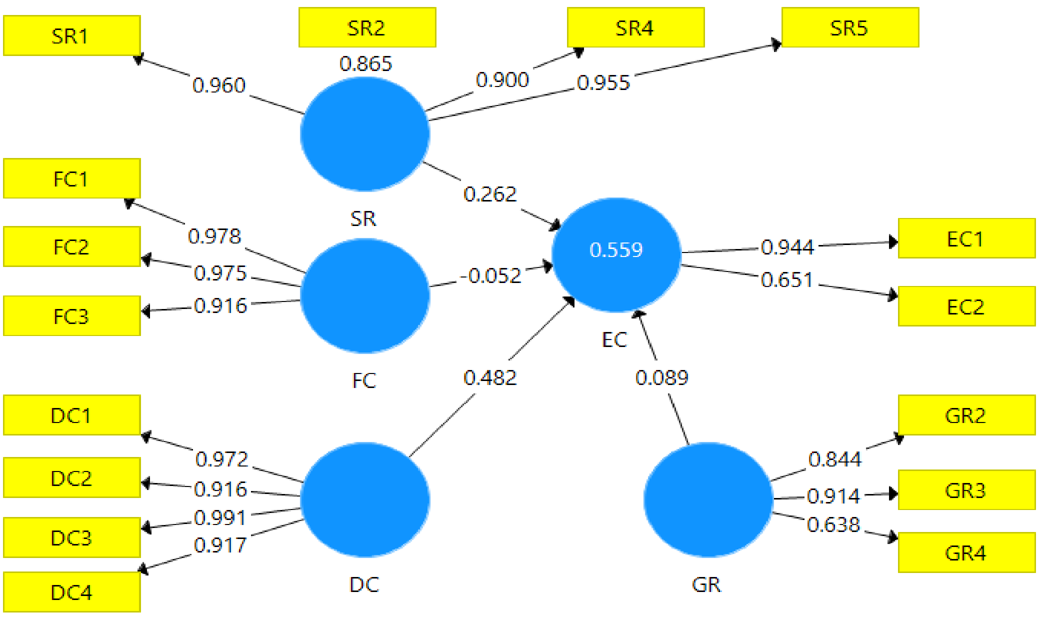
Source: Author's Adaptation from Sun et al. (2010), pp. 243

In order to determine whether the adapted model can effectively generate any relationship between the exogenous variables (Factor Conditions, Demand Conditions, Supporting and Related Industries, and the Government) with the Export Competitiveness of Mozambique's Cashew Nut Industry, a PLS-SEM modelling technique was used to build the new Latent Variables, on the basis of the 16 retained indicators contained in Table 5.4 for the quantitative method, the 21 retained indicators contained in Table 5.15 for the qualitative method on which a *Reflective Model* was run with *no mediation and no moderation*[28]. In the use of PLS-SEM, we have followed a multi-stage process that involves the specification of the inner and outer models, data collection and examination, the actual model estimation, and the evaluation of results (Hair et al., 2014). In the model specification stage, we dealt with the set-up of the inner and outer models, where the former, also known as the structural model, displays the relationships between the constructs under evaluation, while the latter, also known as the measurement model, was used to evaluate the relationships between the indicator variables and their corresponding or parent constructs.

5.11.1. PLS-SEM Model Applied to the Quantitative Dataset

In view of the decision to apply PLS-SEM Model for the determination of the nature of relationship between Factor Conditions (FC), Demand Conditions (DC), Supporting and Related Industries (SR), and Government (GR) with the Export Competitiveness (EC) of Mozambique's Cashew Nut Industry, a new set of Latent Variables (constructs) was built from the 26 observable variables shown in Table 5.4. Having set 0.6 as the cut-off level for the factor loadings (Gefen and Straub, 2005), 8 factors with loadings lower than the cut-off level were dropped. During the check on discriminant validity under the cross-loadings criterion, two (2) additional factors found to be loading on other constructs better than on their parent constructs, and therefore, classified as cross-loadings and consequently deleted, as explained in Section 5.7.1. After the deletion, we have come to a total of 10 factors dropped from Table 5.1, resulting in the retention of only 16 indicators, as contained in Tables 5.4 and 5.18, and Figure 5.6. It is worth noting that Figure 5.6 was obtained from the Reflective Model that was subsequently run with no mediation and no moderation. Despite the fact that PLS-SEM does not require any minimum number of factors per construct, to the point of accepting single-factor constructs, unlike CB-SEM that requires a minimum of 3 factors per construct (Hair et al., 2014), we were concerned at the realisation that, for example, FC went down from 5 to 3 indicators, DC and SR from 7 to 4 indicators. Therefore, we decided to look into other options for dealing with cross-loadings. We firstly looked into the fact that the term cross-loading stemmed from the idea that one variable has moderate-size loadings on several factors, all of which are significant, which makes it troublesome to label all the factors which are sharing the same variable and thus hard to make those factors be distinct and represent separate concepts.

Figure 5. 6: The Measurement Model for the Quantitative Method



Source: Author's calculations using SmartPLS 3.3.9

A loading is considered significant (over a certain threshold) depending on the sample size needed for significance (Hair et al., 2009). For a sample size of 80 observations, a loading of 0.56 or higher is significant, and therefore, all the loadings in our model, based on the retained 16 indicators, are significant. The ultimate goal is to reduce the number of significant loadings on each row of the factor matrix and make each variable associate with only one factor. The solution is to try different rotation methods to eliminate any cross-loadings and thus define a simpler structure. If the cross-loadings persist, they become candidates for deletion. Another approach is to examine each variable's communality to assess whether the variables meet acceptable levels of explanation. All variables with communalities less than 0.50 are viewed as insufficient. In our case, all the communalities are greater than this threshold. After having tried all alternative solution with no success, we were left with no other option but to delete them (Hair et al., 2009).

Table 5. 18: Factor Loadings, Reliability and Validity (Quantitative Dataset)

	Constructs and Factors	λ (loadings)	Cronbach's alpha	CR	AVE	Outer VIF	Inner VIF
Nº	**Factor Conditions (FC)**		0.954	0.970	0.915		1.7
1	FC_1: Growth rate of worker's wages in the cashew nut industry	0.978				10.2	
2	FC_2: Growth rate of worker and labourers in the cashew nut industry	0.975				10.4	
3	FC_3: Growth of labour productivity in the cashew nut industry	0.916				3.6	
	Demand Conditions (DC)		0.963	0.973	0.902		4.4
1	DC_1: Growth of total population in 10^6 inhabitants	0.972				36.2	
2	DC_2: Growth of GDP	0.916				5.4	
3	DC_3: Growth of GDP per capita	0.991				61.5	
4	DC_4: Growth of education index	0.917				5.1	
	Supporting and Related Industries (SR)		0.946	0.957	0.848		1.8
1	SR_1: Growth of in-shell cashew nut exports	0.960				15.5	
2	SR_2: Growth of volume of cargo transported by rail in 10^6 ton-km	0.865				7.1	
4	SR_4: Growth of ICT development index	0.900				2.9	
5	SR_5: Growth of air transport in terms of registered carrier departures worldwid	0.955				17.1	
	Competitiveness of the Cashew Nut Industry (EC)		0.534	0.788	0.658		-
1	EC_1: Growth of the intensity of local competition	0.944				1.2	
2	EC_2: Growth of market share of the country in cashew kernel global market	0.651				1.2	
	Government Role (GR)		0.743	0.846	0.651		3.8
2	GR_2: Growth of VAT collections	0.844				1.7	
3	GR_3: Growth of corporate tax collections	0.914				1.7	
4	GR_4: Growth of public service employee's costs	0.638				1.3	

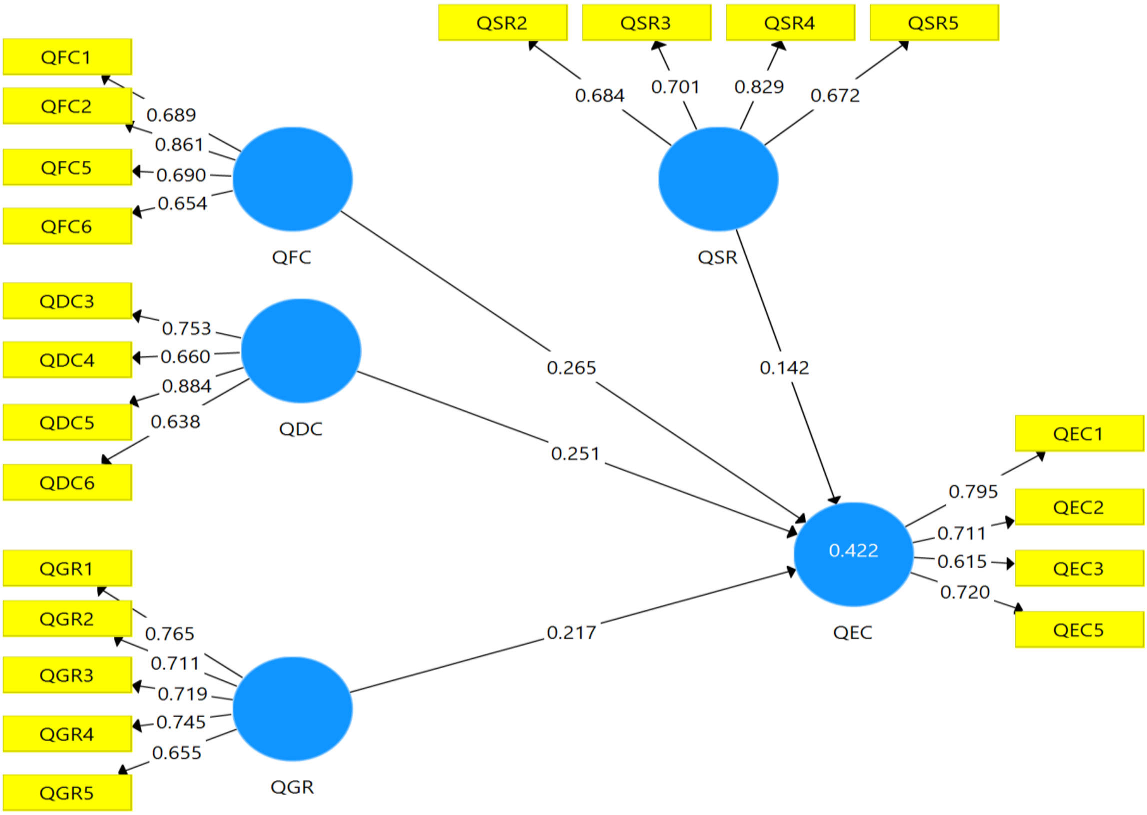
Source: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorova (2010) William & Morgan (2010), and Son & Kenji (2013)

5.11.2. PLS-SEM Model Applied to the Qualitative Dataset

A sample of 310 survey questionnaire responses was received and processed in accordance with the research, using PLS-SEM to build a new set of Latent Variables (constructs) from the list of 30 indicators measured on a 5-point Likert scale, as listed in Table 5.12. Having set 0.6 as the cut-off level for the factor loadings (Gefen and Straub, 2005), 9 factors were deleted for having loadings that were lower than the cut-off level, resulting in the retention of 21 indicators, as contained in Tables 5.15 and 5.19, as well as in Figure 5.7.

Unlike in the case of the quantitative method, during the check on discriminant validity under the cross-loadings criterion, no factor was identified as cross-loading, and therefore, there were no further deletions. Subsequently, a Reflective Model was run with no mediation and no moderation, which resulted in Figure 5.7 and Table 5.19.

Figure 5.7: The Measurement Model for the Qualitative Method



Source: Author's calculations using SmartPLS 3.3.9

According to Hair et al., 2019), a 0.30 loading factor needs a sample size of 350, while a 0.35 loading factor needs a sample size of 250 observations to be significant. In line with this reasoning, for a sample size of 310 observations a loading factor of around 0.32 and up would be significant. Therefore, all the loadings in our model, based on the retained 21 factors, are significant, as displayed in Figure 5.7, and Table 5.19.

For the ease and convenience of reading, comparison and understanding, as far as the use of PLS-SEM model is concerned, we found it more practical and user friendly to conduct the measurement phase in a separate and sequential manner for the quantitative and the qualitative methods. After finding that both models generated satisfactory results, we have decided to move to the next chapter where the results are presented and discussed in a combined manner. So, the PLS-SEM model assessment phase for both methods was conducted in Chapter 6. We were aware of the challenges confronting combined research methodologies. Brewer and Hunter (2006) sustain the view that the mixed methods research tradition is less well known than quantitative or qualitative traditions because it has emerged as a separate orientation only during the past 20 years. Mixed methodologists present an alternative to the quantitative and qualitative by promoting and defending the use of any methodological tools are required to answer the research question under study. Throughout the 20th century, social and behavioural scientists frequently employed mixed methods in their studies, and they continue to do so in the 21st century (Maxwell and Loomis, 2003; and Teddie and Tashakkari, 2003). Among the challenges surrounding the combined approach such as the need to determine a balanced definition of weights to attach each dataset, the sequence of data collection and analysis, at what stage the quantitative and qualitative approaches should be integrated (Creswell, 2003; 2011), and what happens if the quantitative and the qualitative components lead to two totally different conclusions, we decided to embark on a combined quantitative and qualitative research approach, for the assessment of PLS-SEM model whose choice was based on the fact that it is well enhanced to be used as a research tool in strategic management, marketing and other social spheres (Hair, Ringle, & Sarstedt, 2011; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014: Reinartz, Haelein, & Henseler, 2009).

At the time we decided to embark upon a joint assessment we had the perception that the pros weighed more than the cons, and it has paid off since the results presented in Chapter 6 point to an advantage of using both methods and arriving at largely converging research outcomes. The conclusions and recommendations are also done jointly in Chapter 7.

Table 5. 19: Factor Loadings, Reliability and Validity – Qualitative Dataset

	Constructs and Factors	λ (loadings)	Cronbach's alpha	CR	AVE	Outer VIF	Inner VIF
Nº	**Factor Conditions (QFC)**		0.697	0.817	0.530		2.1
1	QFC_1: Availability of raw materials	0.978				1.4	
2	QFC_2: Quality of raw materials	0.975				2.0	
5	QFC_5: Energy supply conditions	0.690				1.3	
6	QFC_6: There are enough specialised professionals in the cashew nut industry	0.654				1.2	
	Demand Conditions (QDC)		0.732	0.827	0.548		2.9
1	QDC_3: The changing level of total demand into the international demand	0.753				1.4	
4	QDC_4: There is cooperation between public and private sectors in the cashew indust	0.660				1.5	
5	QDC_5: The company contributes to the development of the country	0.884				1.8	
6	QDC_6: Service efficiency level after sales	0.638				1.4	
	Supporting and Related Industries (QSR)		0.696	0.814	0.525		1.9
2	QSR_2: The general quality of life easily retains employees in the cashew nut industry	0.684				1.4	
3	QSR_3: Relations with the higher education institutions	0.701				1.3	
4	QSR_4: The labour legislation regulating the cashew nut industry proves motivatnig	0.829				1.6	
5	QSR_5: The level of joint marketing studies with the other organisations	0.655				1.2	
	Competitiveness of the Cashew Nut Industry (QEC)		0.674	0.804	0.509		-
1	QEC_1: Qualifications of cashew nut suppliers	0.795				1.5	
2	QEC_2: Competitiveness of suppliers in the market	0.711				1.3	
3	QEC_3: Level of competition between local competitors in the cashew nut industry	0.615				1.2	
5	QEC_5: Companies openly share information	0.720				1.3	
	Government Role (QGR)		0.775	0.843	0.519		1.2
1	QGR_1: Corporate tax regime favours growth and consolidation of companies	0.765				1.5	
2	QGR_2: The impact of the Value Added tax regime favours industry development	0.711				1.6	
3	QGR_3: The level of incentives stimulate investiments and industry growth	0.719				1.3	
4	QGR_4: Level of doing business environment attracts new cashew processors	0.745				1.6	
5	QGR_5: Level of informal economy benefits the expansion of cashew kernels sales	0.655				1.4	

Source: Author, based on Rugman & Verbeke (1993), Sardy & Fetscherin (2009), Balcorova (2010) William & Morgan (2010), and Son & Kenji (2013)

CHAPTER 6

RESEARCH FINDINGS AND DISCUSSION

6.1. Quantitative Method

6.1.1. Correlation Matrix Analysis

Given the ease of reading, comparison, and understanding, the initial sections method result assessment continued to be performed separately between the quantitative and the qualitative methods. The joint analysis starts in Section 6.3, and continues onto the end of Chapter 6, and onto Chapter 7. The first step of the assessment segment starts with the quantitative method construct correlation matrix analysis.

Correlation analysis is an activity that aims to determine the degree of association between variables, where there is no discrimination between dependent and independent variables, and all variables are treated as random or stochastic variables. A correlation matrix is simply a table that displays the correlation, and it is a measure that is best used in variables that demonstrate a linear relationship between each other (Tim Bock, 2018), as shown in Table 6.1. It consists of rows and columns that show the variables, arranged in a cross-sectional way, that is, variables are arranged in a horizontal and vertical way. Each cell in a table contains the correlation coefficient. Usually, in statistics, we measure four (4) types of correlations: **i**) Pearson Correlation; **ii**) Kendall Rank Correlation; **iii**) Spearman Correlation, and **iv**) Point-Biserial Correlation. Pearson and Spearman Correlations are roughly the same, but Kendall is very much different, because it is a test of strength of dependence (one could be written as a linear function of the other), while Pearson and Spearman are nearly equivalent in the way they correlate normally distributed data. Another difference is that Pearson works with raw data values of the variables whereas Spearman works with rank-ordered variables. In most of the abundant literature on this topic, we can find three possible results of a correlational study: **i**) A positive correlation; **ii**) A negative correlation; **iii**) A no correlation.

A perfectly positive correlation means that 100% of the time, the variables in question move together by the exact same percentage and direction, which can be seen between the demand for a product and the product's associated price. Negative correlation means that in a relationship between two variables, one variable increases as the other decreases, and vice versa, implying that the relationship that exists between the two variables is exactly opposite all of the time.

The correlation coefficient measures how strong the relationship between the relative movements of two variables is. Correlation coefficients range from -1 to +1. A correlation of -1 means that there is a perfectly negative correlation, meaning that as one variable goes up, the other goes down.

A correlation of +1 shows that there is a perfectly positive correlation, meaning that both variables move in the same direction together. Correlation coefficient values approaching -1 are said to be strongly negative correlations, and correlation values approaching +1 are said to be strongly positive correlations. For values approaching zero we say they are weak positive or negative correlations. In sum, when the coefficient value is between ±0.5 and ±1, it is said to be a strong correlation. If the coefficient value lies between ±0.30 and ±0.49, then it is said to be a moderate correlation. When the correlation coefficient value lies below +0.29, then it is said to be a low correlation, and for coefficient value equal to zero, we say there is no correlation.

The hypothesis testing would be as follows: Null hypothesis (H_0): The population correlation coefficient is not substantially and significantly different from zero, implying that there is no significant linear relationship (correlation) between X and Y in the population, against the alternative hypothesis (H_A) that the population correlation coefficient is significantly different from zero, implying that there is a significant linear relationship (correlation) between X and Y in the population. The *decision rule* is: if the *p*-value of the calculated correlation coefficient is lower than the significance level (usually 0.05), the null hypothesis (H_0) is rejected and the alternative hypothesis (H_A) is accepted, meaning that there is enough evidence to conclude that there is a significant linear relationship (correlation) between X and Y, because the correlation coefficient is significantly different from zero.

Table 6. 1: Construct Correlation Matrix - Quantitative Method

Constructs	Descriptive Statistics		Pearson Correlation Matrix Coefficients				
	Mean	Standard Deviation	EC	DC	FC	GR	SR
EC	4.717	0.203	1.000				
DC	4.969	0.228	0.708 **	1.000			
FC	4.348	0.392	-0.312 **	-0.520 **	1.000		
GR	5.374	0.699	0.656 **	0.810 **	-0.244 **	1.000	
SR	4.655	1.072	0.548 **	0.484 **	0.047	0.626 **	1.000

Source: **Author's calculations SmartPLS 3.3.9**

**** Correlation Coefficient Significant at 0.00**

Table 6.1 is clearly illustrative of the type of relationship between the variables in the model under consideration, a Pearson’s correlation matrix, generated by SmartPLS 3.3.9 software. On Table 6.1, we note that the highest and statistically significant Pearson’s correlation coefficient was between the Government Role (GR) and Demand Conditions (DC), with the value of 0.810, and a *p*-value of 0.000, implying that the interaction between these two factors is very high. Therefore, irrespective of the role that each of them plays in the model, it is crucially important that they both be kept together, with a view to improving the strength of the model. Inasmuch as the impact of the explanatory variables on the performance of the endogenous variable (EC) is concerned, the least correlated variable is the Factor Conditions (FC) with a Pearson’s coefficient of -0.312, but it is statistically significant, with a *p*-value of 0.000<0.05. The highest Pearson’s correlation coefficient in the relation with the endogenous variable (EC) is with the Demand Conditions (DC), it is actually the best in the entire model, with a Pearson’s correlation coefficient of 0.708, and a *p*-value of with a *p*-value of 0.000<0.05. The second-best correlation of an exogenous variable with the endogenous variable (EC), that is, the second strongest Pearson's correlation coefficient is with the Government Role (GR), with a correlation coefficient of 0.656 and a *p*-value of 0.000<0.05, which augurs a very strong linear relationship between the Government Role (GR) and the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), in the quantitative method. Three (3) out of four (4) exogenous variables (DC, SR, and GR) correlate positively, strongly and statistically significantly with the endogenous variable, the Export Competitiveness of Mozambique's Cashew Nut Industry, and one (1) that has a negative, weak, but statistically significant Pearson's correlation coefficient of -0312 and a *p*-value of 0.000<0.05, and that is FC. Taking into account its statistical significance, there would be a need to further investigate the causes of this condition before considering dropping the variable. However, in our perspective, that would be the scope for another research. For now, FC has to be dropped.

6.1.2. PLS-SEM Quantitative Model Assessment

In Section 5.11 of Chapter 5 we elaborated at length on the Research Model and the use of PLS-SEM modelling. In the coming pages we present an evaluation of the results obtained in this process for both the *quantitative* and *qualitative methods*. In the first place, we have concluded that, following the definitions and criteria contained in the extensive literature on this topic, we are in the presence of a *Reflective Model* for both quantitative and qualitative approaches, and we have not departed from the respective evaluation criteria, procedures, and guidelines, starting with the evaluation of the measurement models. Since the results met all the required criteria, we moved to the assessment of the structural models (Hair et al., 2017a). These PLS-SEM broad rules of thumb have been serving as guidelines to evaluate model results (Chin, 2010; Götz et al., 2010; Henseler et al., 2009; Chin, 1998; Tenenhaus et al., 2005; Roldán and Sáchez-Franco, 2012; Hair et al., 2017a).

Assessment of a Reflective Measurement Model – The first step in reflective measurement model assessment consists of the examination of the factor loadings, which are the key indicators showing the trajectory of the Latent Variable towards the observed variables, that is, how much each observable variable contributes in absolute terms to the definition of Latent Variable. This examination is based on the principle that loadings above 0.708 indicate that the construct explains more than 50% of the indicator's variance, and therefore they must be kept, which demonstrates that the indicator provides a satisfactory degree of reliability, but cut-off levels between 0.5 and 0.7 are also acceptable (Hair et al., 2006). The measurement model of PLS-SEM addresses the fundamental question of how to measure the constructs, and the answers to this question are provided through the determination of the construct validity which is done by assessing the convergent validity as well as the discriminant validity. Calculating the convergent and discriminant validity of a latent variable means that the construct can be a critical determinant in the model under evaluation (Kante et al., 2018).

According to Kline (2013), a convergent validity is established if the inter-correlations of a set of variables that are presumed to measure the same construct are, at least moderate in magnitude. The convergent validity is assessed using the following measures: **i**) Composite Reliability (CR), which is a measure of internal consistency reliability in scale items similar to Cronbach's α (Netemeyer, 2003) but uses different measured that is equal to the total amount of true score variance relative to the total scale score variance (Brunner & Süß, 2005), indicating the shared variance among the observed variables used as an indicator of Latent Variable (Fornell & Larcker, 1981). Its acceptable threshold stands currently at $0.60 < CR < 0.70$; **ii**) Cronbach’s α, which is the coefficient of reliability of a construct. It measures how well a set of indicators or variables measures a single enabler latent variable or construct. It assumes that all the indicators measuring a construct are equally reliable in PLS path models. It is a measure of internal consistency reliability that assumes similar thresholds but yields lower values than CR. Its acceptable threshold stands right now at $0.6 < \alpha < 0.7$; **iii**) Average Variance Extracted (AVE), which measures the amount of variance that a latent enabler variable captures from its measurement items or indicators relative to the amount of variance due to measurement errors. Fornell & Larcker (1981) stated that AVE should be higher than 0.5, which means that at least 50% of measurement variance is captured by the latent enabler variables. Indicators having low loadings should be eliminated as they have very little explanatory power to the model (Aibinu & Al-Lawati, 2010). Figure 5.6 and Table 5.18 for the quantitative method and after the deletions mentioned earlier, all the loadings for the 16 retained factors are greater than 0.60 (the cut-off level), which is in line with the principle that cut-off levels between 0.5 and 0.7 are acceptable (Hair et al., 2006).

Recalling that reliability in Statistics refers to how consistently a method measures something, it means two situations, namely: **i**) The consistency of a measure means that, despite repeated several times, the outcome remains the same, which essentially means the internal consistency of a measure, implying that if the same result can be repeatedly achieved by using the same method under the same circumstances, the measurement is considered reliable. Simply put, it is the likelihood that a product, system, or service will perfectly deliver its intended function or will operate in a defined environment without failure. **ii**) A measure of stability at all times (Kirk & Miller, 1986). The reliability of the measurement procedures can be defined as a measure of stability or consistency, meaning that the same result can be consistently achieved by using the same methods under the same circumstances. Table 5.18 shows that all Cronbach’s α coefficients calculated using SPSS28 software, based on non-standardised items, range from 0.534 to 0.963, which is a good reliability.

For composite reliability criterion, higher values generally indicate higher levels of reliability. Literature converges in considering results between 0.70 and 0.95 from satisfactory to good reliability levels (Hair et al., 2017b, pp. 112). For Likert-type scales with five (5) points, Cronbach’s alpha (α) underestimates the reliability, which renders its use is not recommended (Gadermann et al., 2012). Composite Reliability (CR) provides a more appropriate measure of internal consistency reliability compared to traditional Cronbach's alpha coefficients (Hair et al., 2017). Cronbach's alpha uses unweighted items, while with Composite Reliability, the items are weighted based on the construct indicators' individual loadings and, hence, this reliability is higher than Cronbach's alpha.

Table 5.18 shows that the AVE values range from 0.651 to 0.915, exceeding the 0.50 threshold, which means that all the loadings are significant. For the sake of comfortable reading of these results, Table 6.2 has been prepared, which summarises the Construct Reliability and Validity or the Internal Consistency and Convergent Validity. The estimated strength of the relationships between the latent variables can only be meaningfully interpreted if construct validity is established (Peter and Churchill, 1986).

Table 6. 2: Internal Consistency and Convergent Validity

Constructs	Cronbach's (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
FC	0.954	0.97	0.915
DC	0.963	0.973	0.902
SR	0.946	0.957	0.848
EC	0.534	0.788	0.658
GR	0.743	0.846	0.651

Source: Author's calculations using SmartPLS 3.3.9

Discriminant validity shows the magnitude to which a construct is empirically distinct from other constructs (Garson, 2016), both in terms of how much it correlates with other constructs and distinctly the indicators represent only this single construct. The examination of discriminant validity is one of the key building blocks of model evaluation (Bagozzi and Phillips, 1982; Hair et al., 2010). Discriminant validity guarantees that a construct measure is empirically unique in the sense that it represents certain vital characteristics of interest in the structural equation model that others are unable to capture (Hair et al., 2010). In other words, discriminant validity requires that "a test not correlate too highly with measures from which it is supposed to differ" (Campbell, 1960, pp. 548). If discriminant validity is not established, researchers cannot be certain that the results confirming hypothesised structural paths are real or whether they are a result of statistical discrepancies" (Farrel, 2010). Against this backdrop, discriminant validity has become common practice in SEM studies (Shah and Goldstein, 2006); Shook et al., 2004). Discriminant validity can be assessed using three methods: the Fornell-Larcker criterion, the cross-loadings criterion, and the Heterotrait-Menotrait Ratio (HTMT) (Hair et al., 2014). In spite of the fact that the accepted Fornell-Larcker and cross-loadings criteria as good methods for assessing the discriminant validity of a PLS-SEM model have been seen to have shortcomings (Garson, 2016), we have decided to carry on using them simultaneously, once the debate seems to be still on.

We firstly used the Fornell-Larcker (1981) criterion, which is to check if the AVE of each construct is greater than the squared correlation coefficients between constructs. In Table 6.3, the second column presents the values of AVE for each construct, and the diagonal presents the values of AVE square roots, and the other figures are the correlation coefficients between constructs (the same we presented in Table 6.1).

Table 6. 3: Discriminant Validity _ Fornell-Larcker Criterion (Quantitative Method)

Constructs	AVE	Fornell-Larcker Coefficients				
		FC	**DC**	**SR**	**EC**	**GR**
FC	0.915	***0.957***				
DC	0.902	-0.520	***0.950***			
SR	0.848	0.047	0.484	***0.921***		
EC	0.658	-0.312	0.708	0.548	***0.811***	
GR	0.651	-0.244	0.810	0.626	0.656	***0.807***

Source: Author's calculation using SmartPLS 3.3.9

Fornell and Larcker (1981) came up with the traditional metric and suggested that each construct’s AVE should be compared to the squared inter-construct correlation (as a measure of shared variance) of that same construct and all other reflectively measured constructs in the structural model. The shared variance for all model constructs should not be larger than their AVEs. The discriminant validity assessment has the goal of ensuring that a reflective construct has the strongest relationships with its own indicators than with any other construct in the PLS path model (Hair et al., 2012a). The Fornell-Larcker (1981) discriminant validity criterion has been commonly used to assess the degree of shared variance between the latent variables of the model. According to this criterion, the convergent validity of the measurement model can be assessed by the Average Variance Extracted (AVE) and Composite Reliability (CR). In this sense, the constructs’ discriminant validity has been established if the square root of each construct’s AVE is higher than its correlation with another construct, and the first loading in each construct is the square root of the AVE for that particular construct, and it is higher than all the other loadings underneath (correlations). In Table 6.3 we note that, for example, the square root of AVE of construct FC, that is, the square root of 0.915 is equal to 0.957. In the case of construct EC, its AVE is 0.658, and the square root of 0.658 is 0.811. In the case of construct DC, its AVE is 0.902, and the square root of 0.902 is 0.950, and we get the same result for all the other constructs. Therefore, the discriminant validity through the Fornell-Larcker criterion is established.

The next validity criterion we have examined is cross-loadings, according to which the discriminant validity is established if each factor loads higher on its parent construct than on any other construct. Table 6.4 displays all the loadings and cross-loadings. We can observe that all the factor loadings are greater than their cross-loadings (the figures to the left and to the right), which is a sign of discriminant validity. In other words, the discriminant validity by cross-loadings criterion is established, since all factor loadings are more strongly associated with their respective parent constructs than with all the other constructs, as shown in figures in blue. That is much easier to understand by reading all the figures to the left or to the right of the blue figures in each construct, and we find no greater factors. There are no cross-loadings, knowing that by definition, cross-loadings are those factors that have high loadings on the same construct and those that load highly on multiple constructs, meaning that there is a high correlation between items of the same construct and a very weak correlation between items of a different construct. We recall that the identified cross-loadings were dropped earlier. As simple as this approach is, it has no theoretical justifications or empirical proof (Henseler et. al., 2015). In Table 6.4 the factors in blue represent the factor loadings for each construct and the cross-loading are those in black for the same construct.

Table 6. 4: Discriminant Validity _ Cross-Loadings Criterion (Quantitative Method)

Factors	Constructs				
	FC	DC	SR	EC	GR
FC_1	**0.978**	-0.515	-0.059	-0.357	-0.298
FC_2	**0.975**	-0.485	0.056	-0.288	-0.278
FC_3	**0.916**	-0.492	0.196	-0.226	-0.079
DC_1	-0.418	**0.972**	0.647	0.731	0.834
DC_2	-0.585	**0.916**	0.351	0.613	0.789
DC_3	-0.488	**0.991**	0.558	0.725	0.820
DC_4	-0.504	**0.917**	0.231	0.606	0.620
SR_1	0.180	0.288	**0.960**	0.412	0.492
SR_2	0.340	0.072	**0.865**	0.272	0.300
SR_4	-0.252	0.792	**0.900**	0.705	0.804
SR_5	0.217	0.257	**0.955**	0.408	0.452
EC_1	-0.281	0.750	0.573	**0.944**	0.669
EC_2	-0.234	0.273	0.229	**0.651**	0.314
GR_2	-0.260	0.556	0.394	0.479	**0.844**
GR_3	-0.222	0.859	0.785	0.706	**0.914**
GR_4	-0.063	0.435	0.084	0.274	**0.638**

Source: Author's calculation using SmartPLS 3.3.9

Recent research indicates, however, that the assessment of discriminant validity through Fornell-Larcker and cross-loadings criteria is no longer suitable. Henseler et al. (2015) show that the Fornell-Larcker criterion does not perform well, particularly when the indicator loadings on a construct differ only slightly (e.g., all the indicator loadings are between 0.65 and 0.85). As a replacement, Henseler et al. (2015) proposed the Heterotrait-Monotrait (HTMT) Ratio of the correlations (Voorhees et al., 2016). The HTMT is defined as the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct. Table 6.5 displays the HTMT loadings.

Table 6. 5: Discriminant Validity _Heterotrait-Montrait Ratio = HTMT _ Quantitative Method

DC					
EC	0.860				
FC	0.548	0.423			
GR	0.894	0.872	0.255		
SR	0.415	0.603	0.294	0.561	

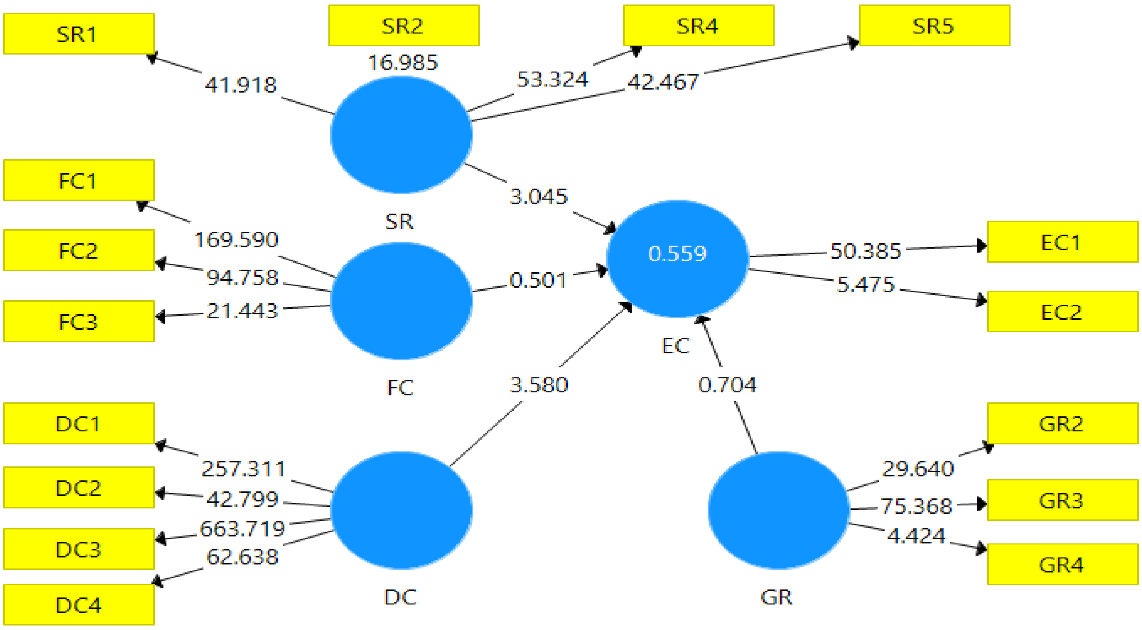
Discriminant Validity through HTMT Ratio criterion is established when the loadings are less than 0.90 for conceptually similar constructs or less than 0.85 for conceptually different constructs. In Table 6.5 it becomes obvious that in our model the discriminant validity through HTMT Ratio is established, since all loadings are less than 0.90.

We adopted Partial Least Squares Structural Equation Modelling (PLS-SEM) for this study in recognition of the fact that it is well conceptualised to be used as a research tool in strategic management, marketing and other social sciences because it is a way of identifying latent variables that are believed to exist, but cannot be directly observed in reality (Hair, Ringle, & Sarstedt, 2011; Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014; Reinartz, Haelein, & Hensler, 2009: Kline, 2016; Bollen, 1989; Kaplan, 2009). Recall that PLS Reflective Measurement was used to assess the reliability and validity of the data (Hair Jr, Hult, Ringle, & Sarstedt, 2013; Hulland, 1999; Ramayah, Lee, & In, 2011). Having satisfactorily concluded the examination of reflective factor loadings, the check on the criteria for internal consistency reliability, convergent validity, and discriminant validity, and after conducting the reflective measurement model analysis and obtaining satisfactory results, we then moved to the subsequent stage which is the evaluation of the structural model.

Assessing structural models – Considering that the measurement model assessment indicates satisfactory quality, the next step in evaluating PLS-SEM results was assessing the structural model.

The structural model relationships were measured using PLS-SEM bootstrapping for the significance of the correlation (Hair, Ringle, & Sarstedt (2011; Hair et Al., 2012; Hair et al., 2013; Hensler et al., 2009). The findings about the significance of the relationship between the exogenous variables and the endogenous variable of the PLS-SEM analysis are presented in Figure 6.1 where we note that FC and GR are not statistically significant at 5% significance level, since their t statistics are 0.501 and 0.704 for FC and GR, respectively, that is, they are lower than 1.96, and SR and DC are statistically significant at 0.05 significance level, because their t statistics are 3.045 and 3.580 for SR and DC, respectively, that is, they are greater than 1.96.

Figure 6. 1: PLS – Structural Model Assessment for the Quantitative Method



Source: Author's calculation using SmartPLS 3.3.9

After checking for potential collinearity issues among the constructs, we found the standard assessment criteria to have been met, and readiness to proceed the analysis of the coefficient of determination (R^2), the effect size (f^2) the blindfolding-based cross-validated redundancy measure (Q^2), and the statistical significance and relevance of the path coefficients (βs), through the determination of the direct relationship.

6.1.3. Direct Relationship and Hypotheses Testing

Before assessing the structural relationships, collinearity was examined to make sure it did not bias the regression results. VIF values above 5 are indicative of probable collinearity issues among the predictor constructs, but collinearity problems can also occur at lower VIF values of 3-5 (Mason and Perreault, 1991; Becker et al., 2015). Ideally, the VIF values should be close to 3 and lower. Table 5.18 in Chapter 5 shows that the values of predictor constructs collinearity that matters, in this case, the inner VIF values, are FC = 1.7; DC = 4.4; SR = 1.8; and GR = 3.8, all below 5. Therefore, collinearity among explanatory constructs was not detected.

Table 6. 6: Direct Relationship Hypotheses Testing Results - Quantitative Method

Endogenous Variable: EC

Exogenous Variables: FC, DC, GR, and SR

HYPOTHESES	Path Coefficients (βs)	Sample Mean	Standard Deviation	t Statistic	*p* - Value	Result
Group 1: FC----> EC	-0.052	-0.047	0.105	0.501	0.617	Unsupported
Group 2: DC----> EC	0.482	0.480	0.135	3.580	0.000	Supported
Group 3: GR----> EC	0.089	0.094	0.127	0.704	0.482	Unsupported
Group 4: SR----> EC	0.262	0.270	0.086	3.093	0.002	Supported

Source: Author's calculation using SmartPLS 3.3.9

R^2 = 55.9%; R^2-Adj. = 53.6%;

A direct relationship check was carried out to determine the path coefficients (β-values) and the t statistics. A total of four (4) hypotheses (Groups 1, 2, 3 and 4) were tested of which two (2) were supported (DC--->EC, and SR--->EC) and two hypotheses were unsupported (FC--->EC, and GR--->EC). The decision rule on the hypotheses testing is based on the magnitude of the t statistic value that could be greater than 1.96 when we have a *p*-value lower than 0.05 (statistical significance at 5% significance level) or lower than 1.96 when we are in the presence of a *p*-value greater than 0.05 (statistical insignificance at 5% significance level). Figure 6.1 and Table 6.6 display these results, and the interpretation is as follows:

Group 1: *The Effect of Factor Conditions (FC) on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC)* - The null hypothesis (H_0) that Factor Conditions (FC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Factor Conditions (FC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). Since Factor Conditions' path coefficient (β) has a *p*-value = 0.617>0.05, we cannot reject the null hypothesis (H_0) that Factor Conditions (FC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), and we reject the alternative hypothesis (H_A) that Factor Conditions (FC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), at 5% significance level, which is at odds not only with our expectations, but also with the economic theory, since it was expected that Factor Conditions would have a positive effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 2: *The Effect of Demand Conditions (DC) on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC)* - The null hypothesis (H_0) that Demand Conditions (DC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Demand Conditions (DC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). Since Demand Condition's path coefficient (β) has a *p*-value = 0.000<0.05, we reject the null hypothesis (H_0) that Demand Conditions (DC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), and we accept the alternative hypothesis (H_A) that Demand Conditions (DC) do have a positive, strong, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, regarding the strong and positive role of Demand Conditions in the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 3: *The Effect of Government Role (GR) on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC)* - The null hypothesis (H_0), that Government Role (GR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Government Role (GR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). Since Government Roles' path coefficient (β) has a p-value = 0.482>0.05, we cannot reject the null hypothesis (H_0) that Government Role (GR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), and we reject the alternative hypothesis (H_A) that Government Role (GR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), at 5% significance level, which is at odds not only with our expectations, but also with the economic theory, since it was expected that Government Role would have a positive effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 4: *The Effect of Supporting and Related Industries (SR) on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC)* - The null hypothesis (H_0) that Supporting and Related Industries (SR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Supporting and Related Industries (SR) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). Since Supporting and Related Industries' path coefficient (β) has a p-value = 0.002<0.05, we reject the null hypothesis (H_0) that Supporting and Related Industries (SR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), and we accept the alternative hypothesis (H_A) that Supporting and Related Industries (SR) do have a positive, strong, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, regarding the strong and positive role of Supporting and Related Industries (SR) in the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

The assessment of a model's quality is based upon its ability to predict endogenous constructs. The coefficient of determination (R^2) is a measure of the model's predictive accuracy. According to Hair et al. (2017), an acceptable level of R^2 should usually be higher than 0.25 for key target constructs. The R^2 measures the variance, which is explained in each of the endogenous constructs and is therefore a measure of the model's explanatory power (Shmueli and Koppius, 2011).

Usually expressed in %, it is the proportion of the variance in the dependent variable that is explained by or predicted from the independent variable or variables. It ranges from 0.0 to 1.0 or from 0% to 100%, and the R^2 value close to the latter is assumed to fit the best regression model. However, we need to be very careful with too high R^2. The most common interpretation of R^2 is how well the regression model fits the observed data. For example, an R^2 of 60% reveals that 60% of the data fit the regression model. An excessively high R^2 may also indicate a number of serious problems with the regression model. Human behaviour inherently has much more unexplainable variability, and this produces R^2 values that are usually less than 50%. Therefore, 90% is way too high in this context. We need to use our knowledge of the subject area to determine what R^2 values are reasonable, by comparing our study to other comparable ones to see what values they obtained. If our R^2 value is too high, we should consider the following potential explanations to determine whether any of them applies to our own regression model, use our expertise, knowledge about our sample data, and the details about the process that was used to fit the model.

As a guideline, R^2 values of 0.75, 0.50 and 0.25 can be considered substantial, moderate and weak (Henseler et al., 2009; Hair et al., 2011). Acceptable R^2 values are based on the context and in some disciplines an R^2 value as low as 0.10 is considered satisfactory, for example, when predicting stock returns (Raithel et al., 2012). More importantly, the R^2 is a function of the number of predictor constructs – the greater the number of predictor constructs, the higher the R^2. Therefore, the R^2 should always be interpreted in relation to the context of the study, based on the R^2 values from related studies and models of similar complexity. R^2 values can also be too high when the model overfits the data. That is, the partial regression model is too complex, which results in fitting the random noise inherent in the sample rather than reflecting the overall population. The same model would likely not fit on another sample drawn from the same population (Sharma et al., 2019a). When measuring a concept that is inherently predictable, such as physical processes, R^2 values of 0.90 might be plausible. Similar R^2 value levels in a model that predicts human attitudes, perceptions and intentions likely indicate an overfit.

For Jim Frost (2020), there are five (5) main reasons why R^2 values are too high, namely: **i**) *Biasness* – The R^2 in a regression output has a tendency to be too high. When calculated from a sample, R^2 is by nature a tendentially biased estimator, and it is systematically higher or lower than the population value. R^2 estimates tend to be greater than the correct population value, which can be mitigated by the use of adjusted R^2, also known as shrunken R^2, although the correct amount of shrinkage is difficult to determine with accuracy; **ii**) *Model over-fitting* - A condition where a statistical model begins to describe the random error in the data rather than the relationships between variables, particularly, because the regression coefficients represent the noise rather than the genuine relationships in the population; **iii**) *Data mining and correlations* - A process of fitting many different models, trying many different independent variables, and primarily using statistical significance to build the final model rather than being guided by theory, which causes an inflated R^2 value; **iv**) Trends in panel (time series) data – This occurs when we have panel data where the dependent variable and the independent variable both have trends over time, this can produce inflated R^2 values; **v**) *The form of a variable* – A case where if we include a different form of the same variable for both the dependent variable and an independent variable, and may end up obtaining an artificially inflated R^2 value. One example is the case where the dependent variable is the temperature in degrees Celsius and the independent variable is a temperature in degrees Fahrenheit, where R^2 is nearly 100%. Another example when the dependent variable is poverty rate, and the independent variable is income. Here we can expect an extremely high R^2 because poverty rate is defined by income.

A too high R^2 is like a faulty scale in your bathroom. The quality of the coefficient depends on several factors, including the units of measure of the variables, the nature of the variables employed in the model, and the applied data transformation. There is no universal rule that governs how to incorporate the coefficient of determination in the assessment of a model. The context that forms the basis for the forecast or experiment is extremely important, and in different scenarios, the insights from the statistical metric can vary. Our R^2 of 55.9% in the quantitative method and 42.2% in the qualitative one is sufficiently strong, and its magnitude doesn't raise any issues. One way of assessing the strength of a model's R^2 is combining its reading with the F statistic.

In addition to evaluating the R^2 values of all endogenous constructs, the change in the R^2 value when a specific predictor construct is omitted from the model can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs. This measure is referred to as the size of effects (f^2), or Cohen's Indicator, which evaluates how much each construct is useful to the model adjustment. Technically, the change in the R^2 values is calculated by estimating a specific partial regression in structural model twice, that is, with the same latent variable scores. First, it is estimated with all exogenous latent variables included (yielding R^2 included) and second, with a selected exogenous latent variable excluded (yielding R^2 excluded). As a rule of thumb, the size of effects f^2 values higher than 0.02, 0.15, and 0.35 are considered small, medium and large f^2 effect sizes (Cohen, 1988; Cohen et al., 2013). Effect of size values of less than 0.02 indicate that there is no effect (Hair et al., 2017). Table 6.7 presents the results of f^2 effect sizes with respect to all the relationships in the model, when explaining a dependent construct in a structural model. Demand Conditions (DC) and Supporting and Related Industries (SR) show moderate effect size of $f^2 = 0.121$ and $f^2 = 0.087$, respectively, while Factor Conditions (FC) and Government Role (GR) show no effect size with $f^2 = 0.004$ and $f^2 = 0.005$, respectively, on the Export Competitiveness of Mozambique's Cashew Nut Industry, given that their values are much less than 0.02.

Table 6. 7: The Effect Size f^2 - Quantitative Method

Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation	t - Statistic	*p* -values
DC -------->EC	0.121	0.136	0.074	1.625	0.105
FC--------->EC	0.004	0.020	0.028	0.130	0.896
GR-------->EC	0.005	0.015	0.021	0.221	0.825
SR--------->EC	0.087	0.102	0.064	1.354	0.176

Source: Author's calculation using SmartPLS 3.3.9

Another means to assess the PLS path model's predictive accuracy is by calculating the Q^2 value (Geisser, 1974; Stone, 1974). The Q^2 value builds upon the blindfolding procedure that removes single points in the data matrix, imputes the removed points with the mean and estimates the model parameters (Rigdon, 2014b; Sarstedt et al., 2014). In other words, it builds on sample re-use procedure, which omits part of the data matrix, estimates the model parameters and predicts the omitted part using the estimates (blindfolding procedure). The smaller the difference between predictive and original values, the greater the Q^2 and thus the model's predictive accuracy. The cross-validated redundancy (Q^2) is a means for assessing the structural model predictive accuracy. Hair et al. (2016) stated that the Q^2 or blindfolding value should be larger than zero, suggesting that the model has predictive value for a certain endogenous construct, and values of zero or less indicate a lack of predictive relevance (Hair et al., 2017). Using these estimates as input, the blindfolding procedure predicts the data points that were removed for all variables. As a rule of thumb, Q^2 values higher than 0; 0.25; and 0.50 depict small, medium and large predictive relevance of the PLS-path model. In the case of our model, Table 6.8 shows that all the Q^2 values are greater than zero, particularly the construct cross-validated redundancy Q^2 is equal to 0.320, meaning that the model has a large predictive relevance.

Table 6. 8: Indicator and Construct Cross-Validated Redundancy (Q^2) - Quantitative Method

Indicator Cross-Validated Redundancy				**Construct Cross-Validated Redundancy**			
Indicators	**SSO**	**SSE**	**Q^2 =(1-SSE/SSO)**	**Constructs**	**SSO**	**SSE**	**Q^2 = (1-SSE/SSO)**
EC1	80.000	34.092	0.574	DC	320.000	320.000	
EC2	80.000	74.759	0.066	EC	160.000	108.852	0.320
				FC	240.000	240.000	
				SR	320.000	320.000	
				GR	240.000	240.000	

Source: Author's calculation using SmartPLS 3.3

The quality of PLS path model evaluated by calculating Q^2 statistics, which is the capability of the model to predict by repeating the observed values by the model itself through blindfolding procedures (Tenenhaus et al., 2005; Shanmugapria & Subramanian, 2015). With a view to initiating the blindfolding procedure, there is a need to determine the sequence of data points of the endogenous construct's indicators to be omitted in a single blindfolding run. It means that if we pick an omission distance of 9, every 9th data point of the endogenous construct's indicators is eliminated in a single blindfolding run. Hair et al. (2017a) suggested using an omission distance between 5 and 10. By using blindfolding procedures, two types of Q^2 statistics can be estimated, namely: **i**) The cross-validated redundancy approach, generally recommended for exploring the predictive relevance of the PLS path model (Wold, 1982), and uses the estimates of the path model to predict eliminated data points using both inner (structural) and outer (measurement) models. Analogous to the f^2 effect size, it is possible to also analyse the Q^2 effect size, which indicates the change in Q^2 value when a specific exogenous construct is omitted from the model. As a relative measure of predictive relevance, f^2 values 0.02;

0.15; and 0.35 indicate that an exogenous construct has a small, medium, or large predictive relevance, respectively, for a certain endogenous construct; **ii**) The cross-validated communality approach, which measures the capability of the model to predict the indicators directly from their enablers by cross-validation using the measurement model.

In terms of *relevance*, path coefficients are usually between -1 to +1, with coefficients closer to +1 representing strong positive relationships, and those closer to -1 indicating strong negative relationships (note that values below -1 and above +1 may technically occur, for instance, when collinearity is at critical levels). A path coefficient (β) of 0.5 implies that if the exogenous construct increases by one standard deviation unit, the dependent construct will increase by 0.5 standard deviation units (*ceteris paribus*). The examination of total effects between constructs, including all their indirect effects, provides a more comprehensive picture of the structural model relationships (Nitzl et al. 2016). Table 6.9 summarises the metrics and guidelines that need to be applied when interpreting and reporting on reflective PLS-SEM results (Hair et al., 2019; & Kante et al., 2018).

Table 6. 9: Some Guidelines for the Use of Reflective PLS-SEM Model Assessment

Measurement Model	
✓ Indicator loadings	✓ ≥0.600; Loadings represent the absolute contribution of indicator to its Latent Variable definition
✓ Internal consistency reliability	✓ Cronbach's alpha is the lower bound, the composite reliability (CR) is the upper bound for internal consistency reliability. ρ_A usually lies between these bounds and may serve as a good representation of a construct's internal consistency reliability, assuming that the factor model is correct. For Likert-type scales with 5 points, Cronbach's alpha underestimates the reliability, and Composite Reliability is recommended instead (Hair et al., 2017). ✓ Minimum of 0.600; Maximum of 0.95; Recommended: 0.70-0.90.
✓ Convergent validity	✓ AVE ≥0.50; the degree to which individual items reflecting a construct converge in comparison to items measuring different constructs
✓ Discriminant validity	✓ HTMT Ratio<1.0; Test if the HTMT is significantly lower than the threshold value; In information systems research, it is argued that discriminant validity should be assessed by HTMT Ratio instead of CR or Cronbach's alpha (α), but the debate is still on.
Structural Model	
✓ Collinearity (VIF)	✓ Probable (critical) collinearity issues when VIF≥5 ✓ Possible collinearity issues when VIF≥3-5 ✓ Ideally show that VIF<3
✓ R^2 value	✓ R^2>0.100; Coefficient of determination; R2 values of 0.75, 0.50 and 0.25 are considered substantial, moderate and weak; R^2 values of 0.90 and higher are typical indicative of overfit
✓ Q^2 value	✓ Q^2 values larger than zero are meaningful ✓ Values higher than 0; 0.25; and 0.50 depict small, medium and large predictive accuracy of PLS path model
✓ Model Validity	✓ Path coefficient's critical t values for a two-tailed test are 1.65 (0.1 significance level); 1.96 (0.05 significance level); and 2.58 (0.01 significance level).
✓ Model Predictability	✓ Predictive relevance: Q^2>0.05; By systematically assuming that a certain number of cases are missing from the sample, the model parameters are estimated and used to predict the omitted values.

Source: Adaptation from Hair et al., (2019), and Kante et al., (2018)

6.2. Qualitative Method

6.2.1. Correlation Matrix Analysis

As indicated in Section 6.1.1, a correlation matrix analysis is an activity that aims to determine the degree of association between variables, where there is no discrimination between dependent and independent variables, and all variables are treated as random stochastic variables. A correlation matrix is simply a table that displays the correlation, and it is a measure that is best used in variables that demonstrate a linear relationship between each other (Tim Bock, 2018), as shown in Table 6.10.

Table 6. 10: Construct Correlation Matrix - Qualitative Method

Constructs	Descriptive Statistics		Pearson Correlation Matrix Coefficients				
	Mean	Standard Deviation	QEC	QDC	QFC	QGR	QSR
QEC	3.655	1.252	1.000				
QDC	3.558	1.323	0.578 **	1.000			
QFC	3.698	1.249	0.503 **	0.708 **	1.000		
QGR	2.884	1.345	0.337 **	0.228 **	0.016	1.000	
QSR	2.815	1.337	0.494 **	0.631 **	0.394 **	0.408 **	1.000

Source: **Author's calculations using SmartPLS 3.3.9**

**** Correlation Coefficient Significant at 0.00**

Table 6.10 illustrates clearly on the type of relationship between the variables in the model under consideration, a Pearson's Correlation Matrix, generated by SmartPLS 3.3.9 software. It is important to note, for example, that the highest positive and statistically significant Pearson's correlation coefficient was between Demand Conditions (DC) and Factor Conditions (FC), with the value of 0.708, and a *p*-value of 0.000, implying that the interaction between these two factors is very high. Therefore, irrespective of the role that any of them plays in the model, it is crucially important that they are kept together, with a view to reinforcing the strength of the model. But in the quantitative method these two variables had a negative correlation. Inasmuch as the impact of the exogenous variables on the performance of the endogenous variable (EC) is concerned, the least correlated variable is the Government Role (GR) with a Pearson's coefficient of 0.337, but it is statistically significant, with a *p*-value of $0.000<0.05$. A Pearson's correlation coefficient of 0.337, although positive and statistically significant, falls under the category of moderate correlation, meaning that the linear association between Government Role (GR) and Export Competitiveness of Mozambique's Cashew Nut Industry is very limited, while in the quantitative dataset method that association is one of the strongest with a Pearson's coefficient of 0.656 and equally positive and statistically significant with a *p*- value of 0.000. The highest Pearson's coefficient in the relation with the endogenous variable (EC) is with the Demand Conditions (DC) with a coefficient of 0.578 and a *p*- value of $0.000<0.05$, which means it is statistically very significant, at 5% significance level.

6.2.2. PLS-SEM Qualitative Model Assessment

The construct reliability and validity assessment were, like in the previous quantitative method, measured by Cronbach's alpha (α), Composite Reliability (CR), and the Average Variance Extracted (AVE), already very familiar to us, with the assistance of SmartPLS 3.3.9 software. Table 5.19 shows that all Cronbach's α coefficients based on non-standardised items, range from 0.674 to 0.771, which is a good reliability. The same Table 5.19 also shows that the AVE values range from 0.509 to 0.548, exceeding the 0.50 threshold, which means that all the loadings are significant. Composite Reliability (CR) coefficients values range from 0.804 to 0.843, thus meeting the standard requirements in terms of threshold levels that should not be below 0.6 or above 0.95. For the sake of comfortable reading of these results Table 6.11 was prepared to summarise the Construct Reliability and Validity or the Internal Consistency and Convergent Validity.

Table 6. 11: Internal Consistency and Convergent Validity

Constructs	Cronbach's (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
QFC	0.697	0.817	0.530
QDC	0.732	0.827	0.548
QSR	0.696	0.814	0.525
QEC	0.674	0.804	0.509
QGR	0.771	0.843	0.519

Source: Author's calculations using SmartPLS 3.3.9

With these results, the internal consistency and convergent validity have been established. The discriminant validity is widely known as the extent to which a construct is empirically distinct from other constructs. Undertaking its examination is one of the key building blocks of model evaluation (Bagozzi and Phillips, 1982; Hair et al., 2010). This assessment entails three dimensions or criteria, as mentioned earlier, namely: the Fornell-Larcker, the cross-loadings, and the HTMT Ratio criteria. The Fornell-Larcker (1981) criterion consists of checking if the AVE of each construct is greater than the squared correlation coefficients between constructs. Having followed the inherent procedures, in Table 6.12 we note that the second column shows AVE values, and the diagonal presents the values of AVE square root, and the other values are correlation coefficients between constructs (the same as depicted in Table 6.10).

Table 6. 12: Discriminant Validity - Fornell-Larcker Criterion - Qualitative Method

Constructs	AVE	Fornell-Larcker Coefficients				
		QFC	QDC	QSR	QEC	QGR
QFC	0.530	***0.728***				
QDC	0.548	0.708	***0.740***			
QSR	0.525	0.394	0.631	***0.725***		
QEC	0.509	0.503	0.578	0.494	***0.713***	
QGR	0.519	0.016	0.810	0.408	0.337	***0.720***

Source: Author's calculation using SmartPLS 3.3.9

The shared variance for all model constructs should not be larger than their AVEs. The discriminant validity assessment has the goal of ensuring that a reflective construct has the strongest relationships with its own indicator than with any other construct in the PLS path model (Hair et al., 2012a).

The constructs' discriminant validity through the Fornell-Larcker criterion has been established if the square root of each construct's AVE is higher than its correlation with another construct, which implies that the first loading in each construct is the square root of the AVE for that particular construct, and it is higher than all the other loadings underneath (correlations). In Table 6.12, we note that, for example, the square root of AVE of construct QFC, that is, the square root of 0.530 is equal to 0.728. In the case of construct QEC, its AVE is 0.509, and the square root of 0.509 is 0.713, and we get the same result for all the other constructs. Therefore, the discriminant validity through Fornell-Larcker criterion is established.

According to the cross-loadings examination criterion, the discriminant validity is established if each factor loads higher on its parent construct than on any other construct. Table 6.13 shows that all the factor loadings are greater than their cross-loadings, meaning that all factor loadings are more strongly associated with their respective parent constructs than with all the other constructs, confirming that discriminant validity is established. By reading all the figures to the left or to the right of the blue figures in each construct we find no greater factors, and unlike in the quantitative method, no cross-loadings were detected, although we know that this approach has no theoretical justifications or empirical proof (Henser et al., 2015). In Table 6.13 the factors in blue represent the factor loadings for each construct and the cross-loading are those in black for the same construct.

Table 6. 13: Discriminant Validity - Cross-Loadings Criterion - Qualitative Method

Factors	Constructs				
	QFC	QDC	QSR	QEC	QGR
QFC_1	**0.689**	0.544	0.168	0.367	0.085
QFC_2	**0.861**	0.608	0.402	0.387	-0.078
QFC_5	**0.690**	0.367	0.202	0.368	-0.083
QFC_6	**0.654**	0.538	0.376	0.336	0.138
QDC_3	0.606	**0.753**	0.467	0.487	0.104
QDC_4	0.360	**0.660**	0.587	0.253	0.202
QDC_5	0.655	**0.884**	0.478	0.558	0.144
QDC_6	0.374	**0.638**	0.420	0.310	0.313
QSR_2	0.450	0.591	**0.684**	0.294	0.083
QSR_3	0.159	0.343	**0.701**	0.334	0.232
QSR_4	0.355	0.531	**0.829**	0.427	0.330
QSR_5	0.193	0.376	**0.672**	0.357	0.498
QEC_1	0.452	0.424	0.369	**0.795**	0.233
QEC_2	0.316	0.379	0.348	**0.711**	0.335
QEC_3	0.207	0.397	0.446	**0.615**	0.109
QEC_5	0.432	0.449	0.263	**0.720**	0.271
QGR_1	0.116	0.338	0.490	0.279	**0.765**
QGR_2	-0.090	0.027	0.114	0.172	**0.711**
QGR_3	0.031	0.180	0.291	0.295	**0.719**
QGR_4	0.011	0.089	0.337	0.213	**0.745**
QGR_5	-0.070	0.103	0.149	0.212	**0.655**

Source: Author's calculation using SmartPLS 3.3.9

Recalling what mentioned earlier, Henseler et al. (2015) showed that the Fornell-Larcker criterion does not perform well, particularly when the indicator loadings on a construct differ only slightly, and suggested the replacement of this method by the Heterotrait-Monotrait (HTMT) Ratio of the correlations (Voorhees et al., 2016). For reasons given earlier, we have decided to proceed with discriminant validity assessment using all three criteria simultaneously. A bootstrapping procedure can be applied to test whether the HTMT value is significantly different from 1.00 (Henseler et al., 2015) or a lower threshold value such as 0.85 or 0.90, which should be defined based on the study context (Franke and Sarstedt, 2019). Table 6.14 depicts all the HTMT loadings.

Table 6. 14: Discriminant Validity - Heterotrait-Montrait Ratio (HTMT) - Qualitative Method

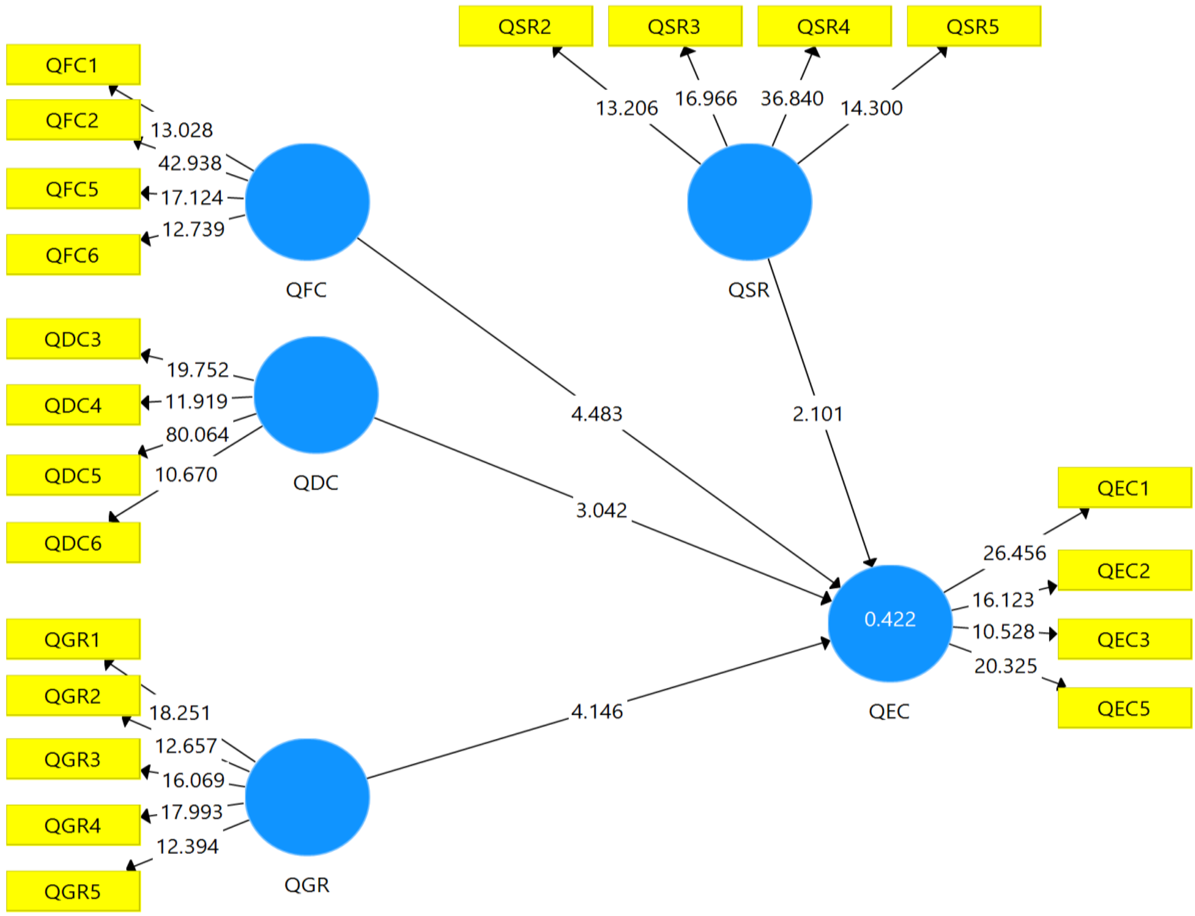
	QDC	QEC	QFC	QGR	QSR
QDC					
QEC	0.772				
QFC	0.942	0.723			
QGR	0.342	0.466	0.251		
QSR	0.927	0.725	0.583	0.544	

Source: Author's calculation using SmartPLS 3.3.9

Discriminant Validity through HTMT Ratio criterion is established if the loadings are less than 1.00. Table 6.14 shows that in our model the discriminant validity through HTMT Ratio is established, since all the loadings are less than 1.00. With these results we concluded that the measurement model was satisfactory for the qualitative method, and we moved to the next step.

Assessing structural models – Considering that the measurement model assessment indicates satisfactory quality results, the next step in evaluating PLS-SEM results was assessing the structural model.

Figure 6. 2: The Structural Model of the Qualitative Method



Source: Author's calculations using SmartPLS 3.3.9

After checking for potential collinearity issues among the constructs, the standard assessment criteria included the coefficient of determination (R^2), the effect size (f^2) the blindfolding-based cross-validated redundancy measure Q^2, and the statistical significance and relevance of the path coefficients (βs).

A direct relationship check was carried out to determine the β-values and the t-values. A total of four (4) hypotheses (Groups 1, 2, 3 and 4) were tested and all of them were supported at 0.05 significance level, as depicted in Figure 6.2 and Table 6.15, and described in detail in Section 6.2.3 of this Chapter.

Table 6. 15: Direct Relationship Hypotheses Testing Results - Qualitative Method

	Endogenous Variable: QEC Exogenous Variables: QFC, QDC, QGR, and QSR					
HYPOTHESES	**Path Coefficients (βs)**	**Sample Mean**	**Standard Deviation**	**t - Statistic**	***p* - Value**	**Result**
Group 1: QFC----> QEC	0.265	0.273	0.058	4.604	0.000	Supported
Group 2: QDC----> QEC	0.251	0.247	0.079	3.186	0.002	Supported
Group 3: QGR----> QEC	0.217	0.228	0.057	3.839	0.000	Supported
Group 4: QSR----> QEC	0.142	0.142	0.066	2.152	0.032	Supported

Source: Author's calculation using SmartPLS 3.3.9

R^2 = 42.2%; R^2-Adj. = 41.4%;

Collinearity among predictor constructs check was performed to make sure it does not bias the regression results, knowing as we do that VIF values above 5 are indicative of probable collinearity issues among the predictor constructs, although collinearity problems can also occur at lower VIF values of 3-5 (Mason and Perreault, 1991; Becker et al., 2015). Ideally, the VIF values should be close to 3 and lower. Collinearity is a problem in our model since the inner VIF values are below 3, namely: QFC = 2.1; QDC = 2.9; QSR = 1.9; and QGR = 1.2, as shown in Table 5.19 in Chapter 5.

6.2.3. Direct Relationship and Hypotheses Testing

By reading Table 6.15, we note that all the t statistics are greater than 1.96 and, consequently, all the calculated *p*-values are less than the significance level of 0.05. These results imply that we reject the null hypothesis (H_0) that the exogenous variables QFC, QDC, QGR, and QSR have no influence on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), at 0.05 significance level because all their *p*-values are less than 0.05. Therefore, all exogenous variables have a positive, strong, and statistically significant association with the Export Competitiveness of Mozambique's Cashew Nut Industry. The detailed explanation follows:

Group 1: *The Effect of Factor Conditions (QFC) on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC)* - The null hypothesis (H_0), that Factor Conditions (QFC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Factor Conditions (QFC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC). Since Factor Conditions' path coefficient (β) has a *p*-value = 0.000<0.05, we reject the null hypothesis (H_0) that Factor Conditions (QFC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), and we accept the alternative hypothesis (H_A) that Factor Conditions (QFC) do have a positive, strong, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, since it was expected that Factor Conditions would have a positive effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 2: *The Effect of Demand Conditions (QDC) on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC)* - The null hypothesis (H_0), that Demand Conditions (QDC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Demand Conditions (QDC) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC). Since Demand Condition's path coefficient (β) has a p-value = 0.002<0.05, we reject the null hypothesis (H_0) that Demand Conditions (QDC) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), and we accept the alternative hypothesis (H_A) that Demand Conditions (QDC) do have a positive, strong, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, regarding the strong and positive role of Demand Conditions in the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 3: *The Effect of Government Role (QGR) on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC)* - The null hypothesis (H_0), that Government Role (QGR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Government Role (QGR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC). Since Government Roles' path coefficient (β) has a p-value = 0.000<0.05, we reject the null hypothesis (H_0) that Government Role (QGR) does not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), and we accept the alternative hypothesis (H_A) that Government Role (QGR) does have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, since it was expected that Government Role would have a positive effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

Group 4: *The Effect of Supporting and Related Industries (QSR) on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC)* - The null hypothesis (H_0), that Supporting and Related Industries (QSR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), against the alternative hypothesis (H_A) that Supporting and Related Industries (QSR) do have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC). Since Supporting and Related Industries' path coefficient (β) has a p-value = 0.032<0.05, we reject the null hypothesis (H_0) that Supporting and Related Industries (QSR) do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), and we accept the alternative hypothesis (H_A) that Supporting and Related Industries (QSR) do have a positive, strong, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (QEC), at 5% significance level, which is in line not only with our expectations, but also with the economic theory, regarding the strong and positive role of Supporting and Related Industries (QSR) in the Export Competitiveness of Mozambique's Cashew Nut Industry, under Porter's Diamond Model.

With the qualitative method there were no issues at all. Everything fell under our expectations and the economic rationality.

The assessment of a model's quality is based upon its ability to predict endogenous constructs. The coefficient of determination (R^2) is a measure of the model's predictive accuracy. According to Hair et al. (2017), an acceptable level of R^2 should usually be higher than 0.25 for key target constructs. The R^2 measures the variance, which is explained in each of the endogenous constructs and is therefore a measure of the model's explanatory power (Shmueli and Koppius, 2011). The R^2 ranges from 0 to 1, with higher values indicating a greater explanatory power, without ignoring the comments made earlier in Section 6.1.3. As a guideline, R^2 values of 0.75, 0.50 and 0.25 can be considered substantial, moderate and weak (Henseler et al., 2009; Hair et al., 2011). Acceptable R^2 values are based on the context and in some disciplines an R^2 value as low as 0.10 is considered satisfactory, for example, when predicting stock returns (Raithel et al., 2012). In our model, as depicted in Figure 6.3 and Table 6.15, we realise that the level of R^2 is equal to 0.422. Taking into account that Henseler et al. (2009) and Hair et al., (2011) classify as moderate to weak an R^2 between 0.50 and 0.25, where the mid-point would be 0.375, and being 0.422 above mid-point, we can classify our R^2 of 0.422 as slightly above moderate, which is an acceptable proportion of the variance in the endogenous variable that is explained by or predicted from the exogenous variables. Recall that Hair et al., (2017) states that an acceptable level of R^2 should usually be higher than 0.25 for key target constructs. In other words, our coefficient of determination has an explanatory power (Shmueli and Koppius, 2011) of 42.2%.

The change in the R^2 value when a specific predictor construct is omitted from the model can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs. This measure is referred to as the effect sizes (f^2), or Cohen's Indicator. As a rule of thumb, the effect sizes f^2 values higher than 0.02, 0.15, and 0.35 are considered small, medium and large f^2 effect sizes (Cohen, 1988; Cohen et al., 2013). Effect size values of less than 0.02 indicate that there is no effect (Hair et al., 2017). Table 6.16 presents the results of f^2 effect sizes with respect to all the relationships in the model, when explaining an endogenous construct in a structural model. Factor Conditions (QFC), Demand Conditions (QDC) and Government Role (QGR) show moderate effect size with f^2 = 0.06, f^2 = 0.04, and f^2 = 0.07, while Supporting and Related Industries (SR) shows small effect size with f^2 = 0.02, on the Export Competitiveness of Mozambique's Cashew Nut Industry, given that its value is less than 0.02.

Table 6. 16: The Effect Size f^2 - Qualitative Method

Relationships	Original Sample (O)	Sample Mean (M)	Standard Deviation	t - Statistic	*p* -values
QDC -------->QEC	0.038	0.045	0.027	1.396	0.163
QFC --------->QEC	0.058	0.062	0.027	2.148	0.032
QGR--------->QEC	0.065	0.075	0.039	1.685	0.093
QSR --------->QEC	0.018	0.022	0.019	0.970	0.332

Source: Author's calculation using SmartPLS 3.3.9

In any case, only two coefficients are statistically significant, being FC at 0.05 significance level, and GR at 0.1 significance level since their t statistics based on a two-tailed test are greater than 1.96 and 1.65, respectively. DC and SR are not significant at all, and nothing much can be said or done about statistically insignificant coefficients.

The PLS path model's predictive accuracy assessment was made by calculating the Q^2 value (Geisser, 1974; Stone, 1974). The Q^2 value builds upon the blindfolding procedure that removes single points in the data matrix, imputes the removed points with the mean and estimates the model parameters (Rigdon, 2014b; Sarstedt et al., 2014). The cross-validated redundancy (Q^2) is a means for assessing the structural model predictive accuracy.

Table 6. 17: Indicator and Construct Cross-Validated Redundancy (Q^2) - Qualitative Method

Indicator Cross-Validated Redundancy				Construct Cross-Validated Redundancy			
Indicators	SSO	SSE	Q^2 =(1-SSE/SSO)	Constructs	SSO	SSE	Q^2 = (1-SSE/SSO)
QEC1	310.000	234.483	0.244	QDC	1,240.000	1,240.000	
QEC2	310.000	247.292	0.202	QEC	1,240.000	988.073	0.203
QEC3	310.000	270.457	0.128	QFC	1,240.000	1,240.000	
QEC5	310.000	235.841	0.239	QSR	1,240.000	1,240.000	
				QGR	1,550.000	1,550.000	

Source: Author's calculation using SmartPLS 3.3.9

Hair et al. (2016) stated that the Q^2 or blindfolding value should be larger than zero, suggesting that the model has predictive value for a certain endogenous construct, and values of zero or less indicate a lack of predictive relevance (Hair et al., 2017). As a rule of thumb, Q^2 values higher than 0, 0.25, and 0.50 depict small, medium, and large predictive relevance of the PLS-path model. In our model, Table 6.17 shows that all the Q^2 values are greater than zero, particularly the Construct Cross-Validated Redundancy (Q^2) is equal to 0.203, meaning that the model has a predictive relevance on the Export Competitiveness of Mozambique's Cashew Nut Industry.

6.3. Research Results for Both Quantitative and Qualitative Methods

Recall that the main purpose of this research is to identify in light of Porter's Diamond Model what factors, if any, have an impact on the Export Competitiveness of Mozambique's Cashew Nut Industry. The results of the *quantitative method* can be considered as partially falling beyond our expectations. On the one hand, we expected a very strong Government Role effect on the Export Competitiveness of

Mozambique's Cashew Nut Industry, particularly knowing as we do that Government has for decades been providing incentives and other facilitating conditions, including visible efforts towards the establishment, development and consolidation of private business and investment-conducive environment in the country, which has not totally materialised, if we look at GR's path coefficient (β) of 0.089, with a *p*-value of $0.482>0.05$. This is puzzling, particularly when we recall that the Pearson's positive and strong correlation between these two constructs with a coefficient of 0.656, as displayed in Table 6.1, is the second strongest after Demand Conditions that has a coefficient of 0.708, and both statistically significant. A Pearson's correlation coefficient this strong would imply that irrespective of the role that each one of them plays in the model, it should be crucially important that they (GR and EC) are kept together, in view of the need to continuously strengthening the model. When it comes to analysing the *qualitative method*, however, we realise that, with a path coefficient (β) of 0.217 and a *p*-value of 0.000, QGR is one of the strongest factors influencing the Export Competitiveness of Mozambique's Cashew Nut Industry, although the two variables have a weak linear relationship with a Pearson's correlation coefficients of 0.377, with a *p*-value of 0.000, one of the weakest linear relationships. But the fact that the association between the two variables is positive opens a window for a further analysis in terms of what else can the government do to help improve the Export Competitiveness of Mozambique's Cashew Nut Industry.

At this point, we were left with the idea that given the extremely low path coefficient (β) and its statistical insignificance GR did not hold any relationship with the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). However, when we performed a Granger causality test whose results are displayed in Table 5.15 in Chapter 5, we found that the Government Role (GR) Granger-causes the Export Competitiveness of Mozambique's Cashew Nut Industry, given the calculated Chi-Square value of 4.57 with *p*-value of $0.03<0.05$. This result was obtained on the basis of a hypothesis formulated as follows: The null hypothesis (H_0) that Government Role (GR) does not Granger-cause Export Competitiveness of Mozambique's Cashew Nut Industry (EC), against the alternative hypothesis (H_A) that Government Role (GR) does Granger-cause Export Competitiveness of Mozambique's Cashew Nut Industry (EC), and the *decision rule* was: if the *p*-value of the calculated Chi-Square is less than the 0.05 significance level we reject the null hypothesis (H_0), and accept the alternative hypothesis (H_A). Considering that the *p*-value of the calculated Chi-Square is $0.03<0.05$, we reject the null hypothesis (H_0) that Government Role (GR) does not Granger-cause Export Competitiveness of Mozambique's Cashew Nut Industry and accept the alternative hypothesis (H_A) that Government Role (QGR) Granger-causes Export Competitiveness of Mozambique's Cashew Nut Industry, at 0.05 significant level. But unfortunately, there is nothing else that can be said when a construct is statistically insignificant in a model. It has to be dropped, just like FC. When it comes to analysing the other problematic construct in the *quantitative method*, that is Factor Conditions (FC) whose path coefficient (β) is -0.052, with a *p*-value of $0.617>0.005$, we note that the results are at odds not only with our expectations but also with the economic theory, while in the *qualitative method* the results obtained are in line with our expectations as well as with the economic rationality, with the strongest path coefficient (β) standing at 0.265 with a *p*-value of 0.000<0.05. In terms of Pearson's correlation coefficient, we note that it is -0.312, with a *p*-value of 0.000<0.05 it confirms the negative linear relationship between FC and EC, which, in spite of being weak it is statistically significant at 0.05 significance level. Factor Conditions determinants in Porter's Diamond Model include the production factors necessary to compete in a given industry (Porter, 1990b), such as: human resources, physical resources, knowledge resources, capital resources, and infrastructure. The retained indicators in the quantitative method used as representatives of these resources include the archival data of annual growth rates over 20 years of the following: worker's wages in the cashew nut industry, number of workers and labourers in the cashew nut industry, and labour productivity in the cashew nut industry. The retained indicators in the qualitative method include data obtained through a questionnaire responded by the cashew nut industry stakeholders for 2021 namely with regard to the following items: availability of raw materials (in-shell cashew nuts), quality of in-shell cashew nuts, electricity supply conditions, and availability of specialised professionals (human capital) in the cashew nut industry. As we can see in Table 6.18, there is no major departure between the two datasets in terms of area of concentration of the study, that would justify such a differing result in the case of this construct. In Table 6.18 we summarise the results of a joint analysis of the two methods.

Table 6. 18: Direct Relationship Hypotheses Testing Results - Quantitative and Qualitative Methods

Endogenous Variable: Export Competitiveness (EC)
Exogenous Variables: FC, DC, GR, and SR

Endogenous Variable: Export Competitiveness (QEC)
Exogenous Variables: QFC, QDC, QGR, and QSR

Quantitative Method					Qualitative Method				
Hypotheses	**β**	**t statistic**	***p*-Value**	**Results**	**Hypotheses**	**β**	**t statistic**	***p*-Value**	**Results**
DC------>EC	0.482	3.580	0.000		**QDC------>QEC**	0.251	3.186	0.002	
FC------>EC	-0.052	0.501	0.617		**QFC------>QEC**	0.265	4.604	0.000	
GR------>EC	0.089	0.704	0.482		**QGR------>QEC**	0.217	3.839	0.000	
SR------>EC	0.262	3.093	0.002		**QSR------>QEC**	0.142	2.152	0.032	

R^2 = 55.9%

= Supported
= Unsupported

R^2 = 42.2%

Source: Author's Calculations using SmartPLS3.3.9

The only difference is, in fact, that one is cross-sectional and the other one is longitudinal. There is a need to undertake additional studies that could eventually bring to the surface the reasons for the difference in these results.

These results provide an evidence that in the *quantitative method*, two (2) of the three (3) Porter's Diamond Model determinants operating as exogenous variables, namely: Demand Conditions (DC) and Supporting and Related Industries (SR), both individually and jointly have a strong, positive, and statistically significant effect on the Export Competitiveness of Mozambique's Cashew Nut Industry (EC). Overall, despite the difference in the data collection method used, *there is a 50% convergence in* *terms of final results between the two methods*. There is clearly a positive role to be played by Demand Conditions (DC) and Supporting and Related Industries (SR) in both methods. This fact brings about the need to continue to research to get the facts that substantiate these differences, in future assignments. In the meantime, the exogenous constructs FC and GR were dropped from the model, and the *quantitative* method re-estimated.

Before moving to the conclusions and recommendations (Chapter 7), we would like to drop a few notes and comments at this point on the concept of statistical significance or insignificance, and the impact of dropping factors from the model based on mere statistical considerations.

Statistical significance is commonly misreported and misinterpreted. An overwhelming majority of researchers would agree or disagree about whether an intervention does or does not work, based on tests of statistical significance, that is, p-values<0.05, or t statistic value >1.96. This is likely to be misleading. Imprecision of an estimate of effects is only one of several factors that may decrease or increase our confidence in an estimate of effect (Guyatt et al., 2011). It should be interpreted together with other factors that can increase or decrease our confidence.

When the results are not statistically significant, we cannot assume that there was no impact. Typically, a cut-off of 5% is used to indicate statistical significance. This means that the results are considered statistically insignificant if the analysis shows differences as large as (or larger than) the observed difference would be expected to occur by chance more than one out of twenty times (p-value>0.05). There are, however, two problems with this assumption: **i**) The cut-off point of 0.05 is arbitrary; **ii**) Statistically insignificant results (sometimes mislabelled as negative) might or might not be inconclusive.

In literature, there is convergence of views regarding statistical significance or insignificance of our research results. When we conduct a statistical analysis over a dataset that took so much of our time to collect and systematise, applying a statistical software that has proven to be among the best, and yet our results come out with those pesky p-values above 0.05, that is, with no statistical significance, we tend to look back and ask ourselves what went wrong, what can we do to fix it. But we need to understand that this situation is very common in research studies at all levels and all the time. Statistically non-significant results in research study are not necessarily a bad thing. Findings that are different from what we expected can make room for an interesting and thoughtful discussion, an avenue for raising new questions that future researchers can explore, which can include potential reasons why our results defied our expectations, such as characteristics of the population studied, the existence of outside factors that we did not control properly, among others (David Sternberg, 1981).

Although all PLS-SEM steps regarding the *quantitative method* have been perfectly performed, and the comments above, we have come to results that are statistically insignificant at 5% significance level, for two of the four exogenous constructs namely: Factor Conditions (FC) and Government Role (GR), since their t statistics are less than 1.96, and their p-values are higher than 0.05. The quantitative method we are talking about here comprises four exogenous constructs and one endogenous construct.

The idea of bringing these notes here stems from the perspective supported by a substantial number of researchers which states that the presence of many statistically insignificant path coefficients (βs) may be indicative of several problems among which we can list possibly excessive lags, possible multicollinearity of the right-hand side constructs, model over-parameterisation, possible presence of redundant constructs. However, at this point, it is worth recalling that the longitudinal *quantitative* dataset was subjected to long and detailed series of tests, and it was concluded that it does not suffer from any anomalies that denote the presence of any of these ailments.

The two exogenous constructs, namely: Factor Conditions (FC), and Government Role (GR) are not statistically significant at 0.05 significance level, meaning conventionally that they are statistically irrelevant, since nothing can be done or said about a statistically insignificant construct. However, sometimes we need to differentiate between statistical significance and practical or economic significance. While the former shows that an effect exists in a study, the latter shows that the effect is large enough to be meaningful in the real world.

The major problem with the presence of statistically insignificant path coefficients is that there is nothing that can be done about them or towards interpreting their meaning. They are simply meaningless, which makes their removal a pressing need to move from the over-parameterised model to the thrifty or parsimonious one. So, we dropped Factor Conditions (FC) and Government Role (GR) and re-estimated the model.

After dropping the two statistically insignificant exogenous constructs, with the consequent reduction in the number of factors from 16 to 10, we experienced a very smooth functioning of the PLS-SEM model, and every step was performed precisely the same way as before. The technical operation of the model was not affected, given that PLS-SEM can operate perfectly without requiring any minimum number of factors per construct or any minimum number of exogenous constructs (Hair et al., 2014). In PLS-SEM we can have a model with only one construct and only one indicator, although we know that single-item variables tend to cause identification and convergence problems in covariance-based SEM, but this is not a problem in PLS-SEM (Hair, Hutt, and Sarstedt, 2014, pp. 16; Garson, 2016, pp. 31).

As a result, our *quantitative* method was reduced to two exogenous constructs and one endogenous construct. The model re-estimation brought about two positive, strong, and statistically very significant path coefficients, in conformity with our expectations and economic rationality, that is the rejection of the null hypothesis that DC and SR do not have any effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, and the acceptance of the alternative hypothesis that DC and SR have an effect on the Export Competitiveness of Mozambique's Cashew Nut Industry, which allowed us to analyse the results in a combined way with the *qualitative method*.

The path coefficient (βs) DC--->EC improved from 0.482 to 0.586, and SR--->EC improved from 0.262 to 0.270, but the *p*-values remained unchanged. R^2 improved from 55.9% to 57.0%; Q^2 improved from 0.320 to 0.333, and f^2 improved from 0.121 to 0.611 for DC, and from 0.087 to 0.130

for SR. Everything else remained unchanged. Our joint analysis is based on Table 6.19 without the unsupported hypotheses of the *quantitative* method. To some extent this analysis complements the one done regarding Table 6.1

Table 6. 19: Direct Relationship Hypotheses Testing Results - Quantitative and Qualitative Methods

Endogenous Variable: Export Competitiveness (EC) Exogenous Variables: DC, and SR	Endogenous Variable: Export Competitiveness (QEC) Exogenous Variables: QFC, QDC, QGR, and QSR

The Thrifty Quantitative Method					Qualitative Method				
Hypotheses	**β**	**t statistic**	***p*-Value**	**Results**	**Hypotheses**	**β**	**t statistic**	***p*-Value**	**Results**
DC------>EC	0.586	3.580	0.000		**QDC------>QEC**	0.251	3.186	0.002	
					QFC------>QEC	0.265	4.604	0.000	
					QGR------>QEC	0.217	3.839	0.000	
SR------>EC	0.270	3.093	0.002		**QSR------>QEC**	0.142	2.152	0.032	
	R^2 = 57.0%				= Supported		**R^2 = 42.2%**		

Source: Author's Calculations using SmartPLS3.3.9

In this case, Factor Conditions is one of the four corners of the Diamond Model we are testing for the Export Competitiveness of Mozambique's Cashew Nut Industry, and it might have an impact when assessed jointly with the other determinants. With the dropping of FC, we are also dropping the role of the growth of worker's wages, the number of workers and labourers, and the impact of the productivity growth in the cashew nut industry, factors that will not stop impacting the cashew nut industry simply because they have been dropped from the model. By dropping GR we are also dropping the effect of the growth of corporate tax and VAT collection, as well as the growth of public service employee's costs, which will certainly continue to impact the cashew nut industry in reality, even after being dropped from the model. The GR effect will continue to be felt also because the other indicators captured by the quantitative method.

It is worth bringing the Redman's (2013) and Gallo's (2016) analyses on the issue of statistical significance. When we run an experiment or analyse data, we want to know if our findings are significant. But business relevance (practical significance) isn't always the same thing as confidence that a result isn't due purely to chance (statistical significance). This is an important distinction. Unfortunately, *statistical significance* is often misunderstood and misused in organisations today. And yet because more and more companies are relying on data to make critical business decisions, it's an essential concept for managers to understand (Redman, 2013; Gallo, 2016).

Statistical significance helps quantify whether a result is likely due to chance or to some factor of interest (Redman, 2013). When a finding is significant, it simply means we can feel confident that it's real, not that we just got lucky (or unlucky) in choosing the sample. When we run an experiment, conduct a survey, take a poll, or analyse a set of data, we are taking a sample of some population of interest, not looking at every single data point that we possibly can.

Redman (2013) notes that there are two main contributors to sampling error: the size of the sample and the variation in the underlying population. Understanding the impact of the sample size is quite straight forward: With bigger sample sizes, we are less likely to get results that reflect randomness.

Understanding the impact of variation is a little trickier, but Redman (2013) insists that developing a sense for it is critical for all managers who use data.

Irrespective of the subject we are studying, the process for evaluating significance is the same. We start by stating a null hypothesis (H_0) that no exogenous construct has an impact on competitiveness, and we also state an alternative hypothesis (H_A) that at least one exogenous construct has an impact on competitiveness. The significance level is an expression of how rare our results are, under the assumption that the null hypothesis is true. It is usually expressed as a "*p*-value," and the lower the *p*-value, the less likely the results are due purely to chance.

Setting a target and interpreting *p*-values can be dauntingly complex. Redman (2013) says it depends substantially on what we are analysing. In many business experiments, managers skip these two initial steps and don't worry about significance until after the results are in. However, it's good scientific practice to do these two things ahead of time. Then we collect our data, plot the results, and calculate statistics, including the *p*-value, which incorporates variation and the sample size. If we get a *p*-value lower than our set significance level, then we reject the null hypothesis in favour of the alternative. Again, this means the probability is small that our results were due solely to chance. A substantial number of good statistical packages will report the significance along with the results (Redman, 2013). Still, it's helpful to know the process described above in order to understand and interpret the results. Managers should not trust a model they don't understand (Redman, 2013).

Company managers use statistical significance to understand how strongly the results of an experiment, survey, or poll they've conducted should influence the decisions they make. For example, if a manager runs a pricing study to understand how best to price a new product, he will calculate the statistical significance — with the help of an analyst, most likely — so that he knows whether the findings should affect the final price.

The reason why managers bother with statistical significance is that they want to know what findings say about what they should do in the real world. But "confidence intervals and hypothesis tests were designed to support science, where the idea is to learn something that will stand the test of time (Redman, 2013). Even if a finding isn't statistically significant, it may have utility to the company. On the other hand, when we are working with large datasets, it's possible to obtain results that are statistically significant but practically meaningless, like that an event A is 0.000001% more likely to take place over an event B. So rather than obsessing about whether our findings are precisely right, we need to think about the implication of each finding for the decision we are hoping to make.

Statistical significance is a slippery concept and is often misunderstood (Redman, 2013), and we don't run into very many situations where managers need to understand it deeply, but they need to know how to not misuse it."

Of course, data scientists don't have a monopoly on the word "significant," and often in businesses it's used to mean whether a finding is strategically important. It's good practice to use language that's as clear as possible when talking about data findings. If we want to discuss whether the finding has implications for our strategy or decisions, it's fine to use the word "significant," but if we want to know whether something is statistically significant, we should be precise in our language. Next time we look at results of a survey or experiment, we should ask about the statistical significance if the analyst hasn't reported it.

We always need to remember that statistical significance tests help us account for potential sampling errors, but Redman (2013) argues that what is often more worrisome is the non-sampling error in the sense that a non-sampling error involves things where the experimental and/or measurement protocols didn't happen according to plan, such as people lying on the survey, data getting lost, or mistakes being made in the analysis. This is where Redman sees more-troubling results. There is so much that can happen from the time we plan the survey or experiment to the time we get the results. We should be more worried about whether the raw data is trustworthy than how many people they talked to (Redman, 2013). Clean data and careful analysis are more important than statistical significance.

Keeping in mind the practical application of the finding is also crucially more important than getting too hung up on setting a strict confidence interval. Redman (2013) says there's a bias in scientific literature that a result wasn't publishable unless it hit a $p \leq 0.05$. But for many decisions, like which marketing approach to use, we need a much lower confidence interval. In business, there's often more-important criteria than statistical significance. The important question is, "Does the result stand up in the market, even if only for a brief period of time?" (Redman, 2013). According to Redman (2013), the results only give us so much information, and we are all for using statistics, but we always need to wed it with a good judgment.

We dropped two important constructs from the *quantitative* method for mere statistical considerations because we are not in a position to turn Redman's comments into rules of procedure in research studies. Hopefully, future assignment will dedicate the necessary resources to look into what this study could not cover with regard to this topic.

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CHAPTER 7

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusions

In this research, we used Porter’s Diamond Model, which considers the competitive priorities of some sectors in a country and establishes the country's competitiveness infrastructure, and basically used for measuring the competitiveness of firms, sectors, and countries, despite all the lengthy and inconclusive debates on the real meaning of this concept. There is, indeed, abundant literature on this model (Bulu et al., 2006, 2007; Eraslan et al., 2008; Neven and Dröge, 2001; Barragan, 2005; Mehrizi and Pakneiat, 2008; Sun et al., 2010; Watchravesringkan et al., 2010), many of them studying different topics and different sectors, but keeping the basic Model in all the adaptations. Based on the extensive literature review that we undertook to define the model's underpinning factors, we decided to follow two paths in our research: the *quantitative an*d *qualitative method*s, in that particular order.

On the *quantitative method*, it has been possible to get results aligned with our expectations and economic rationality concerning Demand Conditions (DC) and the Supporting and Related Industries (SR). As far as Factor Conditions (FC) and Government Role (GR) are concerned, the results obtained were at odds. FC result indicates that this construct has a negative path coefficient (β=-0.052), with no statistical significance at 0.05 significance level, and a negative and weak correlation with EC (r=-0.312), although statistically significant at 0.05 significance level. This seems to suggest that instead of reducing the appeal and importance of Porter’s Diamond Model, it opens up an opportunity to look into the model from various angles and dimensions, to check which factors have a positive impact on which reality, thus developing new approaches to the applicability of the Model, adjusted to each specific reality or each specific country. Recall that Erzberger and Prein (1977), as cited in Teddie and Tashakkari (2005), defend the view that “*divergent findings are valuable in that they lead to a re-examination of the conceptual frameworks and the assumptions underlying each of the two components”* (pp. 35).

The validity and reliability test undertaken using SmartPLS 3.3.9 software was successful since the three diagnostic tests for model validity (serial correlation, normality, and heteroskedasticity) were satisfactory. The Cronbach’s α for both quantitative and qualitative methods were all above 0.7, which implies that the research was successful. Then this study will have become, to the best of our knowledge, the first valuable contribution of the application of Porter’s Diamond Model to assess the competitiveness of the cashew nut industry not only in Mozambique but in the whole group of cashew nut producing countries in the world. Given this, the final results of this research are an essential contribution to further studies on this topic. As mentioned earlier, the qualitative method results have been perfectly aligned with our expectations and economic rationality, implying that we have reached a piece of valuable information. The results will have policy and managerial implications for both the government as well as the managers of the firms, both operating in the abovementioned factories and the ones that plan to join the sector, in terms of the competitiveness of the cashew nut industry in Mozambique. The potential is enormous and waiting for investors.

7.2. Policy and Managerial Implications

Among the significant challenges to managers in the cashew nut business, the high cost of production, aggravated by the low quality and limited availability of in-shell cashew nuts, needs urgent addressing to ensure sustainable growth and development of the cashew nut industry in Mozambique, as elaborated in Chapters 2, 3, and 4. The main factors negatively impacting production costs are labour shortage, limited skills, and low land productivity. Promoting social recognition of plantation workers' needs is essential to overcome the labour shortage. Making the facilities available for skill development will also attract the young generation to the cashew nut industry.

Cashew tree plantation firms should increase soil fertility levels by rehabilitating soils using compost. Research institutions should develop fast-growing cashew trees that could have a longer and more sustainable life span. In this regard, assistance from Supporting and Related Industries should play a key role. As an incentive provider, the government should continue to deliver, re-align and reinforce incentives, which have a positive and significant role in the cost of cashew tree replanting.

Stimulating, establishing, and consolidating an intensely competitive environment in the local market is a vital strategy to enhance competitiveness. Considering the high demand for cashew kernels by tourists in the domestic market, we believe that developing unique packaging for foreigners would increase sales in the domestic market. Instituto de Amendoas de Mocambique, in partnership with AICAJU, ACIANA, and the processing companies, could also embark on cashew kernel sales promotional campaigns in the domestic market, taking advantage of the yearly domestic tourism peaks to increase sales.

There has been no promotional action to broaden the knowledge about the “Zambique Cashew” brand created a few years back, intending to cultivate consumers’ trust towards the product, and the firm helps to build brand loyal customers. To assure the customers of the best quality in keeping with international standards, cashew nut processing and kernel exporting firms need to obtain international quality certificates such as ISO 9001-2008, HACCP, and USDA Organic, among others. Additional measures such as improving processing habits and standards, including the gradual adoption of traceability techniques to reinforce consumers' trust and confidence, would be critical steps to supplement the acquisition of quality certificates.

As we can see from the range of measures discussed, most of the actions that need to be introduced concern the private sector, with a small complementary role to be played by the Government. The government should aim to strengthen the macroeconomic control functions and the government's guiding process, which needs to be emphasised. In other words, the country's foreign exchange rate stability, tariff structure, import-export policies and procedures, and support to expand export destinations need strengthening to gain a cashew kernel exporting competitive advantage. On the other hand, the government's support for promoting "Zambique Cashew" as a brand rather than exporting cashew kernels in bulk must complement all the necessary initiatives towards developing the whole production value chain.

Given its current position, Mozambique has significant room to improve the export competitiveness in the cashew nut industry by improving the quality of its raw cashew nuts, including applying technological innovation to the production process. These improvements, in turn, will create a competition-enabling environment in the local market, stabilising the local currency and attracting new and more significant investments necessary for infrastructure development and export expansion. These findings clearly emphasise that Mozambique's Government has to play a crucial role in providing an environment that would have allowed the development of competitiveness of the cashew nut industry. In addition to that, the industry should be moved from short-term opportunities to long-term strategies. It should build up long-term competitive positions through quality and brand reputation. By analysing the results and comments of questionnaire respondents, we found strong suggestions to improve the competitiveness of the cashew nut industry in Mozambique.

Looking at the competitive advantage concept coined by Michael Porter in 1990 and its determinants as channels through which the promotion of Export Competitiveness of Mozambique's Cashew Nut Industry can take place, we need to establish a coherent and consequent order of priorities in the design and implementation of strategies to address the identified issues. The guiding method must be the one in which all the exogenous constructs interact positively with statistical significance towards improving the Export Competitiveness of Mozambique's Cashew Nut Industry, which is, in this case, the qualitative method.

The *first construct* to be tackled must be on the supply side, which is Factor Conditions (QFC), which leads with $\beta=0.265$, p-value=0.000, and a Pearson's correlation coefficient with QEC of $r=0.503$, the details of which can be seen in the recommendations contained in the next section 7.3 of the current chapter 7. Considering that we are operating in a *ceteris paribus* setting, for every 1% improvement in Factor Conditions, there is a 0.27% improvement in the Export Competitiveness of Mozambique's Cashew Nut Industry, which is very substantial. Around 89.4% of survey respondents attach the greatest priority to the need to ensure the availability of in-shell cashew nuts in quantity to allow all the processors to operate at their total capacity and attract others to maximise the use of the production potential that the country has to offer, while 82% of the same questionnaire respondents attach the greatest importance to the in-shell cashew nuts quality which maximises revenue from the crop through good kernel prices from the international kernel market.

The *second construct* to be tackled would be Demand Conditions (QDC) which comes equally in line not only with our expectations but also with economic rationality in both methods. In the qualitative method, its impact is positive, strong, and statistically significant with $\beta=0.251$, a p-value=0.003, and a Pearson's correlation coefficient with QEC of $r=0.578$, the details of which can be seen in the recommendations contained in the next section 7.3. The impact of β in a *ceteris paribus* setting means that every 1% increase in the Demand Conditions (QDC) is associated with a 0.25% improvement in the Export Competitiveness of Mozambique's Cashew Nut Industry, which is equally substantial. In terms of the survey questionnaire, 72.2% of respondents gave extreme importance to adherence to international standards, while 59.7% attached great value to healthy cooperation between IAM and the processors.

The *third construct* in ranking would be Government Role (QGR), comprising taxation, fiscal incentives, business environment, and economy informality, with β=0.217, a *p*-value=0.000, and a Pearson's correlation coefficient with QEC of r=0.337, whose details are found in section 7.3 of this chapter 7. Considering the *ceteris paribus* environment we are in, the impact of β means that for every 1% increase in Government action, there is a corresponding 0.22% improvement in the Export Competitiveness of Mozambique's Cashew Nut Industry, which is very meaningful. Around 46.5% of questionnaire respondents stated that the functioning of corporate tax and VAT administration disfavours the growth and consolidation of the cashew nut industry, while 42.9% are of the view that the economy's informality disfavours the sales of cashew nut kernels in the domestic market.

The *fourth construct* in ranking would be the Supporting and Related Industries (QSR), comprising internationally competitive suppliers, physical infrastructure (ports, airports, railways, roads, air traffic, and ICT development in the value chain), with β=0.142, a p-value=0.047, and a Pearson's correlation coefficient with QEC of r=0.494, whose details are found in section 7.3 of this chapter 7. In a *ceteris paribus* setting, the impact of β=0.142 means that every 1% change in the variance of QSR is associated with a 0.14% change in the Export Competitiveness of Mozambique's Cashew Nut Industry, which is meaningful. More than 65% of questionnaire respondents attached major importance to the incentives to retain experienced and specialised professionals in the cashew nut industry, while 60% attach great importance to cooperation with higher education institutions and collaboration in research and development (R&D). This issue is worth being taken together with the perspective on the centrality of human resources and human resource management (HRM), in alignment with the resource-based view which has strongly emphasised the critical role of human resources in establishing and sustaining competitive advantage, where a significant number of researchers and practitioners support the strong view that a sustained competitive advantage is created through HRM practices, a complex and inimitable system, and not only on the mere existence of human resources, as it does suffice to hire the best people to surpass the competition, and in order to build a firm capability, employee competencies need to be developed and retained through effective HRM (Ulrich, Lake, 1991; Pfeffer, 1994; Becker, Gerhart, 1996; Boxall, Purcell, 2003). Therefore, the view of the 65% of questionnaire respondents find its substantiation in this view that allows the implementation of proper incentives to retain high calibre professionals through appropriate HRM practices.

Here we have just jointly analysed the constructs that positively affect the Export Competitiveness of Mozambique's Cashew Nut Industry in quantitative and qualitative methods. If we examined the qualitative approach alone, the ordering would be completely different. Anyway, this combined attempt at analysing the results from both models has the ultimate goal of showing that it is possible to apply different methods in one research project and also aims to draw attention to new research areas in this critical industry. Taking the four exogenous constructs (3 Porter's determinants, and the Government), we get an average β coefficient of 0.21875, meaning that joint effect of these four exogenous constructs on the QEC, and recalling that we are operating in a *ceteris paribus* environment, for every 1% joint variance in this group of exogenous variables (representing a set of private and public policy measures) there is a 0.22% improvement in the Export Competitiveness of Mozambique's Cashew Nut Industry, which is positive, strong and statistically significant, thus encouraging all stakeholders to join their efforts in the implementation of the measures recommended in this chapter, since their effect is very positive and strong. When we consider the two constructs in the quantitative method alone, we would conclude that for every 1% joint variance of DC and SR (half of the exogenous variables) there is 0.37% improvement in the Export Competitiveness of Mozambique's Cashew Nut Industry, although with a strong reservation, given the fact that we cannot capture the impact of the entirety of the exogenous variables on the endogenous variable.

7.3. Recommendations

These recommendations are presented in a joint format covering both quantitative and qualitative methods and focus only on the model's exogenous constructs consisting of four (4) variables with an influence on the Export Competitiveness of Mozambique's Cashew Nut Industry, namely the three (3) Porter's Model determinants plus the government, with their respective indicators. The *first construct* is Factor Conditions (FC in the quantitative method and QFC in the qualitative method) which has no statistical significance in the quantitative method, but it is the top-ranking exogenous construct in the qualitative method, with a path coefficient (β=0.265) and a *p*-value of 0.000. We have retained four (4) indicators in the qualitative method (availability of in-shell cashew nuts for processing, quality of available in-shell cashew nuts, electricity supply conditions, and the availability of skilled professionals in the cashew nut industry), all of them related to the production factor supply. We adapted a number of recommendations from the 2011-2020 Cashew Master Plan produced by IAM's predecessor (INCAJU, 2011), and the study by Costa & Delgado (2019). Under the first construct, the major recommendation regards the level of wages for unskilled workers. With the increasing mechanisation of cashew nut processing worldwide, low-wage unskilled workers in the cashew nut industry in Mozambique are no longer an advantage. We also find a very strong link between skills, wages, and technology, cutting across the two methods. To compete with other players in the industry, processors must invest in skill acquisition for their workers.

Regarding processing technologies, 58.8% of questionnaire respondents still believe in manual shelling. Therefore, the issue of skills is considered critical by a significant number of questionnaire respondents, and 70.5% of them recommend that intensive skill-building programmes be established in collaboration between the private sector and the public sector to secure a medium to long-run sustainability of the cashew nut industry in Mozambique. Apart from wages and skills, there is a long list of recommendations of which we include here only a few critical ones, namely: **a**) Expand the production of in-shell cashew nuts and improve their quality, which can only be achieved through the implementation of various measures in partnership between the private sector and the public sector, namely: $\mathbf{a_1}$) Orchard renovation and rejuvenation; $\mathbf{a_2}$) Increase the level of incidence and improve the quality of fungal disease spraying; $\mathbf{a_3}$) Implementation of a proper cashew tree care (pruning, budding, and grafting), harvesting techniques (cashew nut drying and storage); $\mathbf{a_4}$) Stringent measures against uncontrolled wildfires; $\mathbf{a_5}$) Development of planting material and appropriate incentives for growers to have a good access to them; $\mathbf{a_6}$) Dissemination of good quality information on the correct application of agronomic techniques and pesticides; $\mathbf{a_7}$) Training programmes for teaching growers; $\mathbf{a_8}$) Expansion of access to financial support to growers for the acquisition of inputs (pesticides, fungicides, sprayers and respective spare parts); $\mathbf{a_9}$) Expansion of access to technology by growers for the processing of perishable cashew fruit, in order to improve overall economic returns per cashew tree.

The *second construct* in order of importance for both quantitative and qualitative methods is Demand Conditions (DC in the quantitative method and QDC in the qualitative method), with a path coefficient (β=0.482) and a *p*-value of 0.000 in the quantitative method and a path coefficient (β=0.251) and a *p*-value of 0.002 in the qualitative method. The quantitative method comprises 4 (four) retained indicators (growth rates of the total population, GDP, GDP *per capita*, and employment), whereas the qualitative method consists of 4 (four) retained indicators (international demand for cashew kernels, cooperation between the public and private sector, companies' contribution to the country's development, and after-sales services efficiency). All private and public sector efforts towards developing Demand Conditions must be based on the understanding that it is the international kernel market that matters most, and therefore, it is critical to keep pace with the changes in this commodity's consumption habits and demand patterns in this market, because they have a very strong influence on the performance of its processors and exporters. As a matter of fact, 72.2% of questionnaire respondents supported that the international kernel market is of critical importance.

The domestic market's supplemental role to the international market can be enhanced by stimulating the establishment and consolidation of an intensely competitive environment in the local market. There is a demand for cashew nut kernels by tourists in the domestic market. The creation of a special packaging for that specific category of consumers would increase the level of sales in the domestic market. Instituto de Amêndoas de Moçambique, IP, in partnership with the AICAJU, ACIANA, and the processing companies, could also embark on cashew kernel sales promotional campaigns in the domestic market, taking advantage of the yearly domestic tourism peaks to increase sales. Around 59.7% of questionnaire respondents believe that there is a healthy relationship between the kernel processors and IAM, which makes this partnership potentially more feasible and relatively easy to enact.

The private sector should also embark upon the broadening of knowledge about the "Zambique Cashew" brand created a few years back, with a view to cultivating consumers' trust towards the product and building brand loyal customers. Brand has become a very critical component in business development today, so much so that nearly everything is branded, even fruits and vegetables (Wickramasinghe and Liyanage, 2009, pp. 58). Brand loyalty is critical for the promotion and consolidation of competitive advantage to the firm. It relies on thorough understanding of the firms' customers' behaviour and business environment. Consumer satisfaction is integrated as a dominant factor of purchase intentions of customers. A consumer who trusts a firm is likely to trust its brand. As Panyachokchai (2013) stated it, brand loyalty is an important factor to keep long-term costumers to use the product and also it is very important to make business plan and gain competitive advantage. Brand loyalty favours and consolidates the relationship between the firm and the consumers that results in consistent purchase of the product over time and it is the result of consumers' learning that one brand can satisfy their needs (Assael, 2001). It is about time for "Zambique Cashew" to be put to a good use. To assure the customers of the best quality in keeping with international standards, cashew kernel processors and kernel exporting firms need to obtain international quality certificates such as ISO9001-2008, and HACCP food safety management system certification, and USDA Organic, among others, along with the improvement in processing habits and standards, including gradual implementation of traceability technologies to improve consumers' trust and confidence.

The *third construct* is Supporting and Related Industries (SR in the quantitative method and QSR in the qualitative method), which is statistically significant for both the quantitative and the qualitative, coming second in importance in the quantitative method with a path coefficient (β=0.262) and a *p*-value of 0.00, and fourth in the qualitative method with a path coefficient (β=0.142) and a *p*-value of 0.03. In the quantitative method we have retained 4 (four) indicators (the growth of in-shell cashew nut exports, volume of cargo transported by railway, ICT development index, and air transport in terms of carrier departures worldwide), whereas in the qualitative method we have equally retained 4(four) indicators (the general quality of incentives to retain employees in the cashew nut industry, the relationship with higher education institutions, the labour legislation and employee motivation, and the joint marketing studies by the various players in the cashew nut industry). Other domains under this construct include cooperation with government institutions, land access and cost, and infrastructure development (roads, railways, ports, and airports).

Despite favourable weather and soil conditions, land resources, and abundant availability of workforce, the country continues to have very low rates of agricultural productivity by international standards[29] (Albuquerque & Hobbs, 2016). This situation is worsened by the limited use of drought-resistant seeds and irrigation, and by the fact that the majority of rural producers is focused on subsistence agriculture, and a dry year can lead to serious challenges, including food insecurity. Within the context of the implementation of efficient and sustainable land use in Mozambique, combined efforts by the Government, private sector, and civil society have resulted in good progress towards solving some of the institutional and operational impediments, but many gaps remain (Albuquerque & Hobbs, 2016), namely: **i**) *Develop Public Financial Incentives and Public Private Partnerships* – About 99% of Mozambican farmers, including cashew growers, are small producers cultivating less than 10 ha (Albuquerque & Hobbs, 2016). Access to credit is seen as usually having a positive association with increased agricultural productivity. However, the 2010 Agricultural Census results demonstrate that a meagre 2.3% of small agricultural growers have benefitted from bank loans, whereas 7.0% of medium and 15.2% of large farms took really substantial loans. There is a need to adopt measures aimed at: **a**) Mitigating the prevailing high interest rates; **b**) Ensuring the use of land for loan collateral to mitigate currency and management, with a view to stimulating production and productivity increase, particularly in the cashew nut industry sector; **c**) Improving the levels of financial literacy with a view to increasing transactions between traditional financial institutions and small growers, including skill acquisition and literacy in business and financial management; **d**) Expanding the physical presence of banks and financial tools in rural areas, including other insurance instruments adapted to agricultural risks such as droughts, floods, and infestations; **e**) Expanding public financial incentives such as rural credit and crop insurance aimed at minimising risk for growers; **f**) Assessing the potential use of public-private partnerships (PPPs) as a tool to provide support to larger agricultural companies; **g**) Developing new public financial incentives for small growers while streamlining PPPs for larger farmers in order to enable more significant private investment in climate-resilient and productive agriculture practices, with a very high quantity and quality production of cashew nuts; **ii**) *Prioritise Key Infrastructure Projects* – Recall that among the retained indicators under this construct we have, for the quantitative method, transport infrastructure (roads, railways, ports, and airports) whose improvement is of capital importance. There is an imperative to upgrade road infrastructure that facilitates a substantial increase in agricultural production (Dorosh et al., 2012). However, investments in other key sectors for agriculture, including irrigation and energy, and the production of cashew seedlings must keep pace with the need. Irrigation investment in places with significant potential for productivity improvement, and to key cash crops such as cashew nuts are extremely important. Electricity supply reliability is a fundamental pre-requisite for the development of the agricultural sector, with particular emphasis in the operation machinery and irrigation systems, as well as for all the cashew nut processing stages. Mozambique has a low national electrification rate of 43.7% (MIREME, 2021), of which only 8% in the rural areas. While a significant progress has been made in recent years, some challenges persist, namely the need for: **a**) A greater private investment in this key sector; **b**) Improved incentives for off-grid energy generation and distribution; **c**) A review of the import tariffs on all components for renewable energy systems; **d)** Improved skill acquisition programmes for renewable energy deployment throughout the country. If given appropriate incentives, agricultural businesses throughout the country could begin installing renewables faster than it has ever been in the past, and these power sources would significantly benefit rural communities. Training in solar installation would make use of solar for agricultural cooling or powering irrigation systems much more practical. Investment facilitation is an extremely important strategy to preserve natural resources for the benefit of communities near them, the opportunity cost of the incentive to convert land to agricultural use may well increase (Albuquerque & Hobbs, 2016).

Under this construct, ICT development is equally of crucial importance. Mozambique needs to re-double its efforts towards a faster development of its potential in this area. Many positive competitive developments took place in Mozambique's communication market, but the Gillawald, Mothobi & Rademan (2019) survey found that this market is still at an embryonic stage. A significant number of Mozambicans (15 years and older) do not have mobile phones (60%). Internet penetration is only 10% of the population using the Internet. Even in areas of full coverage there are large numbers of people within the coverage areas of the mobile broadband operators who do not have internet, indicating not only significant demand side constraints of both affordability and lack of local content, but also the classical human development challenges of education and digital skills that need to be addressed with a view to creating the enabling environment, namely the: **a**) Removal of all excise duties on feature and entry level smartphones; **b**) Review of universal services levies and funds that are not meeting objectives; **c**) Leverage of private investments for servicing public sector connectivity in under-serviced areas; **d)** Adoption and implementation of incentives for infrastructure-sharing and wholesale regulation of facilities and bandwidth to reduce input costs for service providers and private networks.

On the issue of labour legislation and incentives for skilled employee retention, it is worth recalling that working conditions are a key component that is needed to stimulate productive work.

Mozambique has experienced sustained economic growth in the not-so-distant past which remained strong for many years, with a GDP growth rate of 8% per annum, at the same time that the economy became more open in that the share of trade as a percentage of GDP increased considerably to reach 75% in 2005.

In terms of labour legislation and incentives towards the retention of skilled employees in the cashew sector, there appears to be a balanced view, with 38.7% of questionnaire respondents stating that it is not motivating and 36.2% stating otherwise. When it comes to assessing the quality of incentives, 51.9% of respondents showed their approval. The discussions focus on such as long working hours and their impacts, health and safety concerns, low job satisfaction, inadequate social protection, and low pay.

Some of the measures that are considered of high relevance include the need to: **i**) Prioritise education and prevention over penalisation in the work of Labour Inspectors; **ii**) Give primacy to the leadership of trade unions in all matters concerning the improvement of working conditions; **iii**) Join efforts between the private sector, trade unions, and the Government with a view to fostering the integration of the informal sector into the formal economy; **iv**) Forge cooperation ties between the private sector and the public sector for the establishment of joint skill acquisition and employee specialisation programmes through technical and professional training for workers in areas related to cashew production and processing; **v**) Embark upon joint endeavours to establish a clear link between employers and workers through the application of existing standards and laws that encourage employment and labour relations on the basis of explicit and consensual contractual arrangements; **vi**) Upgrade the existing incentives, including pay rises in order to help cashew sector workers to gradually meet the rising cost of living, recalling that 26.1% of questionnaire respondents expressed the view that current incentives to workers are insufficient to retain employees in the industry.

As far as the relationship with higher education institutions is concerned, 47.1% of questionnaire respondents stated that the cashew nut industry does not cooperate with these institutions, unlike in other cashew processing countries which derive many benefits from the research and development (R&D) activities undertaken by these institutions. In Mozambique that is practically inexistent. Cashew processors need to design and implement cooperation programmes with these institutions if they are to gain competitive advantages internationally. Recall that Chacko, Wader & Asar (1997) found that cost, quality, delivery, and flexibility are the goals a firm should strive to achieve, through the creation of techno-managerial practices like automation, total quality management, benchmarking, employee empowerment and training. Inasmuch as joint marketing studies and actions are concerned, we recall the example of Vietnam where the creation of VINACAS has translated into a very effective government support to cashew processing, trade and marketing of cashew kernels, which includes technical support and training for growers and businesses in the cashew sector, as well as the signing of agreements with trade associations of key in-shell cashew nut exporting countries. Joint market studies have the advantage of allowing synergies to materialise, resulting in cost savings and cashew nut quantity and quality production expansion. In fact, 48.7% of questionnaire respondents expressed their strong views on this shortcoming and the need to tackle it and overcome it.

The *fourth construct* is Government Role (GR in the quantitative method and QGR in the qualitative method) with no statistical significance in the quantitative method, but it became the third ranking exogenous variable in the qualitative method, with a path coefficient (β=0.217) and a *p*-value of 0.000. In the qualitative method we have retained 5 (five) indicators (the functioning of the corporate tax collections, the functioning of the Value Added Tax (VAT) collections, fiscal incentives (Code of Fiscal Benefits included), bureaucracy and the impact of the informal economy), all basically related to the functioning of the tax system. Around 37.4% of questionnaire respondents are of the view that the functioning of corporate tax collection system disfavours the growth and consolidation of the cashew nut industry in the country, at the same time that 46.5% support the view that the functioning of the Value Added Tax collection system has similar impact, and 43% think that the existing fiscal incentives do not stimulate investment and growth of the cashew nut industry, and finally, 42.9% are of the view that the level of informal economy is seriously detrimental to the cashew kernel sales increase in the country.

Government-imposed taxes, tariffs, inspection fees, and administrative procedures can either support or discourage investment in agriculture (Albuquerque & Hobbs, 2016). A well-designed system can promote investment while protecting natural resources and safeguarding local rights, whereas a poorly designed system can discourage investment and decrease productivity. The Government made strides in reforming the tax system over the years, and as a result, the current tax system in Mozambique conforms broadly to international standards for good practice in developing countries, with the main sources of revenue coming from the Value Added Tax (VAT), corporate income tax (IRPC) and individual income tax (IRPS), respectively (IMF 2008). The reforms focused on improving the efficiency and capacity of the tax administration, being the establishment of the Mozambique Revenue Authority in 2006, and the streamlining and modernisation of tax administration in 2011, some of the most remarkable steps in the right direction. However, Mozambique still fell behind in the Doing Business ranking in the category of "paying taxes" (World Bank 2015), as analysed in Section 3.2 of Chapter 3. This means that the administrative burden associated with paying taxes is unusually high (Albuquerque & Hobbs, 2016), the main issue affecting tax compliance is the complexity of procedures required to pay the taxes: arbitrary and punitive enforcement practices by tax officials, complexity of the tax system, lack of taxpayer services, and difficulties in recovering refunds which are far more prevalent concerns than tax rates and number of taxes (World Bank 2003, FIAS 2006, Nathan Associates 2007), and low quality of tax administration in general which opens room for companies to take advantage of the Government's limited capacity to monitor compliance and create corrupt schemes to evade taxation (Nathan Associates 2009). In view of the above described, the following recommendations appear to be appropriate to improve the system: **i**) *Coordination and Training for Tax Administrators:* The need for training in tax administration (SPEED+, 2012) including advanced audit skills and information disclosure; **ii**) *Regional Agreements to Ease Trade*: Harmonisation of trade policies, particularly for fertilisers and pesticides by eliminating or reducing tariff and non-tariff barriers for private investments. By lowering trade costs and relaxing the constraints faced by many firms in accessing essential inputs, services, and skills, deeper regional integration can lead to diversification with higher value-added products production and trade (World Bank 2011); **iii**) *Improve Access to Fiscal Benefits* - Mozambique's tax regime is extremely favourable to agriculture, standing at a rate as low as 10%. Companies can get an additional reduction of 50% under the Code of Fiscal Benefits which brings down the corporate tax rate to 5%. Around 43% of questionnaire respondents support the view that the functioning of the Code of Fiscal Benefits (incentives) does not help stimulate investments in the cashew nut industry, whereas 22% declined expressing their opinion. Given that accessing the benefits contained in the Code of Fiscal Benefits (CFB) is so critical to making Mozambique an attractive place to invest, there are two crucial reforms needed to improve the system, namely: **a**) The current system discriminates against small businesses, as they cannot handle all the administrative costs of the process to access the benefits, calling for the need to make the CFB automatic to all investors, thus providing attractive incentives to all investors, easing the burden on the government's administration; **b**) Redesigning some aspects of training on the CFB in terms of the deduction for expenses on professional training of Mozambican locals. The current limit of up to 5% of taxable income is unreasonable considering the lack of qualified professionals affecting many economic sectors. Training should be more broadly promoted since it creates positive externalities for the economy. The critical role of human resources in establishing and sustaining competitive advantages created through human resource management practices needs to be developed and retained through effective human resource management training as the most important component (Ulrich, Lake, 1991; Pfeffer, 1994; Becker, Gerhart, 1996; Boxall, Purcell, 2003). **iv**) *Simplify and Modify the Rural Land Tax*: Rates are specified according to a complex mix of factors such as location, holding size, nationality of the owner, among others seeking to reflect both land value and certain public policies. The tax rates range from US$120/ha up to US$3.000/ha, which is considered far more complex than necessary (World Bank 2005), giving little incentive for land rights holders to maximise land productivity, as landholders who lack the capital or the interest in cultivating their own land are unable to transfer it to another party, leaving land uncultivated. It is, therefore, an imperative to simplify the current annual fees, since it is much easier to enforce a simple structure of land taxes with minimal differentiation between different categories of users than to have a complex system that cannot be implemented (Nathan Associates Inc. 2007); **iv**) *Improve Efficiency of VAT Refund*: VAT refund efficiency in Mozambique is well below the average of SADC countries (World Bank 2014). Despite the significant improvements made, there are many firms complaining that they wait months for refunds to end up, sometimes, with a refund denial merely for technicalities (USAID 2012) thus affecting the cash flow of enterprises and offsetting all the tax benefits of the Code of Fiscal Benefits regime. The VAT became a tax on production rather than a tax on final consumption, creating inefficiencies that cause the tax system to unduly influence production decisions (Transparency International, 2014). Refund delays act as a temporary tax on exports, reducing the profitability of export sales which undermines incentives to invest (Nathan Associates, 2007). VAT discourages exports and delays in VAT refunds adversely affect capital investment. The use of non-standard language in VAT legislation creates ambiguity as to what is exempt and what is zero-rated. The Revenue Authority should guarantee it has the funds to make the reimbursements. It could create a dedicated subaccount to pay VAT refunds, to be regularly replenished by the refund claims received to prevent the accumulation of new arrears (IMF 2016). Additionally, the government could allow firms with excess VAT credits (for example, due to import of capital goods) to use them to offset other taxes already incurred, diminishing these firms request of VAT refunds. The government could also adopt a simplified VAT refund process using computerised risk-assessment and automatic payment for low-risk claims. Alternatively, it could employ a "gold card", which provides automatic refunds to enterprises that have established a record of excellent tax compliance

(Albuquerque & Hobbs, 2016); **v**) *Make VAT Registration Voluntary Below the Payment Threshold* - VAT registration should not be used as tool to track taxpayers. VAT registration should be directly linked to the payment threshold, making it required only for firms that have turnover greater than that threshold. Firms with low turnovers but which nevertheless deal with registered VAT traders may still want to register, so that VAT paid on inputs can be credited against VAT charged on output. Another important step is to expand registration of farmers who are competing with duty free imports; buyers will prefer to buy from registered importers than from local producers in order to get the refund; **vi**) *Resolve Ambiguity Between Zero-Rated and Exempt Supplies* - VAT legislation should be updated to clearly state which supplies are exempt and which are zero-rated, and the government should be encouraged to avoid the temptation to increase the number of exemptions and zero-rating of domestic supplies, as the VAT structure prevents it from being the best way to protect the agricultural sector; **vii**) *Develop Official Invoice Templates* - The Revenue Authority needs to develop a system where purchasing firms issue invoices on behalf of the supplier. These invoices would document expenses by firms buying agricultural products from smallholder producers who are not registered taxpayers, and these expenses will be deductible for income tax purposes (DAI and Nathan Associates, 2012). Additionally, through the register of these invoices, the Revenue Authority would have access to information of non-registered farmers which will allow scrutinising any farmers who are not complying with tax regulations; **viii**) *Exempt Smallholders From "Taxa Liberatória*" - The "*Taxa Liberatória"* is a 20% withholding tax that companies that do business with an unregistered person or firm are supposed to pay. Registration by small farmers brings very little revenue but it has high costs to both farmers and the Government. The Government should develop rules so that "*taxa liberatória*" is not applied to smallholder farmers (DAI and Nathan Associates 2012); **ix**) *Decrease Scanning Fees* - Mozambique does not levy any specific export taxes on agricultural products, other than in-shell cashew nuts. The Government imposes an export tax of between 18% and 22% of FOB price on in-shell cashew nuts to encourage in-country processing and does not provide any export subsidies either. But other non-tariff costs implied in trade of products in the form of time delays associated with inspection and administrative processes are significant. The authorities could enforce the private operator of this concession to follow the international standard by charging only cargo that was indeed scanned; **x**) *Develop and Implement Risk-management Tools* - There is enormous room for improvement in collection efficiency through modern risk management, which will simultaneously reduce the compliance burden and facilitate tax transactions for most taxpayers (Nathan Associates 2009). By using automated systems to distinguish cases with high versus low revenue risk, Customs could then focus resources on cases where the potential revenue gains are highest. The limited resources of tax administration should be concentrated on those firms that routinely export and import, regardless of their size.

7.4. Limitations and Further Research

The development of this research project could not have taken place without some limitations. The fact that the empirical analysis was conducted in the context of the Mozambican cashew nut sector reality means, in the first place, that the longitudinal dataset was not easy to access, which raises some concerns in terms of its reliability, and the cross-sectional survey through questionnaires could not be as comprehensive as it would be desired when, for security reasons, it was not possible to carry out visits and interviews in Cabo Delgado province, the second largest cashew nut producing province in Mozambique.

It has been an enriching experience and challenge at the same time to develop a doctoral thesis research on the competitiveness of the cashew nut industry in Mozambique in an environment where there is a multiplicity of studies on the same topic that has been conducted either by Government initiative or by private sector initiative or even by donor agencies' initiative, where the motivation and purpose would not be necessarily coincident. Above all, none of the studies was conducted by a higher education institution, let alone the aim of testing the possibility of recourse to Michael Porter's postulates as vehicles that can be used to channel or at least formalise the design and implementation of policies and strategies to enhance the Export Competitiveness of Mozambique's Cashew Nut Industry. We are left with the sense that we have started something that, if embraced by others, may shed some light on new ways of studying this topic to benefit the country and its citizens.

Last but not least, the highly challenging approach of using quantitative and qualitative methods in one research project whose results converged in 50% opens up an opportunity for further studies on the topic for a better explanation (Erzberger and Prein, 1977).

REFERENCES

Abrahamsson, H. and Nilsson, A. (1995). *Mozambique: The Troubled Transition - From Socialist Construction to Free Market Capitalism*. Zed Books, London.

ACA (2019). "African Cashew Alliance: Growing the African Cashew Industry Issue Nº 7"; Available on www.africancashewalliance.com. Accessed 20th April 2021.

Banco de Moçambique (2021). "Dados da Balança de Pagamentos". Available on www.bancomoc.mz/fm_pgLink.aspx?id=222. Accessed 17th May 2021.

Instituto de Amêndoas de Moçambique. "Informações e Dados Estatísticos Relativos ao Sector de Caju em Moçambique". 2021

African Cashew Alliance, 2019. 2018 *Annual Report*. Accra.

Aguirre-Urreta, M. I. and Rönkkö, M. (2018). "Statistical Inference with PLS Using Bootstrap Confidence Intervals", *MIS Quarterly*, Vol. **42** (3), pp. 1001-1020. Q_1. Na

Aires, P. H. (2016). "What Drives International Competitiveness? An Empirical Test in Emerging Indonesian Market." *Journal of Competitiveness,* Vol. **8** (4) pp. 124-139. https://doi.org/10.7441/joc.2016.04.08. Q_1-Q_2.

Ajmi, A., Aye, G., Balcilar, M., Gupta, R. (2015). "Causality Between Exports and Economic Growth in South Africa: Evidence from Linear and Nonlinear Tests", *Journal of Developing Areas,* Vol. **49** (2), pp. 163-181. Q_2-Q_4.

Akingbe, O. et al. (2005). "Cashew Nuts in Mozambique: Recommendations for Developing a Viable Sector", prepared for Technoserve by SIPA EPD Workshop team.

Akingbe, Olutayo et el. (2005). "Cashew Nuts in Mozambique: Recommendations for Developing a Viable Sector." Prepared for Technoserve by SIPA EPD Workshop Team.

Aksoy, M.A., Yağci, F. (2012). "Mozambique Cashew Reforms Revisited". World Bank Policy Research Working Paper nº 5939, Washington, D.C.

Alberti, F. & Giusti, J. (2012). "Cultural Heritage, Tourism and Regional Competitiveness: The Motor Valley Cluster", *City, Culture and Society,* Vol. **3**, pp. 261-273.

Ali, F., Rasoolimanesh, S. M., Sarctedt, M., Ringle, C. M. And Ryu, K. (2018b). "An Assessment of the Use of Partial Least Squares Structural Equation Modelling (PLS-SEM) in Hospitality Research", *International Journal of Contemporary Hospitality Management,* Vol. **30** (1), pp. 514-538. Q_1-Q_2.

Alon, I., Fetscherin, M., and Johnson, J. P. (2010). "An Integrated Framework for Export Competitiveness: Evidence from Global Alcoholic Beverages Industry", *European Journal of International Management,* Vol. **5** (2), pp. 99-121. Q_3.

Amaratunga, D., Baldry, D., Sarshar, M., and Newton, R. (2002). "Quantitative and Qualitative Research in the Built Environment: Application of Mixed Research Approach", *Work Study,* Vol. **51** (1), pp. 17-31.

Ambashta, A., & Momaya, K. (2004). "Competitiveness of Firms: Review of Theory, Frameworks and Model", *Singapore Management Journal,* Vol. **26** (1), pp. 45-61.

Amit, R., & Schoemaker, P. (1993). "Strategic assets and organizational rent", *Strategic Management Journal,* Vol. **14**, pp. 33-46. Q_1.

Anca, H.D.B (2012). "Literature Review of the Evolution of the Competitiveness Concept", *Journal of Economic Literature,* Vol. **1** (1), pp. 41-46. Q_1.

Anderson, K. (2018). "Australian Wine Competitiveness: Why So Slow to Emerge". *The Australian Journal of Agricultural and Resource Economics.* Vol. **62**, pp. 507-526. Q_3.

Avkiran, N. K. and Ringle, C. M. (2018). *Partial Least Squares Structural Equation Modelling: Recent Advances in Banking and Finance,* Springer International Publishing, Cham.

Bacchetta, M. (2007). “Releasing Export Constraints: The Role of Governments”, Draft Framework Paper for the AERC Collaborative Research Project on Export Supply Constraints in Africa. Nairobi.

Bagala Biswal and Urvashi Dhawan. (1998). “Export-led growth hypothesis: cointegration and causality analysis for Taiwan, *Applied Economics Letters*, Vol. **5**, pp. 699-701. Q_4.

Bakan, I. and Doğan, I. F. (2012). Competitiveness of Industries Based on the Porter’s Diamond Model: An Empirical Study, *International Journal of Recent Research and Applied Studies* (*IJRRAS*), Vol. **11** (3).

Balassa, B. (1965). Trade Liberalisation and “Revealed” Comparative Advantage”, *Manchester School*, Vol. **33** (2), pp. 99-123. Q_4.

Balassa, B. (1985). “Exports, Policy Choices and Economic Growth in Developing after the 1973 Oil Shock”, *Journal of Development Economics*, Vol. **18**, pp. 23-35. Q_1.

Balkyte, A., Tvaronaviciene, M. (2010). “Perception of Competitiveness in the Context of Sustainable Development: Facets of “Sustainable Competitiveness””, *Journal of Business Economics and Management*, Vol. **11** (2), pp. 208-225. Q_2-Q_4.

Banwet, D. K., Momaya, K., & Shee, H. K. (2002). “Competitiveness: Perceptions, Reflections and Directions”, *IIMB Management Review*, Vol. **14** (3), pp. 105-116.

Barney, J. B. (1995). “Looking inside for competitive advantage”, *Academy of Management Executive*, Vol. **9** (4), pp. 49-61. Q_2.

Barney, J. B. (2011). “Firm resources and sustained competitive advantage”, *Journal of Management*, Vol. **17**(1), pp. 99-120. Q_1.

Batt, R. (2002). “Managing customer services: human resource practices, quit rates, and sales growth”, *Academy of Management Journal*, Vol. **45** (3), pp. 587-597. Q_1.

Becker, B. (1996). “The impact of human resource management on organizational performance: progress and prospects”, *Academy of Management Journal*, Vol. **39** (4), pp. 779-801. Q_1.

Becker, J,-M., Ringle, C. M. and Sarstedt, M. (2018). “Estimating Moderating Effects in PLS-SEM and PLSc-SEM: Interaction Term Generation* Data Treatment”, *Journal of Applied Structural Equation Modelling*, Vol. **2** (2), pp. 1-21.

Benziger, V. (1996). “Small Fields, Big Money: Two Successful Programs in Helping Small Farmers Make the Transition to High Value-added Crops”, *World Development*, Vol. **24** (11), pp. 1681-1693. Q_1.

Bhana, N. (2018). Corporate social responsibility initiatives and its impact on firm share price performance: Evidence from South Africa, *Journal of Contemporary Management*, **15** (1), pp. 100-126.

Bhawsar, P., and Chattopadhyay, U. (2015). “Competitiveness: Review, Reflections, and Directions”, *Global Business Review*, Vol. **16** (4), pp. 665-679.

Biggs, T. (2007). “Assessing Export Supply Constraints: Methodology, Data, Measurement”, Draft Framework Paper for the AERC Collaborative Research Project on Export Supply Constraints in Africa. Nairobi.

Boriss Siliverstovs and Dierk Herzer. (2006). “Export Led Growth Hypothesis: Evidence for Chile” *Applied Economics Letters*, Vol. **13**, pp. 319-324. Q_4.

Bravo, G., Potvin, L. (1991). “Estimating the Reliability of Continuous Measures with Cronbach’s Alpha or the Intraclass Correlation Coefficient: Toward the Integration of Two Traditions”. *Journal of Clinical Epidemiology*. Vol. **44** (4/5), pp. 381-390. Q_1.

Brencic, M.M., Ekar, A. and Virant, V. (2001). “The Influence of Relationship Making Components on Export Performance: A Comparison of Transitional vs. Established Markets”, *Journal of International Marketing*, Vol. **9** (4), pp. 9-18. Q_1.

Buckley, P. J., Pass, C. L., Prescott, K. (1988). "Measures of International Competitiveness: A Critical Survey", *Journal of Marketing Management*, Vol. **4** (2), pp. 175-200. Q_3.

Burke, R. J. (2005). *Reinventing Human Resource Management: Challenges and New Directions,* R. J. Burke, C. L. Cooper (Eds), London, Routledge.

Camisón, C. & Forés. (2015). "Is Tourism Firm Competitiveness Driven by Different Internal or External Specific Factors? New Empirical Evidence from Spain", *Tourism Management,* pp. 477-499.

Cardeal, N., António, N. (2012). "Valuable, Rare, Inimitable Resources and Organisation (VRIO) Resources or Valuable, Rare, Inimitable Resources (VRI) Capabilities: What Leads to Competitive Advantage?", *African Journal of Business Management,* Vol. **6** (37), pp. 10159 – 10170. Q_3.

Cetindamar, D. & Kilitcioglu, H. (2013). Measuring the Competitiveness of a Firm for an Award System", *Competitiveness Review,* Vol. **23** (1), pp. 7-22.

Chaudhuri, S. & Ray, S. (1997). "The Competitiveness Conundrum Literature Review and Reflections", *Economic and Political Weekly,* Vol. **32** (48), pp. 83-91. Q_4.

Cheah, J.-H., Sarstedt, M., Ringle, C. M., Ramayah, T. and Ting, H. (2018). "Convergent Validity Assessment of Formatively Measured Constructs in PLS-SEM: On Using Single-Item Versus Multi-Item Measures in Redundancy Analyses", *International Journal of Contemporary Hospitality Management,* Vol. **30** (11), pp. 3192-3210. Q_1-Q_2.

Chen, J.-C., Huamg, J.-W. (2007). "Strategic Human Resource Practices and Innovation Performance: The Mediating Role of Knowledge Management Capacity", *Journal of Business Research,* Vol. **62**, pp. 104-114. Q_1.

Cho, D. S. Moon, H. C., & Kim, M. Y. (2009). "Does One Size Fit All? A Dual Double Diamond Approach to Country-Specific Advantages", *Asian Business and Management,* Vol. **8** (1), pp. 83-102. Q_2.

Cho, H.-J., Pucik, V. (2005). "Relationship Between Innovativeness, Quality, Growth, Profitability, and Market Value", *Strategic Management Journal,* Vol. **25**, pp. 555-575. Q_1.

Collier, P. (2007). *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It.* Oxford University Press.

Collier, P. and O'Connel, S. A. (2007). "Opportunities and Choices". In Benno, N. O'Connel, S., Bates, R., Collier, P. and Soludo. C, eds, *The Political Economy of Economic Growth in Africa, 1960-2000,* Vol. **1**. Cambridge, UK, Cambridge University Press.

Collier, P. and Venables, T. (2007). *Trade Preferences and Manufacturing Export Response: Lessons from Theory and Policy,* Oxford/CEPR.

ComCashew. (2019a). Opportunities and Challenges in Cashew Processing in Africa", *Cashew Processing Guides Nº 2.*

Conner, R. (1991). "An historical comparison of resource-based theory and five schools of thought within industrial organization economics: Do we have a new theory of the firm?", *Journal of Management,* Vol. **17**, pp. 121-154. Q_1.

Correia, G. (2015). Competitiveness of the Mozambican Cashew Industry". Technoserve Business Solutions to Poverty.

Costa, C., and Delgado, C. (2019). "The Cashew Value Chain in Mozambique". World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO.

Cramer, C. (1999). "Can Africa Industrialize by Processing Primary Commodities? The Case of Mozambique Cashew Nuts". *World Development,* Vol. **27** (7), pp. 1247-1266. Q_1.

Croes, R. & Kubickova, M. (2013). "From Potential to Ability to Compete: Towards a Performance-Based Tourism Competitiveness Index, *Journal of Destination Marketing & Management,* Vol. **2**, pp. 146-154. Q_1.

Curran, P. J., West, S. G., and Finch, J. F. (1995). "Structural Equation Models with Non-Normal Variables: Problems and Remedies". In R. Hoyle (Ed), *Structural Equation Modelling: Concepts, Issues and Applications,* pp. 56-75.

Curran, P. J., West, S. G., and Finch, J. F. (1996). "The Robustness of Test Statistics to Non-Normality and Specification Error in Confirmatory Factor Analysis", *Psychological Methods,* Vol. 1, pp. 16-29.

Dalia Marin, "Is the Export-Led Growth Hypothesis Valid for Industrialized Countries?", *Review of Economics and Statistics*, 1992, Vol. **74** (4), pp. 678-688. Q_1.

Davis, H., Ellis, P. (2000). "Porter's Competitive Advantage of Nations: Time for the Final Judgement?", *Journal of Management Studies,* Vol. **37** (8), pp. 1189-1213. Q_1.

Dijkstra, T. K. and Henseler, J. (2015). "Consistent Partial Least Squares Path Modelling", *MIS Quarterly,* Vol. **39** (2), pp. 297-316. Q_1.

do Valle, P. O. and Assaker, G. (2016). "Using Partial Least Squares Structural Equation Modelling in Tourism Research: A Review of Past Research and Recommendations for Future Applications", *Journal of Travel Research,* Vol. **55** (6), pp. 695-708. Q_2.

Dollar, D. and Kraay, A. (2003). "Institutions, Trade and Growth", *Journal of Monetary Economics,* Vol. **50** (1). Q_1.

Dong, D. & Zhang, Q. (2016). "Empirical Analysis on International Competitiveness of China's Service Trade on the Basis of Diamond Model", *Advances in Economics, Business and Management,* Vol. **20**, pp. 39-43.

Doorewaard, H. (2003). "HRM and organisational change: an emotional endeavour", *Journal of Organizational Change Management,* Vol. **16** (3), Pp. 272-286. Q_4.

Dunning, J. H. (1993). "Internationalising Porter's Diamond", *Management International Review,* Vol. **33**, pp. 7-15. Q_3.

Dunning, J.H. (1993). "Internationalizing Porter's Diamond", *Management International Review,* Vol. **33**, pp. 7-15. Q_3.

Estêvão, C., Nunes, S. Ferreira, J., & Fernandes, C. (2018). "Tourism Sector Competitiveness in Portugal: Applying Porter's Diamond", *Tourism & Management Studies,* Vol. **14** (1), pp. 30-44.

Evans, N. (2016). "Sustainable Competitive Advantage in Tourism Organisations: A Strategic Model Applying Service Dominant Logic and Tourism's Defining Characteristics", *Tourism Management Perspectives,* Vol. **18**, pp. 14-25. Q_1.

Fagerberg, J. (1988). "International Competitiveness", *Economic Journal,* Vol. **98**, pp. 355-374. Q_1.

Fagerberg, J., Shrolec, M., & Knell, M. (2005). *The Competitiveness of Nations.* Retrieved 17 April 2013 from http://www.druid.dk/uploads/tx_picturedb/ds2005-1558.pdf

Fauziyah, E., Aniyatussholihah, A., Hidayati, D. (2017). "Strategy of Export Competitiveness Enhancement on Cashew Nut Commodity". *Journal of Economics and Policy,* Vol. **10** (2). pp. 302-316.

Fitzpatrick, J. (2011). Competitiveness of the African Cashew Sector: African Cashew Initiative. Eschborn, Germany.

Fitzpatrick, J. (2017). "Outlook & Opportunity: World Cashew Market". Presentation at Mozambican Cashew Industry Conference, Hotel Avenida, Maputo.

Flanagan, R., Lu, W., Shen, L., & Jewel, C. (2007). "Competitiveness in Construction: A Critical Review of Research", *Construction Management and Economics,* Vol. **25**, pp. 989-1000.

Fornell, C. G. and Bookstein, F. L. (1982). "Two Structural Equation Models: Linear Structural Relations (LISREL) and PLS Applied to Consumer Exit-Voice Theory", *Journal of Marketing Research,* Vol. **19** (4). Pp. 440-452. Q_2.

Francis, A. (1986). "The concept of competitiveness", *E.S.R.C. Woriking Paper*.
Franke, G. R. and Sarstedt, M. (2019). "Heuristics Versus Statistics in Discriminant Validity Testing: A Comparison of Four Procedures", *Internet Research,* Vol. **29** (3), pp. 430-447. Q_1-Q_2.
Frey, S. (2005). "Leading Firms in the Value Chain: The Development of a Globally Competitive Cashew Industry in Mozambique", published by SEEP (Small Enterprise Education and Promotion) Network (Technoserve/USAID Project).
Frost, Jim (2020). *Regression Analysis: An Intuitive Guide for Using and Interpreting Linear Models,* Statistics by Jim Publishing, State College, Pennsylvania, USA.
Fumio, T. (1985). "Product competitiveness evaluation - quantitative analysis for development strategy", *Technological Forecasting and Social Change,* Vol. **28** (2), pp. 123-139. Q_1.
Garelli, S. (2012). *IMD World Competitiveness Yearbook.* Retrieved 25 April 2013, from http://www.imd.org/research/centers/wcc/upload/Fundamentals.pdf.
Gittell, H., Seidner, R., Wimbush, J. (2010). "A Relational Model of How High-Performance Work Systems Work", *Organization Science,* Vol. **21** (2), pp. 490-506. Q_2.
Gong, Y., Chang, K., Xin, K. (2009). "Human Resources Management and Firm Performance: The Differential Role of Managerial Affective and Continuance Commitment, *Journal of Applied Psychology,* Vol. **94** (1), pp. 263-275. Q_1-Q_2.
Goodhue, D. L., Lewis, W. and Thompson, R. (2012). "Does PLS Have Advantages for Small Sample Size or Non-Normal Data?", *MIS Quarterly,* Vol. **36** (3), pp. 981-1001.
Grant, R. (1991). "The Resource-based Theory of Competitive Advantage: Implications for Strategy Formulation", *California Management Review,* Vol. **33** (3), pp. 114-135. Q_1.
Grant, R. M. (1991). Porter's Competitive Advantage of Nations: An Assessment, *Strategic Management Journal,* Vol. **12**, pp. 535-548. Q_1.
Gray, H. P. (1991). "International Competitiveness of Countries: A Review Article", *Ekonomista,* Vol. **5**, pp. 503-517. Q_4.
Haenlein, M., Kaplan, A. (2004). "A Beginner's Guide to Partial Least Squares Analysis", *Understanding Statistics,* Vol. **3** (4), pp. 283-297.
Hair, J. F. and Ringle, C. M. (2019). "Rethinking Some of the Rethinking of Partial Least Squares", *European Journal of Marketing,* Vol. **53** (4), pp. 566-584. Q_2.
Hair, J. F., Risher, J. J., Sarstedt, M. and Ringle, C. M. (2019). "When to Use and How to Report the Results of PLS-SEM", *European Business Review,* Vol. **31** (1), pp. 2-24.
Hair, J. F., Sardedt, M., Ringle, C. M. and Mena, J. A. (2012). "An Assessment of the Use of Partial Least Squares Structural Equation Modelling in Marketing Research", *Journal of the Academy Marketing Science,* Vol. **40**, pp. 414-433. Q_1.
Hakobyan, S. (2013). "GSP Expiration and Declining Exports from Developing Countries", Mimeo (Bronx), NY, Fordham University).
Hamel, G. (1991). "Competition for competence and inter-partner learning within international strategic alliances", *Strategic Management Journal*, Vol. **12**, pp. 83-103. Q_1.
Hanlon, J. (1996). *Peace Without Profit: How the IMF Blocks Rebuilding in Mozambique*. James Currey/Heinemann, Oxford and Portsmouth, NH.
Hausmann, R. and Rodrik, D. (2006). *What You Export Matters*, Harvard University, John F. Kennedy School of Government.
Helpman, E. (1984). "A Simple Theory of International Trade with Multinational Corporations", *Journal of Political Economy,* Vol. **92** (3), pp. 451-471. Q_1.
Henseler, J. (2010). "On the Convergence of the Partial Least Squares Path Modelling Algorithm", *Computational Statistics,* Vol. **25** (1), pp. 107-120. Q_4.

Henseler, J. Hubona, G. S. and Ray, P. A. (2016a). “Using PLS Path Modelling in New Technology Research: Updated Guidelines”, *Industrial Management and Data Systems,* Vol. **116** (1), pp. 1-19. Q_2.

Henseler, J., Ringle, C. M. and Sarstedt, M. (2016b). “Testing Measurement Invariance of Composites Using Partial Least Squares”, *International Marketing Review,* Vol. **33** (3), pp. 405-431. Q_2.

Hilmarsson, Hilmar, T. (1995) Cashew pricing and marketing in Mozambique: Second draft. World Bank Working Paper, World Bank, Washington, DC.

Hult, G. T. M. (2012). “A Focus on International Competitiveness”, *Journal of the Academy of Marketing Science*, Vol. **40**, pp. 195-201. Q_1.

Huo, D., Chen, Y., Hung, K., Zening, S., Jialin, G. et A. (2019). “Diamond Model and the Export Competitiveness of the Agriculture Industry from Emerging Markets: An Exploratory Vision Based on a Spatial Effect Study Using a Genetic Algorithm”. *Economic Research*, ISSN: 1331-667X. Q_2.

Huselid, M. A. (1997). “Technical and strategic human resource management effectiveness as determinants of firm performance”, *Academy of Management Journal,* Vol. **40** (l), pp. 171-188. Q_1.

Hussam-Eldin, D., Mazen, B. (2015). “Export-Led Growth: Time Series Approach Analysis “Case of Jordan, Kuwait and Egypt”, *European Scientific Journal,* Vol. **11** (7), pp. 1857- 7431.

Ignacio, L. (2007). “Implications of Standards and Technical regulations on Export Competitiveness”. Draft Framework Paper for AERC Collaborative Research Project on Export Supply Constraints in Africa. Nairobi.

Ilhan Ozturk and Ali Acaravci (2010). “Testing the Export-led Growth Hypothesis: Empirical Evidence from Turkey”, *Journal of Developing Areas,* Vol. **44** (1), pp. 245-254. Q_2-Q_4.

International Nut and Dried Fruit Council Foundation. (2020). *Nuts and Dried Fruit Statistical Yearbook 2019/2020,* Reus, Spain.

Islam, M. Z. & Siengthai, S. (2010). “Human Resource Management Practices and Firm Performance Improvement in Dhaka Export Processing Zone (DEPZ), *Research and Practice in Human Resource Management,* Vol. **18** (1), pp. 60-77.

Jacint Balaguer and Manuel Cantavella–Jorda. (2001). “Examining the Export-led Growth Hypothesis for Spain in the Last Century” *Applied Economics Letters,* Vol. **8**, pp. 681-685. Q_4.

Jamal Husein. (2009). “Export-led growth hypothesis: A multivariate cointegration and Causality Evidence for Jordan” *Journal of Developing Areas*, Vol. **42** (2), pp. 253-266. Q_2-Q_4.

Jambor, A., Toth, A. T., Koroshegyi, D. (2018). “Competitiveness in the Trade of Spices: A Global Evidence”. *Bulgarian Journal of Agricultural Science,* Vol. **24** (5), pp. 729-736. Q_4.

Jin, B. and Moon, H. (2006). “The Diamond Approach to the Competitiveness of Korea’s Apparel Industry: Michael Porter and Beyond”, *Journal of Fashion Marketing,* Vol. **10** (2), pp. 195-208. Q_3.

Kazlauskaitė, R., Bučiūnienė, I. (2008). “The Role of Human Resources and Their Management in the Establishment of Sustainable Competitive Advantage”, *Engineering Economics,* Vol. **5** (60), pp. 78-83.

Khan, G. F., Sarstedt, M., Chiau, W.-L., Hair, J. F., Ringle, C. M. and Fritze, M. (2019). “Methodological Research on Partial Least Squares Structural Equation Modelling (PLS-SEM): An Analysis Based on Social Network Approaches”, *Internet Research,* Vol. **29** (3), pp. 407-429. Q_1-Q_2.

Kharub, M., Sharma, R. (2016). “Investigating the Role of Porter Diamond Determinants for Competitiveness in MSMEs”, *International Journal for Quality Research,* Vol. **10** (3), pp. 471-486.

Kogut, B. (1985). “Designing Global Strategies: Comparative and Competitive Value-Added Chains”, Sloan *Management Review*, pp. 15-28. Q_1.
Krugman, P. (1980). “Scale Economics, Product Differentiation and Patterns of Trade”, *American Economic Review*, Vol.**70** (5), pp. 950-959. Q_1.
Krugman, P. (1994). “Competitiveness: A Dangerous Obsession”, *Foreign Affairs*, Vol. **73** (2). Q_1.
Krugman, P. (1996). “Making Sense of Competitiveness Debate”, *Oxford Review of Economic Policy*, Vol. **12** (2), pp. 17-25. Q_1.
Lado, A. A. (1994). “Human Resource Systems and Sustained Competitive Advantage: Competence-Based Perspective”, *Academy of Management Review*, Vol. **19** (4), pp. 699-727. Q_1.
Leamer, Edward E. (1987), *Sources of International Competitive Advantage.: Theory and Evidence*, MIT Press, Cambridge, Mass.
Lederman, D., Olarreaga, M. and Payton, L. (2007). *Export Promotion Agencies: What Works and What Doesn’t.* World Bank Policy Research Working Paper 4044, Revised March 2007. Washington, DC, World Bank.
Leite, J. P. (2000). “A Guerra do Caju e as Relações Mombique-Índia na Época Pós-Colonial”, em *Lusophonies asiatiques, Asiatiques en Lusophonies. Lusotopie.* (pp. 295-332). Karthala.
Locker, Jan De. (2007). “Do Exports Generate Higher Productivity? Evidence from Slovenia”, *Journal of International Economics*, Vol. **73**, pp. 69-98. Q_1.
Mahoney, J.T., & Pandian, J.R. (1992). “The resource-based view within the conversation of strategic management”, *Strategic Management Journal*, Vol. **13**, pp. 363-380. Q_1.
Mann, M. & Byun, S. (2011). “Accessing Opportunities in Apparel Retail Sectors in India: Porter’s Diamond Approach”, *Journal of Fashion Marketing and Management: An International Journal*, Vol. **15** (2), 194-210. Q_3.
Manzur, M., Wong, W.K., Chee, I.C. (1999). “Measuring International Competitiveness: Experience from East Asia”, *Applied Economics*, Vol. **31** (11), pp 1383-1391. Q_3.
Massol, O., B.- Estañol, A. (2014). “Export Diversification Through Resource-Based Industrialisation: The Case of Natural Gas”, *European Journal of Operational Research*, Vol. **237**, pp. 1067 – 1082. Q_1.
Matkovski, B., Kalas, B., Zekić, S. (2019). “Agri-Food Competitiveness in South East Europe”. *Outlook on Agriculture*, Vol. **48** (4) pp 326-335. Q_2.
Mbekeani, K. (2007). “The Role of Infrastructure in Determining Export Competitiveness”, Draft Framework Paper for the AERC Collaborative Research Project on Export Supply Constraints in Africa. Nairobi.
Mboya, J., Kazungu, K. (2015). “Determinants of Competitive Advantage in the Textile and Apparel Industry in Tanzania: The Application of Porter’s Diamond Model”, *British Journal of Economics, Management and Trade*, Vol. **7** (2), pp. 128-147.
McMillan, M., Rodrik, D. and Karen, W. H. (2002). “When Economic Reform Goes Wrong: Cashews in Mozambique”, NBER Working Paper 9117, National Bureau of Economic Research, Inc.
Melitz, M. J. (2003). “The Impact of Trade on Intra-Industry Reallocation and Aggregate Industry Productivity”, *Econometrica*, Vol. **71** (6), pp. 1695-1725. Q_1.
Ministry of Tourism, Trade and Industry (1997). *Cashew Marketing Liberalisation Impact Study*. Submitted by Deloitte and Touche ILA (Africa) and Deloitte Touche Tohmatsu Sisteconta. Government of Mozambique, Maputo.
Mirsha, S. and Martin, W. (2016). “Mozambican Cashew Industry Analysis: PowerPoint Presentation”, *Technoserve*.
Mohsen B.-O. and Claire, E. (2009). “Export-led Growth vs Growth-led Export, LDCs Experiences” *Journal of Developing Areas*, Vol. **42** (2), pp. 179-212. Q_2-Q_4.

Momaya, K. (2008). “Evaluating Country Competitiveness in Emerging Industries: Learning from a Case of Nanotechnology”, *Journal of International Business and Economy,* Vol. **9** (1), pp. 37-58.

Monecke, A. and Leisch, F. (2012). “SEM-PLS: Structural Equation Modelling Using Partial Least Squares”, *Journal of Statistical Software,* Vol. **48** (3), pp. 1-32. Q_1.

Moon, C. H., Newman, S. P. Jr (1995). “Competitiveness of Product, Firm, Industry, and Nation in a Global Business”, *Competitiveness Review,* Vol. **5** (1), pp. 37-43.

Moon, H. C., & Cho, D. S. (2000). National Competitiveness: A Nine Factor Approach and Its Empirical Application”, *Journal of International Business and Economy,* Fall, pp. 17-38.

Moon, H. C., Rugman, A., & Verbeke, A. (1998). “A Generalised Double Diamond Approach to the Competitiveness of Korea and Singapore”, *International Business Review,* Vol. **7**, pp. 135-150. Q_2.

Moon, H.C. (1993). “The dynamics of Porter’s three generics in international business strategy”. In A.M. Rugman (Ed.), *Research in global strategic management,* Vol. **4**, JAI Press, pp. 51-64.

Moravcikova, D., Krizanova, A., Kliestikova, J. & Rypakova, M. (2017). Green marketing as the source of the competitive advantage of the business, *Sustainability,* Vol. **9** (12). Q_2-Q_3.

Mulatu, A. (2016). “On the Concept of Competitiveness and Its Usefulness for Policy”, *Structural Change and Economic Dynamics,* Vol. **36**, pp 50-62. Q_2.

Narayan, S., Bhattacharya, P. (2018). “Relative Competitiveness of Agricultural Commodities and its Determinants: Some Evidence from India”. *World Development.* Vol. **117**, pp. 29-47. Q_1.

Nitidae. 2020. “Competitiveness of the Cashew Nut Industry in Mozambique”.

Nogami, H. (2008). “Relevance and consistency of the competitive indicators”, *Hiratsuka & Uchida eds., Vertical Specialization and Economic Integration in East Asia, Chosakenkyu-Hokokusho, IDE-JETRO,* pp. 133-147.

Owens, Trudy and Wood, A. (1997). “Export-oriented industrialisation through primary processing? *World Development* **25** (9), 1453-1470. Q_1.

Pascucci, F. (2018). “The Export Competitiveness of Italian Coffee Roasting Industry”. *British Food Journal,* Vol. **120** (7), pp. 1529-1546. Q_2.

Paul, A.K. & Anantharaman, R.N. (2003). Impact of People Management Practices on Organisational Performance: Analysis of Causal Model, *International Journal of Human Resource Management,* Vol. **14** (7), pp. 1246-1266. Q_2.

Pedrycz, W. (2011). Fuzzy multicriteria decision-making: Models, methods and applications, Chichester: Wiley.

Pfeffer, J. (1994). “Competitive Advantage Through People”, *California Management Review,* Vol. **36**, pp. 9-28. Q_2.

Pillania, R. K. (2008). “State-of-Art of Indian Competitiveness”, *Journal of Applied Economic Sciences,* Vol. **3** (2), pp. 115-123.

Porter, M. E. (1980). *Competitive strategy.* New York, NY: The Free Press, 1980.

Porter, M. E. (1990). *The Competitive Advantage of Nations: With a New Introduction*. New York, NY: The Free Press.

Porter, M. E. (1998). “Clusters and the New Economics of Competition”, *Harvard Business Review,* Vol. **76** (6), pp. 77-90. Q_1.

Prahalad, C. K., & Hamel, G. (1990). “The Core Competence of the Corporation”, *Harvard Business Review,* Vol. **68**, pp. 79-90. Q_1.

Ribeiro, F. B. (2008). “From Hammers to Blades: Global Dynamics and Manufacturing Policies in the Cashew Nut Industry in Mozambique”, *Revista de Ciências Sociais,* Vol. **51** (2), pp. 511-531

Rigdon, E. E. (2014b). “Rethinking Partial Least Squares Path Modelling: Breaking Chains and Forging Ahead”, *Long Range Planning,* Vol. **47** (3), pp. 161-167. Q_1.

Rugman, A. M., & D’Cruz, J. R. (1993). “The Double Diamond Model of International Competitiveness: The Canadian Experience”, *Management International Review,* Vol. **33**, pp. 17-39. Q_3.

Sachitra, K.M.V., Kumarasinghe, P. J. (2012). “Tea Export Competitiveness in Sri Lanka: An Empirical Study Based on Partial Least Squares Structural Equation Model (PLS-SEM).

Sachs, J. D. and Warner, A. (2001). “The Curse of Natural Resources”, *European Economic Review,* Vol. **45** (4-6), pp. 827-838. Q_2.

Safeer, A. A., Abrar, M., Yuanqiong, H., Atta, U. (2019). “Diagnostics of the Challenges and Potential Solutions to Improve Export Competitiveness in International Markets: The Case of Pakistani Ready-Made Garments Industry”. *Journal of Competitiveness*, Vol. **11** (13), pp. 128-143. Q_1-Q_2.

Salazar, M. D. V., Vilchez, V. F., & Poso, E. C. (2012). “Coaching: An Effective Practice for Business”, *Competitiveness Review,* Vol. **22** (5), pp. 423-433.

Sardy, M., & Fetscherin, M. (2009). “A Double Diamond Comparison of the Automotive Industry of China, India, and South Korea”, *Competition Forum,* Vol. **7** (1), pp. 6-16.

Sarstedt, M., Ringle, C.M., and Hair, J. F. (2017). “Partial Least Squares Structural Equation Modelling”, *Springer International Publishing/Handbook of Market Research*.

Satya Paul and Kabir Chowdhury. (1995). “Export-led Growth Hypothesis: some empirical testing in the case of Australia”, *Applied Economics Letters,* Vol. **2**, pp. 177-179. Q_4.

Schuller, R. S. (2005). “A quarter-century review of human resource management in the US: the growth in importance of the international perspective”, *Management Review*, Vol. **16** (1), pp. 11-35.

Shafaei, R. (2009). “An Analytical Approach to Assessing Competitiveness in the Textile Industry”, *Journal of Fashion Marketing and Management,* Vol. **13** (1). pp. 20-36. Q_3-Q_4.

Shafaei, R., & Shahriari, H. (2009). “Investigation of Leather Industry Competitiveness in Iran”, *Journal of Fashion Marketing and Management,* Vol. **13** (3), pp. 343-357. Q_3.

Sharma, P. N., Shmueli, G., Sarstedt, M., Danks, S. and Ray, N. (2019b). “Prediction-Oriented Model Selection in Partial Least Squares Path Modelling”, *Decision Sciences,* Vol. **52** (3), pp. 567-607. Q_1.

Shmueli, G. and Koppius, O.R. (2011). *MIS Quarterly,* Vol. **35** (3), pp. 353-572. Q_1.

Shpak, N., Kyrylych, T., & Greblikaitė, J. (2016). Diversification models of sales activity for steady development of an enterprise, *Sustainability,* 8(4). Q_2-Q_3.

Shpak, N., Seliuchenko, N., Kharchuk, V., Kosar, N., Sroka, W. (2019). Evaluation of Product Competitiveness: A Case Study Analysis”. *Organuzacija*, Vol. **52** (2), pp. 107-125.

Smit, A. J. (2010). “The Competitive Advantage of Nations: Is Porter’s Diamond Framework a New Theory that Explains the International Competitiveness of Countries?”, *Southern African Business Review,* Vol. **14** (1), pp. 105-130.

Soderbom, M. and Teal, F. (2003). “Are Manufacturing Exports the Key to Economic Success in Africa?”, *Journal of African Economies,* Vol. **12** (1), pp. 1-29. Q_3.

Sonali, K. S., Kevin, G. C. (2006). “Building Better Theory by Bridging the Quantitative-Qualitative Divide”. *Journal of Management Studies,* 43 (8). Q_1.

Spence, A. M., Hazard, H. A. (1988). “International Competitiveness”, *Southern Economic Journal,* Vol. **55** (2), pp. 534-536. Q_3.

Stonehouse, G. and Snowdon, B. (2007). “Competitive Advantage Revisited: Michael Porter on Strategy and Competitiveness”, *Journal of Management Inquiry,* Vol. **16** (3), pp. 256-273. Q_3.

Strandskov, J. (2006). “Sources of competitive advantages and business Performance”, *Journal of Business Economics and Management,* Vol. **7** (3), pp. 119-129. Q_2-Q_3.

Sun, H., Fan, Z., Zhou, Y. ve Shi, Y., 2010. "Empirical Research on Competitiveness Factors Analysis of Real Estate Industry of Beijing and Tianjin", *Engineering, Construction and Architectural Management*, Vol. **17** (3), pp. 240-251. Q_2.

Tan, L.Q., Wu, C.L., Qu, Y. (2020). "Measuring the International Trade Competitiveness of China's Aquatic Products from 2008-2018", *Journal of Coastal Research,* SI. (106), pp 157-160. Q_4.

Technoserve (USAID), "What Drives Competitiveness in Mozambique Cashew Value Chain?" Powerpoint presentation by Jake Walters.

Thurow, L.C. (1992). "Who owns the twenty-first century?", *Sloan Management Review,* pp. 5-17. Q_1.

Titus O. Awokuse. (2003). "Is the export-led growth hypothesis valid for Canada?", *The Canadian Journal of Economics*/Revue Canadienne d'Economique,Vol. **36** (1), pp. 126-136.

Tyunhyukova, E., Ruban, V., Burovtsev, V. (2018). "Modern Approaches to Product Competitiveness Evaluation for Companies of Various Industries", *MATEC Web of Conferences,* 216, 02016 (2018).

Ullman, J. B. (2006). "Structural Equation Modelling: Reviewing the Basics and Moving Forward", *Journal of Personality Assessment,* Vol. **87** (1), pp. 35-50. Q_2.

Ulrich, D. (1991). "Organizational capability: creating competitive advantage", *Academy of Management Executive,* Vol. **5** (1), pp. 77-92. Q_2.

UNCTAD (2008). "Export Competitiveness and Development in LDCs: Policies, Issues and Priorities for Least Developed Countries for Action During and Beyond UNCTAD XII, UNCTAD/ALDC/2008/1; http://www.unctad.org

United Nations Economic Commission for Europe. (2013). Standard DDP-17 Concerning the Marketing and Commercial Quality Control of Cashew Kernels. United Nations. Geneva and New York.

Vernon, R. (1966). "International Investment and International Trade in the Product Cycle", *Quarterly Journal of Economics,* Vol. **80**, pp. 190-207. Q_1.

Vlados, Charis. (2019). "Porter's Diamond Approaches and the Competitiveness Web", *International Journal of Business Administration,* Vol. **10** (5), pp 33-52.

Voorhees, C. M., Brady, M. K., Calantone, R. and Ramirez, E. (2016). "Discriminant Validity Testing in Marketing: An Analysis, Causes for Concern, and Proposed Remedies", *Journal of the Academy of Marketing Science,* Vol. **44** (1), pp. 119-134. Q_1.

Waheeduzzaman, A. N. M. (2011). "Competitiveness and Convergence in G7 and Emerging Markets", *Competitiveness Review,* Vol. 21 (2), pp. 110-128.

White, R. E. (1986). "Generic Business Strategies, Organisational Context and Performance: An Empirical Investigation", *Strategic Management Journal,* Vol. 7 (3), pp. 217-231. Q_1.

Wood, A. and Berge. K. (1994). Exporting manufactures: Trade policy or human resources? IDS Working Paper No. 4. Institute of Development Studies. University of Sussex, Brighton.

Wood, S. (1999). "Human Resource Management and Performance", *International Journal of Management Reviews,* Vol. **1** (4), pp. 367-413. Q_1.

World Bank. (2020). *Doing Business 2020*. Washington, D.C.

Wright, P. M. (1994). "Human resources and sustained competitive advantage: a resource-based perspective", *International Journal of Human Resource Management,* Vol. **5** (2), pp. 301-326. Q_2.

Zikria, V., Takahashi, K., Maeda, K. (2019). "International Competitiveness of Indonesia's Cocoa Sector: From the Viewpoint of Product Differentiation". *Journal of the Faculty of Agriculture Kyushu University.* Vol. **64** (2), pp. 407-413. Q_4.

UNCTAD (2021). "Commodities at a Glance: Special Issue on Cashew Nuts". United Nations, Geneva. Available on https://www.unctad.org/system/files/official-document/ditccom2020d1_en.pdf. Accessed 5th May 2021.

APPENDICES

Annex A: Factor Conditions (FC) Construct Indicators (2000-2019)

Quarters	FC_1	FC_2	FC_3	Quarters	FC_1	FC_2	FC_3
1Q2000	96.0130	94.8216	97.1254	**1Q2010**	28.3351	48.7806	33.5307
2Q2000	89.4503	95.7897	97.3008	**2Q2010**	33.6097	51.8797	42.4220
3Q2000	115.3137	109.7316	105.9644	**3Q2010**	31.2421	54.8588	40.6433
4Q2000	100.0000	100.0000	100.0000	**4Q2010**	30.9629	51.7866	38.7116
1Q2001	77.2148	87.7607	80.0164	**1Q2011**	35.5899	61.9737	36.5907
2Q2001	92.5880	92.6505	91.7227	**2Q2011**	38.6866	52.4299	44.9947
3Q2001	81.3294	88.9646	78.4418	**3Q2011**	38.3490	50.0234	44.2671
4Q2001	83.2717	89.6105	82.9323	**4Q2011**	37.5031	54.9894	41.3767
1Q2002	124.6356	103.2594	89.2606	**1Q2012**	49.5659	67.6599	49.6755
2Q2002	108.2132	103.1905	80.1180	**2Q2012**	57.4033	52.2508	53.6932
3Q2002	123.2775	103.9272	92.0382	**3Q2012**	38.7224	61.8487	41.9526
4Q2002	118.7616	103.5714	87.1050	**4Q2012**	48.1608	61.2255	48.2673
1Q2003	123.7495	105.1824	85.0692	**1Q2013**	40.1136	57.5453	48.0900
2Q2003	174.2459	131.7468	102.0962	**2Q2013**	49.0865	62.3437	50.4330
3Q2003	214.5780	125.5003	106.6078	**3Q2013**	59.1490	67.0164	52.2697
4Q2003	169.4067	121.3489	98.2469	**4Q2013**	49.0960	62.3557	50.4269
1Q2004	198.9630	136.0158	106.4044	**1Q2014**	86.6193	73.1048	67.5095
2Q2004	193.4593	122.6058	107.5553	**2Q2014**	112.9052	101.6601	83.6746
3Q2004	228.2415	133.9793	111.8296	**3Q2014**	122.3632	98.2696	74.3814
4Q2004	206.7120	130.9839	108.6180	**4Q2014**	106.8101	90.5127	75.1503
1Q2005	231.2404	121.6764	120.9929	**1Q2015**	93.2485	96.0660	80.2059
2Q2005	221.0796	140.2734	126.3722	**2Q2015**	111.2474	94.8861	87.5492
3Q2005	146.8275	111.2963	82.0417	**3Q2015**	72.2458	75.5198	59.2827
4Q2005	194.9200	123.6754	107.2479	**4Q2015**	90.6168	88.1430	74.4488
1Q2006	166.1625	117.4429	103.1628	**1Q2016**	37.5823	65.5833	55.2409
2Q2006	144.7943	123.6710	95.6116	**2Q2016**	45.2583	67.8984	47.5189
3Q2006	124.7773	87.2067	76.7258	**3Q2016**	59.4188	75.5478	71.5747
4Q2006	143.8932	108.4165	95.0085	**4Q2016**	46.7102	69.6863	57.6409
1Q2007	112.7200	106.8817	46.9547	**1Q2017**	47.9427	73.3383	54.2694
2Q2007	103.2250	110.4226	36.7874	**2Q2017**	89.1788	97.8021	84.1536
3Q2007	79.9129	64.8179	29.4455	**3Q2017**	60.5847	73.3943	60.7725
4Q2007	97.5282	92.4768	37.0567	**4Q2017**	64.5693	81.2311	65.6650
1Q2008	60.3381	75.1184	48.9150	**1Q2018**	75.3366	85.6024	68.8545
2Q2008	50.0090	65.2651	49.1965	**2Q2018**	78.7001	73.5463	74.3691
3Q2008	53.9995	57.7182	43.2711	**3Q2018**	106.0403	124.0365	78.0578
4Q2008	54.8459	66.0226	47.1881	**4Q2018**	76.7254	88.8443	69.8038
1Q2009	64.4876	73.5206	52.4630	**1Q2019**	106.0266	106.7219	80.3229
2Q2009	73.4477	74.6064	64.8490	**2Q2019**	102.9251	103.0354	85.8877
3Q2009	58.8710	69.3022	42.5732	**3Q2019**	56.5427	78.9598	53.8644
4Q2009	65.4529	72.5252	52.9831	**4Q2019**	85.8249	95.7290	72.0492

Sources: The Global Econmy (2016); INCAJU (2016); Knoema World Atlas (2020); FAOSTAT (2020)

FC_1 Wages in the Cashew Industry in US$/hour;

FC_2 Labour Productivity in the Cashew Industry

FC_3 Inward Investments in the Cashew Industry

Note Figures in growth indices with 4Q2000 = 100

Annex B: Demand Conditions (DC) Construct Indicators (2000-2019)

Quarters	D_1	D_2	D_3	D_4	Quarters	D_1	D_2	D_3	D_4
1Q2000	98.46	92.95	91.84	99.31	**1Q2010**	128.70	160.35	96.62	158.76
2Q2000	98.97	96.48	93.88	100.14	**2Q2010**	129.37	157.51	96.50	161.38
3Q2000	99.48	100.00	95.92	100.28	**3Q2010**	130.04	154.68	96.38	164.55
4Q2000	100.00	100.00	100.00	100.00	**4Q2010**	130.72	151.85	96.14	166.21
1Q2001	101.24	98.76	100.12	105.52	**1Q2011**	132.53	162.98	96.01	167.72
2Q2001	102.35	97.52	100.24	107.72	**2Q2011**	133.22	174.11	95.89	169.31
3Q2001	102.91	96.28	100.36	109.93	**3Q2011**	133.92	185.24	95.77	170.83
4Q2001	103.46	95.05	100.48	112.28	**4Q2011**	134.61	196.37	95.65	172.34
1Q2002	104.02	90.10	100.48	114.90	**1Q2012**	136.37	406.18	95.41	174.34
2Q2002	105.32	85.15	100.48	114.90	**2Q2012**	137.08	209.81	95.17	177.79
3Q2002	106.64	80.20	100.48	115.72	**3Q2012**	137.79	216.53	94.93	177.93
4Q2002	107.97	75.25	100.48	116.55	**4Q2012**	138.51	223.26	94.69	179.72
1Q2003	107.36	77.36	100.48	117.79	**1Q2013**	140.20	225.38	94.57	183.45
2Q2003	107.91	79.47	100.48	118.76	**2Q2013**	140.93	227.51	94.44	184.14
3Q2003	108.48	81.59	100.48	121.10	**3Q2013**	141.66	229.63	94.20	184.83
4Q2003	109.04	83.70	100.48	122.34	**4Q2013**	142.40	231.76	93.72	186.07
1Q2004	110.69	88.31	100.36	124.14	**1Q2014**	144.03	234.29	93.48	191.86
2Q2004	111.27	92.93	100.24	125.52	**2Q2014**	144.78	236.82	93.24	192.28
3Q2004	111.85	97.54	100.12	126.07	**3Q2014**	145.54	239.36	93.00	193.24
4Q2004	112.43	102.16	100.00	126.59	**4Q2014**	146.29	241.89	92.75	193.79
1Q2005	114.03	105.49	99.88	127.86	**1Q2015**	147.87	235.87	92.51	196.28
2Q2005	114.62	108.83	99.76	129.38	**2Q2015**	148.64	229.84	92.27	198.76
3Q2005	115.22	112.16	99.64	130.90	**3Q2015**	149.41	223.82	92.03	202.34
4Q2005	115.82	115.50	99.52	132.28	**4Q2015**	150.19	217.79	91.79	202.76
1Q2006	117.37	117.70	99.40	137.38	**1Q2016**	152.25	204.09	91.79	202.48
2Q2006	117.98	119.90	99.28	137.52	**2Q2016**	153.04	190.39	91.79	202.48
3Q2006	118.59	122.10	99.15	139.31	**3Q2016**	153.84	176.69	91.79	200.14
4Q2006	119.21	124.30	99.03	140.83	**4Q2016**	154.64	162.99	91.79	202.07
1Q2007	120.71	128.25	98.91	143.86	**1Q2017**	156.63	167.36	91.79	202.34
2Q2007	121.33	132.19	98.79	144.83	**2Q2017**	157.45	171.74	91.79	203.17
3Q2007	121.96	136.13	98.67	145.66	**3Q2017**	158.26	176.12	91.79	203.72
4Q2007	122.60	140.08	98.55	147.17	**4Q2017**	159.09	180.49	91.79	204.14
1Q2008	124.04	148.03	98.43	148.97	**1Q2018**	161.56	185.60	92.27	204.28
2Q2008	124.69	155.98	98.31	150.90	**2Q2018**	162.40	190.72	92.75	204.28
3Q2008	125.34	163.94	98.19	152.69	**3Q2018**	163.24	195.83	93.24	204.28
4Q2008	125.99	171.89	98.07	154.55	**4Q2018**	164.09	200.94	93.72	204.41
1Q2009	126.82	169.71	97.83	155.59	**1Q2019**	166.49	201.66	93.12	201.79
2Q2009	127.48	167.53	97.58	156.55	**2Q2019**	167.35	202.37	92.51	203.72
3Q2009	128.15	165.36	97.34	157.66	**3Q2019**	168.22	203.08	91.91	203.45
4Q2009	128.81	163.18	97.10	158.48	**4Q2019**	169.10	203.80	91.30	203.03

Sources: The Global Econmy (2016); INCAJU (2016); Knoema Wolrd Atlas (2020); FAOSTAT (2020)

DC_1 Population in 10^6 Inhabitants

DC_2 Gross Domestic Product in US\$ 10^6

DC_3 Employment as a % of Total Population

DC_4 Gross Domestic Product Per Capita in US\$

Note Figures in growth indices with 4Q2000 = 100

Annex C: Supporting and Related Industries (SR) Construct Indicators (2000-2019)

Quarters	SR_1	SR_2	SR_4	SR_5	Quarters	SR_1	SR_2	SR_4	SR_5
1Q2000	76.80	70.67	93.91	90.11	**1Q2010**	11.51	21.24	46.77	1,747.68
2Q2000	61.60	78.97	115.63	88.85	**2Q2010**	10.15	18.54	54.18	1,711.20
3Q2000	47.52	126.00	77.25	108.00	**3Q2010**	8.71	24.41	40.68	2,197.05
4Q2000	100.00	100.00	100.00	100.00	**4Q2010**	9.23	20.60	43.84	1,824.43
1Q2001	45.37	39.83	111.87	170.14	**1Q2011**	105.73	38.55	72.42	2,685.33
2Q2001	42.15	60.79	117.55	129.69	**2Q2011**	137.28	25.42	83.12	2,669.34
3Q2001	31.82	83.17	101.98	144.65	**3Q2011**	91.28	21.87	61.83	2,624.17
4Q2001	66.77	66.91	118.00	166.93	**4Q2011**	149.43	29.98	75.40	2,810.48
1Q2002	325.30	110.95	167.79	266.28	**1Q2012**	16.05	17.62	75.71	3,119.46
2Q2002	396.91	57.54	169.08	345.24	**2Q2012**	21.99	42.77	97.88	3,207.46
3Q2002	392.35	92.33	143.03	494.64	**3Q2012**	12.65	33.53	61.04	3,075.09
4Q2002	602.48	97.60	177.83	421.74	**4Q2012**	15.95	30.35	74.79	3,112.78
1Q2003	218.99	48.84	192.67	443.38	**1Q2013**	55.63	38.62	81.82	4,682.56
2Q2003	256.41	75.41	198.79	527.90	**2Q2013**	48.44	47.12	98.64	5,277.69
3Q2003	340.51	78.35	220.23	406.72	**3Q2013**	60.73	24.10	83.04	5,221.48
4Q2003	257.90	66.09	200.49	467.44	**4Q2013**	75.12	36.99	89.35	5,175.33
1Q2004	265.93	64.66	155.43	703.92	**1Q2014**	80.19	45.50	91.07	7,496.48
2Q2004	389.90	103.38	172.86	708.90	**2Q2014**	57.09	27.65	80.18	7,020.96
3Q2004	323.99	40.50	153.80	809.97	**3Q2014**	39.25	30.82	82.73	6,378.85
4Q2004	341.32	69.43	162.75	752.90	**4Q2014**	108.82	35.19	86.69	7,135.94
1Q2005	251.00	47.97	80.33	1,024.74	**1Q2015**	2.81	42.45	101.75	8,951.36
2Q2005	174.11	43.89	76.64	875.93	**2Q2015**	4.08	42.47	109.44	9,021.29
3Q2005	120.26	36.70	58.78	889.27	**3Q2015**	2.03	44.93	115.57	9,918.45
4Q2005	141.38	40.04	67.03	874.09	**4Q2015**	2.92	43.28	108.80	9,300.27
1Q2006	71.28	21.88	44.77	869.12	**1Q2016**	92.64	65.43	168.10	10,191.64
2Q2006	115.77	33.27	48.37	1,031.32	**2Q2016**	143.44	64.25	177.49	11,295.57
3Q2006	65.86	27.88	44.82	790.37	**3Q2016**	80.56	93.07	201.31	12,998.82
4Q2006	53.32	24.06	40.15	788.48	**4Q2016**	119.81	84.62	208.48	13,376.66
1Q2007	97.80	27.33	38.69	1,150.61	**1Q2017**	223.48	112.52	246.61	12,076.18
2Q2007	78.64	25.28	37.57	1,039.22	**2Q2017**	245.20	106.25	250.80	11,892.20
3Q2007	137.43	27.36	51.60	1,107.11	**3Q2017**	284.52	90.89	250.48	13,040.42
4Q2007	102.31	26.77	41.95	1,107.35	**4Q2017**	251.00	103.20	249.16	12,354.18
1Q2008	24.68	10.28	30.86	937.27	**1Q2018**	92.46	110.07	235.02	13,125.84
2Q2008	23.05	19.20	25.25	941.01	**2Q2018**	79.05	98.82	240.14	12,273.93
3Q2008	14.04	17.81	20.11	915.80	**3Q2018**	137.49	74.47	224.75	13,748.64
4Q2008	19.50	16.25	24.58	928.21	**4Q2018**	103.53	95.04	234.15	13,077.34
1Q2009	51.02	10.98	30.10	1,530.60	**1Q2019**	262.43	122.65	229.05	12,799.36
2Q2009	79.86	38.82	49.69	1,630.49	**2Q2019**	245.01	92.73	224.50	12,556.81
3Q2009	59.01	19.32	27.87	1,580.55	**3Q2019**	263.15	67.47	218.43	12,145.28
4Q2009	60.13	20.68	33.66	1,558.09	**4Q2019**	256.35	94.14	223.75	12,507.07

Sources: The Global Econmy (2016); Knoema World Data Atlas (2000-2020)

SR_1 In-Shell Cashew Nut Exports Volume in 10^6 tons

SR_2 Share of Paved Roads as % of Total Roads

SR_4 Volume of Cargo Transported by Railway in 10^6 ton-km

SR_5 Number of Cellphone line susbscribers in 10^2 units

Note Figures in growth indices with 4Q2000 = 100

Annex D: Firm Strategy, Structure and Rivalry (Competitiveness =EC) Construct Indicators (2000-2019)

Quarters	EC_1	EC_2	Quarters	EC_1	EC_4
1Q2000	87.50	87.50	**1Q2010**	125.14	53.28
2Q2000	112.50	85.00	**2Q2010**	102.63	64.14
3Q2000	100.00	112.50	**3Q2010**	153.71	89.66
4Q2000	100.00	100.00	**4Q2010**	128.09	69.75
1Q2001	112.50	112.50	**1Q2011**	125.96	62.98
2Q2001	100.00	101.25	**2Q2011**	104.16	74.87
3Q2001	100.00	75.00	**3Q2011**	113.96	63.31
4Q2001	100.00	100.00	**4Q2011**	150.39	72.06
1Q2002	112.50	62.50	**1Q2012**	115.92	46.24
2Q2002	112.50	37.50	**2Q2012**	109.45	36.48
3Q2002	100.00	37.50	**3Q2012**	123.16	49.26
4Q2002	100.00	50.00	**4Q2012**	115.85	46.22
1Q2003	87.50	50.00	**1Q2013**	151.16	75.58
2Q2003	112.50	62.50	**2Q2013**	134.75	49.00
3Q2003	112.50	62.50	**3Q2013**	102.67	64.17
4Q2003	112.50	50.00	**4Q2013**	131.40	62.57
1Q2004	112.50	37.50	**1Q2014**	155.65	44.30
2Q2004	87.50	37.50	**2Q2014**	137.03	35.75
3Q2004	125.00	28.75	**3Q2014**	137.87	38.96
4Q2004	112.50	37.50	**4Q2014**	132.34	39.10
1Q2005	100.00	87.50	**1Q2015**	142.74	62.06
2Q2005	125.00	62.50	**2Q2015**	121.95	42.68
3Q2005	100.00	75.00	**3Q2015**	149.81	23.05
4Q2005	112.50	75.00	**4Q2015**	137.48	42.21
1Q2006	125.00	50.00	**1Q2016**	149.64	68.58
2Q2006	112.50	62.50	**2Q2016**	136.69	48.82
3Q2006	100.00	37.50	**3Q2016**	137.13	62.33
4Q2006	112.50	50.00	**4Q2016**	140.60	69.05
1Q2007	112.50	62.50	**1Q2017**	131.40	62.57
2Q2007	125.00	50.00	**2Q2017**	146.47	104.81
3Q2007	100.00	62.50	**3Q2017**	155.18	103.45
4Q2007	112.50	62.50	**4Q2017**	143.83	90.06
1Q2008	100.00	50.00	**1Q2018**	148.18	75.47
2Q2008	125.00	75.00	**2Q2018**	166.90	102.71
3Q2008	100.00	50.00	**3Q2018**	123.24	49.30
4Q2008	112.50	62.50	**4Q2018**	148.31	75.54
1Q2009	125.00	37.50	**1Q2019**	143.77	101.29
2Q2009	112.50	37.50	**2Q2019**	139.14	75.89
3Q2009	125.00	75.00	**3Q2019**	156.80	117.60
4Q2009	112.50	50.00	**4Q2019**	146.46	100.45

Sources: The Global Econmy (2016); INE Yearbook (2000 -2019); Knoema World Data Atlas (2000-2020)

EC_1 Intensity of Local Competition Points

EC_2 World Bank Distance to Frontier Points

Note Figures in growth indices with 4Q2000 = 100

Annex E: The Government Role (GR) Construct Indicators (2000-2019)

Quarters	EC_1	EC_2	Quarters	EC_1	EC_4
1Q2000	87.50	87.50	**1Q2010**	125.14	53.28
2Q2000	112.50	85.00	**2Q2010**	102.63	64.14
3Q2000	100.00	112.50	**3Q2010**	153.71	89.66
4Q2000	100.00	100.00	**4Q2010**	128.09	69.75
1Q2001	112.50	112.50	**1Q2011**	125.96	62.98
2Q2001	100.00	101.25	**2Q2011**	104.16	74.87
3Q2001	100.00	75.00	**3Q2011**	113.96	63.31
4Q2001	100.00	100.00	**4Q2011**	150.39	72.06
1Q2002	112.50	62.50	**1Q2012**	115.92	46.24
2Q2002	112.50	37.50	**2Q2012**	109.45	36.48
3Q2002	100.00	37.50	**3Q2012**	123.16	49.26
4Q2002	100.00	50.00	**4Q2012**	115.85	46.22
1Q2003	87.50	50.00	**1Q2013**	151.16	75.58
2Q2003	112.50	62.50	**2Q2013**	134.75	49.00
3Q2003	112.50	62.50	**3Q2013**	102.67	64.17
4Q2003	112.50	50.00	**4Q2013**	131.40	62.57
1Q2004	112.50	37.50	**1Q2014**	155.65	44.30
2Q2004	87.50	37.50	**2Q2014**	137.03	35.75
3Q2004	125.00	28.75	**3Q2014**	137.87	38.96
4Q2004	112.50	37.50	**4Q2014**	132.34	39.10
1Q2005	100.00	87.50	**1Q2015**	142.74	62.06
2Q2005	125.00	62.50	**2Q2015**	121.95	42.68
3Q2005	100.00	75.00	**3Q2015**	149.81	23.05
4Q2005	112.50	75.00	**4Q2015**	137.48	42.21
1Q2006	125.00	50.00	**1Q2016**	149.64	68.58
2Q2006	112.50	62.50	**2Q2016**	136.69	48.82
3Q2006	100.00	37.50	**3Q2016**	137.13	62.33
4Q2006	112.50	50.00	**4Q2016**	140.60	69.05
1Q2007	112.50	62.50	**1Q2017**	131.40	62.57
2Q2007	125.00	50.00	**2Q2017**	146.47	104.81
3Q2007	100.00	62.50	**3Q2017**	155.18	103.45
4Q2007	112.50	62.50	**4Q2017**	143.83	90.06
1Q2008	100.00	50.00	**1Q2018**	148.18	75.47
2Q2008	125.00	75.00	**2Q2018**	166.90	102.71
3Q2008	100.00	50.00	**3Q2018**	123.24	49.30
4Q2008	112.50	62.50	**4Q2018**	148.31	75.54
1Q2009	125.00	37.50	**1Q2019**	143.77	101.29
2Q2009	112.50	37.50	**2Q2019**	139.14	75.89
3Q2009	125.00	75.00	**3Q2019**	156.80	117.60
4Q2009	112.50	50.00	**4Q2019**	146.46	100.45

Sources: The Global Econmy (2016); INE Yearbook (2000 -2019); Knoema World Data Atlas (2000-2020)

EC_1 Intensity of Local Competition Points

EC_2 World Bank Distance to Frontier Points

Note Figures in growth indices with 4Q2000 = 100

Annex F: Qualitative Research Questionnaire

The production and export of cashew kernels in Mozambique was in a not-so-distant past one of the main sources of income, employment and foreign exchange revenues. In recent times this industry resents several internal and external problems that need to be identified and studied in order for the country to regain its past position in the international market of this product. This is an invitation to participate in the survey[30] on the Export Competitiveness of Mozambique's Cashew Nut Industry: Applying Michael Porter's Diamond Model, being developed by Salvador Namburete, within the framework of the preparation of his Doctoral Thesis in Applied Business Management at ISCTE-IUL, Lisbon University Institute - Portugal, a higher education institution of great reputation, to contribute ideas and suggestions to help seek ways of solving existing problems. Please accept my thanks in advance for your attention, participation and contribution.

* = It is required

1. Your email address*

…………………………………………………

2. Are you willing to participate in this survey?*

Yes	No

3. State your gender

Female	Male

4. State your age group*

	Less than 30 years old
	Between 31 and 39 years old
	Between 40 and 49 years old
	Between 50 and 64 years old
	65 years or older

5. What is your workplace?*

	Public sector
	Cashew processing factory
	Local trader or exporter
	Other private sector

6. What is your experience at workplace in number of years*

	Less than 10 years
	Between 10 and 15 years
	16 years and above

7. State your position at your workplace*

	Owner
	Manager
	Technical staff
	Base employee

8. What is your education level?*

	Primary School
	Secondary School
	Medium (High School)
	University Degree

Construct I: Factor Conditions (QFC) – On a scale of 1 to 5, where 1 means that you totally disagree, 2 means that you agree, 3 in the middle means neutral position or no opinion, 4 means that you agree, and 5 means that you totally agree, please indicate how you rank the following statements:

1.1. The availability of raw materials (in-shell cashew nuts) for processing is critical for the success of the cashew nut industry*

1	2	3	4	5

1.2. The quality of the raw material available is suitable for the good performance of the cashew nut industry*

1	2	3	4	5

1.3. Manual cashew nut shelling technology is better than mechanized shelling technology*

1	2	3	4	5

1.4. The domestic market for equipment, spare parts, accessories, and the services rendered to the production of cashew nut kernels in general is efficient*

1	2	3	4	5

1.5. The electricity supply conditions adversely affect the quality of the cashew kernels produced in the industry*

1	2	3	4	5

1.6. The qualifications of the cashew nut industry professionals are adequate*

1	2	3	4	5

Construct II: Demand Conditions (QDC) – On a scale of 1 to 5, where 1 means that you totally disagree, 2 means that you agree, 3 in the middle means neutral position or no opinion, 4 means that you agree, and 5 means that you totally agree, please indicate how you rank the following statements:

2.1. The size of the domestic market for cashew kernels is a fundamental factor for the success of the cashew nut industry in the country*

1	2	3	4	5

2.2. The level of awareness on foreign consumer tastes and preferences is a very indispensable detail to the success of cashew nut processing and kernel exports*

1	2	3	4	5

2.3. Changes in the consumption habits and international standards of cashew kernel demand does have an influence on processors and exporters performance in this product*

1	2	3	4	5

2.4. There is a healthy cooperation between the cashew nut processing companies and the Instituto de Amêndoas de Moçambique, IP*

1	2	3	4	5

2.5. Cashew nut processing companies contribute to the economic and social development of the country*

1	2	3	4	5

2.6. The level of efficiency of the cashew kernel after-sales services is adequate*

1	2	3	4	5

Construct III: Supporting and Related Industries (QSR) – On a scale of 1 to 5, where 1 means that you totally disagree, 2 means that you agree, 3 in the middle means neutral position or no opinion, 4 means that you agree, and 5 means that you totally agree, please indicate how you rank the following statements:

3.1. The relationship between cashew nut processing companies and the Government authorities is health*

1	2	3	4	5

3.2. The incentives granted to cashew sector workers is sufficient to ensure the retention of the highest qualified professionals in the industry*

1	2	3	4	5

3.3. The cashew nut industry has established cooperation ties with the country's higher education institutions*

1	2	3	4	5

3.4. Labour legislation regulating the cashew industry motivates the performance of workers in the sector*

1	2	3	4	5

3.5. Cashew industrialists jointly conduct market research and cashew kernel marketing campaigns or actions*

1	2	3	4	5

3.6. Technological innovation and management models are key factors in the development of the cashew kernel business*

Construct IV: Firm's Strategy, Structure, and Rivalry (Export Competitiveness) (QEC) - On a scale of 1 to 5, where 1 means that you totally disagree, 2 means that you agree, 3 in the middle means neutral position or no opinion, 4 means that you agree, and 5 means that you totally agree, please indicate how you rank the following statements:

4.1. The qualifications of the technical staff at the service of raw cashew nut supplying companies and service providers in general are adequate*

1	2	3	4	5

4.2. The raw material and service supplier market is in general very competitive*

1	2	3	4	5

4.3. The level of competition between raw material traders and the cashew nut processing companies is healthy*

1	2	3	4	5

4.4. Cashew nut processing companies in Mozambique openly share commercial information with each other*

1	2	3	4	5

4.5. Certification of quality standards has a positive impact on the cashew kernel business*

1	2	3	4	5

4.6. There is easy access to financing for the cashew nut industry*

1	2	3	4	5

Construct V: Government Role (QGR) - On a scale of 1 to 5, where 1 means that you totally disagree, 2 means that you agree, 3 in the middle means neutral position or no opinion, 4 means that you agree, and 5 means that you totally agree, please indicate how you rank the following statements:

5.1. Corporate income tax functioning favours the growth and consolidation of the national cashew nut industry*

1	2	3	4	5

5.2. Value Added Tax (VAT) functioning promotes the growth and consolidation of the national cashew nut industry*

1	2	3	4	5

5.3. The fiscal incentives granted to the cashew nut industrial sector stimulates the investment and growth of the cashew nut processing industry*

1	2	3	4	5

5.4. The current business environment in the country favours the attraction of new cashew processing companies*

1	2	3	4	5

5.5. The current level of the informal economy is beneficial for thr increase in sales of cashew kernels in general*

1	2	3	4	5

5.6. The establishment and operation of training programmes for technical staff and specialists for the cashew industrial sector ensure the sustainability of the industry in the medium and long term.

1	2	3	4	5

Annex G (Page 1) _ Spreadsheet Containing the Qualitative Research Questionnaire Results

QFC1	QFC2	QFC3	QFC4	QFC5	QFC6	QDC1	QDC2	QDC3	QDC4	QDC5	QDC6	QSR1	QSR2	QSR3	QSR4	QSR5	QSR6	QEC1	QEC2	QEC3	QEC4	QEC5	QEC6	QGR1	QGR2	QGR3	QGR4	QGR5	QGR6
5	1	2	2	1	1	1	5	2	1	3	2	5	1	3	1	1	2	3	4	2	5	5	3	5	5	5	5	5	5
5	4	3	5	3	4	5	5	5	4	4	4	3	3	4	3	4	5	5	5	3	2	5	2	3	3	4	2	2	5
5	3	4	2	2	2	1	4	1	1	2	2	5	1	1	1	1	3	1	4	1	4	2	2	4	5	2	5	4	4
5	5	5	5	4	3	2	4	4	2	4	3	2	3	4	5	3	5	4	5	2	2	5	5	3	2	4	3	1	2
5	1	1	1	1	1	1	5	1	2	4	5	4	2	2	2	2	2	2	4	1	5	5	5	5	5	5	4	5	5
5	5	4	5	5	1	1	5	5	1	5	2	1	4	1	2	1	5	5	1	1	1	5	4	4	2	1	1	1	5
5	2	1	1	1	3	2	1	2	2	1	5	4	2	1	1	4	2	1	4	1	5	4	2	2	4	3	3	4	4
5	5	5	5	4	4	4	4	4	4	3	3	4	3	3	3	3	4	4	4	3	3	4	3	3	3	4	4	3	5
3	2	3	3	2	3	3	3	2	2	3	3	2	2	2	3	4	3	2	3	4	5	5	5	5	5	5	5	5	5
5	5	4	4	4	4	3	5	5	3	5	3	2	4	3	3	4	4	4	4	3	3	5	3	3	3	3	2	2	3
4	2	2	3	2	2	4	5	4	3	5	4	5	4	4	3	4	4	4	5	5	4	4	3	4	5	5	3	5	5
5	5	4	3	4	2	2	5	4	2	5	2	2	2	1	3	1	4	5	5	2	1	5	2	2	2	2	3	1	4
5	1	1	1	4	2	1	5	3	3	5	5	5	2	3	2	3	4	4	5	5	5	5	5	3	5	2	5	4	5
4	5	5	4	5	1	1	4	4	1	4	1	1	2	1	1	1	5	4	5	1	2	4	2	2	2	1	1	1	3
3	1	1	1	1	2	5	5	3	4	2	2	3	1	3	2	3	5	4	5	3	3	2	1	3	3	5	3	5	5
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2	4	3	4	4	4	2	1	5	3	1	1	1	4	3	3	1	5	4	1	3	1	2	3	4	2	3	2	1	2
3	2	4	2	3	2	4	2	2	1	1	1	3	2	2	1	2	4	1	2	3	4	2	2	1	1	1	3	2	1
3	1	1	2	1	2	2	2	4	1	1	2	4	1	1	1	2	1	2	3	1	1	2	4	1	2	3	4	3	3
4	4	1	2	1	1	4	3	2	4	2	2	3	2	3	2	1	4	4	4	4	1	2	1	2	1	2	1	4	2
5	1	1	1	2	2	1	5	1	2	4	2	5	1	2	1	1	1	3	5	2	4	5	3	1	5	4	4	5	5
5	5	3	4	4	2	3	5	2	1	2	1	1	1	1	1	1	5	2	4	2	1	2	1	2	2	4	2	1	5
1	1	1	2	2	2	2	5	1	3	4	4	4	1	1	1	1	1	2	2	2	4	4	5	4	4	5	5	5	5
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4	4	2	4	1	5	5	2	1	5	2	3	2	1	2	1	1	3	2	1	2	1	4	1	2	1	1	4	4	5
4	2	2	1	2	1	2	4	1	1	1	4	4	1	1	1	2	4	1	1	4	3	5	2	4	2	2	4	2	2
2	2	3	3	3	3	5	5	1	1	2	4	2	4	3	1	2	1	2	1	1	4	4	2	3	3	3	4	4	4
4	1	2	1	1	2	1	2	2	4	2	3	3	1	2	1	1	3	1	1	1	1	3	4	2	3	3	3	2	2
5	5	5	3	4	5	1	5	5	5	5	5	5	5	2	5	2	5	5	5	2	3	5	5	5	2	5	1	1	5
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3	3	2	1	1	3	1	4	3	3	3	3	3	1	5	5	3	1	5	1	3	3	5	5	3	4	4	3	3	1
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Annex G (Page 2) _ Spreadsheet Containing the Qualitative Research Questionnaire Results

QFC1	QFC2	QFC3	QFC4	QFC5	QFC6	QDC1	QDC2	QDC3	QDC4	QDC5	QDC6	QSR1	QSR2	QSR3	QSR4	QSR5	QSR6	QEC1	QEC2	QEC3	QEC4	QEC5	QEC6	QGR1	QGR2	QGR3	QGR4	QGR5	QGR6
5	5	5	5	3	5	5	5	2	5	5	2	5	2	2	5	2	2	5	5	2	2	5	2	2	2	5	2	2	5
5	5	5	5	3	5	5	5	5	5	5	5	5	2	3	2	1	2	1	2	1	1	3	1	1	1	1	1	1	3
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QFC1	QFC2	QFC3	QFC4	QFC5	QFC6	QDC1	QDC2	QDC3	QDC4	QDC5	QDC6	QSR1	QSR2	QSR3	QSR4	QSR5	QSR6	QEC1	QEC2	QEC3	QEC4	QEC5	QEC6	QGR1	QGR2	QGR3	QGR4	QGR5	QGR6
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QFC1	QFC2	QFC3	QFC4	QFC5	QFC6	QDC1	QDC2	QDC3	QDC4	QDC5	QDC6	QSR1	QSR2	QSR3	QSR4	QSR5	QSR6	QEC1	QEC2	QEC3	QEC4	QEC5	QEC6	QGR1	QGR2	QGR3	QGR4	QGR5	QGR6
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Annex H (Page 1): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Producers	146.000	195.000	500.000	500.000
Processors	11 processors	22 mini + 11 large	1.700	224
Employees industry	6.293	170.000 - 200.000	1.000.000	600.000 – 700.000
Employees processing	10.000	15.000	500.000	210.000
Area (ha)	50.000	680.000	730.000	433.000
Kg produced/ha	1.160	268	815 on average	1.240
MT produced	70.000	170.000	460.000	400.000
MT processed	33.000	280.000	302.200	700.000
MT kernel exported	3.167	51.556	110.815	154.700
MT raw cashew nuts imported	0	0	252.605	300.000
Exports revenue (US$)	15.000.000	145.000.000	571.000.000	500.000.000
Usage of by-products	1) Production of cashew juice (*xikadju*), not for commercial purposes; 2) Fruit for firewater production (*thonthontho*) for limited commercial use; 3) Juice not for commercial use 4) Insufficient cashew volumes to process CNSL.	1) 20% of fruit for juice, jams, animal feed, candy, desserts and cosmetics 2) CNSL used for chemical industry in dyes, lubricants and cosmetics. 3) Gum and nut shells used in chemical industry.	1) Exports of 6.400 MT of CNSL on average per year. 2) Sale of cashew shells ad outer layer peel to leather and paint industries. 3) Production 2000 bottles of apple syrup per year for local consumption. 4) Cashew apple liquor and wine production in commercial terms only in Goa.	1) 5 to 10% of nut shells are burnt to fuel roasting or steaming process. 2) CNSL extracted from shells and processed by paint industries. 3) Currently 10 companies export primarily to China.
Future targets	1) National target: 75.000 MT. exports of US$10 million. More than 4.000 jobs		1) Increase exports of kernels to 275,000 MT; 2) Increase domestic in-shell cashew nut production to 1.9 million MT; 3) Make sure that 20% of cashews exported are value added and marketed with "Made in India" brand.	1) Expansion of cashew tree growing areas up to 500,000 ha; 2) Increase domestic market by 20%
Institutional Support	1) Government Agencies: ◦ Instituto de Amêndoas; ◦ Ministry of Agriculture and Rural Development; ◦ National Institute for Agronomical Research; ◦ Institute for Quality and Standardisation. 2) NGO and Donors: ◦ USAID, AfD, EU; ◦ World Vision, Technoserve.	1) Banco do Brazil; 2) EMBRAPA 3) CENTEC (Instituto de Ensino Tecnológico) 4) OCEC (Organização das Cooperativas do Estado do Ceará) 5) UFC (Universidade Federal de Ceará) 6) SEAGRI (Secretaria de Agricultura e Pecuária); 7) SDLR 8) INDI 9) SETUR 10) SEBRAE (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas 11) SESCOOP/CE – Serviço Nacional de Aprendizagem do Cooperativismo do Ceará) 12) SINDICAJU 13) SINCAJU – Sindicato dos Produtores de Caju do Estado do Ceará) 14) ASCAJU – Association of Cashew Growers of the State of Ceará) 15) FAEC 16) SENAR 17) Centro Nacional de Pesquisas do Caju 18) Sindicato de Exportação de Amêndoas 19) EMATERCE – Empresa de Assistência Técnica 20) EMPACE – Empresa de Asseio, Conservação e Empreendimentos.	1) National Bank for Agriculture and Rural Development 2) Cashew Export Promotion Council (CEPC) 3) Department of Agriculture 4) Indian Council of Agricultural Research 5) Cashew Research Station of Kerala Agricultural University 6) Directorate of Cashew Nut and Cocoa Development 7) National Research Centre for Cashew 8) Plantation Corporation of Kerala 9) Central Plantation Crops Research Institute (CPCR) 10) Each cashew producing State has local affiliates of the national organisations listed above	1) Ministry of Agriculture and Rural Development 2) Department of Agriculture and Rural Development 3) Vietnam Institute of Scientific and Agricultural Engineering 4) Institute of Agricultural Science of Southern Vietnam 5) Department of Industry 6) Institute of Policy and Strategy for Agriculture and Research Development 7) Institute for Scientific and Economic Research Policy 8) Vietnam Chamber of Commerce and Industry 9) Agriculture Extension Centre 10) Vietnam Cashew Association 11) Department of Science and Technology 12) International Labour Organisation 13) GTZ-SME Development Programme 14) Vietnam Bank of Agriculture and Rural Development 15) Vietnam Bank of Social Policy 16) Centre of Agricultural Policy (CAP)

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 2): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Farm Gate Price	1) MZN 40 (US$ 0.63) in 2004/2005; 2) MZN 32 in 2007; information based on Luis and Kanji's personal interviews.	1) US$ 0.50 per kg of raw cashew nuts (USAID, 2006); 2) There is a minimum price of US$ 0.44 agreed between the Union of Cashew Producers of Ceará and the processors' Union (SINCAJU)	US$ 0.80/kg of raw cashew nuts	US$ 0.57/kg of raw cashew nuts
Collector Gate Price	No reliable data available	US$ 0.57/kg from mini-fabrica (based on 2.25 R/US exchange rate (USAID)		US$ 0.65/kg of raw cashew nuts
Processor Gate Price	US$ 0.53/kg	1) US$ 1.01/kg mini-fabrica 2) U$S 0.77/kg for mechanized (based on 2.25R/US exchange rate (USAID report)	US$ 1.18/kg (Harilal et al. (2005)	US$ 0.80/kg (Technoserve)
Export Price	1) Avg FOB US$ 454/MT 2) Peak US$ 640/MT in 2004/2005	US$ 4.7/kg mini-fabrica (USAID report)	US$ 5.45/kg (Harilal et al. (2005)	US$ 4.3/kg
R&D	National Institute for Agricultural Research	EMBRAPA; National Center for Cashew Research, SEAGI/CE	1) Regional Fruit Research Station (RFRS); 2) Cashew Research Sanitation at Kerala 3) Agricultural University National Research Centre for Cashew 4) University-based Research Stations in Cashew Producing States that are part of the India Coordinated Research Project or private firms	1) Center of Agricultural Policy (CAP); 2) Institute of Agricultural Science 3) Institute for Social and Economic Research and Policy (ISERP) 4) Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD)
Seed technology	Improved local strains as well as species imported from Brazil	EMBRAPA has developed new seed varieties, but only large producers have access	Seeds from optional progenies have been identified and promoted in Maharashtra – these are also researched at the institutions listed above	State institute has developed five new seed varieties. The best of those varieties can produce 4 to 5 MT/hectare
Genetic type tree	1) Avg yield lags behind other countries 2) Outturn lags other countries 3) Stock of cashew trees is old and poorly maintained 4) 42-46 lbs quality	Only 9% of Brazilian producers have the dwarf variety.	1) Between 30-40 cultivars released, 8-10kg per tree output; 2) 200,000 ha of government supported plantations are using high yielding grafts	1) 30% of cashew regions have adopted new tree varieties 2) Avg yield in Binh Phuoc province is 2-4 MT/ha (national average is 1-2 MT/ha).
Disease resistance/Use of pesticide	1) Powdery Mildew Disease is a major problem 2) Costs are too high for growers to afford 3) Spraying is offered by IAM. 4) The demand for this intervention exceeds IAM's capacity	EMBRAPA has conducted extensive research on the development of disease resistant varieties and use of pesticides through its integrated Cashew Production Programme	1) Primarily organic – Cashew Research Station at Kerala Agricultural University is exploring integrated pest management strategies 2) Tea mosquito bug is the principal pest but the Cashew Research Station has identified 20 insects as pests at its facility. 3) Chemical spraying on government plantations in Northern Kerala controversial as they are considered the cause of rising birth defects in neighbouring communities.	1) Pesticides available on open market; 2) Commonly used; 3) Some new varieties are also disease resistant.
Types of Producers/% of Smallholder Producers	1) Smallholders: 95% of production 2) 1.4 million rural households (40% of rural population) have access to cashew trees. 3) Cashew trees account for about 1/5 of total household income and 2/3 of total cash income	1) 94% of the 57,000 cashew nut producers in the country and are responsible for 52% of the harvest. 2) 48% done by large-scale cashew plantations. They produce up to 40% of the cashews they process and buy the remaining supply from small and medium-sized producers.	1) NABARD estimates that 90% of production is from small growers who intercrop (with pepper, coconut, etc.) 2) The remaining 10% is from government-operated plantations	Majority smallholder growers
Production by Region	1) North & Nampula: 80% of 40,000 MT 2) South: 20% (10,000 MT) (Gaza and Inhambane)	1) Ceará 2) Maranhão 3) Piaiu 4) Rio Grande do Norte	1) Maharashtra 2) Andhra Pradesh 3) Kerala 4) Orissa 5) Tamil Nadu Directorate of Cashew Nut and Cocoa Department)	1) Binh Phuoc 2) Binh Duong 3) Dong Ngai

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 2): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Access to Land	1) Land tenure system, government owns all of the country's land 2) Land allocation through a tenure system and men are generally the owners of land and trees 3) However, women also own trees.	1) Land distribution is a controversial issue in Ceará, and in Brazil in general 2) Although land tenure system has improved, agrarian reform has been implemented with variable success	1) The Department of Agriculture supports an Employment Guarantee Scheme to bring fallow lands under cultivation 2) National Cashew Research Project has also prepared large tracts of land for new plantations 3) In the State of Kerala the existence of land ceiling until recently limited the establishment of privately-owned plantations 4) Land access issues may vary by State according to land availability	1) Government owns the land, but the growers have the right to use it however they like 2) Land certificates are difficult to obtain 3) Typical farm size is 2 ha as a result of the Land Law of 1993.
Grower Financing	1) There only one commercial bank that offers credit to processors at very high interest rates and requesting all sort of insurances; 2) A Loan Guarantee Fund is in place to support processors access to working capital. USAID and IAM are partners. 3) Some small NGOs offer microfinance services and prefer dealing with grower associations). Forming associations is extremely costly, bureaucratic and time-consuming) 4) Inability to use land as collateral makes access to credit even more difficult 5) Cashew processing is regarded as a risky business. Difficult to have access to loans to buy in-shell cashew nuts or build storage facilities. 6) Interest rates over 30% for this purpose (2003).	1) Banco do Nordeste is the main source of credit. 2) Credit offered for investment in starting mini-mills, rather than working capital for growers (subsidies for fixed investment in ratio of 3 to 1 compared to working capital (USAID, 2006); 3) Value chain financing is common	Government-supported agencies include: 1) National Bank of Agriculture and Rural Development (NABARD); 2) Cashew Export Promotion Council (CEPC); 3) Microfinance institutions and self-help Groups 4) Cooperative and commercial banks finance SMEs 5) Value chain financing – trade credit, warehouse receipts and in-kind support such as shared transport and machinery (e.g. In Panrut, Tamil Nadu machinery is jointly owned or leased)	1) Limited access for disadvantaged small (particularly ethnic) growers. 2) Growers primarily use their own capital, but are able to borrow up to 5 million dong/hectare at 1.5% interest rate/month from any of many State-owned banks. 3) Collateral is difficult to acquire due to lack of land certificates
Training/Agricultural Extension	1) IAM, IP 2) Ministry of Agriculture and Rural Development 3) National Institute for Agronomic Research (INIA) 4) Institute for Quality Standardisation (INNOQ) 5) USAID, AfDE, UE. 6) World Vision, Technoserve. 7) National Strategy to promote the Cashew Sector (SNV)- ADPP and Technoserve.	1) Ematerce (Empresa de Assistência Técnica e Extensão Rural do Ceará) 2) EMBRAPA 3) SEAGI/CE 4) Ministério do Desenvolvimento Agrário	1) NABARD 2) Cashew Export Promotion Council (CEPC) 3) Quality Upgradation Lab provides training on production techniques and quality standards 4) All India Cashew Research Project 5) Indian Council of Agricultural Research 6) District rural development agency 7) Cashew Research Station 8) Government extension offices located in most villages	1) National Agricultural Extension Centers (AECs) through Ministry of Agriculture and Rural Development (MARD); 2) One AEC in each province, 64 provinces, under provincial centers there are centers in each district; 3) Reach approximately 80% of rural communities.
Inputs	1) IAM focused on maintenance offering fertilizer and care techniques rather than planting new trees. 2) Too much demand for their services, not enough supply	1) Data found in EMBRAPA publication is approximately 10 years old (so less accurate due to inflation and exchange rates changes). 2) To plant on a ha of dwarf cashew trees is estimated to cost R$ 847,00 (US$2.017)/kg of cashew nuts. 3) To maintain 1 ha of dwarf cashew trees costs an estimated R$ 312.00, which is equivalent to 743 kg of cashew nuts.	1) National Cashew Research Project and the Indian Council of Agricultural Research train in use of planting materials and propagation methods. 2) In some areas input sales are subsidised.	Seedlings, fertilisers, and other inputs are available on the market as well as at AECs at subsidised rates

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 3): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Quality Standards	1) Growers do not market raw cashew nuts based on different quality grades 2) Mozambique receives lower export prices compared to neighbouring countries 3) North produces higher quality nuts 4) No system in place that rewards production of higher quality nuts	1) Quality standards are not strongly enforced through a price differential when purchased by an intermediary 2) Intermediaries will judge on colour, size, etc. However, there appears to be little difference in price	1) India is the global benchmark 2) CEPC supports a Quality Upgradation Lab and trains processors 3) Western India Cashew Co. has an accredited quality control unit.	There is currently a lack of universal quality standards. MARD is working on standardisation of quality.
Labour	1) High availability of low-cost labour 2) Perception that working conditions have deteriorated in the liberalised environment 3) Factories assisted by Technoserve provide a free meal, have access to health services, and pay annual holidays	High costs	1) More growers are run by household members 2) In processing, low wages are a source of comparative advantage for India 3) Kerala has the highest wages in processing, which has caused firms to relocate their plants to other States	1) Most growers do not hire extra labour, however some need to during harvest season. 2) Cost of labour per MT are: Weeding: 17.8, Fertiliser/Pesticide: 47.31, Harvest/nut: 73.79, Other: 22.01, Total: US$ 241.79, the average cost over 30 years (Dak Lak Report)
Seasonality	1) North: October-January 2) South: December- March	September-December	March-May	February-March
Storage	1) Few growers, associations or communities have their own storage facilities 2) Processing of cashew kernels is limited since factories are not yet operational year-round as they are not yet able to procure and store a sufficient stock of in-shell cashew nuts.	1) Only 10% of production remains in storage and is sold between harvests 2) 30% of production is sold before the harvest and 60% is sold during the harvest (USAID, 2006)	ICICI Bank finances digitalised and interlinked warehouse storage facilities and offers commodity-based financing	Growers do not have access to storage. Collectors collect nuts daily and processors store them
Irrigation	Irrigation not commonly practiced	1) Avg cost of a micro aspersion system for irrigation of dwarf cashews planted in a space of 7X7 m, varies between US$ 1,150,00 to US$ 1,500.00 per ha. 2) For a drop system of cost varies between US$ 1,350.00 and US$ 1,600.00 (EMBRAPA, 1996)	Irrigation not commonly practiced	Irrigation not commonly practiced
Gender	1) Women are heavily involved in cashew production. Women work more hours than men, though they earn less. Men and women share participation in all the different activities of the process. 2) Smallholder agriculture employs 89% of women and 63.2% of men (Delloite and Touche, 1997) 3) Women usually don't work with machinery	Little information on gender issues	Farms are owned and operated by household but 95% of workers in processing facilities are women	Many growers are women and ethnic minorities
Usage of Unprocessed By-Products	Minor domestic consumption of by-products (juice & firewater)	A range of food production for household consumption	Apple is used mostly for household consumption (fruit, juice and Feni, a type of alcoholic drink)	Cashew apple is not used. Sometimes is used as cattle feed.
Farmer Transportation	1) Number of mobile traders has increased with the liberalisation. They have motor vehicles to access the areas of production 2) Terrible road infrastructure forces repackaging, which increases costs. However, roads are being improved and built as more plants are being installed. Political leverage with the Government	A problem for small producers, which is why most sell their raw cashew nuts to small or large traders	1) Modes of transport (carts, trucks) can be leased in Panruti. 2) Fair Trade Alliance Kerala coordinates transport of raw cashew nuts from village deposits to processing plants for its cooperative members	Competition for cashew nuts results in collectors going to the growers, therefore not and issue for growers.

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 4): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Major Impediments	1) Competing food security needs 2) Profitability concerns in planting 3) Maintaining and commercialising cashews 4) Difficult access to credit 5) Poor access to extension services	1) Access to financing 2) Access to land	1) Price volatility is causing growers to switch to rubber cultivation. 2) Rising labour costs in Kerala 3) Difficulty in organic certification	1) Access to information 2) Access to land certificates 3) Lack of coordination and cooperation among growers
Petty Traders	1) License is legally required but many unlicensed traders exist 2) Purchase directly from growers and sell to larger traders, processors or exporters	Small local traders receive raw nuts in exchange for their merchandise (food, consumer goods and agricultural supplies)	Most producers deal with 2-3 intermediaries	Up to 6 middlemen depending on the distance
Main Traders	Most processors directly relate to an international broker	Professionals who have financial resources and are knowledgeable about the producing regions	Usually affiliated with larger processing units	Usually affiliated with larger processing units
Direct Grower to Mill	Pick up by processors or intermediary based on closest mill	Only documented in case of Pa-Rural coop system; or medium-sized producers who can wait for payment	1) In Kerala there is significant distance between producers and the processing facilities 2) There are reports of a growing cottage industry in the country as a whole given the rising labour costs	1) Very little direct sales from grower to processor. 2) Easier for processors to work with a collector – efficiency of scale
Commission	US$ 24.36/MT Commission (Irish Aid Report)	High interest rates and lack of transparency	Low in comparison to other countries (cultivators capture 16% of supermarket retail price, while traders capture 20%	1) Lack of transparency: middlemen make high margins because growers are unaware of fair market prices. 2) Producers capture 30% of profit, collectors 20%, processors 30%, and exporters 20%.
Relationship Middlemen/Grower	Still young, no established ties	Abusive/power imbalance	Some traders provide informal credit in the off-season	Since competition for raw nuts is high, collectors assist producers on-farm in separating the apple from the nut during peak season. Sometimes collectors offer growers credit for inputs.
Quality Control	Old trees and low level of quality control. IAM is attempting to give quality training to middlemen so that price structures can change	Traders determine prices. Price based on the perceived quality of the product and trustworthiness of the order rather than the size of the nuts; standards vary with the trader	Some traders and processors test quality of raw nuts. However, quality is determined by buyers in most cases	Based on trader; methods are very informal and not technical; growers may try to skew prices by weighing down cashews, which causes price depreciation.
Farm to Port Transportation	Extremely poor transportation infrastructure; roads in the north almost non-existent; processors transport their production to Nacala Port, where AIA has a warehouse	Difficult to travel from farm to mill	Overall, India has very good infrastructure. Some grower cooperatives use cooperative transport systems	Transportation is not a major impediment for traders. Processors that move to more distant regions pay for transport of nuts, but this does not offset the higher profit margin due to cheaper labour.
Type of Processor	Small and medium: 500 to 5,000 tons capacity	Large firms and mini-mills	Public and private. Private dominates the industry. Cottage has grown recently	Micro to large processors. Most State owned have been partially oy totally privatised.
Processor Financing	Lack of access to finance for processors. USAID supported loan guarantee fund with IAM and Technoserve support	EMBRAPA, SEBRAE and CONAB	Commercial banks and district rural development agencies. In some regions processors are registered by district industries centres which facilitates their access to credit	Financing provided by State-owned banks. Difficulties acquiring credit due to lack of land use certificates.
Processing Capacity	Small; exports of raw nuts	Some processors do not operate due to lack of supply. 270,000/year, all from northeast of the country	Exceeds domestic production: India imports ±50% of cashew nuts processed	Exceeds domestic production. 300,000 tons of raw nuts imports per year (30%), primarily from Africa and Indonesia
Processing Standards	Association beginning to implement a standardised assessment for quality control for all members	HACCP and ISO favours large processors in compliance and certification	CEPC Integrated Scheme for Cashew Quality trains managers in processing that optimises quality	Few processors adhere to ISO, HACCP, and GMP standards
Shelling, Peeling and Sorting Labour Costs	US$ 0.17/kg	US$ 0.88	US$ 0.26/kg	US$ 0.23/kg
Processing avg monthly salary	n.a.	n.a.	US$ 54	US$ 23
Gender in Processing	Most shelling by women	n.a.	95% of total labour	Most shelling done by women

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 5): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Soaking/Steaming	Most processors use steam, fire-based; few are getting tech to use electric means	Mini-mills soak; large processors steam	Primarily drum roasting and steaming. About 5% of cashew nuts are dried in the sun for 2 or 3 days, and shelled without roasting	Two thirds of factories use burning method, and the remainder use steaming.
De-Shelling	Semi-manual	Mini-mills use semi-manual removal techniques resulting in higher number of whole kernels (75%-85%), while large processors use mechanized deshelling and get only 50 to 55% of whole kernels.	Most shelling is done manually using mallets, which results in up to 90% of whole kernels for the most skilled and experienced workers	Semi-manual cutting, manual peeling (with a knife), and manual sorting of nuts.
Use of Processing By-Products	Very little	Export of cashew shell liquid (CNSL)	CNSL is sold domestically and exported; shells are used to fuel steaming; liquor is sold in Goa	5-10% of nut shells are burnt to fuel roasting or steaming process. CNSL is extracted from shells and later processed by paint industries. Today 10 companies export, primarily to China
Grading	n.a.	1) 4 scales of colour; size classified by average quantity per pound (smallest are 450 units/lb), and the largest at 160 units/lb. 2) Price determination by a combination of size, lightness of colour and wholeness	1) 26-32 types depending on colour, scratch, size and wholeness 2) Grading takes place in the factory per CEPC specifications 3) Despite training by NGOs, most MSEs don't grade and those who do use only 4 categories	1) Different processors have different grade standards. 2) Average approximately 24 different grades. 3) Sorted by hand according to size and colour.
Technical Assistance	Technoserve	SEBRAE, CONAB and EMBRAPA	It varies by State: 1) In Maharashtra, NGOs provide training but it is only partially implemented. 2) CEPC Lab provides voluntary training of manufacturers, primarily in Kerala	None
Type of Packaging	Vaccum sealed bags with Zambique logo 25kg	50 lb vacuum-sealed aluminium foil bags or two metal cans of 25lb each. Packaging for retail sale of semi-processed or roasted nut can in glass or plastic jars, plastic bags, metallicized bags, or metal cans, which can be between 50g and 1kg with the processor or packager brand label	25 lb vacuum-sealed tins filled with carbon-dioxide gas; developed industry standard: the flexi-puch pack.	Vacuum-sealed in 50 lbs boxes for expors.
Management of Packaging Units	n.a.	n.a.	Western India Cashew Co. Quality Control Packaging Unit was one of the first to be awarded ISO 9001:2000 accreditation	All packaging done by processors
Institutional Support	The establishment of a government guarantee fund that supports processors, and a reduction of the fee for mandatory environmental and social impact assessments for new cashew processing plants.	n.a.	CEPC provides subsidies and assistance for vacuum sealing, product upgrading and vacuum sealing machines.	None
Processing Quality	Sorted by machine to ensure that no nuts were broken and final quality control	n.a.	GE vita packaging system (vacuum seal, carbon) is considered superior	Sorted by hand and/or machine for quality nuts also passed through metal detector to ensure pureness of nuts for export.
Percentage of Export	70% in-shell cashew nuts	80% kernels	50% kernels	98% kernels
Export Quality	30%-40% of kernel exports are W320	Domestic consumption mainly of mini-mill lower quality cashews. high quality is for export	n.a.	Highest quality for export; low quality sold in the domestic market
# of HACCP Compliant Processors	1) All AIA network operating over 3 years meet 60% of HACCP standards 2) At least 2 processors meet all HACCP standards;	n.a.	Western India Cashew Company was one of the first to be certified in the industry globally. National Centre for HACCP Certification is located in Kerala	7 in 2005
# of ISO Compliant Processors	n.a.	n.a.	Only the large processors	10 in 2005

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex H (Page 6): The Cashew Industry in the Four Major Kernel Producing Countries (2007)

Items	Mozambique	Brazil	India	Vietnam
Major importers	Main market: Europe; There is joint Dutch broker who charges 3%	70% to the USA	38% to the USA, followed by Europe	USA (21%), China (20%), UK and Netherlands (12%), and Australia (10%)
Marketing Strategy and Consumer Behaviour	1) the consolidation of the Zambique brand has been a strong component of the overall strategy 2) they are principally aiming for the European market, and less interest in the USA market	Organic, fair trade and traceability of Brazilian cashew are being explored and merit further development	Branding, flavoured cashews as a new product, focus on "hand crafted" production	Branding is being considered; quality improvement; plans to develop domestic market (will rise as incomes rise)
Exchange Rate	Mozambique faces more exchange rate volatility from internal pressures such as inflation. Furthermore, since the major market for Mozambique processed nuts are in Amsterdam, they are less concerned with a deflated US currency.	A depreciated US currency has negatively affected the competitiveness of Brazil's industry and has affected the profit margins of mini-mills and mechanized processors.	Industry has been hurt by the depreciation of the US dollar	The Vietnamese government and the State Bank of Vietnam have been pursuing a crawling peg policy for some years now, letting the Dong gradually depreciate (30%) against the US dollar at a steady rate in order to bolster the export sector. Rising FDI, remittances, exports, and equity inflows made this policy of "managed devaluation" unsustainable, and 2007 brought an end to it. The central bank plans to keep the Dong stable in a flexible manner. As, Vietnam is Southeast Asia's fastest growing economy, it will be hard for the central bank to continue a depreciation
Comparative Advantage	Name recognition among brokers (Zambique brand). Long tradition and low cost of labour	The proximity to USA market; Cashew kernel traceability	Labour, hand processing (high quality) and history of production	Processing capabilities, high quality nuts grown naturally (good soil for cashew production), higher yielding trees; close to Chinese market
Export Tax	Fixed yearly between 18% and 23% of raw cashew nut FOB price. Support is building up towards its elimination	Until 2005 Brazil taxed all cashews exports above the quota of 10,000 tons at the rate of 30%. Currently there is no export tax	0%	0%
Storage	Some processors now have storage capacity and warehouse is used as collateral. Apparently, very recently introduced	n.a.	ICICI bank funds digitalized and interlinked warehouse facilities	Processors have their own storage facilities
Port Infrastructure	The Nacala Port: 1) Recently concessioned to a private manager 2) Can accommodate container ships. However, because of the north and Malawi low level of economic activity, the volume of goods shipped through the port is limited; 3) Many times goods are directed through Durban or other ports to gain economies of scale; 4) Lacks adequate facilities such as lifters and tugboats, can create delays; 5) Approximately 200 ships dock at the port of Nacala annually.	Ceará exports 80% of cashews through the ports of Fortaleza. Strong infrastructure supports this trade.	Since 2007 improved container service from Kochi to the USA, and exports from ports at Kochi, Goa, Mangalore, Tuticorin and Visakhapatnam	All nuts are exported through port at Ho Chi Minh Citu

Source: Author's Adaptation from Hall, M. et al. (2007)

Annex I: Cashew Nut Processing Units in Mozambique (2021)

Nº	Name	Location	Type	Capacity (MT)		Status	Year
				Installed	Efective		
1	Condor Nuts	Anchilo - Nampula	Large factory	12,000	-	Inoperational	2021
2	Condor Caju	Nametil - Nampula	Large factory	7,000	-	Inoperational	2021
3	Olam (3 Units)	Monapo - Nampula	Large factory	18,000	-	Inoperational	2021
4	Caju Ilha	Lumbo - Nampula	Large factory	7,500	-	Inoperational	2021
5	Caju Ilha	Angoche - Nampula	Large factory	7,500	-	Inoperational	2021
6	Korosho	Nampula - Cidade	Large factory	10,000	10,000	Operational	
7	Mocaju	Murrupula - Nampula	Large factory	3,000	2,000	Operational	
8	Sunny Moz International	Rex - Nampula	Large factory	3,000	2,000	Operational	
9	Indo Africa	Mecua - Nampula	Large factory	2,000	2,000	Operational	
10	Indo Africa (Khan)	Meconta - Nampula	Large factory	5,000	3,000	Operational	
11	CN Caju	Nacala Porto	Large factory	10,000	6,000	Operational	
12	DML Cashew, Lda	Angoche - Nampula	Large factory	10,000	-	Inoperational	2019
13	Agrico Marketing	Monapo - Nampula	Large factory	6,000	1,550	Operational	
14	Korosho	Chiure - Cabo Delgado	Large factory	6,000	6,000	Operational	
15	Condor Anacardium	Macia - Gaza	Large factory	8,000	8,000	Operational	
	Sub-Total	-	**15**	**115,000**	**40,550**		
1	ADPP	Itoculo - Nampula	Small factory	50	35	Operational	
2	ICS, Lda	Mogincual - Nampula	Small factory	365	365	Operational	
3	Sumaila Caju	Mogincual - Nampula	Small factory	300	300	Operational	
4	Cashew Processing	Marracuene - Maputo	Small factory	300	300	Operational	
5	Unildy, Lda	Bobole - Maputo	Small factory	200	200	Operational	
	Sub-Total		**5**	**1,215**	**1,200**		
	Total		**20**	**116,215**	**41,750**		

Source: IAM (2021)

Annex J: Uses of Produced In-shell Cashew Nuts in Mozambique in MT (2005-2021)

Season	Production	Processed		Exports		Informal		Producers		Other uses	
	MT	MT	(%)	MT	(%)	MT	(%)	MT	(%)	MT	(%)
2005 /2006	62,821	21,943	34.9	26,349	41.9	4,397	7.0	7,539	12.0	2,593	4.1
2006 /2007	74,397	20,280	27.3	24,176	32.5	5,208	7.0	9,300	12.5	15,434	20.7
2007 /2008	94,314	24,000	25.4	31,607	33.5	6,602	7.0	11,789	12.5	20,316	21.5
2008 /2009	64,150	24,013	37.4	11,720	18.3	4,491	7.0	8,019	12.5	15,908	24.8
2009 /2010	96,557	26,616	27.6	27,923	28.9	6,759	7.0	12,070	12.5	23,190	24.0
2010 /2011	112,753	30,000	26.6	42,000	37.2	7,893	7.0	14,094	12.5	18,767	16.6
2011 /2012	65,093	25,400	39.0	5,595	8.6	4,556	7.0	8,137	12.5	21,405	32.9
2012 /2013	83,141	26,657	32.1	11,700	14.1	5,820	7.0	10,393	12.5	28,571	34.4
2013 /2014	63,081	17,717	28.1	7,188	11.4	4,416	7.0	7,885	12.5	25,875	41.0
2014 /2015	81,240	29,351	36.1	6,493	8.0	5,687	7.0	10,155	12.5	29,554	36.4
2015 /2016	104,179	34,390	33.0	22,596	21.7	77,293	7.0	13,022	12.5	26,879	25.8
2016 /2017	166,715	47,993	28.8	69,873	41.9	9,736	5.8	17,386	10.4	21,627	15.5
2017 /2018	129,643	53,717	41.4	34,271	26.4	9,075	7.0	16,205	12.5	16,375	13.0
2018 /2019	142,104	64,887	45.7	24,334	17.1	9,947	7.0	17,763	12.5	25,172	17.7
2019 /2020	143,398	45,505	31.7	33,251	23.2	15,306	10.7	6,291	4.4	43,046	30.0
2020 /2021	144,823	35,888	24.8	26,795	18.5	17,327	12.0	202	0.1	64,610	44.6
Average	101,776	33,022	**32.5**	25,367	**24.0**	12,157	**7.5**	10,641	**11.0**	24,958	**25.0**

Source: IAM (2021)

Annex K: Cashew Nut Industry Institutional Framework in Mozambique (2021)

Season	Production	Processed		Exports		Informal		Producers		Other uses	
	MT	MT	(%)	MT	(%)	MT	(%)	MT	(%)	MT	(%)
2005 /2006	62,821	21,943	34.9	26,349	41.9	4,397	7.0	7,539	12.0	2,593	4.1
2006 /2007	74,397	20,280	27.3	24,176	32.5	5,208	7.0	9,300	12.5	15,434	20.7
2007 /2008	94,314	24,000	25.4	31,607	33.5	6,602	7.0	11,789	12.5	20,316	21.5
2008 /2009	64,150	24,013	37.4	11,720	18.3	4,491	7.0	8,019	12.5	15,908	24.8
2009 /2010	96,557	26,616	27.6	27,923	28.9	6,759	7.0	12,070	12.5	23,190	24.0
2010 /2011	112,753	30,000	26.6	42,000	37.2	7,893	7.0	14,094	12.5	18,767	16.6
2011 /2012	65,093	25,400	39.0	5,595	8.6	4,556	7.0	8,137	12.5	21,405	32.9
2012 /2013	83,141	26,657	32.1	11,700	14.1	5,820	7.0	10,393	12.5	28,571	34.4
2013 /2014	63,081	17,717	28.1	7,188	11.4	4,416	7.0	7,885	12.5	25,875	41.0
2014 /2015	81,240	29,351	36.1	6,493	8.0	5,687	7.0	10,155	12.5	29,554	36.4
2015 /2016	104,179	34,390	33.0	22,596	21.7	77,293	7.0	13,022	12.5	26,879	25.8
2016 /2017	166,715	47,993	28.8	69,873	41.9	9,736	5.8	17,386	10.4	21,627	15.5
2017 /2018	129,643	53,717	41.4	34,271	26.4	9,075	7.0	16,205	12.5	16,375	13.0
2018 /2019	142,104	64,887	45.7	24,334	17.1	9,947	7.0	17,763	12.5	25,172	17.7
2019 /2020	143,398	45,505	31.7	33,251	23.2	15,306	10.7	6,291	4.4	43,046	30.0
2020 /2021	144,823	35,888	24.8	26,795	18.5	17,327	12.0	202	0.1	64,610	44.6
Average	101,776	33,022	**32.5**	25,367	**24.0**	12,157	**7.5**	10,641	**11.0**	24,958	**25.0**

Source: IAM (2021)

ENDNOTES

[1]The poverty line, poverty threshold, poverty limit or breadline is the minimum level of income deemed adequate in a particular country. The level of poverty incidence is usually calculated by determining the amount of essential goods and services that an average human adult consumes in a year. The poverty line as an international measure indicates the proportion or the percentage of the number of people who sustain themselves on less than $1.90 or less than $3.20 a day. In Mozambique, the level of poverty is 63.7% living on less than $1.90 a day or 82.3% living on less than $3.20 a day, at 2011 international prices.

[2] Cashew nut is, by definition, the kidney-shaped seed sourced from the cashew tree - a tropical tree native to Brazil but now cultivated in various warm climates across the world. It is found inside a pit in the drupe that hangs to the bottom of the cashew apple, an accessory fruit that grows on the cashew tree (*anacardium occidentale*). The cashew kernel itself is protected in the pit by a very strong shell that needs to be roasted or steamed for shelling. The kernel represents only around 20% of the whole drupe in weight. The cashew tree is native of tropical regions of Brazil brought to Mozambique in the 16th century by Portuguese sailors, and it is also grown now in many other countries, namely: Benin, Brazil, Burkina Faso, Côte d'Ivoire, Ghana, Guinea-Bissau, India, Indonesia, Kenya, Mozambique, Nigeria, Senegal, Tanzania, The Gambia, and Vietnam, being Vietnam the current largest supplier of the international cashew kernel market.

[3] *Xitshwa* is one of the many bantu languages spoken in southern Mozambique. In accordance with the 2017 general population census, *Xitshwa* is the communication vehicle for over 58% of Inhambane province population (author's calculation based on INE data.

[4] Donated corn doesn't fill up your barn.

[5] INCAJU is the Institute for the Development of Cashew, established in 1997, and replaced by the Instituto de Amêndoas de Moçambique (IAM). Henceforth, any reference to IAM means one or the other, depending on the circumstances.

[6] Kernel Output Ratio (KOR) is the quantity in pounds (lbs) of marketable kernels obtained per 80 kg of in-shell cashew nuts (Ogunsina, 2013).

[7] The research was conducted under the African Cashew Initiative (ACi) and funded by Bill & Melinda Gates Foundation, the Cooperation between the governments of Côte d'Ivoire and Germany, and private partners. It was implemented by GIZ (German Cooperation) in Cooperation with the African Cashew Association (ACA), Technoserve, and Fair Match Support, and executed by Mr. James Fitzpatrick, a Trinity College Dublin Graduate British citizen with a Master's degree in Economics and Social Sciences, and consultant and importer with more than 30 years of experience in trading, importing and developing supply chains globally for a range of natural ingredients, including cashew nuts. He has also been providing advisory and research services in many areas over the years.

[8] Processors are well aware of the need to adhere to HACCP certification which is a requirement for effective food safety control. Basically, it is built around seven principles: Conduct Hazard Analysis of biological, chemical or physical food hazards. Determine critical control points. A HACCP plan is required if you own a food business (catering, retail or manufacturing) then the Regulation (EC) No 852/2004 requires you put in place, implement and maintain a permanent procedure based on the Codex HACCP principles.

[9] BRC Certification is an internationally recognised mark of food safety and quality, whose status of a certified BRC food facility, that facility has to undergo a third-party audit against standard requirements by an accredited certification body. Originally developed and published in 1998, the British Retail Consortium (BRC) Global Standards specify safety, quality and operational criteria for food producers and suppliers.

[10] The Accredited Certifiers Association, Inc. (ACA) is a 501(c)(3) non-profit educational organisation created to benefit the accredited organic certifier community and the organic industry. We envision a world in which the USDA Organic label is always trusted and valued. Our primary mission is to ensure consistent implementation of USDA Organic Regulations through collaboration and education of accredited certification agencies. Purposes include, developing uniform criteria for implementation of the USDA National Organic Programme.

[11] A cottage industry is a small-scale, decentralised manufacturing business often operated out of a home rather than a purpose-built facility.

[12] The Spaghetti Bowl Effect, also known in Asian Countries as "The Noodle Bowl Effect", is typically a problem that occurs during the implementation of free trade agreements (FTAs) concerning the rules of origin through which it is possible to devise which country a product comes from (Bhagwati, 1995; Horaguchi, 2007). A country might sign FTAs with other countries with varying legal dispositions and regulations on the issue of rules of origin, allowing a firm benefit from zero tariffs in the exports of their goods and services to one particular country, but that prerrogative may not be have been contemplated in preferential trade arrangements in other countries. In an endeavour to sale finished goods to importing countries at the cheapest price, companies might end up producing half-finished products and parts in different countries to leverage tariff differentiation in

FTA agreements, which leads to a criss-crossing of jurisdictions, much like spaghetti tangled in a bowl. This is a very puzzling phenomenon in trade economics where the increasing number of Free Trade Agreements (FTAs) between countries slows down trade relations between them.

[13] which indicates the total sustained interruption duration for the average customer during a pre-defined period of time, commonly measured in minutes or hours.

[14] Nitidae is a French non-governmental organisation, which aims to develop projects that combine the preservation of the environment and reinforces local economies, with a staff size of 100 employees, and projects in Madagascar, Burkina Faso, Mozambique, and Côte d'Ivoire.

[15] ACAMOZ is a project financed by the French Development Agency (AFD) and is implemented jointly with Instituto de Amêndoas de Moçambique (IAM, IP) and the Ministry of Agriculture and Rural Development (MADER), with the aim of strengthening the cashew value chain, in order to increase the incomes of small growers, promote national processing and its integration in the international market, and improve the competitiveness and the economic, environmental and social sustainability of the cashew nuts production within a stronger and more transparent institutional framework led by Instituto de Amêndoas de Moçambique, IP.

[16] Tanzania, Côte d'Ivoire, Mozambique, Nigeria, Benin, Ghana, Burkina Faso.

[17] G7 is the group of the most industrialised countries created in 1975, and includes USA, UK, France, Germany, Italy, Canada, and Japan.

[18] This group includes South Korea, South Africa, Turkey, Brazil, People's Republic of China, Indonesia, Mexico, the Philippines, Poland, Russia.

[19] Paul Krugman (1993) defends the view that the growing obsession among advanced nations with international competitiveness is absolutely wrong because the concerns are unfounded and the concept is nothing but just a dangerous political device that can result in policy distortions, and a wasteful spending of public resources.

[20] The QCD+F code is a management approach originally developed to help automotive manufacturing industry in the 1970s. It was later improved by many researchers, including Rahul Laxman Iyer, an ASQ Certified Engineer (2015).

[21] The simplest definition of export competitiveness is the share of exports of goods and services in a country's GDP relative to the corresponding share for the world.

[22] In order to cater for the presumable shortcomings caused by data insufficiency and attempt to address the issues associated with the mix and inconclusive results, Awokuse included in the model real GDP, real exports, real terms of trade, manufacturing employment as proxy for labour, gross capital formation as proxy for capital, and industrial production index for all industrialised countries as proxy for foreign output.

[23] According to the United Nations Conference on Trade and Development (UNCTAD), the Least Developed Countries (LDCs) are a group of 46 countries, as of the 4th of December 2020 (with the graduation of Vanuatu), a group highly dependent on aid, even with its clear diversity in many respects relevant to its integration into the world economy, and it takes in a disproportionate number of small-island and landlocked countries, and countries in which exports are dominated by mineral rents (Collier and O'Connell, 2007). On the African Continent there are 33 members (72%), namely: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Togo, Uganda, United Republic of Tanzania, and Zambia; Asia has 9 members, namely: Afghanistan, Bangladesh, Bhutan, Cambodia, Lao People's Democratic Republic, Myanmar, Nepal, Timor-Leste, and Yemen; Oceania has 3 members, namely: Kiribati, Solomon Islands, and Tuvalu; and the Caribbean has 1 member, namely: Haiti. The main criterion is GNI *per capita* equal or lower than US$ 1,025 (above US$ 1,230 is graduation threshold), to which the human capital weakness (nutrition, infant mortality, education, and illiteracy), economic vulnerability (population size, isolation, export concentration, share of agriculture, forestry and fisheries in GDP, goods and services exports instability, number of natural calamity victims, and agricultural production instability).

[24] The intensity of local competition is an index used in the Global Competitiveness Report for the measurement of competition in the domestic market. According to the index, 1 means not intense at all, and 7 means extremely intense.

[25] Path coefficients (βs) and t-statistics: In PLS path models, structural model and significance of the hypotheses are tested by computing path coefficients (βs). PLS-SEM models do not require data normality, as it is evaluated with R^2 for each latent endogenous variable which provides how well the model fits the hypothesised relationships. For hypotheses significance assessment, the bootstrapping procedure is used (Chin 1998), applying appropriate software. Tables 6.6 and 6.15 depict the hypothesised path coefficient values (βs), along with the t statistics (bootstrap) values, and *p*-values for the quantitative and qualitative methods, respectively. Recall that critical t statistics for a two-tailed test are: 1.65* (10% significance level); 1.96** (5% significance level); and 2.58*** (1% significance level).

[26] Marash, officially known as Kahramanmaraş, historically known as Germanicea, is a city in the Mediterranean Region of Turkey and the administrative centre of Kahramanmaraş Province. Before 1973, Kahramanmaraş was officially named Maraş, and later, it attained the prefix "kahraman" to commemorate the Battle of Marash.

[27] A mediating, mediator or intervening variable is a variable that links the exogenous and the endogenous variables and whose existence explains the relationship between the other two variables. Moderating variable is a qualitative or quantitative variable that can strengthen, weaken, negate or otherwise alter the association between exogenous and endogenous variables. It can also change the direction of this relationship (Baron & Kenny, 1986).

[28] Introducing a mediator to see how it works and using multiple mediators to make the model complex are neither a good advice nor a practice and focusing merely on statistical justification and data analysis tools is also not sufficient to justify a mediation study (Rungtusanatham et al., 2010). The need of a mediator in a model must be explicitly raised and justified up-front by responding two key questions: **i**) Why a mediator is needed? **ii**) Which variable should be considered the mediator, and why?

[29]With regard to food production, food demand, nutrition, and rural population, Mocambique still faces a challenging 31st position in a group of 192 assessed countries.

[30] This is just the list and structure of questions (constructs and indicators) contained in the questionnaire. The questionnaire itself was implemented using Google Forms, given its ease not only in terms of processing the compiled information, but also in terms of responses, once all the respondents with access to Internet could fill the questionnaires online and send them back to us for processing.