INSTITUTO UNIVERSITÁRIO DE LISBOA

UNIVERSIDADE D COIMBRA

Lisbon School of Economics & Management
Universidade de Lisboa

Essays on the Political Economy of the Balance-of-Payments

Gonçalo Filipe Amado

Ph.D. in Political Economy

Supervisor: Doctor Francisco Louçã, Full Professor, ISEG (Universidade de Lisboa)

December, 2023

Political Economy Department

Essays on the Political Economy of the Balance-of-Payments

Gonçalo Filipe Amado

Ph.D. in Political Economy

Jury:

President of the jury: Doctor Ana Costa, Associate Professor, ISCTE-IUL
Doctor Elias Soukiazis, Associate Professor (with Habilitation), Universidade de Coimbra
Doctor Arslan Razmi, Associate Professor, University of Massachusetts
Doctor Ricardo Paes Mamede, Associate Professor, ISCTE-IUL
Doctor Karsten Kohler, Associate Professor, Leeds University
Doctor Michael Ash, Associate Professor, University of Massachusetts
Doctor Francisco Louçã, Full Professor, ISEG (Universidade de Lisboa)

December, 2023

"Completing a PhD dissertation is like running a marathon; it requires endurance, determination, and the ability to overcome obstacles. In both cases, the journey is long and challenging, but the feeling of crossing the finish line is incredibly rewarding."

ChatGPT

"(...) the existence of a variety of balance-of-payments definitions makes it possible for an observer always to be grave, or optimistic, according to his temperament."

(Kindleberger 1969, p.887)

Acknowledgment

Any opinion expressed in this dissertation belongs solely to the author and does not represent the opinion of Banco de Portugal unless it is expressly stated that the author is authorized to do so.

This research has been made financially possible by Fundação para a Ciência e Tecnologia (grant reference number 2021.05858.BD). In addition, financial support has been received from Fundação Luso-Americana para o Desenvolvimento during the author's visiting program at the Political Economy Research Institute (PERI), University of Massachusetts, Amherst (USA). Banco de Portugal also supported part of the tuition fees for the PhD.

I am thankful to my Supervisor, Professor Francisco Louçã, for all the help, motivation, and useful discussions. It was a privilege to benefit from his knowledge, experience, and guidance. Also, I am grateful to Professors Arslan Razmi and Gerald Epstein for hosting me as a visiting student at Amherst, Massachusetts. It was a fantastic semester that allowed me to grow personally, acquire unforgettable professional and academic skills, and introduce me to an academic community conducive to my research work.

I owe special thanks to the coordination of the PhD in Political Economy, in the person of Professor Ana Costa, and all the Professors involved in the PhD program for their support and knowledge shared throughout these years. The financial support provided by the doctoral program was also essential to attend the summer school in Panel Data Econometrics (25-30th July 2022, Bertinoro, Italy).

I would also like to thank the Associação Portuguesa de Economia Política and my research center – Research Unit on Complexity and Economics (UECE) – for support financially my expenses with travel and accommodation arising from my participation in the following conferences, seminars, and workshops: "Political Economy of the European Peripheries Summer School 2022" (3-6th July 2022, Avis, Portugal); Summer school in Panel Data Econometrics (25-30th July 2022, Bertinoro, Italy); "6º Encontro Anual de Economia Política" (January 2023, UTAD); "International Political Economy Working Group (IPEG) annual workshop" (11th May 2023, King's College London); "14th Annual PhD Student Conference" (12th May, PKES, University of Greenwich); "5th International Conference on European Studies" (12-14th June 2023 at KOF, ETH Zurich); "Workshop on Value and Valuation" (22-23rd June 2023, ISCTE-IUL); "ICEBRS 2023" (29th June - 1st July 2023, Universidade de Coimbra); "SASE Annual Conference" (20-22nd July 2023, Rio de Janeiro). I am very grateful to the organizers and participants for the opportunity

to present and discuss my work and for all the important comments and suggestions that contributed to improving my PhD thesis.

I am also in debt to Professors Elias Soukiazis, Michael Ash, Ricardo Paes Mamede, Sérgio Branco, and Sofia Vale for the helpful comments and suggestions on specific issues of this PhD dissertation without any implication. I must thank anonymous referees as well as some discussants for their comments on presentations I have given in conferences, classes, and workshops, namely Alberto Botta, Annamaria Simonazzi, Fátima Ferreiro, Karsten Kohler, Roberto Golinelli, and Yannis Dafermos. I must also acknowledge Jon Nesbit for his technical proofreading of the written English used in this work.

My gratitude is extended to all my colleagues and supervisors at Banco de Portugal, who shared with me a large part of the time during which I developed this project. A special word of thanks to Paula Menezes, who led me in two different teams. For her patience and openness when she sometimes faced my physical and mental unavailability for the daily work.

The PhD experience would not have been the same without the wonderful people at my side. To my friends, especially Fábio, Pessa, and Thomas, for introducing me to issues that motivated me to do this research. Also, my thanks go to my PhD colleagues (in ISCTE and all over the world) Alexandre, Cristina, Charlotte, Debamanyu, Loureiro, Juliana, Lorenzo, Serena, and Vitor for essential and exciting talks, advice, exchange of ideas and methods, or comments to previous versions of my work. Last but not least, to my (g)old friends André, Beatriz, Maria João, Mafalda, Telmo, and Teodoro (in alphabetical order), for always taking care of me and for dealing with my whims, annoyances, or waves of anger.

Of course, I would like to thank the support of my parents, Isabel and Luis, and my sister Catarina. They have always been my shelter and have always supported me unconditionally throughout my 25 years of academic life. I am very lucky to have them.

It has been a long journey that began in 2019 and is now coming to an end. During the time I have carried out this project my whole life has changed, and it is difficult to remember all those who have accompanied this change. Paying tribute to those who have contributed positively to this end is a difficult task, and I fear I will be unfair.

The usual disclaimer applies.

Gonçalo Amado
Lisbon, December 2023

Resumo

Negligenciar os números da balança de pagamentos, durante o processo de construção e nos primeiros anos do euro, teve sérias implicações. Esta atuação das instituições, e dos observadores, foi influenciada pelas ideias convencionais que, entre outros argumentos, defenderam que numa união monetária os desequilíbrios externos resolver-se-iam através de mecanismos eficientes de mercado.

As suas análises limitaram-se ao acompanhamento do saldo da balança corrente, que este trabalho demonstra ser consequência de vários mecanismos interligados, e não causa. Para um conjunto de países periféricos da zona euro, explicitam-se os mecanismos teóricos e encontra-se causalidade de Granger entre convergência das taxas de juro soberanas e variações do saldo externo, entre 1996 e 2007.

São igualmente investigados os mecanismos pelos quais as entradas de capital especulativo do exterior afetam a economia real, com os bancos a assumirem um papel de intermediação. Pegando no caso português, os fluxos brutos de capitais estão pouco correlacionados com o saldo da balança corrente, corroborando a literatura heterodoxa recente.

O papel dos preços relativos não é estatisticamente significativo na explicação do comércio internacional de serviços, contrariando abordagens dominantes que enfatizam a importância de reduzir os custos unitários do trabalho como solução para ganhos de competitividade externa. Também um estudo aprofundado da balança comercial comprova a relevância da competitividade não-preço (associada a tecnologia, inovação) para a sustentabilidade das contas externas e para o crescimento de longo-prazo.

Sob o campo de investigação em Economia Política, esta tese demonstra que a informação da balança de pagamentos realmente interessa, mesmo numa união monetária.

Palavras-chave: Balança de Pagamentos, Comércio Internacional, Competitividade Externa, Economia Política Internacional, Economia Pós-Keynesiana, Zona Euro.

Classificação JEL: F32, F41, P52

Abstract

Neglecting the balance-of-payments figures during the setting up process of the euro and in its early years had serious implications. This action by the institutions, and by observers in general, is influenced by mainstream ideas, which, among other arguments, advocated that external imbalances would be resolved through efficient market mechanisms in a monetary union.

Their analysis was limited to monitoring the current account balance, which this work shows is a consequence of inter-linked mechanisms rather than a cause. For a group of peripheral Eurozone countries, the theoretical mechanisms are explained, and Granger-causality is found between the convergence of sovereign interest rates and changes in the external balance between 1996 and 2007.

The mechanisms through which foreign capital inflows affect the real economy are also investigated, with banks playing an important intermediation role. In the case of Portugal, gross capital inflows are poorly correlated with the current account balance, corroborating recent heterodox literature.

The role of relative prices is not statistically significant in explaining international trade in services, contrary to dominant approaches that emphasize the need to reduce unit labor costs as a solution to external competitiveness gains. An in-depth study of the trade balance also proves the relevance of non-price competitiveness (associated with technology, innovation) for the sustainability of external accounts and long-term growth.

In the field of Political Economy research, this thesis demonstrates that balance-of-payments information matters, even in a monetary union.

Keywords: Balance-of-Payments, External Competitiveness, Eurozone, International Political Economy, International Trade, Post-Keynesian Economics.

JEL Classification: F32, F41, P52

Contents

List of Tables

List of Figures

List of Acronyms

AMECO: Annual macro-economic database
BPM: Balance of Payments Manual
CAB: Current Account Balance
CPE: Comparative Political Economy
dca: Annual change in quarterly current account balance
EA: Euro Area
ECB: European Central Bank
EMU: Economic and Monetary Union
ESA: European System of Accounts (2010)
EU: European Union
EZC: Eurozone Crisis
FC: Financial Corporations
FE: Fixed-Effects
FDI: Foreign Direct Investment
GDP: Gross Domestic Product
GDPPC: Gross Domestic Product per capita
GDPW: world real Gross Domestic Product
GFC: Global Financial Crisis
HT: High-technology manufactures
ICT: Information and Communication Technology
IIP: International Investment Position
IMF: International Monetary Fund
IRF: Impulse-response function
LT: Low-technology manufactures
MT: Medium-technology manufactures
OCA: Optimum currency area
OECD: Organisation for Economic Co-operation and Development
OI: Other Investment
OS: Other Services
PI: Portfolio Investment
PK: Post-Keynesian
PP: Primary Products
NFC: Non-financial Corporations
RB: Resource-based manufactures

RER: Real exchange rate
RoW: Rest-of-the-World
SC: Transportation Services
SD: Travel Services
SGP: Single Growth Path
SITC: Standard International Trade Classification (revision 2)
ULC: Unit Labor Costs
US: United States (of America)
VAR: Vector Autoregressive
WDI: World Development Indicators
WGDPPC: World real Gross Domestic Product per capita
WTO: World Trade Organization

CHAPTER 1

Introduction

1.1. Introduction

The balance-of-payments (BoP) is a subject that puzzles many social scientists, including economists. A macroeconomic analysis needs to be cross-referenced with the narratives of decision-makers and observers, their ideas and interests in terms of international trade, finance and international relations. In this way, this dissertation brings the BoP figures into the field of Political Economy.

In a nutshell, the balance-of-payments is a macroeconomic indicator that measures transactions between resident and non-resident economic agents, in a given economy. It consists of the current account, the capital account, and the financial account. Each inflow (outflow) on the non-financial account (current and capital account) is matched by an outflow (inflow) on the financial account. It structure follows the assumptions defined by the Balance of Payments Manual (IMF 2009), in its most recent (sixth) edition. International institutions regularly monitor external accounts, especially in countries subject to official external intervention.

In the case of a resident firm X exporting a good worth 150 USD, this entry is made in the current and capital account (balance of goods). Suppose the firm receives the export money in a bank account based abroad. The counterpart appears in the financial account instrument "Currency and deposits"[1]. This operation generates a current and capital account balance of +150 USD, and a financial account balance of +150 USD (see Table 1.1). The balance-of-payments, as a result of the difference between the current and capital account and the financial account, is therefore, and by definition, *always in equilibrium.*

Likewise, purely financial transactions are also recorded, which offset each other between gross inflows and outflows in the financial account. Suppose that the same resident company X takes out a loan from a non-resident bank for 250 USD. This entry is made in the functional category of "Other Investment" as a net increase in liabilities (gross inflow). Suppose again that the firm uses its foreign bank account to receive this loan. The counterpart of this financial transaction is a net increase in assets (gross outflow) in the

[1]If company X had its bank account based at a resident bank, the same movement would occur under "Currency and deposits", but on the balance sheet (increase in foreign net assets) of the Central Bank, and not at company X. If the buyer of the goods is resident in a Eurozone country, as is company X, these Central Bank foreign net assets increase against the TARGET2 system. This is why net exports increase the foreign net assets (or reduce the foreign net liabilities) of the Central Bank vis-à-vis TARGET2, and net imports increase the foreign net liabilities (or reduce the foreign net assets) of the Central Bank vis-à-vis TARGET2.

TABLE 1.1. Recording example of a transaction in the current and capital account, and its counterpart in the financial account, regarding Firm X.

Item	**Exports**	**Imports**
G1 – Goods (merchandise)	150 USD	
Current and capital balance (= 150 USD)		
Item	**Net acquisition of assets**	**Net incurrence of liabilities**
Currency and deposits	150 USD	
Financial account balance (= 150 USD)		

financial account instrument "Currency and deposits" (Table 1.2). Any future interest payments abroad would be recorded, on the one hand, in the primary income account (imports) and, on the other, as a decrease in assets in the financial account ("Currency and deposits").

It should also be noted that each financial account transaction increases or decreases the economy's international investment position (IIP) towards the rest-of-the-world. In the first example, the net IIP would increase by 150 USD, due to the increase in the stock of assets abroad. In the second example, even though a loan was taken out from abroad, the net IIP would remain unchanged.

TABLE 1.2. Recording example of a purely financial transaction in the balance-of-payments, regarding Firm X.

Item	**Net acquisition of assets**	**Net incurrence of liabilities**
Currency and deposits	250 USD	
Loans		250 USD
Financial account balance (= 0 USD)		

If the balance-of-payments is, by definition, always in equilibrium, *why is it worth analyzing*? External accounts statistics allow for various breakdowns regarding information by BoP item, functional category, financial instrument, counterpart country, net external position, or external debt. In short, this dissertation aims to demonstrate the usefulness of the various items that make up the balance-of-payments, a hitherto purely technical issue that the author intend to bring into the field of Political Economy.

This chapter begins with a short motivation of the thesis, explaining the research gap and its objectives (Section 1.2). Section 1.3 has a literature review that allows the balance-of-payments figures to be read in light of the definition of Political Economy. Section 1.4 presents the four Essays that accomplish this thesis, establishing a bridge between them and the empirical strategy followed, naming the sources, and justifying the methods. In themselves, the four articles involve Political Economy literature, which makes them part of this field of research. The last Section presents the structure of the entire thesis (Section 1.5).

1.2. Motivation, research gap, and objectives

The inspiration for this PhD thesis comes from the author's work as an adviser in the balance-of-payments and international investment position statistics area at Banco de Portugal, between 2015 and 2021.

The title of this dissertation, "Essays on the Political Economy of the Balance-of-Payments", calls for an analysis that goes far beyond the balance-of-payments (BoP) as a macroeconomic indicator. It appeals to a critical study of the role of ideas in constructing narratives by institutions and observers when they lend themselves to analysis and recommendations based on the BoP. It also calls for the role of interests, reading the distributive effects of policy decisions, and suggesting alternative approaches to those established by convention. Taking advantage of all the technical knowledge acquired as a compiler of these statistics, the idea is to let PhD studies in Political Economy *invade* the balance-of-payments figures.

To this end, quantitative analyses and an in-depth literature review are performed. The latter reveals the intense debate on the causes of external imbalances until the Eurozone crisis (EZC) in the countries that make it up, the importance of the BoP in a monetary union, or the role of external demand in economic growth. With this, a contribution is made to breaking down the mainstream approach that, within the framework of a currency union, more specifically, the Economic and Monetary Union (EMU), the balance-of-payments would no longer affect a country's growth and international relations, and that imbalances between countries would be spontaneously solved through efficient market mechanisms. Until the EZC, the balance-of-payments was somewhat dismissed as an indicator. From then on, the literature began to debate about where the external deficits in the countries of the South came from, and it emerged that the countries that suffered most from the crisis were precisely those that had accumulated deficits until then.

This thesis contributes to the academic community by answering a set of starting questions: What relevance do external accounts have within the framework of a monetary union, and which role have international institutions and observers in general attributed to them? Which mechanisms were behind the external imbalances in the early years of the EMU? Which ideas lie behind the narrative of these institutions, and what are the alternative visions? What other items are worth looking at besides the current and capital balance[2], and how should these be read in the light of a Political Economy analysis? What constraints are placed on economic growth by the balance-of-payments?

To the best of our knowledge, few studies in the literature merge solid balance-of-payments knowledge with critical analytical perspectives. As such, this work brings together the causes in the literature for the unfavorable evolution of the external balance in Eurozone countries until the single currency crisis, making a distinctive empirical contribution to this discussion. It offers to the reader a debate on the relevance of the balance-of-payments in the context of a monetary union. It points to gross financial flows (less explored in the literature) as revealing events to the current account and generators of financial instability (and which institutional sectors guide them). This dissertation also

[2]From now on, just *current account balance*.

explores the growing role of international trade in services and evokes non-price competitiveness as a driver of external demand.

1.3. State of the Art: the Political Economy of the balance-of-payments

1.3.1. From the Classics' perspective for foreign trade to the rebirth of the Political Economy

According to the mercantilist doctrine, dominant from the XV century on, wealth of nations depends on the accumulation of foreign reserves or precious metals (gold), which implies a *positive trade balance*. However, classical political economists criticized this view, using the quantity theory of money to explain that accumulating precious metals would only lead to a proportional price increase without affecting the real economy (Hume 1752). Also Smith (1776) defended the neutrality of money idea, and later Ricardo (1817) put new emphasis on the supply-side: it is the ability to realize savings that allows investment, and that generates growth.

Say's Law would be well regarded by the classics, in which "every supply would generate its own demand", without taking into account the inefficient allocation of resources between sectors, or current account imbalances, which these authors considered self-adjusting by the mechanisms underlying the gold standard and the internal terms of trade (see McCombie & Thirlwall (1999)). Keynes (1937) sought to influence the issue in the early XX century, postulating that the engine of growth would be the *effective aggregate demand*. It is due to the fact that the demand differs across countries that economic growth is uneven.

Harrod (1933) developed a model in which he gives to foreign trade an output multiplier effect ($1/m$ where m represents the marginal propensity to import), assigning burdens to open economy models, and to the constraints on output that may arise from it, something that neither the classics nor Keynes emphasized.

The meaning of the balance-of-payments has always been present in Political Economy debates since the Classics. It is therefore important to draw attention to Hall (1997)'s definition of Political Economy, through the *troika* of ideas, interests, and institutions, bringing *the politics* and questions of distribution into this sphere of analysis.

Economists got stuck to neoclassical economic models, and political economists were left with the link between politics and economics. The latter group is skeptical about the distributive efficiency of markets, pointing out how institutions affect the performance of market mechanisms and question the artificial conceptions idealized by economics. Neoclassical orthodoxy has established itself as the dominant school of thought within economics. It became a discipline disconnected from sociology and history, where mathematization and formalism were imposed, highly influenced by the marginalist revolution (Milonakis & Fine 2009).

According to Blyth (2009), the rebirth of Political Economy took place at the end of the 1970s, when economists disagreed on dealing with phenomena such as oil shocks,

stagflation, unemployment, or low growth. For the author, the separation between politics and markets that economics made until this decade helps explain some of these phenomena. More than a decade after the Global Financial Crisis (GFC) and the EZC, economists have also been unable to agree on the origins of these events, which is evidence of the intellectual crisis of economics' epistemology and methodology (Boyer 2018).

The rebirth of Political Economy intersects with the emergence of *post-Keynesian (PK) approaches*, initially inspired by Keynes and Kalecki, and first disseminated in the works of Cambridge school authors such as Nicholas Kaldor and Joan Robinson. Like other strands of Political Economy, the PK literature emerged as a response to the limitations and simplifications of neoclassical mainstream economics, particularly the neoclassical synthesis.

There are several characteristics of the PK approach that make it a *subfield* of Political Economy: heterodox rationalism (it is based on reality and not on imaginary hypotheses, and therefore constructs *stylized facts*); organicism or holism (individuals are social beings, which goes against individualism); procedural rationality (individuals face severe limitations to their ability to acquire and process information, which is why they follow the rules or customs, and create institutions to better cope with uncertainty); the primacy of production and growth, rather than exchange and scarcity (Lavoie 2009, 2015, Hein & Stockhammer 2010, Hein 2017).

The assumption that the economy is demand-determined and not constrained by supply (this means that capital investment is essentially independent of saving) links the PK literature to the balance-of-payments. The constraints that external demand places on economic growth have been developed by PK authors, inspired by the Thirlwall's Law (Thirlwall 1979, 2011). According to this model, developed below, growth is affected by demand forces from abroad and by the economy's marginal propensities to import and export. So, growth is externally demand-driven. Extensions to this model add the weight of capital flows in total inflows (Thirlwall & Hussain 1982), the ratio of external debt to GDP (Moreno-Brid 1999, Barbosa-Filho 2002), the public debt and budget deficits (Soukiazis et al. 2012), or the growth of the capital stock, bringing supply-side variables into the model (Razmi 2016).

This Section aims to provide a state of the art review of the literature concerning the Political Economy of the balance-of-payments, cross-referencing literature that offers conflicting points of view. After this, Subsection 1.3.2 explores the conflicting ideas surrounding the interpretation and analysis of the BoP figures in a monetary union, using the Eurozone as a case study. Subsection 1.3.3 looks at the different theoretical perspectives that explain the external account imbalances between the Northern and Southern countries within the euro area (EA). Dominant ideas resulted in narratives adopted by the institutions and decisions with consequences that favor specific interests, which are explored in Subsection 1.3.4. Finally, the Subsection 1.3.5 closes with some concluding remarks.

1.3.2. Does each country's balance-of-payments matter in a monetary union?

The wealth of the debate around the BoP in academia and the political sphere starts with discussing whether or not it is a relevant indicator. Particularly, is it in a monetary union? Table 1.3 helps to realize that the role attributed to the balance-of-payments in the literature has diverged between relevance and a null or limited function and between the approaches of the mainstream literature and the heterodox literature.

This discussion has been going on since at least the end of World War II (WW II) when Keynes and White were drawing up the guidelines for the international monetary system (Clarke 2022). It has become more relevant in the design of the EMU, its implementation, and its deepening. The experience of the euro as a single currency for a group of countries that closely seeks to follow a monetary union of states, like the US, has been followed by other desires in Africa and Latin America.

Returning to the initial concept of Optimal Optimum currency area (OCA), in an "optimal" monetary union, the current account balance of the member countries is of no such interest to most economists. In their classic version of central banks draining foreign reserves, *balance-of-payments crises would no longer be a problem for Eurozone countries* (Ingram 1973, European Commission 1990, Frankel & Rose 1997, Constâncio 2000).

Symmetry mechanisms between countries would be strengthened by trade integration, and fiscal control mechanisms would avoid pro-cyclical expansionary policies. It would become more accessible to finance deficits in a broad market, with liquidity and a single currency, and prior structural adjustment mechanisms would be created by countries without relevant economic policy tools such as exchange rate policy. Possible external imbalances would be addressed by price mechanisms: a country in permanent deficit and with little supply of money would adjust its wages to become more competitive (increasing exports) and reduce domestic demand (and imports), which would improve the current account balance.

Nevertheless, after the end of the Cold War, the international environment changed and capital movements proliferated, making the current account a difficult instrument to interpret. Also, the deviating behavior of governments could lead to external deficits becoming unsustainable (Knight & Scacciavillani 1998, Catte 1998).

The issue centered on the sustainability of the deficits, which meant that consecutive deficits could be viewed favorably. Some authors, assuming the rationality of economic agents, argued that external deficits were the result of an inter-temporal choice between consuming today and saving tomorrow, foreseeing future economic growth (European Commission 1998, Decressin & Disyatat 2000, Gaspar & Fagan 2006). For other authors, deficit situations in the euro's peripheral countries were merely a result of the convergence process (Blanchard & Giavazzi 2002). Also, external deficits may not be related to the behavior of fiscal policy. Instead, they may signal the country's financial attractiveness in the eyes of foreign investors (Tatom 1998).

TABLE 1.3. Theoretical approaches to the relevance of the BoP in a currency area. Source: author´s elaboration.

Role assigned to the balance-of-payments	**Mainstream approaches**	**Heterodox approaches**
Null or limited	• It is no longer relevant in a monetary union, as market mechanisms resolve imbalances efficiently. • Possible imbalances may arise from: 1) inter-temporal optimization of consumption decisions; 2) convergence process in the union.	• The TARGET2 system guarantees permanent liquidity to countries with deficit external balances.
	Ingram (1973), European Commission (1990), Frankel & Rose (1997), Catte (1998), Knight & Scacciavillani (1998), European Commission (1998), Decressin & Disyatat (2000), Blanchard (2006)	*Lavoie (2015), Febrero et al. (2018), Mazzocchi & Tamborini (2021)*
Relevant	• It is helpful to understand the EZC, which can be seen as a competitiveness crisis that led to a sudden stop (a classic balance-of-payments crisis). • Must be monitored (setting up of the Macroeconomic Imbalance Procedure).	• It is helpful to understand the EZC, which can be seen as a financialization crisis that led to a sudden stop (a classic balance-of-payments crisis). • Gross capital flows (the financial account) reveal financial instability and vulnerability to speculative attacks disconnected from foreign trade.
	Giavazzi & Spaventa (2010), Sinn (2012), Merler & Pisani-Ferry (2012), Gros (2015b)	*Cesaratto (2013, 2015, 2017), Kohler (2020, 2022, 2023)*

After the euro crisis, the *dominant view* gave the balance-of-payments an *essential role* in understanding the EZC, showing a change in standing in relation to this indicator.

Countries that had accumulated external deficits before this crisis event revealed structural problems of external competitiveness and convergence, which led to a sudden-stop typical of a classic BoP crisis (Giavazzi & Spaventa 2010, Sinn 2012, Merler & Pisani-Ferry 2012). The authors admitted that the inter-temporal solvency constraint did not work because the deficit countries mainly produced/exported non-tradable goods and services, which did not boost productivity. These authors also admitted that *the EMU neglected the existence of external account problems*, and the countries that are part of it were excluded from the possibility of mutual assistance in the event of a balance-of-payments crisis (Marzinotto et al. 2010). The markets abruptly halted foreign capital flows, which had been helping the peripheral countries, leading to public deficits and soaring public debt, especially that held by non-residents (Gros 2015*b*).

The resurgence of external account precautions must be connected to the adoption of the Macroeconomic Imbalance Procedure (MIP), formally embraced in 2011, to prevent and correct macroeconomic imbalances in the Eurozone (see, for example, European Commission (2023)). Motivated by the gaps in competitiveness, this was the first time the European Commission decided to monitor the external accounts of EA countries.

There are authors with *an alternative perspective* to the mainstream literature, who also attribute a *limited role* to external accounts in the context of a monetary union. In this scenario, countries issue currency, which they use to transact with foreign countries. Therefore, one would expect a balance-of-payments crisis to be avoided, since all the Central Banks have to do is print money to buy goods and services from abroad. If there are successive external imbalances, one of two things happens: either the banking system replenishes liquidity in the deficit countries by automatically drawing on the surpluses of the other countries (a function of the TARGET2 system); or there is a banking crisis that stops this system and reduces the money supply, cutting domestic demand and wages, and increasing the price competitiveness of the economy, restoring the solvency of the economy as a whole towards the rest-of-the-world (Mazzocchi & Tamborini 2021).

In the case of the Eurozone, unless the deficit country grows at a faster rate than the interest rate on its debt, or has dominance in the international monetary system equivalent to that of the US, there is another factor that can associate unsustainability with its deficits: the markets' confidence that the country will leave the monetary zone and return to its domestic currency (Garber 1998).

Regarding the role of TARGET2, authors such as Lavoie (2015) and Febrero et al. (2018) assume that the existence of this automatic mechanism for inter-banking settlements is enough to prevent classic balance-of-payments crises from occurring. Current account imbalances are a mere consequence of the debt-led boom following the introduction of the euro. If they occur, sudden-stops would be due to market perceptions of the ECB acting as a lender of last resort, assigning a limited role to external imbalances. They thus contradict the view that the EZC is a BoP crisis.

Still in the field of heterodoxy, Cesaratto (2013, 2015, 2017) presents an *opposite view* to the last authors mentioned, reinforcing the idea of mainstream authors that the euro crisis was, in fact, a balance-of-payments crisis. In various papers, the author pointed to the liberalization of the financial system, the growth of indebtedness in the peripherals fueled by capital inflows, and the growth of wages over productivity, generating inflationary pressures and external deficits. Sooner or later, the problems in the external accounts come to light, with investors withdrawing their positions and seeing arbitrage opportunities disappear, which leads to capital outflows. In addition, the IMF's interventions throughout the euro crisis in the peripheral countries resemble classic BoP crisis, and countries could always (as an alternative to austerity) abandon the euro and promote currency depreciations.

For Kohler (2020, 2022, 2023), through a monetary perspective of the PK approach, the analysis should focus on *gross capital flows* because they signal financial vulnerabilities, speculative attacks, and uneven development. The author uses balance-of-payments and balance-sheet accounting exercises, like authors such as Borio & Disyatat (2015) or Avdjiev et al. (2018), and concludes on the independent relationship between *gross* capital flows and *net* flows (or trade flows) – see also Pérez (2019). He also explains the mechanisms through which gross capital flows, purely financial and with no impact on the net balance, are independent of savings levels and generate effects on the real economy, such as inflation or volatility in the price of domestic assets.

The focus on financial balance items, by instrument or institutional sector, from the perspective of net assets or liabilities, reinforces the *richness and multiplicity of points of view* in the analysis of external statistics.

1.3.3. External imbalances in the early years of the euro: conflicts of ideas in explaining them

This Subsection sets out the debates in the literature on the euro crisis, bringing mainstream and heterodox approaches into dialogue. This is relevant because the crisis is based on imbalances in the countries' external accounts that have joined the single currency. Even within each of the approaches, the authors present different points of view. It is, therefore, something that intersects with the debate on the relevance of the balance-of-payments in a monetary zone. The EA is a large market with a considerable expectation of price stability, and the international role of the euro is important in the global trade. That is why it is worth using this case to study how external imbalances are generated between countries with the same currency.

Setting up the EMU has revived the debate around the concept of the *optimal currency area (OCA)*. It was created by Mundell (1961) as a response to monetarist claims of adopting a global flexible exchange rate regime in the debate about the pros and cons of the fixed (but adjustable) exchange rate regime resulting from the Bretton Woods agreements. An "optimal" monetary union would imply a fixed exchange rate regime among the countries that are part of it.

However, certain conditions would have to be associated with this union, which De Grauwe (2006) summarizes well. These are symmetry (to shocks), flexibility (in labor markets), and integration (in trade). Comparisons with the U.S. emerged, with the issue of labor mobility, relative wage adjustment capacity, and capital mobility being characteristics that effectively react to external shocks (Blanchard & Katz 1992). Mechanisms for fiscal transfers between countries would ensure that situations of external imbalance would not be perpetuated.

Some authors explain the euro crisis, which occurred a few years after the GFC, based on the idea that the Eurozone is not an OCA. The *institutional difference* between countries explains the asymmetry in the face of external shocks felt by the countries that

are part of the EMU. The mainstream theory calls these "rotating slumps", i.e., non-synchronized business cycles across countries (Blanchard 2006). Therefore, the interest rate set by the ECB in the early years of the euro was too high for Germany, contributing to its weak growth, and too low for Southern European countries, leading to inflated wages and prices. Then, macroeconomic policies should be more symmetric between countries (De Grauwe 2013).

Also significant is the possibility of having a lender of last resort, which prevents the precipitation of liquidity crises. De Grauwe (2011) compared the banking situation in the UK and Spain, concluding that the reaction of the markets was more adverse in the country that does not control the currency in which it issues debt.

According to Johnston & Regan (2016) and Regan (2017), the Eurozone is an internal market with intense commercial exchanges. This interdependence coexists in the presence of two different growth models, which help explain the crisis: the demand-led model, based on internal demand, typical of the Southern countries (Greece, Portugal, Italy, and Spain), and the export-led model, specializing in high value-added products, based on cutting-edge technology, with wage coordination, and with incremental innovation, typical of the Northern countries (Germany). This view is associated with the institutionalist literature of Varieties of Capitalism (Hall & Soskice 2001, Hall 2014).

Baccaro & Pontusson (2016) contributed to the Comparative Political Economy (CPE) literature – until then focused on "supply-side institutions" – by adding elements of macroeconomics and aggregate demand for a more restricted set of countries. Thus, they built growth models that included *export-led economies*, restricting consumption and wages to make the export sector more competitive. In this way, they brought *BoP elements* into the comparative study of advanced capitalist political economies.

Authors such as Bibow (2013) or Simonazzi et al. (2013) argue that Germany's export-led strategy of containing wage increases has made this economy competitive to the point of accumulating external surpluses since the euro's inception. For Bofinger (2015), Germany's policy of containing aggregate demand has restricted its imports, harming the exports of its single currency partners. These authors stand alongside other non-mainstream authors, who argue that the impossibility of using exchange rate policy instruments (Flassbeck & Lapavitsas 2013) or the premature de-industrialization of the Southern countries (Ginzburg & Simonazzi 2017) have created different levels of *price competitiveness* in the euro countries (see Table 1.4).

These approaches break with those that were dominant until then. Blanchard (2006) and Allard & Everaert (2010) had argued that the low level of productivity in the Southern countries interrupted the expected convergence process, and Cavallo & Cottani (2010) and Wyplosz (2010) pointed to the high growth of nominal wages in the South relative to the other EA partners. Sinn (2014) argued that wage restriction policies would be needed to promote internal depreciation, improving external price-competitiveness conditions in countries with accumulated current account deficits. China's entry into international

TABLE 1.4. Turbulence in the field of ideas: causes of external imbalances in the Eurozone and the subsequent EZC. Source: author´s elaboration.

	Mainstream approaches	**Heterodox approaches**
Competitiveness Problem	• High wage costs in Southern countries • Low productivity in Southern countries • Trade shocks: new competitors – China (WTO) and Eastern countries (EU); rising oil prices	• Low wage increases in Germany (export-led model) • No exchange rate policy (impossibility of depreciations in the South) • Premature deindustrialization in the South vs. strong industrial base in the core
	Allard & Everaert (2010), Cavallo & Cottani (2010), Wyplosz (2010), Chen et al. (2013), Belke & Dreger (2013), Sinn (2014)	*Lapavitsas et al. (2010), Stockhammer (2011), Bibow (2013), Flassbeck & Lapavitsas (2013), Felipe & Kumar (2014), Ginzburg & Simonazzi (2017)*
North-South Flows	• Unlimited access to TARGET2 system (Germany financing the South) • Too optimistic feelings about peripherics convergence and subsequent sudden-stop • Development of financial system and easing credit conditions	• Banking deregulation and financial liberalization • Financial markets movements, power and feelings
	Gros (2011), Sinn (2011), Schmitz & von Hagen (2011), Lane & Pels (2011), Sinn & Wollmershäuser (2012), Obstfeld (2013)	*De Grauwe & Ji (2012, 2013), Storm (2016a), Bellofiore et al. (2016), Fuller (2017)*
Excess of public and/or private spending	• Non-compliance with budget rules (SGP). Public spending out-of-control (wasteful-less) in peripherics • Credit boom and housing bubble • Spillover effects from the US subprime crisis	• Twin deficits (no evidence for Eurozone countries) • A banking sector crisis: bad credit allocation and self-regulating expectations
	Issing (2009), Shambaugh (2012), Holinski et al. (2012), Wyplosz (2013b), Schäuble (2011, 2013), Reis (2015)	*Gaulier & Vicard (2012), Nikiforos et al. (2015), Storm & Naastepad (2016)*

trade and the accession of eastern countries to the European Union in 2004 also affected EMU countries asymmetrically (Chen et al. 2013).

Unlimited access to the TARGET2 automatic inter-banking payment system[3] led to a *massive flow of capital from the North to the South* of Europe. The South's liquidity needs were covered by the savings of the other countries, which generated growing imbalances in the intra-Eurozone external accounts, and the solution would be to limit access to this

[3]TARGET is an acronym for Trans-European Automated Real-time Gross Settlement Express Transfer System. This mechanism allows current account deficits to be financed by capital imports from TARGET2, and current account surpluses to be exported to the other EA countries.

system (Sinn 2011, Sinn & Wollmershäuser 2012). For Schmitz & von Hagen (2011), this would be the result of the integration of the financial markets and their ability to allocate resources efficiently. For Gros (2011), the imbalances revealed in central bank balance sheets in relation to TARGET2 led to sudden-stops and a classic BoP crisis.

Contrary to this approach, De Grauwe & Ji (2013) have shown that the panic and self-sentiment of the financial markets (and not necessarily macroeconomic fundamentals) led to speculative movements and capital allocation from the South to Germany during the EZC. The fragility of the financial system in Europe and its deregulation (rather than a problem of competitiveness) caused the capital movements between the North and periphery (Bellofiore et al. 2016, Fuller 2017). On the other hand, Storm (2016*a*) points to financial capital flowing to the South as being responsible for the latter's loss of external competitiveness: access to liquidity led to investment in non-tradable sectors with little room for productivity growth (such as tourism or real estate), reinforcing the structural differences between core and periphery.

Another group of authors points to *excessive Government spending* in peripheral countries as the cause of the EZC (Issing 2009, Schäuble 2011, 2013). This conclusion is linked to the mechanism of low financing costs that created incentives for public sector indebtedness, typically prioritizing investments in non-tradable sectors (Froot & Rogoff 1991). The credit boom, intermediated by banks, is another cause of external imbalances. Obtaining funds from abroad also generates future payments of capital income, damaging the external balance (Holinski et al. 2012). The lack of regulation in the banking sector, overly optimistic expectations regarding the convergence process of economies, and banking exposure to the Subprime crisis in the US are also pointed out in Obstfeld (2013), Wyplosz (2013*b*), or Constâncio (2014). Shambaugh (2012) argues that the banking and sovereign debt crises are strongly connected.

An alternative perspective on the excess of investment over public sector savings is presented in Storm (2016*a*,*b*), who explains that the crisis was due to a problem of *private indebtedness* reflected in the external accounts. Gaulier & Vicard (2012) blame the banks for misallocating external inflows by assigning loans to the real estate sector, thus reducing the risk of the collateral. Nikiforos et al. (2015) do not find evidence for twin deficits (public deficit and external deficit) in Greece, and Bird et al. (2019) do not find the same relationship for a group of OECD countries. For De Grauwe (2011) it is not a question of public or private debt levels, but rather the lack of a lender of last resort to act in crises events in the EA.

As Table 1.4 shows, external competitiveness, capital flows between North and South, and excess investment over savings in the public and private sectors, although strongly interlinked, make it possible to clarify the causes pointed out in the literature for external imbalances and the Eurozone crisis.

However, it is about *external competitiveness* that the debate is most closely linked to the balance-of-payments. Felipe & Kumar (2014) and Storm & Naastepad (2015, 2016)

criticized the conventional view, both on the mainstream right and on the left, who pointed to cost-competitiveness as a relevant factor in explaining external imbalances in the EA. They argued that unit labor costs are a small part of the final price and drew attention to the role of non-price competitiveness in improving the external balance. The importance of technological competitiveness and the introduction of high technology, design processes, and innovation are of significant interest.

The impact of non-price competitiveness is emphasized in *balance-of-payments constrained growth models*, initially studied by Thirlwall (1979). According to this model, in its simplified version, long-run economic growth is determined by the ratio between exports and the income elasticity of imports (or, in other words, the marginal propensity to import). This establishes a connection between growth and external competitiveness, in which, within the framework of PK macroeconomics, aggregate demand is the driver of growth (Blecker 2022, Baccaro et al. 2022). Nevertheless, the same growth rate of exports in two countries does not mean that they will grow at the same rate: the products imported by the two countries, necessary to satisfy the same level of exports, may differ. That is, both may be different in terms of the income elasticity of imports (McCombie & Thirlwall 1999).

In Araujo & Lima (2007), Gouvêa & Lima (2010) and Gouvêa & Lima (2013), using multi-sector models, it can be seen that the production sector and the type of product exported matter. Therefore, a country can grow by reallocating its productive activity, even if external demand does not increase. That is relevant because it brings supply-side conditions into determining the economic growth rate.

If the country wants to promote economic growth, more is needed than simply expanding its aggregate demand. Improving the attractiveness of its exports through product design, reliability, marketing, and delivery, also creates less dependence on non-domestic products (Greenhalgh 1990). Recent empirical studies have shown that both the relative price and the real exchange rate do not affect the competitiveness of products with incorporated technology (developed countries) but do affect the competitive performance of mid-range or resource-based products (developing countries) – see Caglayan & Demir (2019) or Bottega & Romero (2021).

Of course, in the context of the growing dominance of the dollar in the monetary system, where international transactions are mostly purely financial, current account imbalances mirror the imbalances caused by the predominance of this currency in the international financial system (Toporowski 2022, Kohler et al. 2023). This means that monetary power affects growth models, i.e., external deficits in recent decades in the US are seen as a sign of "exorbitant privilege"[4] rather than a constraint on long-term growth.

[4]A concept widely studied. See, for instance, Gourinchas & Rey (2007), Gourinchas et al. (2019), Maggiori et al. (2019), or Kohler et al. (2023). The US dollar is at the top of the hierarchy of the international monetary system and is seen as a safe asset that attracts liquidity from countries with external surpluses. The inflow of capital into the US finances the purchase of goods and services abroad, generating consecutive external deficits, which further finance the rest-of-the-world and allow other countries to maintain an export-led growth strategy.

This casts doubt on Thirlwall's fundamental premise that "*No country could grow faster than the rate consistent with a balanced external account, unless it finances ever-growing deficits which, in general, it cannot*" (Thirlwall 2011, p.370).

1.3.4. On the role of institutions and interests (and distribution issues)

During the discussion on the foundations of the euro and the setting up of a currency zone, another question was whether a currency zone had to be "optimal" ex-ante or ex-post. This is a *political question* that divided German and French economists. The former argued that preconditions had to be created for EMU to be formed. They wanted a tiny group of countries and advocated strict convergence criteria for joining the union. Germany finally gave in when it saw its demands for central bank independence, a single policy goal of "high-level price stability," a prohibition on purchasing bonds from member governments, a "no bailout" rule for countries that became insolvent, and a location in Frankfurt (Feldstein 2011). Germany also forced the creation of a Stability and Growth Pact (1997), which started to limit member countries' public debt and budget deficit.

From a "monetarist" perspective, France argued that the conditions for OCA would be met during the lifetime of the Eurozone and that a "dirigiste" perspective should be adopted to lead members to convergence (Snaith 2014). Authors have argued in favor of the latter solution, showing evidence that integration would make trade patterns among members and the harmonization of business cycles as endogenous variables. This means that countries will be better able to meet the conditions for joining a currency union after integrating it (Frankel & Rose 1997).

Controversies over asymmetrical interests and powers continued into the third phase of the EMU (1999). Some countries did not meet the defined convergence criteria, including Germany, and the criteria were adjusted, allowing the entrance of countries that demonstrated that the excessive debt would have a "sustainable downward path" (European Commission 1998). As Germany and other core countries that did not meet the criteria were given the green light to join the euro, countries with weaker macroeconomic fundamentals also eventually joined, bringing the Eurozone to a union of eleven countries, contrary to the initial logic in which an OCA should be of restricted size (McKinnon 1963).

Subsequent failure to meet macroeconomic requirements that guaranteed stability and growth, even by Germany or France, created doubts about the degree of commitment of members within the union. Alongside this, doubts arose about which autonomous political entity could decide in the face of an asymmetric shock and how a mechanism for solidarity and transfers between regions would be promoted.

Nölke (2016) stated that, not only the OCA theory raising democratic implications (loss of monetary and exchange rate policy autonomy) but also the transfers between North and South would be comparatively insufficient compared to the solidarity within an established nation-state. The theory left unexplained why countries in the core and the periphery reacted so unevenly to the surging of competition from emerging markets.

Low interest rates and low inflation levels would benefit the interests of Germany, which designed the EA according to its coordinated market, in order to neutralize the competition brought by the mixed market economies of the South (Iversen et al. 2016). For some authors, the crisis has come to be seen as *revenge with the Eurozone* for not becoming an OCA before it was conceived (Krugman 2013).

The external imbalances in the early years of the euro (see Figure 1.1), reflected in the current account balances, between countries that accumulated consecutive deficits (Greece, Portugal, or Spain) and surplus countries (Germany, Finland, or the Netherlands) show institutional shortcomings in the design of the single currency, and an uneven benefit from its introduction.

The creation of the euro was based on the powerful idea that it would be possible to create an optimal monetary zone, and this is an example of how economics neglected the political conditions for the euro to succeed. The rational expectations of governments and economic agents would lead them to produce the necessary changes regarding public accounts, liberalizing reforms called "structural", and the flexibilization of the labor factor. In this process, the interests of those who gain, such as European multinationals and highly qualified workers, differ from those who lose, such as less qualified workers, welfare dependents, and small and medium-sized firms (Boyer 2018).

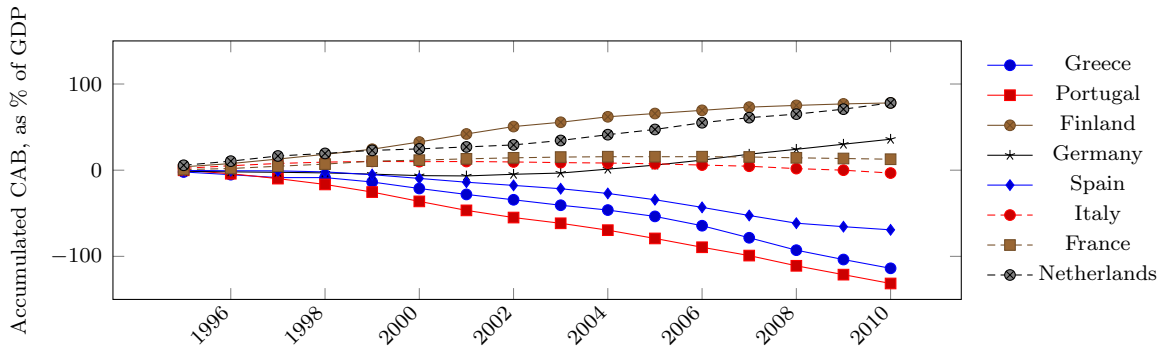


FIGURE 1.1. Accumulated current account balances (as % of GDP) as a mirror of uneven intra-EA development. Source: author's calculations on Ameco database

Schelkle (2017) defended the need for greater monetary solidarity among EA members, creating institutions such as a cross-border payment system, risk-sharing platforms, or policy coordination dynamics as in Sweden, which prevent solutions from being left to market forces. However, the institutional advances to be made in the Eurozone were not agreed upon in the literature. If, on the one hand, there was a call for mechanisms to mutualize debt and transfers between countries (see, for example, Lapavitsas (2013), Bibow (2013), Fuller (2017)), on the other hand, institutional reforms would involve creating mechanisms to make the labor market even more flexible (Feldstein 2011, Wyplosz 2013*a*).

The neglecting of the balance-of-payments, based on the dominant idea of continuously setting up an optimal currency area, was matched with external accounts imbalances

between countries in the single currency. The correction of external deficits by the countries at the bottom of Figure 1.1 was done at the cost of deflationary measures and the contraction of demand.

The countries of the South lose out, not only because of the deterioration of their external debt until the euro crisis, but also due to the correction since then through "internal depreciation" policies, in order to promoting price-competitiveness (which the empirical literature does not agree is a relevant factor for the performance of external accounts).

The very creation of the MIP, after the EZC, indicates a *preference for adopting an export-led growth model* for the euro countries. It relieves countries with external surpluses from sanctions (they cannot go beyond 6%), penalizes external deficits below 4%, and a net IIP below -35% of GDP. It also creates penalizations for negative export growth, nominal ULC increase, or rising housing prices, thus restricting consumption-led growth regimes (Johnston & Matthijs 2022).

Price competitiveness is commonly measured by changes in unit labor costs (ULC), which represent the ratio between labor wages and the productivity of this factor of production:

$$\text{ULC} = \frac{\text{Wage per worker}}{\text{Labor productivity}} = \frac{\frac{\text{Wages}}{\text{Total Employment}}}{\frac{\text{GDP}}{\text{Total Employment}}} = \frac{\text{Wages}}{\text{GDP}} \tag{1.1}$$

Improving price-competitiveness affects the distribution of income, as it implies a reduction in the share of labor remuneration in GDP, benefiting the share of capital income in output. Reducing ULC would imply a reduction in wages while maintaining the same level of GDP; or increasing GDP while maintaining the level of wages. The level of employment has a neutral effect (it affects the denominator and the numerator to the same extent) and GDP growth is closely associated with increases in productivity – the creation of greater added value, using the same quantity of factors of production.

1.3.5. Conclusions

Reflecting on the Eurozone crisis intersects with the role that the literature assigns to the balance-of-payments, especially in a monetary union. The process of setting the euro was influenced by mainstream ideas that attributed a somehow negligent role to the BoP within a monetary union, assuming it to be very close to an optimal currency area. Although there is no total consensus among authors on the origins of the external deficits accumulated in peripheral countries, it is known that the economic development could have been more cohesive among the countries that first joined the euro.

The correction of BoP imbalances between countries after the GFC meant that those with deficits had to adopt severe austerity measures, further hampering their development. Many adjustment measures still need to be reversed, such as the reduction of the number

of civil servants, the deregulation of the labor market, the raise of taxes, the cut in public investment, and the implementation of privatization programs (see, for instance, Uxó et al. (2014), Pérez & Matsaganis (2019), Teles, Caldas & Martins (2020)). Despite the reduction in real Government spending (excluding debt charges), which occurred in most of the EA countries and which lasted at least until 2018 at levels below those of 2008, the weight of public debt as a percentage of GDP increased in the countries most affected by the crisis and where the adjustment was more vigorous.

Also, an "export-led for all" strategy was adopted for the Eurozone after the euro crisis. Johnston & Matthijs (2022) point out the risks of this strategy. Positive trade balances in the euro countries mean that consumption and public investment are constrained, jeopardizing the provision of services and the quality of public capital. This has consequences for people's quality of life and the emergence of anti-system movements. In addition, for the euro countries to be in surplus, other countries like the UK or the US are in deficit. The protectionist measures carried out recently by the US or China could put the European export-led model at risk. The UK's exit from the European Union adds doubts as to whether it will remain a customer.

For many mainstream and heterodox authors, the Eurozone crisis was seen as a classic BoP crisis, coinciding with the creation of the MIP. It is proposed to emphasize gross capital flows, the intermediation role of banks, or the self-fulfillment of financial markets.

European leaders and observers, in general, have feared the risks of Government failures much more than the macroeconomic risks associated with external account imbalances. The different approaches to the EZC have one thing in common: a better institutional design would make it possible to alleviate external imbalances between North and South. The balance-of-payments reflects different growth models and political forces' relationship between the two groups.

1.4. Empirical strategy, contributions and argument

This thesis consists of four interlinked Essays that can be read individually rather than in a conventional monograph model. This strategy was defined to make each of the Essays publishable before and after the submission of the thesis, to disseminate the knowledge produced here as widely as possible. This plan was achieved (Essay 1[5] and Essay 3[6] were published in peer review journals) and included writing one of the Essays as a visiting student at the University of Massachusetts (Amherst). The strategy also helped collect preliminary work accepted for presentation at Conferences, Seminars, and Workshops, receiving significant feedback, and greatly enriching the author's PhD experience.

It is important to note that this work draws exclusively on information provided on the websites of organizations that publish *official statistics*, specifically the European

[5]Essay 1 has already been published in the peer-reviewed journal *International Review of Applied Economics* (Amado 2023*b*).

[6]Essay 3 has already been published in the peer-reviewed journal *Investigación Económica* (Amado 2023*a*).

Commission (Ameco), the European Central Bank (ECB), Banco de Portugal (BPstat), the Bank for International Settlements (BIS), the World Bank (World Development Indicators), Eurostat, the IMF, the United Nations (UN), and the OECD. The empirical exercises throughout this thesis are applied using the econometric software Stata (StataCorp 17.0) and R (R Core Team, 2018). Specifically, for Stata it was used the commands *reg*, *xtreg*, *pvargranger*, *pvarirf*, *pvar* (Abrigo & Love 2016). For R it was used the packages *plm* (Croissant & Millo 2019), *cluster*, *factoextra*, and *FactoMineR* (Hennig & Liao 2013, Martos et al. 2023).

The period under analysis is mainly between 1996 and 2019, and in some analyses, between 1996 and 2008. Above all, it is a recent period, with available data, and it is interesting to place the analysis from the preparatory phase of the setting up of the euro to the pre-pandemic period.

The first two Essays focus on the role of the balance-of-payments in a monetary union, specifically the Eurozone. The last two contribute to the theory of balance-of-payments constrained growth (BPCG). The four articles have in common that they seek to bring together conflicting theoretical approaches (characteristic of a Political Economy analysis).

Accordingly, the first Essay looks in more depth at the case of the Eurozone as a paradigmatic example for creating a monetary union, doing a comparative analysis. In its early years, setting the euro enabled the accumulation of external imbalances between members that became core and others that became peripheral (which are distinguished through quantitative clustering techniques). It gives an overview of the debate surrounding the explanations for these external imbalances that led to the crisis, starting from the fact that the countries that suffered the most from the crisis (and saw the cost of their debt rise substantially) were the same ones that had accumulated external deficits until then.

The hypothesis that the convergence of interest rates *Granger-caused* the variations in the current account balance is explored for the period before the Euro crisis. Using econometric methods, evidence validates this hypothesis, and the mechanisms for this to happen are described. The Granger-causality relationship was inspired by the work of Gabrisch & Staehr (2014), who established the same relationship for the variables "changes in unit labor costs" and "changes in current account balances".

The second Essay offers different views in the literature on the relevance of the BoP, especially its role in a monetary union. It does so for the specific case of Portugal, a peripheral economy in the Eurozone, using a set of reports from international institutions to understand what ideas underpinned the narrative of institutional recommendation in the early years of the single currency. The economic policies of that time somewhat neglected the balance-of-payments, and this article explains the reasons for this and its consequences.

Furthermore, this second Essay goes beyond an analysis typically limited to the current account and trade balances. It explores the mechanisms through which gross capital

flows and currency endogeneity alter current account balances and cause financial instability (which links to the mechanisms developed in Essay 1). The dynamics of statistical correlation between gross capital flows by institutional sector and functional category are analyzed. The stylized facts from this last exercise give banks an intermediation role in financial flows towards the rest-of-the world. The public sector accumulates outflows with the rest-of-the-world at times when banks accumulates inflows, and vice versa, which demonstrates the role of the public sector as a counterweight force against the financial private sector.

In this second Essay, the empirical part closely followed the experiences of Avdjiev et al. (2018) and Kohler (2023) in analyzing the gross capital flows of the financial account.

As in the previous Essay, the third begins by confronting ideas about the origins of growth and does so generally from a Post-Keynesian (PK) perspective. According to this approach, growth derives from aggregate demand, and, as such, the external balance is a constraint on economic growth. For a nation to grow, it needs to export so that, in turn, it can also import goods and services that it cannot produce domestically. In order to export, it ought to be competitive, and Essays 3 and 4 show that price is not a statistically significant factor in explaining the evolution of exports (and imports). The non-significance of relative prices goes against the conventional theories, explained in Essay 2, which attribute the correction of external imbalances to market price mechanisms.

Essay 3 also has the particularity of analyzing exclusively an item that has gained momentum in international trade in recent years: the balance of services. It employs an econometric analysis with panel data (as in the first Essay) for various countries with data on the IMF website. Services are heterogeneous, and different patterns of specialization in services show different patterns of economic growth. As expected, highly developed countries have higher levels of non-price competitiveness than the rest, in the services sector. However, countries specializing in the tourism services sector tend to have current account deficits, which challenges models about tourism-led growth.

In the third Essay, the works of Eichengreen & Gupta (2011) and Baldwin & Forslid (2020) on the services sector, and of Araujo & Lima (2007), Gouvêa & Lima (2010), and Soukiazis et al. (2017) on the application of the multi-sector version of Thilwall's Law, served as a reference for sources, structure and methods.

The fourth and final Essay returns to time series analysis, as in the second Essay. The works by Caselli et al. (1996) and Soukiazis & Antunes (2012*b*) on reconciling PK and neoclassical models inspired this work. The origins of economic growth in Finland and Portugal between 1996 and 2019 are explained using a neoclassical growth model, reconciling demand and supply forces. The choice of these two countries is because, in the mid-1990s, they were preparing to share the same currency and had similar real GDP levels.

The variables on the external demand side are determined in the chapter, the non-price competitiveness ratio being one of them, and the supply variables are associated

with labor force skills indicators. In both economies, productive sectors with greater non-price competitiveness typically show higher current account balances and are those that incorporate more technology. It is therefore important to invest in technological incorporation, design and productive innovation – factors from the supply-side. Human capital indicators were not significant in the growth models applied to the two countries.

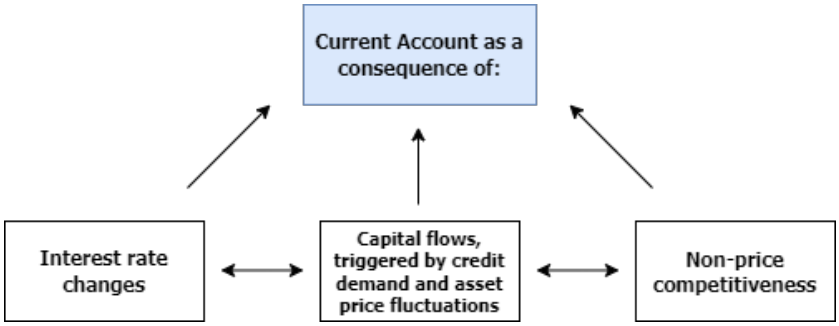


FIGURE 1.2. The current account as a result of a set of endogenous mechanisms. Source: author's elaboration.

For mainstream authors, it is the total economy's aggregate savings (or the current account balance) that causes investment and credit flows. The four Essays presented show that the current account are a consequence and not the cause of a number of interconnected mechanisms, such as changes in market nominal interest rates, capital flows triggered by the demand for credit, or the level of non-price competitiveness of productive sectors (Figure 1.2).

Interest rate convergence is explored in Essay 1, and links to the finance-centric approach to the euro crisis. The reduction in financing costs facilitated a *recycling of surpluses* from the North to the South. In other words, it is the current account surpluses of countries like Germany or Finland that explain the deficit balances in the countries of the South.

Capital flows, triggered by credit demand and asset price fluctuations is explored in Essay 2. It is import needs that drive the demand for credit, which is endogenous. Interbank loans and the efficiency of the TARGET2 payment system mean that the provision of credit to the economy is not constrained by the reserves of commercial banks. The instability of asset prices, such as real estate, caused by speculative financial movements (direct or portfolio investment), are also independent causal factors.

Non-price competitiveness issues are further explored in Essays 3 and 4. Specialization in primary production sectors or in the tourism sector creates a need for imports of products with incorporated technology. This dependence is even more noticeable when a country joins a broad, competitive and liquid single market.

1.5. Structure of the Dissertation

The remainder of the PhD dissertation is organized as follows. Chapter 2 begins by analyzing the debate in the literature around the causes of the euro crisis. It starts from

the correlation between the accumulation of external deficits until 2007 and the subsequent rise in interest rates on sovereign debt. This leads to an analysis of the mechanisms that guided the deterioration of the external accounts of Greece, Spain, Ireland, and Portugal. To do this, it uses econometric techniques and cluster analysis.

Chapter 3 looks at the theoretical approaches to the role of the BoP, especially in a country that is part of a monetary union. The stances and recommendations adopted by mainstream institutions for Portugal are also studied. For the same country, particular emphasis is placed on the empirical analysis of gross capital flows.

The effects on economic growth of developed and developing countries associated with the expansion of international trade in services are analyzed in Chapter 4. This is done by applying the multi-sector Thirlwall's Law and using econometric methods with panel data.

Chapter 5 applies the balance-of-payments constrained growth model for two countries with similar levels of real GDP in the 1990s, Finland and Portugal. The growth conditions in both countries are studied using a neoclassical growth equation that combines supply-side and external demand-side conditions.

Finally, Chapter 6 concludes and presents a set of policy recommendations based on the detail and richness of the external accounts as a macroeconomic indicator. Also, this last chapter indicates the main limitations of this PhD thesis and makes suggestions for further research regarding balance-of-payments figures.

We add a page brake to show that the even page number appears on the left

CHAPTER 2

Revisiting the debate on the Eurozone crisis: causes, clustering periphery and core, and the role of interest rate convergence

2.1. Introduction

This chapter investigates the mechanisms that explain the euro crisis (2010-12) a decade after this event, developing the argument that the countries most affected by the crisis were those that had accumulated external deficits until then. Also, it is developed the idea, in a novel way, that the convergence of nominal long-term interest rates played a Granger-causal role in these imbalances.

A set of non-obvious mechanisms, with different interpretations, generated the Eurozone crisis (EZC), and the literature has diverged in explaining them. Even so, the rise in the sovereign spreads of some crisis-stricken countries (Portugal, Ireland, Italy, Greece, and Spain) vis-à-vis Germany seems to be the most visible form of the phenomenon. The evolution of spreads is strongly correlated with the presence of external deficits (Gros 2011, Shambaugh 2012, De Grauwe & Ji 2013), and the most penalized countries were those with current account deficits[1]. Although this is a heavily discussed issue in the literature, this Essay offers a point of order in the literature by contrasting the different arguments. This work also makes a strict separation between the core and periphery of the Eurozone and offers an empirical explanation for the increased financing needs of the peripheral economies prior to the crisis.

An innovative way to expose a literature survey on the EZC will be constructed in Section 2.2, explaining the intra-Eurozone external imbalances, considering the three items of the fundamental macroeconomic identity: current account differences reflecting different levels of external competitiveness; financial flows in North-South direction; excess of investment over savings both in public and private sectors. These three main explanations communicate with each other (through different transmission mechanisms), being non-mutually exclusive. And, within each, there are divergences between authors, following mainstream or non-mainstream approaches, which makes it a Political Economy issue.

The literature calls for the analysis of numerous economic indicators to explain the crisis. So, taking the variables that the authors point out as explanatory for the external

[0]This work has already been published in the peer-reviewed journal *International Review of Applied Economics* (Amado 2023*b*). This chapter and its earlier versions were presented at the following conferences and workshops: "Political Economy of the European Peripheries Summer School 2022" (August 2022); "5th International Conference on European Studies" (12-14th June 2023 at KOF, ETH Zurich); "ICEBRS 2023" (29th June - 1st July 2023, Universidade de Coimbra).

[1]The empirical literature excludes the connection between public debt and sovereign debt spreads since spreads were changing in the same direction before the crisis, whatever the public debt ratios.

imbalances, we tested the statistical significance concerning changes in the cumulative current account, between 1999 and 2007 (Section 2.3). Some empirical works inspire these univariate linear (ordinary least squares) regressions (see Kohler & Stockhammer (2020), Shambaugh (2012)) and concern the same group of countries: the eleven countries that joined the euro in the first stage (1999), plus Greece, which entered in 2000. We developed a cluster analysis for the variables in which we found statistical significance against changes in the cumulative current account. Here, the separation between the periphery (Portugal, Greece, Spain, and Ireland), and core countries (Germany and Finland) is evident.

In Section 2.4, taking advantage of the work developed in the previous Sections, we expand the argument that the convergence of nominal long-term interest rates in the periphery cluster countries, relative to the core cluster countries, was the trigger for the three "fundamental causes" mentioned above, showing the mechanisms for that. As such, we test the hypothesis that nominal long-term interest rates convergence after the Madrid Summit (1995) Granger-caused subsequent variations in the current account balances, of periphery Eurozone countries. This chapter uses Granger-causality tests, and the conclusions are straightforward: for Greece, Ireland, Spain, and Portugal, there is a strong and significant link between interest rate spreads vis-à-vis core countries and changes in the current account over a one to two years horizon, between 1996 and 2007. The hypothesis of no reverse Granger-causality between these two variables is not rejected.

2.2. Literature review

As we shall see, explaining the EZC requires explaining the origins of the external imbalances. The following three Subsections focus on the different (and sometimes contradictory) explanations for the occurrence of intra-Eurozone external imbalances before the crisis, following the three sectoral balances equation (Lavoie 2014):

$$CA = FA = S_P + S_G \tag{2.1}$$

The pre-crisis current account imbalances (CA) between Eurozone countries are linked in the literature as a symptom of weak external competitiveness of the periphery compared to core countries, what is usually called as "the competitiveness problem". Another fundamental cause is related to intra-euro area flows (FA) in the North-South direction. And the last explanation lies in the irresponsible behavior of both the private sector (S_P) and the public sector (S_G). The former is connected to the banking and household sectors, visible through increases in private indebtedness since the 1990s. The last, whose profligacy and large size in the Southern countries, going beyond budget stability agreements, was seen as the main cause.

2.2.1. The competitiveness problem – CA

One of the common arguments in the literature, which emerged right at the onset of the crisis, is that the external competitiveness gap between the Northern and Southern Eurozone countries was the cause of the crisis. A competitive economy provides the institutional environment necessary to foster the development of highly productive firms, to sell their goods and services abroad easily and profitably (Draghi 2012).

Conventional literature points to the lack of price competitiveness in Southern Eurozone countries, and that raising domestic prices reflects increasing unit labor costs (ULC)[2] relative to core countries. This can be explained by low productivity growth (Blanchard 2006, Allard & Everaert 2010) and/or higher nominal wage growth (Cavallo & Cottani 2010, Wyplosz 2010).

Low labor productivity growth rates in the periphery, affecting the denominator of the ULC ratio, cancels out the possibility of verification of the "Balassa Samuelson effect". This effect occurs in the integration process, when there are greater productivity gains in the tradable sector, which generates inflationary trends (there was a transmission of wage gains to the non-tradable sector), leading to the real appreciation of the economy (Samuelson 1994).

Sinn (2014) argues that the periphery countries should have reduced their domestic prices (to promote real depreciations) and the core countries should promote inflation through wage increases, to have a competitive adjustment. To Bibow (2013) and Hall (2014) the problem lies in the low level of ULC growth in core countries (following an export-led strategy), like Germany, due to wage restraint policies carried out since the euro inception. Another dimension of this restraint is the contraction of domestic demand in Germany, affecting the exports of its trading partners (Bofinger 2015).

Gabrisch & Staehr (2014) showed, using panel data econometric analysis for European Union (EU) countries, that it was not changes in ULC that led to current account deficits, and found Granger-causality for the opposite direction. Current account deficits explaining subsequent increases in ULC happened through the phenomenon of financial "Dutch disease" (Botta 2015). Following the reduction in interest rates, an exogenous capital inflow in the Eurozone periphery led domestic banks to request liquidity from abroad.

But some versions of the "competitiveness problem" take a different view. For example, it is argued that the Southern countries could increase their external competitiveness if they had their own exchange rate policy, to fight the wage moderation policy in the North (Stockhammer 2011, Flassbeck & Lapavitsas 2013, 2016). These authors also criticize German policymakers for not promoting a coordinated variation of nominal wages, in line with productivity gains plus the ECB's inflation target. Authors linked to the Varieties of Capitalism school point to the existence of two systems of wage bargaining: the

[2]Commonly defined as the ratio between the nominal wage per worker and the labor productivity or, in the same way, the ratio between nominal wages and total output (GDP).

German coordination model, and the one with less wage coordination and more external competitiveness losses in Southern Europe (Johnston et al. 2013, Hall 2014, 2018).

One of the most widely used indicators to measure external price competitiveness is the real exchange rate (RER), which can be given by the ratio of foreign to domestic prices times the nominal exchange rate. Belke & Dreger (2013), employing panel econometric analysis, point to the RER as the main determinant of external positions. This is especially visible in countries that had external deficits before the crisis. For the authors, measures should be taken in these countries that allow for internal devaluation (wage restraint), while nothing should be done in surplus countries. Inflationary measures in the latter group of countries would harm the Eurozone as a whole.

Some authors agree that ULC is not a good indicator of competitiveness (Felipe & Kumar 2014). Aggregate unit labor costs are an indicator of the distribution between labor and capital factors in the economy (which has political and distributional implications) – reducing ULC implies reducing the labor share in total distributed income. Furthermore, aggregate ULC are poorly related to GDP growth rates (the relationship is complex and not very linear). As such, there is literature proposing to focus on non-price competitiveness, something shared by Storm & Naastepad (2016): international competitiveness is about innovation and technology[3].

Simonazzi et al. (2013) complement this idea, arguing that the peripherals are stuck at mid-technology levels, requiring a coordinated industrial reform, balancing the productive structures and the degree of sophistication within the Eurozone. For the authors, Germany's export-led growth has not been at the expense of exports to the Southern countries involved in the euro crisis. Rather, these exports went to emerging markets such as India and China, or to the Southern-eastern European countries where German foreign investment has been concentrated. The cause of the "competitiveness problem" stems from "premature de-industrialization" and the solution also lies in long-term investment plans that prioritize the deprived regions or targeted public investment (Ginzburg & Simonazzi 2017). Also, a coherent plan that improves innovation, productivity, and sophistication should be implemented in Southern countries (Hall 2018).

Another explanation for the external accounts worsening in the peripherals is related to exogenous trade shocks, affecting the terms of trade. These were due to the rise in oil prices that affected Eurozone countries asymmetrically[4] or to the emergence of new low-price competitors in international trade, such as China (which joined the World Trade Organization – WTO – in 2001) or some Eastern European countries that became part of the European Union in 2004 (Chen et al. 2013).

The hypothesis that the convergence of nominal long-term interest rates in the peripherals caused external competitiveness problems (through inflation and real appreciation

[3]The same authors computed that reducing ULC in Germany, Greece, Italy, Portugal, and Spain has little effect. Input costs and the markup would be the other variables strongly affecting the final price.
[4]According to Chen et al. (2013), rapid income growth in commodity-exporting countries benefited countries like Germany, exporting commodities in high demand by oil producers.

of the economy) and subsequent negative variations in the current account balance, until 2007, will be tested later in this chapter.

2.2.2. North-South flows – FA

The Madrid Summit of December 1995 established the final stage in creating an economic and monetary area, which came into effect in 1999, with its currency and a common central bank. This allowed for price stability in the euro's early years, maintaining relatively low-interest rates, through the irrevocable fixing of conversion rates among currencies of participating countries and against the euro. Since then, the European Central Bank (ECB) has defined the monetary policy and started controlling the payment system involving euro transactions (through the TARGET2 system) and regulating banking activity – withdrawing these powers from each national central bank.

The very creation of the euro is seen as a shock, which led to massive money movements from the core of Europe – Germany, but also the Netherlands – to its periphery, leading to an economic boom and high inflation rates. The sudden stop left these economies with prices and ULC levels well out of line with those in the core (Krugman 2013, p. 444). This is contrary to the initial expectations that the Economic and Monetary Union (EMU) was itself a solution for the future balance-of-payments problems, as the equilibrium would spontaneously re-establish itself (Frankel & Rose 1997, Constâncio 2000, Decressin & Disyatat 2000).

The integration process generates consumption and financing needs, which are expected to be rewarded in the future by higher real income. Thus, in response to increased integration, borrower countries will want to borrow more and lender countries will want to lend more (Blanchard & Giavazzi 2002, Sodsriwiboon & Jaumotte 2010). According to Schmitz & von Hagen (2011), the external imbalances are a natural consequence of the financial markets integration and their "efficiency in allocating resources". Using panel data estimations, the authors find that the trade balance against the euro area is a positive function of per-capita income and that this relationship is strongly statistically significant (contradicting the hypothesis that output levels would not be affected in the convergence process). Also, Diaz-Sanchez & Varoudakis (2016) associated fluctuations in GDP growth as the main cause for current account deficits in the euro periphery, employing vector autoregressive (VAR) estimations.

However, the belief that market movements allow for an efficient allocation of resources and the benevolence of the integration process are criticized by Stockhammer (2011) and Bellofiore et al. (2016). They argue that financial imbalances result from the financialization process that began in the early 1980s. The Eurozone provided a direct mechanism of financialization, through the single currency and low-interest rates in the Southern countries, and financial integration enhanced the liberalization of capital transactions. The fragility of markets and financial forces in Europe, more than any external competitiveness shock, explains the EZC (Fuller 2017). As result, the external indebtedness, both public

and private, has reached limits that economies with their currency could never support with their reserves, leaving peripheral economies vulnerable to sudden stops (Gros 2011).

According to Sinn (2011), the TARGET2 payment system, managed by the ECB, was the main instrument that allowed Northern countries to finance the current account deficits of Southern Eurozone countries. The TARGET2 stocks reflect the accumulation of imbalances in the peripheral banking system, by facilitating that the liquidity needs in one country's agent are offset by liquidity excess in another Eurozone member. The central banks of the Northern countries, such as the Bundesbank, have accumulated net assets, becoming exposed to the external indebtedness of the peripherals.

The question raised by Sinn (2011) was further developed in Sinn & Wollmershäuser (2012). They used central bank balance sheet data to show that TARGET2 system imbalances reflect the classic balance-of-payments problems in fixed exchange rate regimes, and that the Central Banks of Portugal, Greece, Ireland, and Spain are easily creating money financed by the core countries of the Eurozone. Evidence of this is the fact that the accumulation of net liabilities of these Central Banks reflects the accumulation of current account deficits of the same countries.

According to the authors, the solution would be to limit the access of indebted countries to the TARGET2 system, having to use private financing, and limiting the access to credit. In this way, there would no longer be what the authors classify as a German public credit financing private external need. This view is criticized by De Grauwe & Ji (2012): most of the accumulation of German assets in the TARGET2 system is due to volatile and speculative financial movements driven by panic or fear. Also, the authors do not find a significant relationship between current account balances and movements in TARGET2 positions, before the crisis. The latter are correlated with the increase in sovereign debt interest rates, which confirms the thesis that these are speculative and "self-fulfilling" movements (De Grauwe & Ji 2013).

North-South flows have been noted under other mechanisms. International tourism exports from Southern Europeans to the North, are counterparts in the current account of net assets recorded in the financial account[5]. There is an increasing weight of these services in the external accounts and GDP, since the euro creation, at least. Storm & Naastepad (2016) explained that the credit offered by the Northern countries to develop the tourism sector in the South amounted to nothing regarding setting up production capacity and technological capabilities, reinforcing existing structural differences between the core and periphery.

Although tourism-led growth was noticeable after the EZC, this seems to be a result of the comparative advantages of these countries in terms of geography, climate, and natural resources. On the other hand, it is a result of these countries' inability to compete on price

[5]Usually, the financial counterpart is recorded both in the "Currency and Deposits" instrument and "Currency in circulation" (Central Bank's balance sheet), as an increase in net acquisition of financial assets.

with Eastern industries, or with the high-skilled markets and high-value-added systems of Northern countries (Burgisser & Di Carlo 2023).

Other authors pointed to the huge levels of inflows of structural funds in Southern European countries between 1992 and 1998 which, after the integration of Eastern countries into the EU, were reduced, and jeopardized the external accounts of the former group of countries (Holinski et al. 2012, Mamede et al. 2016).

The hypothesis that the nominal long-term interest rate convergence helped to open the door to a surge in capital flows and consecutive external deficits in the periphery, until 2007, will be tested later in this chapter.

2.2.3. Excess of public and/or private spending – S_G, S_P

During the first years of the crisis, the most widespread cause in the conventional literature was related to excessive spending by Southern European Governments. This behavior led to an escalation of public debts, and the term "Sovereign debt crisis" was coined (Lane 2012). Several authors have shared the thesis (Issing 2009, Trichet 2010, Schäuble 2011, 2013), mainly associating the Greece and Portugal cases. According to these analysis, sovereign debt spreads have widened in countries with high budget deficits and public debt levels. The commonly applied prescription (later proven wrong – Blyth (2013)) was austerity measures that would force Governments to comply with fiscal stability agreements. Structural reforms such as labor market deregulation, wage cuts, or fiscal devaluation would accelerate growth (through "expansionary fiscal austerity" – see Alesina & Ardagna (2010)), which seemed to be limited by the debt burden (Reinhart & Rogoff 2010).

The IMF (2011) concluded that past and present fiscal policies directly and indirectly affect current account balances. However, in an attempt to find causality between public deficits and subsequent external deficits, Nikiforos et al. (2015) found no such link for Greece. Also, there seems to be evidence that the causality mechanism is the other way around: fiscal deficits occur to compensate for external deficits, through public policies that increase productivity and automatic stabilizers that act in a crisis. For a recent period and for OECD countries, there is no universal pattern associating changes in fiscal policies with subsequent impacts on the level of external accounts (Bird et al. 2019).

Other authors saw the crisis as a problem of the private sector. Banks allocated easy credit guided by low-interest rates, generating a credit boom. It caused a tremendous deterioration of private net savings after introducing the euro (Holinski et al. 2012).

The lack of regulation of the banking sector – based on the belief that this sector was self-regulated –, the creation of complex securitization products, and the exposure to the US subprime crisis are explored by Constâncio (2014) and pointed out as causes of the crisis, among others. Obstfeld (2013) referred to too optimistic expectations from the banking sector regarding growth in the Southern Eurozone economies, appealing to consumption and spending by the Government sector. This aggregate demand shock explains the current account deficits. Previously, Lane & Pels (2011) explained the role of growth

expectations from a neoclassical perspective: *"(...) lower-income capital-scarce countries will borrow from abroad to finance domestic fixed investment. In the meantime, higher growth prospects for these countries will lead to increased consumption, as households want to smooth consumption over time*" (Lane & Pels 2011, p.3). These two mechanisms explain current account deficits. The authors studied thirty European countries and, using panel estimates for the period 1997-2005, found increased elasticity of net capital flows to growth forecasts, especially in low-income countries, with stronger effects in euro area countries.

To Storm & Naastepad (2016) is also not about competitiveness or fiscal profligacy. The real problem is the private indebtedness (especially in the financial sector), having been jeopardized by a "global banking glut". However, Gaulier & Vicard (2012) presented an alternative explanation: capital inflows went directly to the non-tradable sector of the periphery (less exposed to the foreign competition where more developed industries proliferate) and have promoted, since the financial integration, both a positive shock in the demand for imports and an increase in the prices of goods and services, mainly non-tradables (not in the tradables, whose prices are defined in the global markets). Banks also had a greater incentive to lend to the housing sector, as they reduced risk through collateral security, compared to other types of lending.

In this way, the bad credit allocation has caused inflation, leading to a real appreciation of the domestic currency. This is closely linked with the "competitiveness problem" and, in this situation, the increase in the relative weight of the non-tradable sector contributes to the delay of the convergence process towards the technological frontier and the occurrence of external deficits (Alberola & Benigno 2017). Reis (2015) found evidence for this phenomenon before the crisis, in Portugal.

Following the conclusions of Wyplosz (2013*b*) and Reis et al. (2013), Governments were forced to bail out banks after the banking crisis, in most of the peripheries, which explains the escalating public debt. According to Shambaugh (2012) both banking and sovereign crises are connected: banks needed the liquidity that the Governments offered, so the latter went into debt; indebted Governments negatively affected the bank's balance sheet, composed of sovereign debt securities on the assets side.

Differently, Sinn (2014) mentioned that in Greece and Portugal, the Government sectors used the credit to increase wages and hire civil servants, while in Spain and Ireland investors borrowed to buy real estate and build houses. This standpoint, again, is not consensual: De Grauwe (2011) claims that the ratio between public debt and GDP, in Spain and the UK, was not very different before the crisis, and the same for the situation of private banks in the two countries. But then, what made the crisis perceived in Spain and not so much in the UK? According to the author, the possibility of the UK central bank to act as a lender of last resort.

The interest rate convergence created incentives and made it easier to obtain credit in the periphery, until 2007, both for private and public sectors, generating external deficits. This hypothesis will be tested later in this chapter.

2.3. Data Overview: Separating the core cluster from the peripheral cluster

In this Section we studied the founder countries of the EMU (Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Portugal, Spain, and the Netherlands) plus Greece. First, we analyze the variation of some relevant indicators pointed out by the literature, in Section 2.2, to explain the crisis. Then, we compute a cluster analysis to separate core countries and the periphery. These two exercises will be fundamental to test the hypothesis at stake: has the convergence of interest rates in peripheral countries caused variations in the external balances? The period of analysis is between 1999 and 2007. The year 1999 marks the formal adhesion to the euro of the eleven founder countries, and it is from then on that data is more consistently available.

2.3.1. Variables identified in the literature that are statistically significant in explaining the cumulative external deficits

First, we started by testing the correlation between changes in the cumulative current account balance (cab) before the crisis, and changes in the long-term interest rate ($ltir$) after the crisis. For this equation, and using a simple ordinary least squares regression, we found a negative slope, significantly different from zero at a 5% significance level[6]. This validates the hypothesis that countries that experienced a deterioration in cumulative current account balance between 1999 and 2007 were the ones that saw nominal long-term interest rates rise between 2007 and 2012. Is important to note that this is a simple correlation test, using only one explanatory variable and omitting other relevant variables. Some empirical works inspire these univariate linear (OLS) regressions (see Shambaugh (2012), Kohler & Stockhammer (2020)).

Next, taking the variables that the literature review Section suggests as explanatory of the euro crisis, we analyzed their statistical relationship with the variation of the accumulated current account balance. The independent variables for which we found statistical significance were: changes in real effective exchange rate based on unit labor costs ($reerulc$)[7], changes in manufacturing sector weight in total employment ($manu$)[8], changes

[6]Regression line: $cab = 0.055 - 0.049 * ltir$. The slope coefficient is statistically significant (p-value: 0.001). Data retrieved from the European Commission (Ameco) and ECB.

[7]According to IMF, is a measure of the value of a currency against a weighted average of several foreign currencies, divided by an index of unit labor costs. Regression line: $cab = 9.412 - 1.759 * reerulc$. The slope coefficient is statistically significant (p-value: 0.04). Data retrieved from IMF. See **Figure A.1** in the appendix Section.

[8]According to the KLEIM database and looking only at the countries at the tail end of the chart, these are the sectors with the largest positive variations, in terms of share in employment: construction and finance, insurance, real state, and business services (Ireland); real state, renting and business services, hotels and restaurants, community social and personal services (Portugal and Greece). Regression line: $cab = 58.52 + 19.23 * manu$. The slope coefficient is statistically significant (p-value: 0.028). See Figure **Figure A.2** in the appendix Section.

in cumulative exports of goods to China as a percentage of GDP (*china*)[9], changes in cumulative travel net exports (*travel*)[10], average annual changes in Government spending (less interests payable) as a percentage of GDP (*gov*)[11], changes in credit provided by domestic banks to non-financial domestic private sectors as a percentage of GDP (*credit*)[12].

2.3.2. Defining core and periphery: clustering the EMU countries

In this Subsection is shown the results of a cluster analysis, to identify the periphery and core EMU countries. This exercise is based on the relevant variables for explaining the accumulated external imbalances determined in the previous Subsection. Again, it will be determinant for the Granger causality exercise in the next Section.

Cluster analysis is a technique used for combining observations (countries) into groups or clusters such that: each group or cluster is homogeneous or compact with respect to certain characteristics; each group should be different from other groups with respect to the same characteristics (Hennig & Liao 2013).

For this purpose, we used the significant variables in explaining the changes in the cumulative current account balance when subjected to a univariate OLS regression for the 1999-2007 period. Firstly, we performed a hierarchical cluster analysis dendrogram (see Figure 2.1). Different agglomerative algorithms were used to determine the number of clusters yielding the best results for the dataset. Comparing all agglomerative hierarchical methods, Ward's minimum variance method (Ward 1963) is the only one that does not suffer from the chain effect, a typical problem of hierarchical methods. Given the results, we decided to use five clusters to ensure more equity and homogeneity inside each cluster (measured by the distances between each observation).

Hierarchical and non-hierarchical methods should be complementary (Hennig & Liao 2013, Gülagiz & Sahin 2017). Non-hierarchical techniques require knowledge about the number of clusters. So, the five clusters (the initial partition) reached by the hierarchical

[9]Regression line: $cab = -25.931 + 8.874 * china$. The slope coefficient is statistically significant (p-value: 0.028). Data retrieved from UN Comtrade Database. See **Figure A.3** in the appendix Section. We also tested other explanatory variables related to external competitiveness, with no statistical significance: "Changes in Real Effective Exchange Rate based on CPI" (data from IMF); "Changes in real labor productivity per person / per hour worked" (data from IMF); "Changes in unit labor costs based on hours worked / on persons" (data from IMF); "Changes in the Economic Complexity levels" (data from The Observatory of Economic Complexity).

[10]Regression line: $cab = 13.203 - 2.416 * travel$. The slope coefficient is statistically significant (p-value: 0.005). Data retrieved from Eurostat database. See **Figure A.4** in the appendix Section. We also tested other explanatory variables related to the financial account, with no statistical significance: "Changes in debt securities by country of issuance, in domestic currency in international markets" (data from BIS); "Changes in stocks of debt securities issued (liabilities) cross border by all sectors" (data from BIS); "Changes in financial institutions loans (net assets), as a percentage of GDP" (data from Eurostat).

[11]Regression line: $cab = 4.303 - 26.919 * gov$. The slope coefficient is statistically significant (p-value: 0.019). Data retrieved from Eurostat. See **Figure A.5** in the appendix Section.

[12]Regression line: $cab = 22.183 - 0.695 * credit$. The slope coefficient is statistically significant (p-value: 0.038). Data retrieved from BIS website. See **Figure A.6** in the appendix Section. We also tested other explanatory variables related to excess of investment over savings by public/private sectors, with no statistical significance: "Changes in cumulative public debt, as a percentage of GDP"; "Changes in Households (S14+S15) net assets"; "Changes in non-Financial inst. (S11) net assets"; "Changes in Financial inst. (S12) net assets"; "Changes in Government (S13) net assets" (all data from Eurostat).

method are now submitted to a non-hierarchical method, the "k-means" procedure, to evaluate and improve the previous solutions (see Figure 2.2). Using a statistical software, the method assigns each observation to its closest centroid based on the Euclidean distance between the object and the centroid (cluster means). So, each time an item is reassigned it will recalculate the cluster mean or centroid for the cluster receiving that item and the cluster losing that item. This process is repeated until no more reassignments are made.

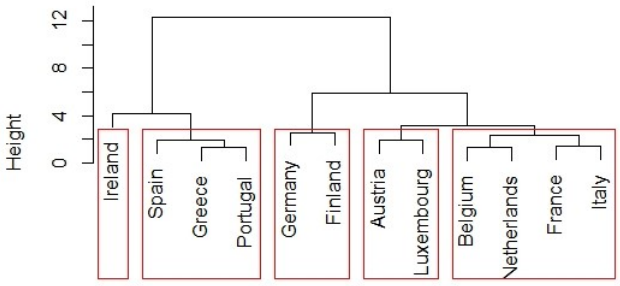


FIGURE 2.1. Hierarchical cluster analysis dendrogram (Ward's method). Source: author's calculations.

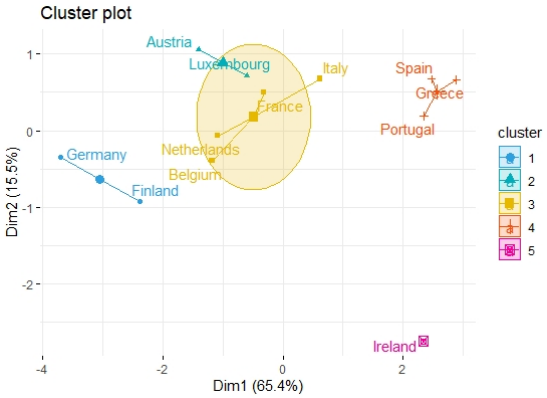


FIGURE 2.2. Factor plot for non-hierarchical cluster analysis (k-means procedure). Source: author's calculations.

2.3.3. Results

Regarding the exercise of correlation between variables identified in the literature review Section and variations in the current account, the signs of the estimated coefficients are as expected. An interesting result stands out: the countries in which international tourism contributed most positively to the current account balance are precisely those with the lowest performance in terms of external accounts.

Using the variables with statistical significance we proceeded to a cluster analysis. The five clusters are composed as follows: Germany and Finland (cluster 1); Austria and Luxembourg (cluster 2); Belgium, the Netherlands, France, and Italy (cluster 3); Spain, Portugal, and Greece (cluster 4); Ireland (cluster 5). Figure 2.1 shows that the partition between two clusters would also be possible, with the disadvantage of aggregating in the same (core) cluster countries with different characteristics in terms of their foreign openness model (for example, Italy and Luxembourg).

The characteristics of cluster 1 (Figure 2.2) allow us to define it as the core cluster: countries that accumulated external surpluses between 1999 and 2007, net travel importers, where the share of manufacturing in total employment fell the least, where the average annual change in Government expenditure was negative and where there was a depreciation of the real effective exchange rate (based on ULC). Germany and Finland are the two countries whose cumulative exports of goods to China increased the most, in the period under analysis.

Clusters 4 and 5 are defined as the periphery clusters. Looking again at the data, is possible to observe that it makes sense to split Ireland from the countries in cluster 4. This was a country with cumulative negative travel net exports, which does not exhibit such high levels of real appreciation based on ULC, and which stands out for the high volume of loans provided by resident banks to the non-financial private sector, as a percentage of GDP.

Austria and Luxembourg (cluster 2) show similar characteristics to the core countries but with more modest values for each variable. The remaining countries (cluster 3), stay at average levels in the selected variables. According to Figure 2.2, Italy comes close to the peripheral clusters. The fact that it has not accumulated as many current account deficits nor has there been a significant increase in banking loans provided to domestic non-financial private agents, distinguish Italy from the peripheral countries.

Gräbner et al. (2020) used the same methods but for a larger sample of European countries and a set of variables that according to the authors reflected the macroeconomic effects of increasing trade and financial openness. Finland and Germany also appear in the core, but together with the Netherlands, Austria, Denmark, and Sweden (not considered in this analysis).

2.4. Testing the hypothesis of periphery interest rates convergence causing subsequent changes in current account balance

In this Section, we concentrated mainly on the peripheral cluster countries (Greece, Ireland, Portugal, and Spain). Using panel data econometric techniques, we tested the hypothesis that the convergence of the nominal long-term interest rates after the Madrid Summit (1995) caused subsequent variations in the countries' current account balances in the peripheral countries. The period of the analysis will be between 1996 (after the Summit) and 2007 (just before a new period of interest rate divergence). To test the hypothesis, we relied on quarterly data from OECD and ECB, having a large set of observations for a panel data exercise. The difference between each country's interest rate and the average interest rate of Germany and Finland (core cluster) is the measure of interest rate convergence ("ltir_c"). The annual change in quarterly current account balance (hereafter "dca") is the other variable in the analysis.

2.4.1. The argument

Figure 2.3 shows the annual data for the current account, divided between a control group (all countries except those in the two peripheral clusters) and a treatment group (peripheral countries, cluster 4 and 5). Starting in 1996 a clear increase in the differences between the control and treatment group is noticeable, and the estimator of this simple difference-in-difference is statistically significant at 1% significance[13].

[13]Regression line: $cab = 1.94 \cdot [time] - 2.53 \cdot [treated] - 5.97 \cdot [did]$, $R^2 = 52.7\%$. *time* is a dummy variable that takes the value equal to one if it is greater than 1996; *treated* is a dummy variable that takes the value equal to one if the country belongs to the periphery cluster; *did* is a dummy that takes the value 1 if it is after 1996 and the country is peripheral, resulting from the product of the last two variables.

Returning to the three "fundamental causes" for the occurrence of these external deficits, according to the literature showed previously, there seems to be a common factor behind them that acted as a trigger: the decline in nominal long-term interest rates (hereafter interest rates) in peripheral countries and their convergence towards core countries. This can be seen in Figure 2.4, which compares the quarterly average interest rate values in the peripheral cluster countries (Greece, Ireland, Portugal, and Spain – orange) with the core cluster countries (Finland and Germany – blue).

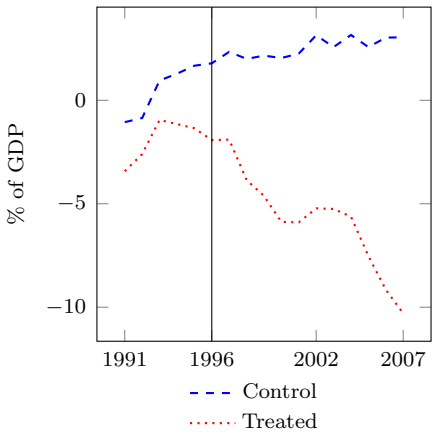


FIGURE 2.3. Annual balance of current transactions with the rest-of-the-world, as a percentage of GDP, in Eurozone periphery countries (Ireland, Portugal, Spain, and Greece – treated) and in other seven countries (control). Source: author's calculations on AMECO database

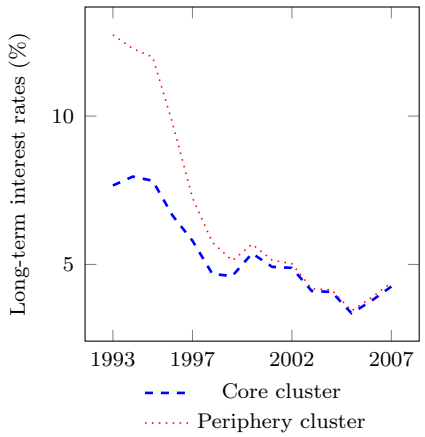


FIGURE 2.4. Quarterly average long-term interest rates (in percentage) in the peripheral cluster countries (Ireland, Portugal, Spain, and Greece) and in the core cluster countries (Germany and Finland). Source: author's calculations on ECB database.

The hypothesis to be tested in this Section is that the convergence of the interest rates after the Madrid Summit (1995) caused subsequent variations in the countries' current account balances in the peripheral clusters (clusters 4 and 5). This exercise is inspired, among other works, by Gabrisch & Staehr (2014) who tested causality between changes in unit labor costs and changes in current account balances. Briefly, interest rate convergence after 1995 is present in all three "fundamental causes" through different mechanisms that inter-relate with each other:

(1) the consecutive interest rates lowering path creates incentives and facilitates credit access, which, when granted, increases the money supply in the economy, generating inflation (augmented by possible Balassa-Samuelson effects) and real appreciation vis-à-vis other countries. This is an effect that causes disruptions in the market for goods and services, negatively affecting external competitiveness and leading to the worsening of the current account balance.

All slope coefficients are statistically significant at 1% level. Luxembourg was excluded from this first exercise due to lack of data for this time series.

(2) the interest rate convergence helped to open the door to a surge in capital flows from Northern to Southern where investment needs were larger due to their lower initial income per capita. These capital inflows enable domestic agents' consumption and investment (and the reduction of private savings), contributing to GDP growth, and reinforcing expectations of convergence with partner countries and the revaluation of local assets. The empirical literature associates these two convergence phenomena with the subsequent accumulation of external deficits (Sodsriwiboon & Jaumotte 2010). Obtaining funds from abroad, either by issuing debt or equity, also generates future net income payments abroad (in the form of interest, reinvested earnings or dividends), contributing to the deterioration of the external balance (Holinski et al. 2012).

(3) The consecutive low-interest rates created incentives and make it easier to obtain credit, leading the banking sector to lend to sectors less exposed to international competition risk and higher collateral guarantees (non-tradable sectors, such as construction or tourism). At the same time, the low financing costs environment creates incentives for Government indebtedness, typically prioritizing investment in non-tradable sectors (Froot & Rogoff 1991). These mechanisms generate dependence on tradable goods from abroad, contributing to the deterioration of the current account.

2.4.2. Granger-causality tests for long-term interest rate convergence and changes in current account balance

We wanted to analyze the causal relationship in the four peripheral countries (Greece, Ireland, Portugal, and Spain) between annual change in the quarterly current account balance, as a percentage of GDP – the dependent variable (absolute values retrieved from OECD, based on IMF – BPM5 figures) –, and the quarterly individual nominal long-term interest rate vis-à-vis the core (cluster 1) average – as the independent variable (values retrieved from ECB website).

First, we performed a univariate OLS regression. The coefficient is positive and not statistically significant. The sign of the coefficient is as expected: the smaller the difference in interest rates compared to the average values in the core countries (convergence), the more negative the change in the current account balance (external accounts deterioration), but there seems to be no clear pattern. The possible causality effects (in Granger's terms for causality) will be evaluated using alternative econometric methods.

We also performed some panel unit-root tests to evaluate the stationarity of the series. The rejection of the null hypothesis of non-stationarity was verified, applying Im-Pesaran-Shin (IPS) and Fisher-type first-generation panel unit-root tests, for the two variables of interest. It is important to note that no quarterly data for the variable "dca" was found for Portugal, for 1996. For this reason, the panel analysis is not fully balanced. The Granger-causality test is performed in a model in which the dependent variable is explained both by one or more lags of itself and one or more lags of an independent explanatory variable

(Granger 1969). The test is a standard Wald test (following an F-distribution) with the null hypothesis that the coefficient or coefficients of the lagged explanatory variable are zero. If the null hypothesis is rejected, the lagged variable is said to Granger-cause the other variable.

TABLE 2.1. Granger-causality tests for different lag lengths and group countries. Source: author's calculations.

Null hypothesis	**Estimation**	**Countries**	**Obs.**	**F-stat./Chi2**	**Prob.**
4 lags=1 year					
dca does not cause *ltir_c*	FE	Cluster 4+5	172	0.52	0.6961
ltir_c does not cause *dca*	FE	Cluster 4+5	172	45.03	0.0054
dca does not cause *ltir_c*	VAR	Cluster 4+5	168	5.038	0.283
ltir_c does not cause *dca*	VAR	Cluster 4+5	168	4.828	0.305
dca does not cause *ltir_c*	FE	Cluster 2+3+4+5	392	1.63	0.2566
ltir_c does not cause *dca*	FE	Cluster 2+3+4+5	392	8.23	0.0062
5 lags					
dca does not cause *ltir_c*	FE	Cluster 4+5	168	0.30	0.8227
ltir_c does not cause *dca*	FE	Cluster 4+5	168	288.61	0.0003
dca does not cause *ltir_c*	VAR	Cluster 4+5	164	4.545	0.474
ltir_c does not cause *dca*	VAR	Cluster 4+5	164	37.811	0.0000
dca does not cause *ltir_c*	FE	Cluster 2+3+4+5	388	1.39	0.3232
ltir_c does not cause *dca*	FE	Cluster 2+3+4+5	388	22.50	0.0002
6 lags					
dca does not cause *ltir_c*	FE	Cluster 4+5	164	1.16	0.453
ltir_c does not cause *dca*	FE	Cluster 4+5	164	9.65	0.0474
dca does not cause *ltir_c*	VAR	Cluster 4+5	160	4.567	0.600
ltir_c does not cause *dca*	VAR	Cluster 4+5	160	41.477	0.000
dca does not cause *ltir_c*	FE	Cluster 2+3+4+5	384	0.86	0.5582

Continued on the next page

Table 2.1 – *Table Continued*

Null hypothesis	Estimation	Countries	Obs.	F-stat./Chi2	Prob.
ltir_c does not cause *dca*	FE	Cluster 2+3+4+5	384	25.86	0.0001
7 lags					
dca does not cause *ltir_c*	FE	Cluster 4+5	160	1.69	0.338
ltir_c does not cause *dca*	FE	Cluster 4+5	160	28.51	0.0105
dca does not cause *ltir_c*	VAR	Cluster 4+5	156	4.597	0.709
ltir_c does not cause *dca*	VAR	Cluster 4+5	156	48.967	0.000
dca does not cause *ltir_c*	FE	Cluster 2+3+4+5	380	0.57	0.7612
ltir_c does not cause *dca*	FE	Cluster 2+3+4+5	380	35.25	0.0000
8 lags=2 years					
dca does not cause *ltir_c*	FE	Cluster 4+5	156	1.07	0.477
ltir_c does not cause *dca*	FE	Cluster 4+5	156	3.24	0.1803
dca does not cause *ltir_c*	VAR	Cluster 4+5	152	3.175	0.923
ltir_c does not cause *dca*	VAR	Cluster 4+5	152	39.491	0.000
dca does not cause *ltir_c*	FE	Cluster 2+3+4+5	376	1.26	0.3741
ltir_c does not cause *dca*	FE	Cluster 2+3+4+5	376	2314.75	0.0000

End of table

Recurring to country fixed effects, and adding time dummies, since the time dimension is not too short (Canova & Ciccarelli 2013), the results show that, for the four countries in the analysis, there is Granger-causality between nominal long-term interest rate convergence and annual changes in the current account, after one year (four lags). The value of the F-distributed test statistic is 45.03 (p-value equal to 0.0054). The results are shown in Table 2.1[14]. For a larger number of lags, there is Granger-causality until the eighth lag (two years). Reverse causality was also tested ("dca" causing "ltir_c") using again fixed

[14]The null hypothesis of the Granger-causality test, in this case, is that the lagged value(s) of the independent variable do(es) not Granger cause the dependent variable. The test statistic is F-distributed for fixed effects. For simple VAR estimation, the test statistic is χ-distributed. Standard errors are clustered along the cross-section for fixed effects estimations, and a constant term and time dummies were included.

effects. The null hypothesis of no explanatory power of "dca" is non rejected (p-value equal to 0.6961). This result suggests unidirectional Granger-causality, between one- and two-year lags, from "ltir_c" to "dca".

2.4.3. Robustness tests

We operated new panel estimations via individual fixed effects but including cluster 2 and 3 countries (a total of ten countries in which Germany and Finland, the core cluster, are excluded), keeping temporal dummies. Granger-causality is again found and for a larger number of lags. Analyzing Granger-causality in the opposite direction, the hypothesis that the coefficients of the explanatory variable "dca" are equal to zero is not rejected, which means that reverse causality is also not found, for a larger group of countries.

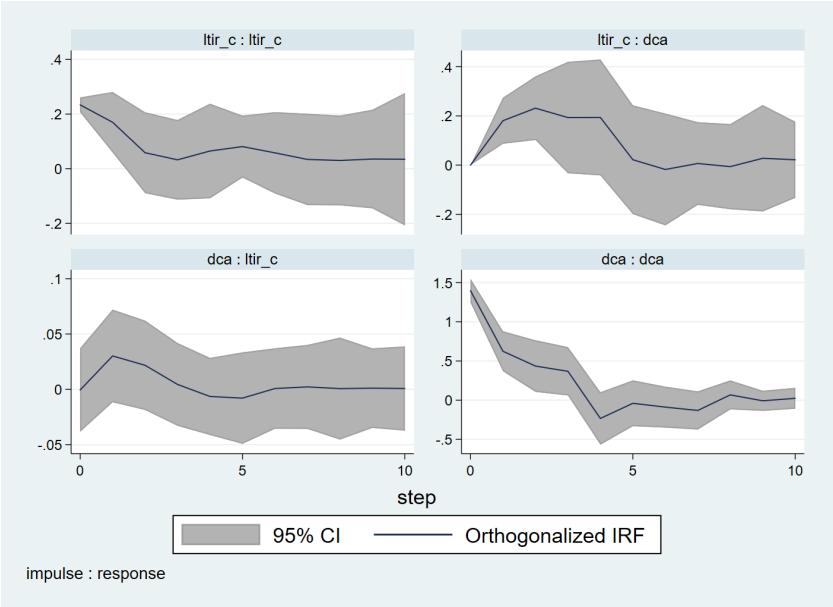


FIGURE 2.5. Response of "dca" and "ltir_c" to innovations in "ltir_c" and "dca", non-factorised innovations, cluster 4 and 5 countries. Source: author's calculations.

Another robustness test using vector autoregression (VAR) models was applied, also shown in Table 2.1, for the group of peripheral countries. Results are similar, although there is Granger-causality between "ltir_c" and "dca" after only five lags.

To visualize the (potentially) two-way relationships, we generated impulse-response functions (IRF). Figure 2.5 shows the impulse-responses assuming no contemporaneous effects between the two variables, only lagged effects. The upper right plot shows the effect on "dca" of a one standard deviation increase in "ltir_c". It follows that the effect is very positive in both statistical and economic terms, with the expected sign, i.e., a shock implying a higher level of difference in interest rates vis-à-vis core countries has a positive effect on the change in the current account balance (an "improvement"). This effect seems to vanish by the fifth lag. The lower left plot shows the impulse-response of "ltir_c" to a shock in "dca" amounting to one standard deviation. Although positive, the effect is smaller in size and dilutes quickly over time (after three lags).

To reinforce the consistency of the results, we analyzed time-series regressions on a country-by-country basis and applying an OLS regression for each country. Then, we tested the same database using a VAR model (see Table 2.2). Generally, the VAR model finds Granger-causality between "dca" and "ltir_c" more often than simple OLS regression for time series. The results of the Wald tests are identical with and without demeaning data. But the temporal moment of causality varies from country to country: for Greece, we found causality after twelve lags (after three years), for Portugal, there is causality at lag twelve (after three years), and for Spain at lag eight (after four years), and for Ireland, we found Granger-causality for all lags.

TABLE 2.2. VAR-Granger-causality tests for different lag lengths and groups of countries. Source: author's calculations.

Country	**Equation**	**Excluded**	χ^2	**df**	**Prob.**	χ^2	**df**	**Prob.**	χ^2	**df**	**Prob.**
			Nr of lags=4			**Nr of lags=8**			**Nr of lags=12**		
Greece	*dca*	*ltir_c*	1.5671	4	0.815	5.453	8	0.708	44.262	12	0.000
Portugal	*dca*	*ltir_c*	1.7038	4	0.790	10.087	8	0.259	28.681	12	0.004
Spain	*dca*	*ltir_c*	8.1511	4	0.086	24.642	8	0.002	148.91	12	0.000
Ireland	*dca*	*ltir_c*	16.67	4	0.002	35.639	8	0.000	76.092	12	0.000

End of table

2.4.4. Discussion of the results

The conclusions from the Granger-causality tests in Tables 2.1 and 2.2 are clear: changes in nominal long-term interest rate differences vis-à-vis the core countries Granger cause changes in the current account, and changes in the current account do not Granger cause changes in nominal long-term interest rate differences vis-à-vis the core countries.

Diaz-Sanchez & Varoudakis (2016), resorting on annual data since 1975 and making use of impulse-response analysis, also found positive significant effects of interest rates on the fluctuation of the current account balance only for a set of peripheral Eurozone countries (which includes Italy), with this effect being significant after two years. However, they also add that other variables such as growth and relative GDP per capita have a greater effect.

Gaspar & Fagan (2006) also find significant effects on external debt, associated with the reduction of financing costs in the peripheral euro countries. For this, the authors developed a general inter-temporal equilibrium model, with the effects extending over a decade.

Although Sodsriwiboon & Jaumotte (2010) described the excess of external indebtedness in Southern countries relative to the norms as crucial, the authors find a negative impact – but statistically insignificant – associated with the decline in interest rates in Southern countries (which not includes Ireland but Italy, as well as other countries such as Malta, Slovenia, and Cyprus).

In a group of OECD countries, changes in the external position have been found to impact spreads, according to Salem & Castelletti-Font (2016). The conclusion of these authors is not confirmed by the results of this Essay (assuming that the variation in the current account reflects changes in net foreign debt accumulation). In this way, we shed fresh light on the topic of the EZC.

2.5. Conclusions

Twenty years after the euro advent and a decade after the peak of the euro crisis, it is time to organize the literature on the subject, exposing the conflicting ideas. To offer a complete explanation for the crisis in the countries that have been most penalized requires explaining the origins of the external imbalances until then. The debate is intense, and this chapter often suggests that authors' thoughts are soon challenged by others.

The results suggest that the statistical relationship between quarterly interest rate convergence and subsequent changes in quarterly external balances, between 1996 and 2007, is clear in peripherical countries, after one-year lag. This is demonstrated using Granger-causality analysis and a set of robustness tests using panel data and time series.

A cluster analysis determined that the core cluster countries would comprise Germany and Finland, and the peripheral clusters would be Greece, Portugal, Spain, and Ireland with the latter being in a separate cluster (which makes sense as Ireland has distinctive macroeconomic indicators compared with other peripherals).

However, it is difficult to conclude whether changes in interest-rate spread cause all the mischief or if we need to roll back and ask what caused the change in the interest rate spread – what is the role of monetary policy, macroeconomic fundamentals, investors' (wrong?) perceptions or monetary endogeneity? These will be issues that can be developed in future works.

All in all, the findings of this chapter also show us the importance of analyzing and following with close attention the balance-of-payments figures, regardless of whether the country is in a currency union or not. The same conclusion was pointed out by Catte (1998), Sodsriwiboon & Jaumotte (2010), and Holinski et al. (2012). Another policy implication is that the euro area should prioritize its internal market for goods and services, think strategically about the definition of industrial policies, and reinforce transfer mechanisms between countries. This avoids successive accumulation of external imbalances, liquidity crisis and asymmetrical shocks. Several authors have suggested this type of measures (see Simonazzi et al. (2013) or Storm & Naastepad (2016)).

Also, differences between peripheral and core countries are evident in this work. Five different groups of countries were found, which is useful in thinking about how a future European disintegration should be avoided and calls into question the policy measures that are taken as if "one size fits all".

CHAPTER 3

The political economy of the balance-of-payments and capital flows in a context of a monetary union: the Portuguese case

3.1. Introduction

The balance-of-payments is a macroeconomic statement that summarizes economic transactions between residents and non-residents during a specific time. It comprises a set of accounts that describe different economic phenomena: the goods and services account, the primary income account, the secondary income account (current account items), the capital account (for instance, credit and debit entries for non-produced non-financial assets and capital transfers between residents and nonresidents), and the financial account (IMF 2009).

The current account balance shows the difference between the sum of exports and income receivable and the sum of imports and income payable (exports and imports refer to goods and services, while income refers to primary and secondary income). The main macroeconomic indicator extracted from the balance-of-payments is the *current and capital account balance*, which is equal to the financial account balance (excluding the net errors and omissions). Also, the net external balance is equal to the saving-investment gap for the total economy, in the private $(S - I)$ and in the public sector $(T - G)$. So, the current account balance[1] is a mirror of domestic imbalances.

What is the role of the balance-of-payments, especially for a country/region in a monetary area like the Eurozone? On the one hand, for some observers, external account imbalances are a result of inter-temporal consumption optimization decisions in a monetary union context. Accordingly, balances would re-establish themselves spontaneously (Ingram 1973, Frankel & Rose 1997, Catte 1998). Other authors argue that the balance-of-payments is relevant in explaining the EZC, pointing to it as an event similar to classic balance-of-payments crises, in which there is a sudden-stop (Merler & Pisani-Ferry 2012, Cesaratto 2013, Gros 2015*a*); other literature also points that the TARGET2 system prevents a liquidity crisis and the EZC was generated by financial instability in the balance sheet of the banking sector (Lavoie 2015, Febrero et al. 2018, Mazzocchi & Tamborini 2021).

[0]This chapter and its earlier versions were presented at the following conferences and workshops: "International Political Economy Working Group (IPEG) annual workshop" (11th May 2023, King's College London); "Workshop on Value and Valuation" (22-23rd June 2023, ISCTE-IUL).

[1]The term "current account balance" is associated in the literature with the current and capital balance, a change made in the sixth edition of the balance-of-payments manual (IMF, 2009).

The chapter focuses on the case of Portugal, a peripheral economy that joined the Eurozone in 1999 and which, like other economies, has attracted attention for having accumulated successive external deficits until the Global Financial Crisis (GFC), without an obvious explanation for this.

The first goal of this Chapter is to explore the different theoretical approaches in the literature to the relevance of the balance-of-payments, especially in the context of a monetary union. Secondly, to evaluate the approach and economic policy recommendations of the international institutions that monitored the macroeconomic situation of one of the member countries, Portugal, from the time it joined the single currency. Here, the IMF reports are mostly a good representation of the mainstream narrative. Moreover, finally, the third goal is to offer an analysis focused on the evolution of gross capital flows rather than a limited approach based on the evolution of the current account balance. For this purpose, balance-of-payments statistics are combined with data from national financial accounts and monetary and financial statistics, taken from Banco de Portugal's website (BPstat).

The analysis of gross capital flows by instrument, functional category, or sector is often left behind, something that this work applies to Portugal. In terms of results, we identified for the Portuguese economy the mechanisms listed in Kohler (2023), through which gross capital inflows affect the real economy. As a result of an analysis of correlations between gross capital inflows by sector and functional category, the author sets four stylized facts that allow to understand the role of each agent in the international financial activity.

The remainder of this chapter is as follows: Section 3.2 finds space in the literature for the role of the balance-of-payments and the constraints it creates for economic growth. Section 3.3 looks at the mainstream institutions and observers' balance-of-payments analysis to show that economic policies in the early years of EMU somewhat neglected external accounts, and explores the reasons for this and its consequences. Section 3.4 presents an alternative PK-inspired empirical analysis, focusing on the evolution of gross capital flows to Portugal. Section 3.5 concludes with some final remarks.

3.2. Literature review: finding room for the balance-of-payments in macroeconomic schools of thought

3.2.1. Heterodox approaches

According to the mercantilist doctrine, dominant from the XV century on, prosperity would be obtained by the accumulation of foreign reserves or precious metals, which implies a positive trade balance. Keynes, later, recognized the value of this thought since a positive trade balance would allow for domestic and foreign investment (Keynes 1937, McCombie & Thirlwall 1999).

In the context of WW II, the concern with external imbalances was also evident in Keynes' proposals at Bretton Woods. Keynes wanted to ensure a mechanism to "clear" the imbalances between creditor and debtor nations and contain the main creditor at the time, the US. To this end, he proposed the creation of a "central bank of central banks",

and the clearing mechanism of imbalances was done through the exchange of a commonly accepted currency anchored to gold, the *bancor*. Countries with permanent external deficits would have to depreciate their currency. Symmetrically, creditor countries would be forced to appreciate their currency, which reveals the essence of Keynes as a political economist, even if guided by the British interest agenda (Clarke 2022).

Keynes wanted a degree of control over the free movement of capital and a fixed but adjustable exchange rate regime. The goal would be to preserve some privilege in exchanges with the British colonies and maintain exchange rate stability. Eventually, the IMF was created, which preserved financial stability but did not have the liquidity powers and the ability to act in the balance-of-payments crises as a lender of last resort that Keynes advocated.

Keynes influenced the guidelines of the Cambridge school, of which authors such as Kaldor and Robinson were part. In the context of basic Kaldorian principles of demand-drive growth or export-led processes, the balance-of-payments constrained growth rate (BPCG) theory was developed (Thirlwall 1979, 2011). In the long-run, the current account must be balanced, and imports must, at most, be equal to exports. Countries with external deficits and high growth rates will be forced to adjust domestic expenditures that will limit the growth of output (and income) to a rate consistent with the balance-of-payments equilibrium (Thirlwall & Dixon 1979). In contrast, if a country wants to increase its growth rate, it cannot simply expand aggregate demand. It will have to increase the attractiveness of its exports or reduce the marginal propensity to import, which requires supply-side policies that upgrade its production structure.

Thirlwall's contribution arises from a growth model developed by Harrod (1933), which identifies a multiplier effect associated with foreign trade and guarantees an equilibrium on the external accounts, not assigning significance to the role of relative prices. In the empirical studies published, some PK authors find low statistical significance and a very low value associated with the relative prices coefficient (see Bairam (1988)). Other works found an offsetting effect between exchange rate variation and changes in domestic prices and wages. Also, the predominance of oligopoly markets, where firms compete for non-price measures, increases the relevance of non-price competitiveness (McCombie 1989, Alonso 1999).

For PK authors, growth is demand-driven because labor force and productivity growth respond to demand growth, both foreign and domestic. In other words, supply adjusts to changes in effective demand, and the economy is path-dependent (Thirlwall & León-Ledesma 2002)[2]. Increasing the effective demand and the wage share of national income has positive effects on output growth since workers have a higher propensity to spend. For capitalists, investment is not only dependent on savings – for PK authors, the rate of

[2]According to Lavoie (2009), other features of PK lines of thought are the negative impact of price flexibility; the monetary production may impose financial constraints (money is non-neutral); the pluralism of theories, subjects, and methodologies (the reality can take multiple forms).

capacity utilization is a key determinant of effective demand (see Lavoie (2014) and Hein (2017)).

The monetary and modern approach to PK theory calls for the focus to be shifted towards the analysis of gross capital flows through a balance sheet perspective, going beyond the current account balance (Kohler 2022, 2023)[3]. The emphasis on the current account balance (and, by analogy, net capital flows) is somehow overrated: a country may have relatively stable external balances, but it hides gross capital flows that are potentially destabilizing. Gross capital flows are, therefore, independent of the current account balance, and net capital flows are a result of consumption/investment needs, not a cause of external imbalances.

Behind this thesis is the *theory of the endogenous money supply*, which argues that the capacity of commercial banks to grant loans is endogenous to the system so this capacity does not depend on the collection of savings from depositors. This is a theory developed by Kaldor (1982) in response to Milton Friedman's quantitative theory of money. Banks grant loans to those who need financing and, in turn, replenish liquidity with the central bank (Lavoie 2014).

It is based on the sovereignty of the monetary system, controlled by the European Central Bank, that authors such as Lavoie (2015), Febrero et al. (2018) or Mazzocchi & Tamborini (2021) conclude that a balance-of-payments crisis is not possible in the EMU thanks to the TARGET2 system. A sudden stop will only occur if the markets believe the country will leave the monetary union (speculative attack), so they attribute a limited role to a country's external accounts.

In a different approach, some of the heterodox authors of Comparative Political Economy (CPE) saw the recent euro crisis as a conflict between countries with mercantilist export-led growth regimes and countries with consumption-led regimes (Baccaro & Pontusson 2016, Baccaro & Höpner 2022). This is a view that challenges the conventional version of the CPE literature, which reacted to the Keynesian turn to macroeconomics, focusing on the role of "supply-side institutions" – corporate finance systems, industrial relations regimes, and vocational training systems. It admits that the role of macroeconomics is limited, and its activism may disturb supply and growth conditions (Iversen & Soskice 2006, Hope & Soskice 2016).

3.2.2. The mainstream neoclassical approach

Classical authors attributed more emphasis to the role of prices. During the gold standard system, the price variation as a function of the amount of available gold affected external competitiveness, creating an automatic balance-of-payments adjustment mechanism. After the fall of this system, in 1931, the adopted flexible exchange rate system prevailed

[3]The balance sheet approach applied to external capital flows is also covered in detail in Al-Safar et al. (2013), Borio & Disyatat (2015), and Kohler (2020).

until Bretton Woods and, assuming the operation of the Marshall-Lerner condition[4], the balance-of-payments would adjust by currency appreciation and depreciation mechanisms.

Later on, modern neoclassical theories, with their emphasis on market and supply-side forces, have also a perspective on the roots of growth quite different from other heterodox schools. The long-run is associated with a stable and balanced steady-state reached regardless of the path taken (Blecker & Setterfield 2019). Through the critical view of Davidson (2012), it is desired to mathematize economics (the only way to do "real economics"), taking advantage of the basic models of physics, to glorify the efficiency of the markets and predetermine the future. No leading role is given to foreign trade, which is contrary to the classical Ricardian literature (albeit based on unrealistic assumptions such as the continuous balance-of-payments equilibrium and full employment), or the recommendations of international institutions on the benefits of foreign trade, in the aftermath of the WW II (McCombie & Thirlwall 1997).

Within the neoclassical school, a neoliberal current of economic and political thought emerged in the mid-1980s. Its theoretical roots lie in principles and assumptions such as individualism, instrumentalism (theories are instruments of analysis regardless of their suitability for the real economy), substantive rationality, exchange, and scarcity, or free and perfectly flexible markets. In practical terms, it is manifested in the following three forms: globalization, financialization, and the growth of inequality (Dardot & Laval 2013).

The neoclassical approach also took advantage of the public choice theory to explain the "failures of Government" and the limits of Government intervention (Trigo Pereira 1997). Governments formed by parties on a representative basis will not look to the collective interest and will spend for their own circumstance. The result is successive deficits and spending (Weingast & Shepsle, Kenneth A. Johnsen 1981, Grilli & Masciandaro, Donato Tabellini 1991, Alesina & Perotti 1994) that must be monitored. By financing some of this spending through borrowing, some of the costs will fall on future governments. Neoclassical authors do not see excessive spending affecting the output – with perfectly competitive markets and rational expectations, this will crowd out private investment and spending. But compared with the socially optimal levels, public investment, and spending will be too high (Iversen & Soskice 2006, p.434).

The mainstream literature also emphasizes the role of aggregate savings as relevant for the creation of funds, which generate financing and investment. The allocation of financing capacities to those who need to be financed is efficient through the market, and this is what lies behind the *loanable funds theory* (see Mankiw (2008) or Shin (2011)). Therefore, money is exogenous, meaning that its supply depends on market interaction and interest rate variation.

In a monetary union, the adjustment of imbalances is no longer made through movements in the currency's value but through adjustments in expenditure, wages, and automatic price formation mechanisms (European Commission 1998, Decressin & Disyatat

[4]An exchange rate depreciation positively affects the current account if the sum of the price-elasticities of demand for exports and imports is greater than one.

2000). Economic agents are rational and this is linked to the *inter-temporal approach* to external accounts: an external deficit can be justified by the optimal choice of agents to anticipate consumption today in order to avoid possible constraints on consumption in the future (crises, tax hikes on imports, etc.): *"The inter-temporal approach to the external accounts investigates the extent to which the current account balance reflects an "optimal" path of domestic savings and consumption arising from a model of optimal borrowing and lending"* (IMF 1997, p.81).

During the establishment of the single currency, the expectation was that external imbalances would be overcome by market mechanisms, as will be seen in the next Section. However, later on, the EZC was seen by mainstream literature as an event similar to a classic balance-of-payments crisis (Giavazzi & Spaventa 2010, Schmitz & von Hagen 2011, Sinn 2012, Merler & Pisani-Ferry 2012, Gros 2015*a*) in which there was a sudden stop to capital inflows into countries with external competitiveness gaps. It is on this basis that the European Commission proposed, in 2011, the Macroeconomic Imbalance Procedure (MIP). This was the first time that the external accounts of the euro countries had been monitored. Even so, by penalizing external deficits more strictly (they could not exceed 6% of GDP) and the net IIP (it could not be more negative than -35% of GDP), it imposed an export-led growth strategy for all members (Johnston & Matthijs 2022).

In contrast to the dominant approach, the Keynesian perspective states that aggregate savings are nothing more than a residual between income and consumption. Likewise, the current account balance is nothing more than the difference between exports and imports. In the PK monetary field, Lavoie (2014) argued that it is the demand for credit (or the need to import) that causes net capital flows and not the other way around, and this is particularly plausible in a monetary union, where the inter-bank lending mechanism is very effective (via the TARGET2 system). Following the same logic, it is the need for imports of goods and services in the countries of the South gives rise to net capital flows from the surplus countries in the North.

Interestingly, this view contradicts some heterodox approaches to the "recycling of surpluses" in the Eurozone (see Storm (2016*b*) or Fuller (2017), and more references in Subsection 2.2.2.), as well as the mainstream view of the loanable funds theory: *"The elimination of exchange rate movements among EMU participants is likely (...) to promote capital flows. This would enhance the possibility for countries to offset temporary drops in domestic income by availing themselves of external savings, thereby smoothing their consumptions schedule"* (IMF 1997, p.81).

3.3. The narrative followed by mainstream European institutions and observers for the balance-of-payments: did they get it right?

Since the Eurozone inception, the focus has turned to price stability and to limiting the fiscal policy, not creating any mechanism for monitoring external accounts in the euro area. The only mechanism that was created to monitor and rescue balance-of-payments

crises was confined to countries outside the euro area. The assistance scheme (Medium-Term Financial Assistance Facility – MTFA) created in 2007 was intended to address balance-of-payments problems to other countries than the Eurozone members[5], as these problems were expected to disappear as a result of forming a monetary union (Marzinotto et al. 2010). On the other hand, the mechanism that had to be complied with by the euro countries (Stability and Growth Pact – SGP), imposed limits on internal deficits and debts, focusing on a single sector of the economy (the General Government).

According to Stockhammer (2016), the strategy of somehow neglecting the external accounts and their signals was strongly guided by the ordo-neo-liberal doctrine imposed mainly by Germany. The use of rules and limits on fiscal policy, inflation levels, and no-bail-out clause are some of the features of this approach. Here are the reasons why balance-of-payments figures were somehow *left behind* by mainstream institutions and observers:

(1) *Around the meaning of the external account balance.* The economic analysis does not provide numerical benchmarks for determining what is a 'good' current-account balance (Milesi-Ferretti & Blanchard 2009). The creation of the EMU (1999) – with the introduction of a single currency, no exchange rate policy, and the free circulation of people, goods, services, and capital – created even more doubts about the meaning of a country's current account signal. But this trend was born after the Bretton Woods era, with the flexibilization of exchange rate regimes. Financial globalization allowed to meet the needs of countries with current account deficits but created another problem: the increasingly less obvious relationship between current account and annual changes in International Investment Position (IIP) as measured by correlation coefficients, especially in high-income countries, and has led to divergent interpretations on current account balances (Obstfeld 2012).

According to Borio & Disyatat (2011), the more relevant criterion to understand risks and vulnerabilities is to consolidate balance sheets across locations, and not follow the balance-of-payments principle of residency. Gourinchas & Obstfeld (2012) argued that the current account generally does not play a significant role in predicting financial crises and many of the financial crises have occurred in countries with current account surpluses. The increasing US external deficits since the last quarter of the XX century have led many economists to perceive this also as a consequence of foreign investors seeking to invest in the country. In that case, current account deficits would even be synonymous with success rather

[5]Mechanism of mutual assistance to member countries of the European Union with a derogation (not belonging to the euro area), in the event of a balance-of-payments crisis, are assured according to article 143 of the Treaty on the Functioning of the European Union. Between 2008 and 2009 this mechanism was used to bail out a balance-of-payments crisis in Latvia and Romania, and a public debt crisis in Hungary (Schelkle 2017).

than fragility. Kindleberger (1969) has also synthesized a set of equilibrium definitions for the balance-of-payments, depending on the specialization pattern of the country or sector. He concludes that given the variety of definitions associated with the concept, readers could make various judgments depending on their "temperament".

In fact, for modern orthodox theory, trade deficits are seen as a mere result of consumption decisions, not representing a problem for countries. Deficits are the outcome of rational decisions to consume now and pay later (Thirlwall 2011, p.314). It is based on this idea that the IMF sets its narrative to justify the external deficits in the years immediately preceding Portugal's entry into the single currency: *"The anticipated acceleration of growth (fueled also by factors such as the 1998 World Expo) would thus justify a temporary deterioration of the current account. If this is the case, and provided financial policies remain prudent, a narrowing current account deficit would be likely looking forward"* and *"The emergence of a deficit in the optimal current account in recent years appears to signal agent´s expectations of a further acceleration of economic activity in the period ahead"*(IMF 1997, p.89).

(2) *The priority is the stability of the public accounts and not the external accounts.* The SGP evidenced that most European leaders were more concerned with the stability of public accounts and the deviant behavior of fiscal policy than with other sources of imbalance. The danger came from the Government and the budgetary side, not from the other economic agents or demand constraints. With the end of debt risks and the possibility of borrowing in a hard currency, there could be incentives for the over-indebtedness of Governments (Schelkle 2017). Only the public budgetary deviations are of interest to monitor since the remaining domestic sectors are "forward-looking", and what they spend today is the result of an efficient allocation between investment and consumption (Blanchard & Giavazzi 2002).

Curbing spending on public administration salaries would also help to promote external competitiveness: *"Reflecting its deeper concerns about competitiveness, staff emphasized wage restraint, which would facilitate relative price adjustments and resource reallocations toward the tradable sector. In this regard, the authorities agreed that public sector wages could play an important signaling role"* (IMF 2003, p.11). Later on, external competitiveness problems were again linked to pro-cyclical government policies: *"the pro-cyclical fiscal policy of recent years and rapidly rising relative unit labor cost growth, much above the euro area average, contributed to the emergence of a competitiveness gap"* (IMF 2006, p.2).

(3) *Limiting the external accounts would be nonsense.* Some authors have proposed external stability pacts, to control imbalances exceeding 2% (Tatom 1998) or 3% (Schwarzer & Dullien 2009) of GDP. However, it would be nonsense to limit

the external accounts of each country on the assumption that one of the reasons for the creation of the euro was to foster financial flows between countries (Marzinotto et al. 2010).

Based on the cases of Portugal and Greece at the beginning of the century, Blanchard & Giavazzi (2002) argued that changing fiscal policy to contain the rise of output above its natural values, eliminating or reducing external deficits, causes one of the advantages of trade integration to be lost: the ability to more effectively allocate consumption and investment inter-temporally (in which, today's consumption would help to create external surpluses tomorrow). They, therefore, called for an approach based on a "benign neglect" of the external imbalances. In addition, for the authors, issuing and accumulating foreign debt is also not a problem compared to public debt. If the latter was seen as a burden for all future generations, the former was seen as an individual problem, which was up to each private agent to solve.

(4) *External deficits would correct themselves spontaneously.* The action of the markets and their freedom to act is an effective tool for discipline in the face of eventual external imbalances. At the same time, capital and labor markets were to become as flexible as possible, to facilitate situations in which an adjustment would be necessary. Price stability, financial markets, and the international role of the euro would in turn ensure that the exchange rate would not be an adjustment mechanism to be considered (Ingram 1973, Catte 1998). This point was stated in the European Commission's narrative in one report for the future single currency: *"A major effect of EMU is that balance-of-payments constraints will disappear in the way they are experienced in international relations. Private markets will finance all viable borrowers, and savings and investment balances will no longer be constraints at the national level"* (European Commission 1990, p.24).

If deficits were still to occur, they would merely be a result of the convergence process and the realignment of competitiveness levels (Blanchard & Giavazzi 2002, Giavazzi & Spaventa 2010). Dealing with external imbalances has become normal in an era of financial globalization, but also predictable. Blanchard & Giavazzi (2002) explained that countries that are growing faster (in a catching-up process), are likely to have a higher rate of return on capital and attract more foreign capital, contributing to current account deficits.

The integration would make trade patterns between members and the harmonization of business cycles endogenous variables, as demonstrated by Frankel & Rose (1997). The Werner report, which lays the foundation for strengthening European integration to the level of a monetary union, gives an idea of one way of ensuring balance: *"Equilibrium within the Unity will be realized [...] thanks*

to the mobility of the factors of production and financial transfers by the public and private sectors" (Werner 1970, p.10).

So, it was believed that traditional balance-of-payments crisis events, in EMU countries, would cease to exist since any country could always finance i tself in euros (eliminating the exchange rate risk) in a broad, liquid, and competitive market, benefiting from the free circulation of capital and the maintenance of the international role of the euro.[6]

(5) *In a Monetary Union it makes no sense to look at the balance-of-payments of a country, but at the balance-of-payments of the Union.* The 1970 Werner report is peremptory about the possibility of external crises: *"For such a union only the global balance-of-payments of the Community vis-à-vis the outside world is of any importance"* (Werner, 1970, pp. 10). The euro's exchange rate stability would allow access to foreign currency financing, with little risk of monetary depreciation (which would affect the country that issues foreign currency debt, something common in balance-of-payments crises), and a fixed exchange regime between members. It was now important to look at the external accounts of the Eurozone as a whole, and it would be this that would determine the euro exchange rate: it would not make sense to analyze the external accounts of each country/region, as in the U.S. (Catte 1998). Statements by a former central banker also show that the countries would now be free from the danger of a classic balance-of-payments crisis: *"Without a currency of our own, we shall never again face the same balance-of-payments problems of the past. There is no macroeconomic monetary problem and no restrictive measures need to be taken for balance-of-payments reasons. No one analyses the macro size of the external account of the Mississipi or of any other region belonging to a large monetary union"* (Constâncio 2000).

The IMF used the same narrative to justify the benevolence of Portugal's external deficits: *"Staff agreed that the current account had become a less proximate indicator of economic imbalances under monetary union, but emphasized that it seemed difficult to attribute the very sharp rise in the external deficit to factors emanating from monetary union."* (IMF 2000, p.15). In a monetary union, economic agents issue money that is used in transactions vis-à-vis the rest-of-the-world, but this does not invalidate the existence of imbalances, financial vulnerabilities, or uneven development paths.

[6]However, many studies challenged the role of prices as an instrument to (spontaneously) adjust current account imbalances. McCloskey & Zecher (1976) have shown that during the gold standard, there was a tendency for the price levels of countries to move in the same direction. It was not movements in relative prices that equilibrated the balance-of-payments, but expenditure and output changes associated with interest rate differentials. Also, price-elasticities assume a higher value only in the long-run (see Artus & Knight (1984)). Price-elasticities will be lower in the short-run due to slow dissemination of information, contractual inertia, pricing to market, or uncertainty about whether relative price changes are temporary or permanent. The productive composition of each country in terms of sectors of activity is also relevant for the computation of elasticities (Imbs & Mejean 2015).

In addition to this "benign view" of external imbalances, the outlook of the institutions that monitored the macroeconomic indicators of the euro countries was limited, focusing almost exclusively on current account balances:

"The sustained large current account deficit (and the corresponding external indebtedness) is symptomatic of the imbalances of the economy. In particular, it reflects weak competitiveness, sustained high private sector borrowing and declining household savings, and large fiscal deficit" (IMF 2007*a*, p.4).

This sentence is also in line with the mainstream narrative of loanable funds. The IMF's recommendations follow the logic that it is national savings that cause net capital flows: *"Taking a longer view, more than half of the deterioration from broad balance in the mid-1990s was due to a decline of national saving"* (IMF 2000, p.9). The suggested recommendation for solving external deficits would involve wage growth restrictions[7], which contradicts the inter-temporal approach to the current account. If agents are forward-looking, wage moderation today would not change the pattern of external consumption, since agents have prospects of future economic growth as a result of the convergence process. The IMF stresses this: *"In standard open-economy inter-temporal models, a sizeable deterioration in the current account deficit can be justified if the current output is below its permanent ones as agents optimally utilize foreign savings to smooth consumption (...)"* (IMF 2000, p.16).

It is then assumed that for the PK monetary view, which defends the endogeneity of money, restricting wage growth (keeping consumption needs constant) would even worsen the external deficit through an increase in the demand for credit to compensate for the loss of real wages.

As it turned out, the lack of external competitiveness is constantly cited by the IMF as the cause of external deficits, although until 2008 there was no year in which exports fell compared to the previous year[8]. All the focus was put on fiscal monitoring and this had consequences for the countries that started stage three of membership in the monetary union. While it is true that the current account of the Eurozone, as a percentage of GDP, was relatively stable vis-à-vis the outside countries during the time the single currency was in place, a country-by-country analysis reveals deep external imbalances.

Moreover, the next Section shows that there are vulnerabilities illustrated in the balance-of-payments that go beyond the current account balance figures.

---

[7] *"Eventually have to revise their consumption profile downwards to repay their debts, even in the context of a currency union [...] the adjustment will now have to come from domestic wages and prices"*(IMF 2000, p.16) and *"The authorities were concerned about a further erosion of competitiveness, and thus agreed with the central role of wage restraint"*(IMF 2004, p.3).

[8]This later took the authorities themselves by surprise – *"Thus it was surprising to many observers that exports registered near 9 percent growth in 2006, and such performance continued into the first few months of 2007"* (IMF 2007*b*, p.3) – assuming that this is due to non-price factors: *"Gradually, Portugal's manufacturing exports have been shifting to higher technology products, although the progress decelerated during the recent economic slowdown"*(IMF 2007*b*, p.6).

3.4. On Gross Capital Flows and Portugal's experience with the euro

Despite the "benign neglect" associated with successive current account deficits, exposed above, some empirical literature shows that this is a predictive indicator of financial crises, especially if countries accumulate liabilities denominated in debt and not in equity (Catão & Milesi-Ferretti 2014). There was already enough experience in the 1990s in developing countries to show that current account deficits matter. Many analysts linked the external account imbalances to crises in Mexico in 1994/95 and in Asia in 1997, and its importance is not confined to these countries but is global (Tatom 1998). Other authors show that reversing this situation can be pretty painful (regarding income losses and depreciations), especially in countries with deficits financing consumption or low foreign openness (Razin & Milesi-Ferretti 1998, Freund & Warnock 2007).

How the economy finances itself from abroad matters, which is not visible in the net lending/net borrowing balance. Looking at the changes in the IIP, they are likely affected by price and volume changes in financial assets that are not included in the current account balance. Moreover, those net values of the financial account, translated by its balance, hide financial phenomena that will only be perceived by separating assets and liabilities (Obstfeld 2012). The maturity of the financing received and granted from abroad is also an indicator of the economy's solvency. The global external statistics are worth even more than the current account (residual) balance.

Some authors have explored the relevance of gross capital flows, considering individually the behavior of gross outflows (net acquisition of assets) and gross inflows (net incurrence of liabilities) in the balance-of-payments (see the explanatory works by Forbes & Warnock (2012), Broner et al. (2013), or Pérez (2019)).

In Avdjiev et al. (2018), it is shown that capital inflows are pro-cyclical for a panel of 85 countries and that this behavior is driven by banks[9] in advanced countries and by sovereigns in developing countries. Borio & Disyatat (2011) points out that current account balances and net capital flows show little about financing. They hide, for example, purely financial transactions that do not involve current account items and do not allow us to capture the role that the country plays in terms of lending and financial intermediation, as well as the financial risks to which the country may potentially be exposed. That kind of narrative clearly distinguishes the notion of savings (or the net lending capacity of the economy) from financing, something that is visible in an economy's flow of funds.

3.4.1. Mechanisms through which gross capital flows can affect the real economy

Indeed, an economy with relatively stable current account balances may be involved in voluminous financial intermediation operations. This is not the case for the Portuguese economy, which has been accumulating external deficits since the second half of the 1990s.

[9]In this exercise, we call "Banks" meaning the whole financial sector except the Central Bank.

Figure 3.1 shows that the evolution of the current account balance, gross inflows, and gross outflows for the Portuguese economy still take different scales.

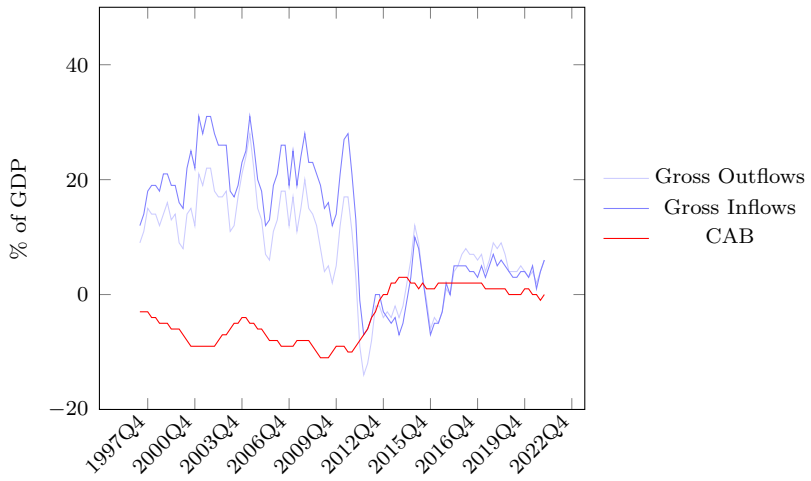


FIGURE 3.1. Total amount of gross capital inflows and outflows, and current account for Portugal (four-quarters moving sum, % GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

Kohler (2023) explains the mechanisms by which gross capital flows could cause imbalances through asymmetric booms, even if they have no impact on net capital flows. The first mechanism is inter-bank flows. Although it attracts capital flows, the author demonstrates through a balance-sheet approach that banks do not need inter-bank financing to provide loans. To do this, they can use automatic liquidity mechanisms from national central banks belonging to the Eurosystem (and this was reflected in TARGET2 imbalances). This is why granting non-profitable loans, which generates equity needs in banks, must be regulated.

Speculative foreign investments trigger the second mechanism for affecting the current account through gross capital inflows. In the case of Portugal, a peripheral EMU economy, this will also be explored below.

Inter-bank flows:

In a nutshell, the first mechanism has to do with inter-bank flows reaching peripheral banks motivated by expectations of convergence, or high returns on assets in an economy in a catching up process. In turn, peripheral banks lend money domestically, increasing aggregate demand in the economy (and inflation), and running current account deficits. Bolukoglu (2020) refers to the fact that, in financially liberalized economies, capital inflows cause real exchange rate appreciation, which lowers the cost of external financing, makes imported intermediate products cheaper, and reduces the wage share.

Relying on data from Banco de Portugal, Figure 3.2 shows the accumulation of gross capital inflows and outflows for the banking sector (financial sector except the central bank). This sector accumulated the most gross capital inflows until 2008. The financial

instrument that stood out the most was "Currency and deposits", which, according to ESA2010 (European Commission 2010, p.168), includes inter-bank lending operations between monetary financial institutions. It is interesting to note that the accumulated volume of gross outflows from the financial sector reached 100% of GDP before the GFC. This adds contradictory evidence to the hypothesis that it was the savings of the North that, flowing to the countries of the South, fueled the external deficits of the latter group.

Figure 3.3 shows the evolution of the accumulated liabilities (gross inflows) of the Portuguese financial sector in "Currency and deposits" and its breakdown by counterparty. Until 2008, around 35% of these inflows came from other banks in the euro area, with the remainder coming mainly from banks outside the euro area, and a small part from foreign sectors other than the financial sector.

To complete the mechanism, the sector to which the most loans provided by commercial banks were granted was also resident banks, followed by households (Figure 3.4). The household sector was also the counterparty whose credit increased the most, mainly for housing purposes. It is also worth highlighting the indebtedness incurred by Portuguese firms (NFC), a decisive element in making this sector vulnerable to direct investment from abroad, as we will see later, during and after the euro crisis.

Table 3.1 shows that between 1995 and 2007 (column 6), Portugal was the fourth country in the Eurozone that accumulated the most liabilities in this instrument, as percentage of GDP. It follows that it was not only deficit countries that accumulated capital inflows. Core countries such as the Netherlands or Germany had accumulated high capital inflows, which contradicts the recycling of surpluses thesis in explaining external imbalances. Again, even a country with recurrent current account deficits can finance other countries.

The introduction of the euro in Portugal triggered inter-bank financing. However, only a portion of this financing was allocated to households. Kohler (2022, 2023) recognized that more liquidity allows commercial banks to relax lending standards. However, this would only explain part of how the real economy is affected by external financing.

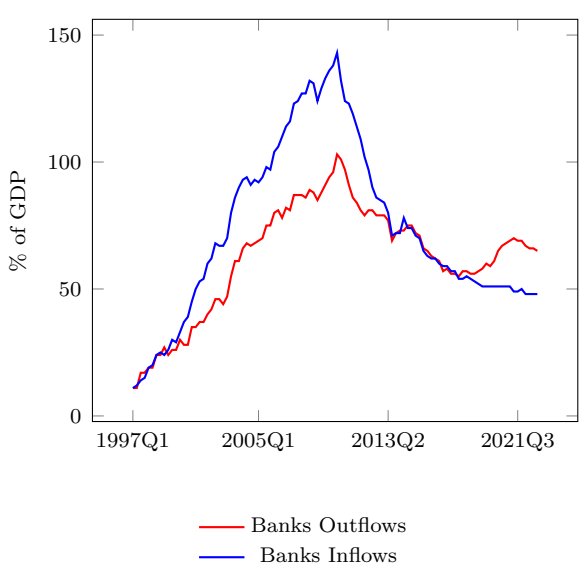


FIGURE 3.2. Financial sector excluding Central Bank – accumulated amount of gross capital inflows and outflows, 1997-2021 (% GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

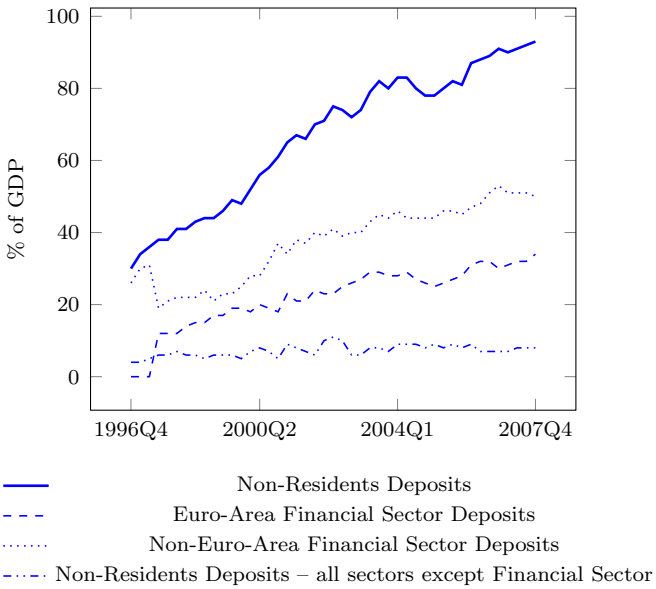


FIGURE 3.3. End-of-period Deposits (F.2) in the financial sector, by counterparty sector, 1997-2007 (% GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

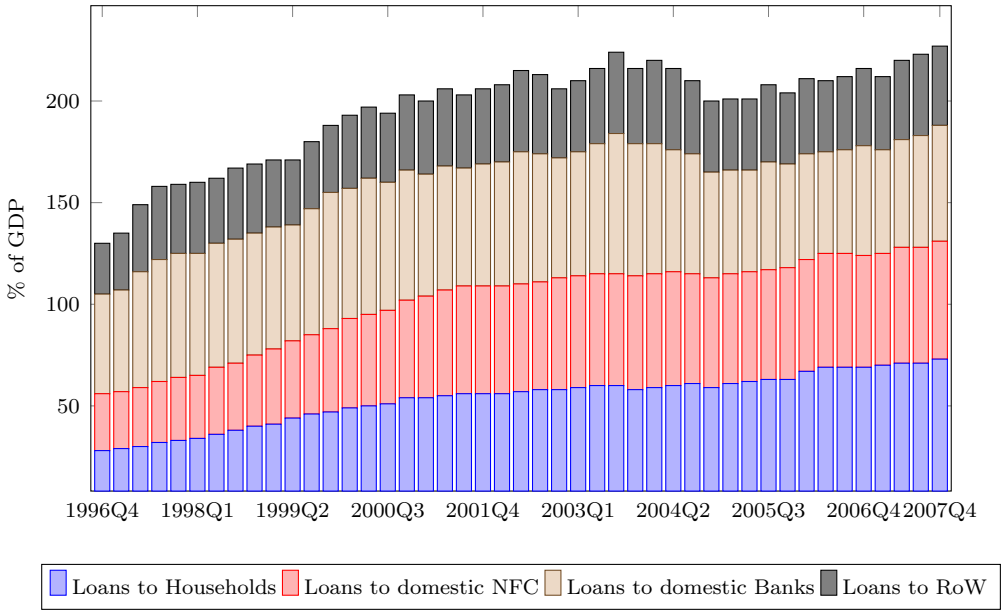


FIGURE 3.4. End-of-period Loans provided by Financial Sector, 1997-2007 (%GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

TABLE 3.1. Stock of "Currency and deposits" – liabilities, by country (% GDP). Source: Eurostat.

Country	1995	2007	2013	change 1995-2007 (p.p.)	change 2007-2013 (p.p.)
Euro area – 20 countries (from 2023)	n.a.	347	402	n.a.	55
Belgium	197	470	447	273	-22
Germany	72	250	229	178	-21
Ireland	n.a.	1291	1980	n.a.	690
Greece	52	190	253	138	63
Spain	69	218	231	149	13
France	76	268	284	192	16
Italy	56	134	153	78	19
The Netherlands	522	889	1044	367	155
Austria	84	282	264	198	-17
Portugal	84	272	300	188	27
Finland	85	248	318	164	70

End of table

Gross speculative inflows:

The second mechanism explained in Kohler (2023), through which gross capital inflows cause domestic disruptions, involves inflows (net incurrence of liabilities) of "Portfolio Investment".

In a nutshell, an increase in "Portfolio Investment" by non-residents pushes up the price and lowers the yield of the domestic bonds demanded. Lower yields stimulate demand for credit in the economy, as they are reference rates for credit contracts in general. This increase in aggregate demand pushes up the price of assets and increases the collateral of banks, which are more willing to grant new loans. The rise in economic activity leads to increased net imports and net inter-bank lending (leading back to the first mechanism).

Figure 3.5 shows the upturn in demand for "Portfolio Investment" in Portugal, in Portuguese government bonds, and the banking sector, before the GFC.

Figure 3.6 displays that during the EZC (and not precisely in 2008, at the start of the GFC), there was an abrupt reduction in total gross inflows, especially in "Portfolio Investment" (and an increase in yields – see Financial Times (2011)). This was noticed in Treasury bonds/securities and in securities issued by the banking sector, without the current account deficits being drastically reduced (or, in other words, without there being a sudden-stop in net capital flows).

Therefore, this independent action of a speculative nature generated causal mechanisms in the Portuguese economy, when the markets no longer attributed credibility to securities issued by resident economic agents. This shows the fact that Portugal suffered a speculative attack in this period due to not having a credible lender of last resort (see De Grauwe & Ji (2012), Lavoie (2015), Febrero et al. (2018)). It seems that this is a more obvious hypothesis than the one that Portugal suffered a classic balance-of-payments crisis (as argued in Cesaratto (2013) or Gros (2015*a*), for example).

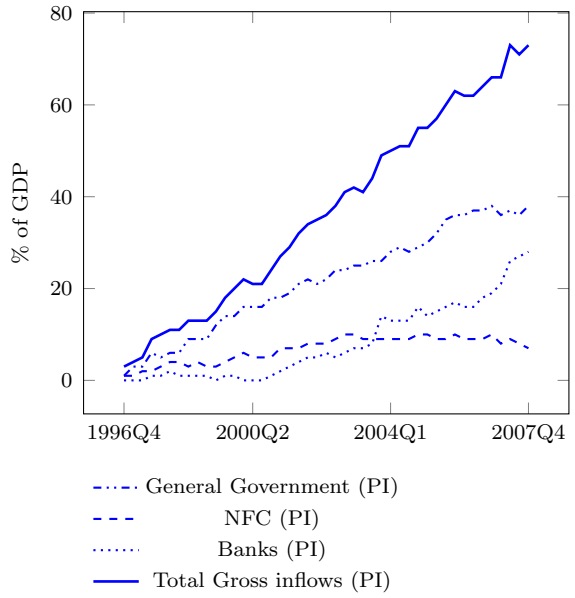


FIGURE 3.5. Accumulated amount of gross capital infows in Portfolio Investment (PI), by issuing sector, 1996-2007 (% GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

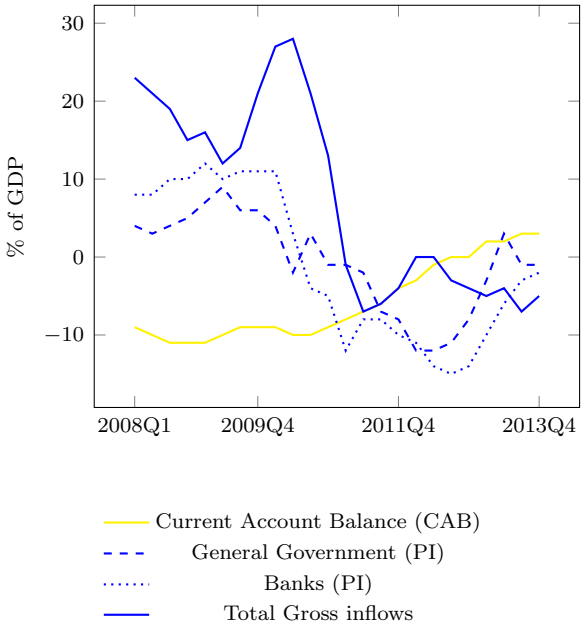


FIGURE 3.6. Total amount of gross capital inflows, in Portfolio Investment (PI) by issuing sector, and CAB, 2008-2013 (four-quarters moving sum, % GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

3.4.2. Some stylized facts based on a correlation analysis of gross external flows

The analysis of gross capital flows toward the rest of the world, using correlations between operations, as is done in the work of Avdjiev et al. (2018) for a panel of countries. Applying it to Portugal provides additional conclusions about the behavior of the drivers of capital flows, which are invisible to observers who only look at the current account balance.

Correlations were analyzed for gross inflows a nd o utflows by fu nctional category[10] and sector (public sector includes General Government and Central Bank), exports and imports of goods and services, and the current account balance as a percentage of GDP. The household sector was not analyzed in this correlation exercise, as they do not have significant foreign operations vis-à-vis non-residents.

Data was used for the year ending each quarter, separating three recent periods for the Portuguese economy: during the membership process and the first years of the single currency (1997-2007) – see correlation matrix in Figure B.1 in Appendix B; the period between the GFC and the EZC (2008-2013) – Figure B.2 in Appendix B; the recent period until the pandemic crisis (2014-2019) – Figure B.3 in Appendix B.

A series of empirical observations on economic growth proposed in Kaldor (1957) was called "stylized facts". The following are some of the stylized facts that come out of this correlation analysis.

Stylized fact 1: Gross capital foreign inflows and outflows by banks are correlated.

A large part of the accumulation of external gross inflows into the economy up until the GFC took place through the banking sector (as seen in Figure 3.2). The key to understanding the process of capital outflows and inflows involves this sector. During the three periods under analysis, there are examples of correlations between capital inflows and outflows by banks towards the rest-of-the-world.

Figure 3.7 shows the correlation between "Foreign Direct Investment" inflows and outflows, for the period 1997-2007. Figure 3.8 shows the correlation between "Portfolio Investment" inflows and outflows carried out by the financial sector, for the period 2008-2013 and Figure 3.9 shows the correlation between inflows and outflows in "Other Investment" debt, between 2014 and 2019.

The reduction in real interest rates, the liberalization and privatization of the financial sector (in Portugal, this took place in the 1990s), the free movement of capital, the end of exchange and credit risk provided by the single market, and the arrival of more competition in the sector, with new (diverse and sophisticated) financial products, explain this stylized fact. These phenomena are undoubtedly associated with the financialization process in Portugal. The emergence of new entities and products is linked to the securitization of loans and the creation of special purpose entities, which complexified operations in the early 2000s (Mamede et al. 2016, Mamede 2020).

[10]According to the sixth edition of the Balance of Payments Manual (IMF 2009, p.99), *"functional categories are the primary classification used for each of financial transactions, positions, and income in the international accounts"*. There are three functional categories analyzed here: "Foreign Direct Investment" (FDI), which implies *"control or a significant degree of influence on the management of an enterprise that is resident in another economy"*; "Portfolio Investment" (PI) defined as *"crossborder transactions and positions involving debt or equity securities, other than those included in direct investment or reserve assets"*; and "Other Investment" (OI), *"a residual category that includes positions and transactions other than those included in Direct Investment, Portfolio Investment, financial derivatives and employee stock options, and reserve assets"*.

Banks acted as intermediaries in financing the economy, raising funds from banks and the ECB, which they then grant to the private sector. It was also preferentially allocated to the non-tradable sectors of the economy, as they offered to commercial banks a higher level of collateral (especially housing loans). This meant that inputs were allocated to un-productive non-tradables, creating dependence on tradable goods from abroad, worsening the external accounts (Reis 2013).

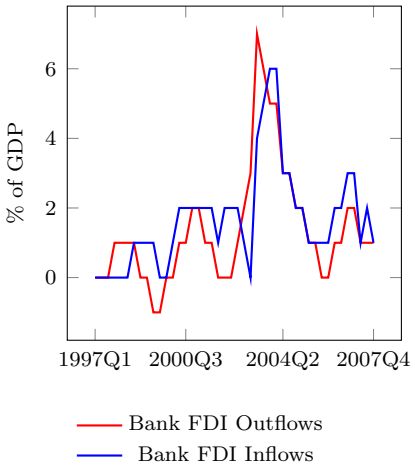


FIGURE 3.7. Total amount of FDI gross inflows and outflows from Banks, 1997-2007 (four-quarters moving sum, % GDP). **Correl.: 0.84**. Source: author's calculations on Banco de Portugal (BPstat) database.

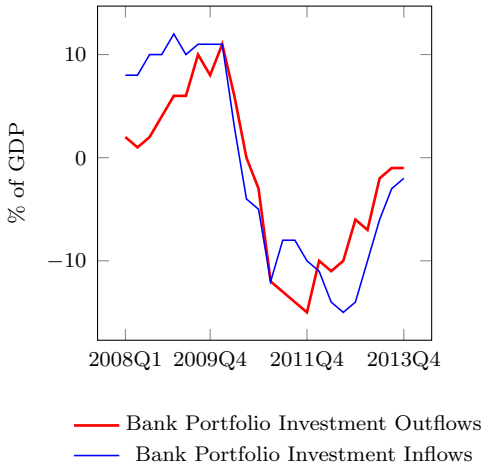


FIGURE 3.8. Total amount of Portfolio Investment gross inflows and outflows from Banks, 2008-2013 (four-quarters moving sum, %GDP). **Correl.: 0.89**. Source: author's calculations on Banco de Portugal (BPstat) database.

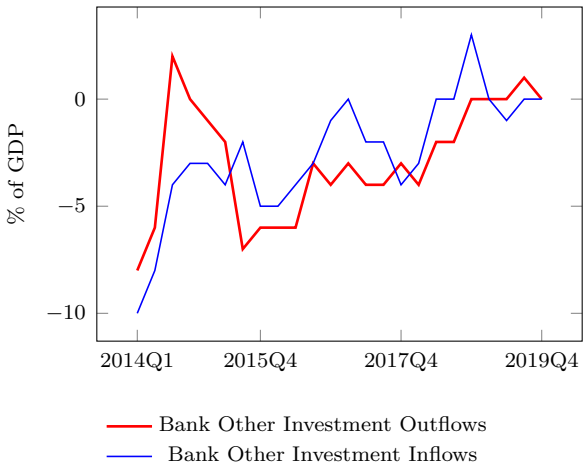


FIGURE 3.9. Total amount of Other Investment gross inflows and outflows from Banks, 2014-2019 (four-quarters moving sum, % GDP). **Correl.: 0.61**. Source: author's calculations on Banco de Portugal (BPstat) database.

Stylized fact 2: Gross capital inflows and outflows from banks and the public sector, and vice versa, are correlated.

Figure 3.10 shows that, in the period before the GFC, the attraction of inflows into the Portuguese economy by banks was accompanied by the accumulation of financial assets abroad by the public sector. Commercial banks were selling Portuguese treasury bonds at a time when the markets perceived their risk as being equal to that of treasury bonds from a core euro country.

The net outflows of the public sector (in this case, the Central Bank) began to increase after joining the euro. These are assets that the Portuguese Central Bank has seen an increase on its balance sheet towards the Eurosystem. These net assets refer to the difference between the banknotes that each national central bank takes from the economy and the volume allocated for issuance. Banco de Portugal collected more banknotes in this period than it put into circulation, giving rise to remunerated asset positions with the Eurosystem. The increase in the circulation of banknotes in the economy is due either to the store of value or to the increase in non-registered activity, such as tourism and remittances (Banco de Portugal 2009, ECB 2021).

Thus, the Central Bank's balance sheet reflects the dynamism of liquidity in the economy and the currency in circulation, which has increased significantly since the introduction of the euro. This is a way through which public and private balance sheets are connected when it comes to international assets/liabilities.

The active role of banks and the Government in promoting credit-based activities resulted in the growth of domestic indebtedness (mirrored in the increase in external debt), making these two sectors highly vulnerable when facing the GFC. The explosion of credit granted to the private sector was evident, and was encouraged by public programs to attract real estate investment, and by financing granted to newly privatized firms (Barradas et al. 2018). The Government itself has facilitated the creation of special-purpose private vehicles, creating tax-free zones and regimes in order to attract liquidity to the economy (such as Madeira Free Trade Zone).

Before the GFC, there was thus a gross inflow of capital recorded in the financial account in the Portuguese banking sector, in the form of FDI (Figure 3.7) and in the form of "Portfolio Investment" (Figure 3.10). This evidence reinforces the second mechanism identified by Kohler (2023), which associates speculative financial investment movements with vulnerabilities and imbalances in the real economy.

This Portfolio and FDI inflows affect the price of domestic assets (financial and real estate), depressing yields. Lower yields encourage aggregate demand and access to credit, as they serve as a benchmark for mortgage contracts. Rising asset prices also increase the collateral on banks' balance sheets (especially in the case of real estate). Under these conditions, credit restrictions are reduced, which boosts economic activity and imports,

thus negatively affecting the current account balance. This mechanism should be significantly addressed when explaining the Portuguese crisis, which led to a foreign assistance program.

In the period between the crises (2008-2013), disinvestment in Government bonds by non-residents was accompanied by disinvestment in foreign assets by the financial sector (Figure 3.11). The economic turmoil in Portugal led to outflows as investors sought safer havens. This trend was only reversed in 2016 (Figure 3.12), which leads to the conclusion that the banks' increase in foreign assets is accompanied by an increase in treasury bonds purchased by non-residents, at a time when confidence has been restored in the credibility of bonds issued by domestic agents.

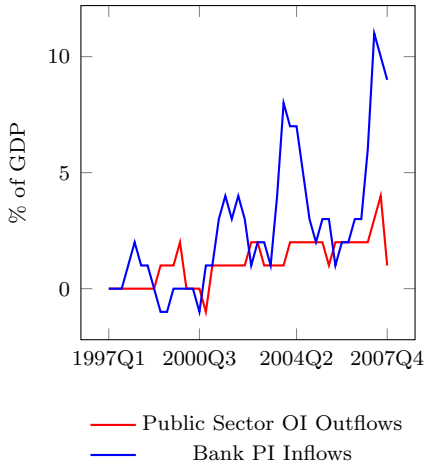


FIGURE 3.10. Total amount of Portfolio Investment inflows on Financial Sector excluding Central Bank, and Other Investment outflows in the Public Sector, 1997-2007 (four-quarters moving sum, % GDP). **Correl.: 0.66**. Source: author's calculations on Banco de Portugal (BPstat) database.

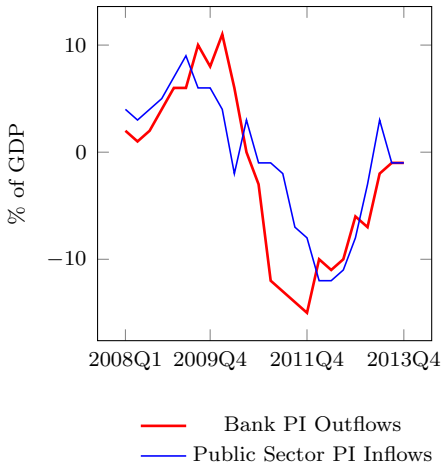


FIGURE 3.11. Total amount of Portfolio Investment inflows in the Public Sector, and Portfolio Investment outflows on Financial Sector, 2008-2013 (four-quarters moving sum, % GDP). **Correl.: 0.80**. Source: author's calculations on Banco de Portugal (BPstat) database.

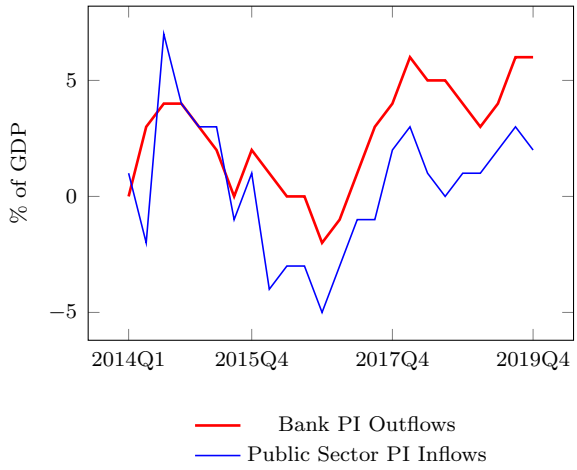


FIGURE 3.12. Total amount of Portfolio Investment inflows in the Public Sector, and Portfolio Investment outflows on Financial Corporations, 2014-2019 (four-quarters moving sum, % GDP). **Correl.: 0.69**. Source: author's calculations on Banco de Portugal (BPstat) database.

Stylized fact 3: After the GFC, the inflows of FDI into NFC strongly correlate with the dynamics of exports and the current account balance.

Apart from this, trade flows generally have little correlation with gross capital flows.

The accumulation of inflows into the economy after the EZC primarily occurred through FDI (Figure 3.13). The growth in FDI inflows between the crises is positively correlated with the evolution of the external balance (Figure 3.14), and with exports of goods and services. This phenomenon is associated with the growing internationalization of the Portuguese economy during and after the foreign official intervention. The private sector's financing needs led to foreign equity investments in Portuguese exporting companies operating in strategic sectors such as electricity, telecommunications, aviation, or airport services (see Teles et al. (2016), Teles, Santos & Rodrigues (2020)).

It is interesting to look at the clear correlation between FDI in Portugal and investment income paid abroad, mainly in the form of dividends, which means that only a tiny part of FDI is reinvested in domestic firms (Figure 3.15) – something also explored in the work of Mamede et al. (2016).

Another way of seeing that part of this "Foreign Direct Investment" in Portuguese firms is not necessarily productive and is sometimes speculative is in the recent increase in real estate investment (Figure 3.16). "Golden visa" status for acquiring real estate by non-residents could trigger this increase (Financial Times 2023), but this is a subject that could be investigated in the future, as it needs more detailed evidence.

Regarding the external gross capital flows of banks and the public sector, the correlation matrices show a low correlation with export transactions, imports of goods and services, and the current account balance. This finding reinforces the argument that there are capital flows that are quite independent of the current account activity and are invisible if the analysis is based on net capital flows (Pérez 2019). The low correlation between current account movements and changes in the IIP was also detected in the empirical work of Obstfeld (2012). On the other hand, trade in goods and services is strongly and positively correlated with each other (again, for more details, see the correlation matrices in Appendix B).

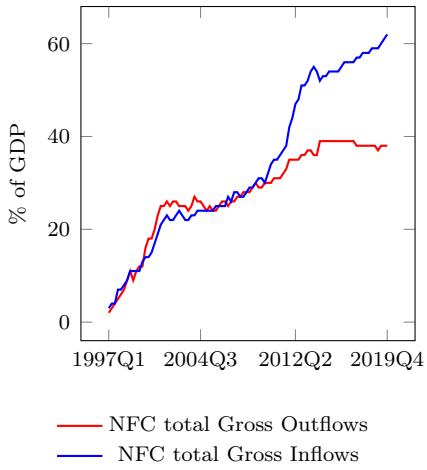


FIGURE 3.13. Accumulated NFC total Gross capital inflows and outflows (as a % of GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

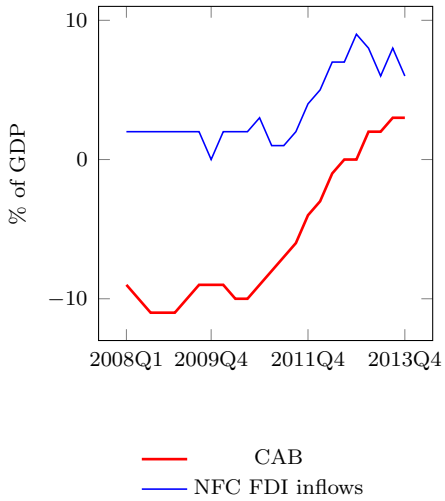


FIGURE 3.14. Total amount of Foreign Direct Investment on NFC and current account balance (four-quarters moving sum, %GDP). **Correl.: 0.89**. Source: author's calculations on Banco de Portugal (BPstat) database.

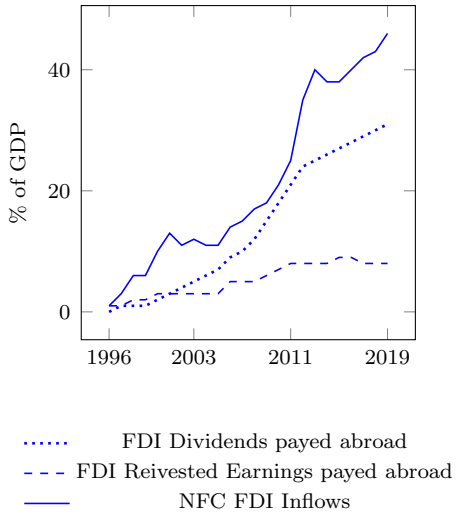


FIGURE 3.15. Accumulated values of Gross inflows of Foreign Direct Investment on NFC, dividends, and reinvested earnings payed abroad (as a % of GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

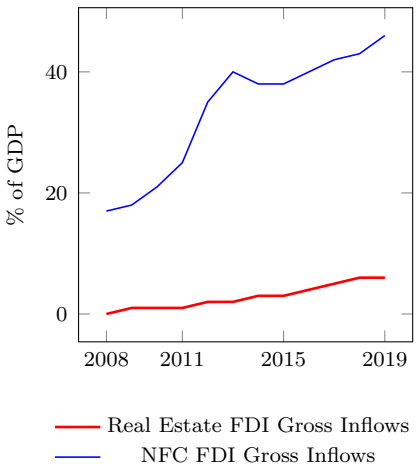


FIGURE 3.16. Accumulated values of gross inflows of FDI on NFC, and real estate FDI inflows (as a % of GDP). Source: author's calculations on Banco de Portugal (BPstat) database.

Stylized fact 4: Gross capital flows of the public sector are generally negatively correlated with those of the non-financial private sector.

The analysis of correlation matrices reveals a negative statistical relationship, in most cases, between public sector operations and the non-financial private sector. Thus, the public sector often behaves differently from other sectors (mainly from firms).

Worth noting is the increase in FDI inflows in firms accompanied by a reduction in "Portfolio Investment" inflows in the public sector for the period 2008-2013 (Figure 3.17). This is the period between the GFC and the EZC, and the disinvestment in Portuguese Government bonds resulted, as analyzed above, in a speculative attack by the markets on sovereign bonds. In this scenario, the price of these assets fell sharply, accompanied by an increase in yelds. This makes the non-financial private sector equally vulnerable, facing higher financing costs and seeing the price of its shares depreciate. This scenario favors foreign investment in Portuguese firms.

After 2013, there is a symmetrical relationship between firms gross inflows in FDI and gross inflows in the public sector in "Other Investment" (Figure 3.18). During this period, still under external official intervention (until 2014), the privatization program proceeded (not only in export sectors, but also in water provision, finance, postal services or freight transport), opening the door to foreign direct investment in the non-financial sector. Firms' financing strategies have also changed: until 2008, they used commercial banks; the weight of the stock of loans to non-financial companies has decreased since then, with the latter seeking liquidity through foreign direct investment (Reis 2018, Teles, Santos & Rodrigues 2020).

At the same time, the internal devaluation with persistent effects strategy carried out during the *troika* program mainly allowed imports to contract (Teles, Caldas & Martins 2020), which led the Portuguese economy to record historic external surpluses. Against this backdrop, the Central Bank's liabilities to the TARGET2 system fell steadily, which explains the reduction in capital inflows in "Other Investment" associated with the public sector (Soares et al. 2020).

For the period before 2008, there are also much more negative correlations, but not greater than -0.5. This pattern reveals that the public sector acts as a counterbalancing force to the private sector, smoothing out movements in gross capital inflows, as other authors have identified in the literature (Alfaro et al. 2014, Avdjiev et al. 2018).

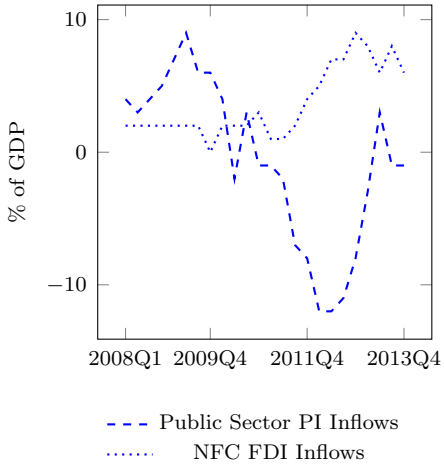


FIGURE 3.17. Total amount of FDI inflows on NFC and Portfolio Investment inflows in the Public Sector, 2008-2013 (four-quarters moving sum, % GDP). **Correl.: -0.59**. Source: author's calculations on Banco de Portugal (BPstat) database.

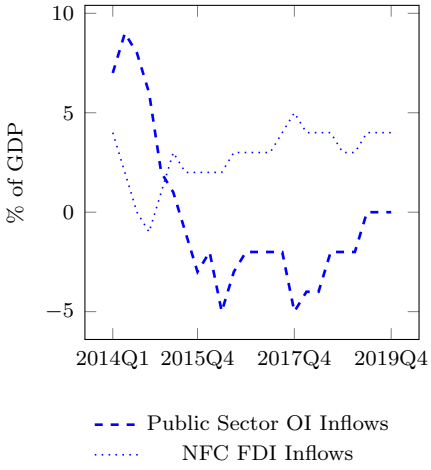


FIGURE 3.18. Total amount of FDI inflows on NFC and Other Investment inflows in the Public Sector, 2014-2019 (four-quarters moving sum, % GDP). **Correl.: -0.56**. Source: author's calculations on Banco de Portugal (BPstat) database.

3.5. Conclusions

This chapter begins by revealing the ideas that heterodox and mainstream approaches have about the relevance of the BoP in a monetary union and its regions. Looking at the IMF's macroeconomic monitoring reports on the Portuguese economy, the focus was excessively on the current account balance. Accordingly, it was necessary to stimulate external competitiveness gains by reducing unit labor costs. Price competitiveness also precedes non-price factors such as quality, sophistication, or productive diversity. Moreover, little attention was paid to the vulnerabilities that gross financial flows could bring to the real economy.

The prevalence of mainstream dominant approaches has meant that, to a certain extent, some items in the balance-of-payments have been overlooked, and the current account balance has been overvalued.

The monetary PK approach for the balance-of-payments sets aside prices as a competitive factor and proposes an assessment of gross international capital flows, a source of financial instability, instead of a narrow analysis based on a residual, which is net capital flows. Regarding the Eurozone, because money is endogenous, i.e., it is the demand for credit that triggers bank lending. So, savings (or net lending, or current account balance) are not the causal mechanism for capital flows. The granting of credit by banks can be replaced, in terms of liquidity, by any commercial bank with national Central Banks through the effectiveness of the TARGET2 system.

We have explored the two mechanisms through which gross capital flows could theoretically affect the real economy, suggested by Kohler (2023), up until the first major crisis event in 2008, relying on official balance-of-payments statistics for Portugal.

One of the mechanisms is capital inflows of domestic banks towards other non-resident banks, mainly in the form of inter-bank loans. This channel is useful but not sufficient to explain the inflow of capital into the economy.

The other mechanism is gross inflows in the functional category of "Portfolio Investment", some of them speculative and that could affect the overheating of the economy. This last mechanism allows us to acknowledge that Portugal has suffered a speculative attack after years in which convergence expectations were disconnected from macroeconomic fundamentals. In turn, the Portuguese version of the EZC does not resemble a classic balance-of-payments crisis (approaching the conclusions of De Grauwe & Ji (2012) or Lavoie (2015)).

The empirical part of this chapter also sets four stylized facts based on the analysis of correlations between gross capital flows (inspired by the work of Avdjiev et al. (2018)), which are: capital inflows and outflows to and from abroad, carried out by banks, are correlated (*fact 1*); capital inflows into banks and outflows by the public sector, and vice versa, are correlated (*fact 2*); trade flows have generally little correlation with gross capital flows (*fact 3*); gross capital flows of the public sector are generally negatively correlated with those of the non-financial private sector (*fact 4*).

Nevertheless, there are few cases of a strong correlation between the current account balance and gross capital flows, reinforcing the argument that looking solely at the current account balance neglects other potentially disruptive factors for the real economy that are included in the financial account.

Banks played the role of drivers of financial flows with foreign countries, acting as intermediaries for the arrival and departure of capital flows. The growing and rapid weight of the financial sector is closely linked to the process of financialization in Portugal.

The public sector had a mirror performance compared to other resident sectors. This is mainly due to the Central Bank's balance sheet with the TARGET2 system. During the euro crisis, the reduction in net inflows to banks and the Government was offset by an increase in the Central Bank's liabilities (net outflow) vis-à-vis TARGET2. After the euro crisis, the net inflow of liquidity into the economy made it possible to reduce these Central Bank's liabilities.

As policy implications, macro-prudential regulation of non-profitable loans and the end of incentives for foreign investment in speculative sectors through the creation of free trade zones should be taken. Specific controls on financial flows of this nature, when strengthened, can be suitable measures to help financial sustainability. With financial globalization and the ease of foreign transactions, there will also be a need to emphasize the critical analysis of the consolidated balance sheets of large banking groups. Future

work on this kind of analysis will help to understand the distortions that intermediation banking flows create in the real economy.

CHAPTER 4

What does the disaggregated trade in services tell about economic growth? A multi-sectoral Thirlwall's Law application

4.1. Introduction

International trade in services has grown strongly since the end of the last century, increasing its weight in the balance of goods and services, and in the total wealth created. According to IMF data, the share of services exports in total goods and services exports almost doubled between 1979 and 2014, from 9 to 14%. More recently, the growth of service exports has also had a positive and statistically significant relationship with GDP per capita growth (Loungani et al. 2017). Data collected from the World Development Indicators (WDI) database allow us to realize that service exports have gained weight in the world's GDP, especially in developed countries (Figure 4.1). In developing countries, there has been notable growth since the beginning of this century.

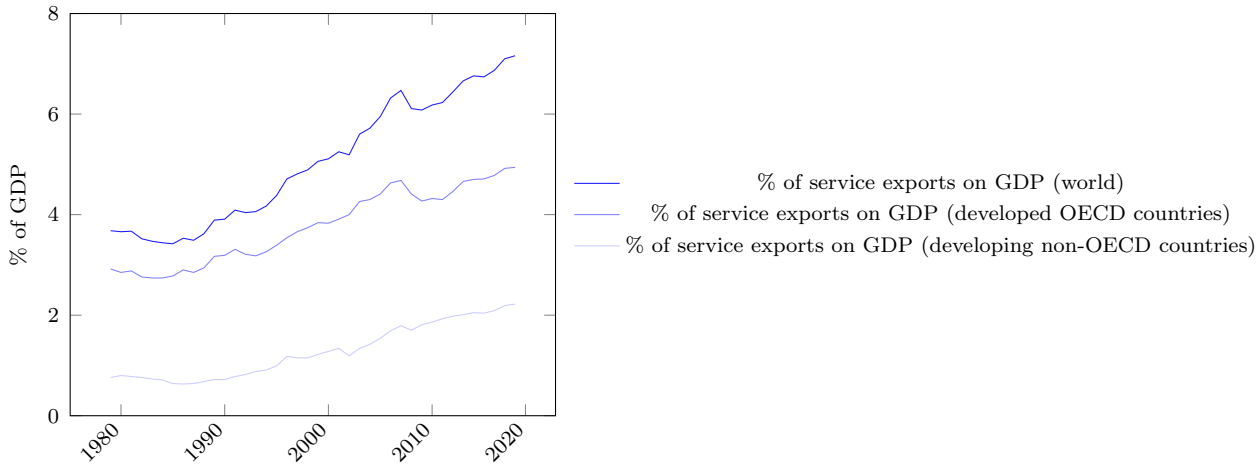


FIGURE 4.1. Share of services exports on GDP, worldwide and in developed and developing economies. Source: author's calculations on WDI database.

The literature tends to point to international trade in goods as one of the sources of economic growth. However, the liberalization of trade and finance, enhanced by the emergence of free trade zones (such as the European Union), China's accession to the World

[0]This work has already been published in the peer-reviewed journal *Investigación Económica* (Amado 2023*a*). This chapter and its earlier versions were presented at the following conferences and workshops: "6º Encontro Anual de Economia Política" (January 2023, UTAD); "International Political Economy Working Group (IPEG) annual workshop" (11th May 2023, King's College London); "14th Annual PhD Student Conference" (12th May, PKES, University of Greenwich); "SASE 2023 Annual Conference" (20-22nd July 2023, Rio de Janeiro).

Trade Organization in 2001, the information and communication technology (ICT) revolution and the digital technology (Digitech), and more recently, the Covid-19 pandemic, have changed global value chains and trade in terms of products, partners, and dynamics. The services sector has contributed more to growth in both developed and developing countries, than the goods sector, over the last three decades (Flaaen et al. 2013). Given the reconfiguration of international trade, it is time to reflect on whether services have gained momentum.

According to Eichengreen & Gupta (2011), there are two waves of service sector growth: the first wave occurs in countries with low income per capita, and the second wave occurs in countries with higher income per capita. The first wave comprises countries exporting traditional services (public administration and defense, wholesale and retail trade, transportation, and storage); the second wave comprises modern services (financial, communication, computer, technical, legal, advertising, and business).

The main objective of this article is to shed more light on the recent development of trade in services, using data available in the IMF's database for international trade in services. Using this data, we tested the hypothesis of the existence of different waves of service sector growth, according to the multi-sectoral Thirlwall's Law – MSTL (Araujo & Lima 2007).

To the best of author's knowledge, MSTL applications in the literature use mostly data by type of goods. Here, we applied the same methods using data by type of service. According to Thirlwall's Law (TL), the long-run growth rate of GDP is predicted by the ratio between the income-elasticity of exports times the growth rate of world GDP and the propensity to import, measured by the income-elasticity of imports (see also Thirlwall (1979, 2011)). The advantage of a multi-sector application is that changes in the composition of demand or in the structure of production, which are not reflected in changes in income-elasticities but come through changes in the share of each type of good or service in aggregate exports or imports, also matter for economic growth.

The ratio of the income export-import elasticities captures the non-price competitiveness of the economy associated with supply-side characteristics such as quality, design, liability, and variety (Soukiazis et al. 2017). Modern services are expected to have a higher income-elasticity of exports than other sectors, ensuring higher levels of non-price external competitiveness for countries with a higher weight in the services sector. It is also expected that more developed countries (in the second wave) have higher levels of non-price external competitiveness, and the opposite for countries in the catching-up process (in the first wave, with higher values of relative growth of GDP per capita).

The outline of the chapter is organized as follows: following the introduction, Section 4.2 reviews the literature on the role of services trade in economic growth, as well as the origins and applications of TL. Section 4.3 presents the data used and the methodology for estimating the multi-sector Thirlwall's Law. Section 4.4 discusses the results obtained in estimating the MSTL, and conducts quantitative analysis on the relationship between

non-price competitiveness in services, growth, and the external accounts, for different groups of countries. Finally, Section 4.5 concludes.

4.2. Literature review

4.2.1. A growing role of services in the international trade

The classical literature looks at the transition to the manufacturing goods as the main driver of economic growth. Kuznets (1957), for example, argued that the weight of services in the national product did not vary significantly with income per capita. Other authors saw in this sector little potential for productivity, exports, and value creation (Baumol & Bowen 1966). Only the growth of the labor-intensive manufacturing sector would guarantee economic prosperity. For Kaldor, the manufacturing sector is the only one with increasing returns to scale (higher productivity gains), while the agricultural sector shows decreasing returns and some services have constant returns. The manufacturing sector improves the productivity of other sectors (Kaldor 1966, 1967). Even recent theories of structural transformation of the economy also point to the manufacturing sector as the leading sector of development and the engine of growth (Rodrik 2011).

However, some recent analyses point to the growing volume of global service transactions (Loungani et al. 2017) and its importance in productivity growth and as a vehicle for economic catching-up processes, both concerning modern services (Di Meglio et al. 2015) and traditional ones, such as tourism (Burgisser & Di Carlo 2023).

Services are increasingly interdependent on industry, and tradable, and the evidence for this is their growth in total exports. The growth of modern service exports has outpaced manufacturing, the biggest reason being the revolution in ICT (Loungani & Mishra 2014). The authors add that the weight of services is higher in developed countries, but its growth is much higher in developing countries. They highlight countries such as India, Malaysia, Nigeria, Cambodia, or Sri Lanka, which have emerged in the technological service sectors. Moving the economy towards services that guarantee high growth rates can be a way out of middle-income traps (Flaaen et al. 2013).

The Digitech revolution, driving down the transaction costs of services, has increased the service trade and decreased the manufacturing trade in relative terms. Baldwin & Forslid (2020) see the transition to services as a process involving many structural changes, which is an opportunity for developing countries. According to the authors, the service-led development path (as in the case of India in ICT services) may become the norm rather than the exception. The service sector has no transport restrictions, no explicit import and export barriers, has been tax-relieved and requires no proximity to major international markets.

Alongside the autonomous growth of services, they have grown in coexistence with industry, especially during and after the pandemic crisis: digital services are used to control production processes, facilitate transactions, and create networks between firms. The growth of services such as e-commerce, consumer support, research and development

(R&D), telemedicine, and e-learning, in countries such as China, Hong Kong, South Korea, India, and Singapore, stands out (UN 2021).

Eichengreen & Gupta (2011) found two waves of service sector growth. They use panel regressions for a wide range of economies, where the explained variable is the share of services in GDP, and the explanatory variables are related to income per capita levels (measures of development). The first wave comprises countries with low-income per capita levels that export traditional services (public administration and defense, wholesale and retail trade, transportation, and storage). The second wave comprises countries with high income per capita levels and exporting modern services (financial, communication, computer, technical, legal, advertising, business) and being receptive to applying new information technology. This last group is characterized by countries that are more open to trade, democratic, and closer to financial centers.

They find different behavior patterns of three categories of services when set against income per capita levels: a negative relationship for traditional services; and a positive for hybrid (of which tourism is included) and modern services. Buera & Kaboski (2012) sorted services into two categories of skill intensity. Low skill, where tourism, transportation, commercial intermediation, or government services are included; and high skill, such as education, financial intermediation, healthcare, technical advertising services, or other business services. Services are heterogeneous. They differ according to skill intensity, information, communication technology, and exchange form (tradability), so different services show different growth patterns.

4.2.2. The balance-of-payments constraint to the growth rate (BPCG)

Following a post-Keynesian approach to the economic growth rate, a country could only grow faster than the rate consistent with a balanced external account if it could finance consecutive deficits, which financial markets would not allow (Thirlwall 2011). This "constraint" imposed by foreign markets and by the external performance of the economy would limit growth more than domestic conditions, such as unemployment.

An economy that faces balance-of-payments problems while expanding demand, before it reaches its capacity for resource-based growth, will have to solve these problems by contracting demand. According to Thirlwall's Law (Thirlwall 1979), the growth rate compatible with the balance-of-payments equilibrium is given by the growth of exports – which in turn depends on the growth of external income and the foreign income-elasticity of exports – divided by the income-elasticity of imports. It is implicit that the same growth rate of exports in two countries does not mean that they will grow at the same rate: the products imported by the two countries, necessary to satisfy the same level of exports, may differ, that is, both may differ in terms of the income-elasticity of imports (McCombie & Thirlwall 1999).

Both heterodox and mainstream economists have criticized this model (see Blecker (2016)). The former group criticizes the infinite elasticity of supply mechanisms in determining exports (McGregor & Swales 1986), and the negligent role attributed to relative

prices (or the real exchange rate) – see Razmi (2016). Mainstream economists prefer, in general, to emphasize total factor productivity as the engine of growth (Krugman 1989) and criticize the assumption that the current account tends to be balanced in the long-run. As is well known, the United States enjoys an "exorbitant privilege". Its currency is a global reference nowadays in terms of a store of value, and it can continually finance its external deficits by seeking short-term liquidity from countries with current account surpluses, such as China (Blecker 2022).

Despite this, there is a panoply of further applications of Thirlwall's Law from its original version. Other versions introduce capital flows and terms of trade (Thirlwall & Hussain 1982, Garcimartin et al. 2016), and multi-sectoral (Araujo & Lima 2007, Gouvêa & Lima 2010), or multiproduct (Gouvêa & Lima 2013, Romero & McCombie 2016) applications. Several studies show proximity between the simple BPCG and the observed growth rate (McCombie & Thirlwall 1997, Alonso 1999, Perraton 2003).

In this chapter, we applied the multi-sectoral Thirlwall's Law not to check its validation against observed growth rates but to determine the external non-price competitiveness ratio of each country, given by the ratio between the weighted income-elasticities of exports and imports of each country, only for the service sector. This ratio captures supply-side characteristics such as quality, the design, liability, and variety (Soukiazis et al. 2017). Since this is a sector in significant expansion and has yet to be explored in the literature on the balance-of-payments constrained growth rate, we crossed this ratio with some indicators of development and external performance of a large set of countries, testing the hypothesis of the presence of two waves of growth in the service sector.

4.3. Methodology and database description: A Thirlwall's Law multi-sectoral application (MSTL)

Starting from the observed equality between exports and imports of goods and services at constant prices, Thirlwall (1979) concludes that the long-run economic growth depends on the price-elasticity of exports (μ), the price-elasticity of imports (Ψ), domestic ($\hat{p}_d$), and external ($\hat{p}_f$) inflation, the income-elasticity of exports (ϵ), the income-elasticity of imports (π)), and the economic growth of external trading partners ($\hat{Y}_f$):

$$\hat{Y}_d^B = \frac{(1 + \mu + \Psi) \cdot (\hat{p_d} - \hat{p_f}) + \epsilon \cdot \hat{Y}_f}{\pi} \tag{4.1}$$

If it is assumed that capital inflows cannot successively make up current account deficits and that the relative prices are constant in the long-run (the role of exchange rate is to bring price equilibrium), then we have:

$$\hat{Y}_d^B = \frac{\epsilon \cdot \hat{Y}_f}{\pi} \tag{4.2}$$

In this way, the relationship between the current account of the balance-of-payments and economic growth is defined, the latter depending on income conditions (internal and external), which determine demand and export and import levels. The unlimited accumulation of current account deficits is not sustainable, even in a country that is part of a monetary union, otherwise this path will lead to stagnation and poverty.

Meanwhile, Araujo & Lima (2007) derived a multi-sectoral version of equation 4.1 and called it "MSTL". This multi-sectoral version of TL asserts that a country's balance-of-payments equilibrium growth rate of income per capita (when long-run external equilibrium is equivalent to current account equilibrium) is directly proportional to the growth rate of its exports, with such proportionality being inversely (directly) related to sectoral income-elasticities of demand for imports (exports). These income-elasticities, in turn, are weighted by coefficients that measure the share of each sector in total exports and imports, respectively. One simplified (and empirically implementable) way of formally representing this multi-sectoral version of TL is as follows:

$$\hat{Y}_d^{MB} = \frac{\sum_{j=1}^{n} a_j \cdot \epsilon_j \cdot \hat{Y}_f}{\sum_{j=1}^{n} b_j \cdot \pi_j} \tag{4.3}$$

where $\hat{Y}_d^{MB}$ is the rate of growth of domestic income consistent with long-run current account equilibrium, ϵ_j is the income-elasticity of demand for exports of sector j (J=1,2, ..., n), π_j is the income-elasticity of demand for imports of sector j, α_j is the share of sector j in total exports, and b_j is the share of sector j in total imports.

That being said, this Essay closely follows the work of Gouvêa & Lima (2013), but applies it using data from the disaggregated international trade in services. The significant implication of MSTL is that changes in the composition of demand or the structure of production, which are not reflected in changes in income-elasticities but come through changes in the share of each sector in aggregate exports or imports, also matter in the long-run growth.

The period chosen, between 1996 and 2019, has the benefit of taking advantage of recent data, available in nominal US dollars, in the IMF's macroeconomic and financial statistics database (Balance of Payments and International Investment Position Statistics – BOP/IIP).

We have divided the services into four categories following the separation made by Loungani et al. (2017), between modern and traditional services. The former aggregates data on computer, information, communication services, royalty licenses, financial, insurance and pension services, and other business services (including, among others, research and development services, professional and management consulting services, technical, trade-related, and other business services). Traditional services are divided into three

other categories: transportation services; travel; other services (in which it was included traditional services not included in other categories, such as manufacturing and maintenance services, construction services, personal, cultural, and recreational services, or government goods and services).

We are working with a database of 90 countries with balance-of-payments data available for all the years concerned, for at least one category of services. The database provided on the IMF website does not have data for some service categories in some countries, so subsequent panel estimates will not be fully balanced.

The other variables used in the estimations are country real gross domestic product (GDP), world real gross domestic product (GDPW), country real gross domestic product per capita (GDPPC), world real gross domestic product per capita (WGDPPC), and country real exchange rate (RER). To have as large a sample size as possible, RER is defined as the product between the average official exchange rate (national currency/US dollar) and the implicit US GDP deflator ratio to the countries' GDP deflator. As services data were available only in nominal terms, we have deflated them using the US GDP deflator. All these variables came from the World Development Indicators (WDI) database. As we are working with a large number of observations and T fixed, the estimations were carried out using 4-year averages to minimize non-stationary problems.

The following equations for sectoral imports and exports demand functions (including a category for trade in goods) were estimated using panel fixed effects:

$$lnM_{jit} = \pi_j \cdot lnGDP_{it} + \Psi_j \cdot lnRER_{it} + c_{ji} + \sum_{K=1}^{T} \lambda_{jt} + u_{jit}, for j = 1, ..., 5 \tag{4.4}$$

$$lnX_{jit} = \epsilon_j \cdot lnGDPW_{it} + \mu_j \cdot lnRER_{it} + c_{ji} + u_{jit}, for j = 1, ..., 5 \tag{4.5}$$

where i is an index representing countries, t is a time index and j represents service categories classification. Unobservable individual specific time-invariant effects were denoted by c_{ji}, and λ_{jt} denote the unobservable time effects that account for common shocks to all countries. Note that exports demand functions does not include observable time effects that account for common shocks, because we had assumed that common shocks are already captured by the variable GDPW – as in Gouvêa & Lima (2013). The parameters π_j, Ψ_j, ϵ_j, and μ_j are, respectively, the income and price-elasticities of demand for imports of sector j and the income and price-elasticities of demand for exports of sector j. To account for possible heteroskedasticity, robust standard errors are clustered at the country level.

The estimations were made individually for each one of the service categories. However, as sectoral price indices are not available for our sample, it is not possible to compute sectoral RER or sectoral terms of trade (which, in theory, might be more suitable for the

estimation of sectoral export and import demand functions). Therefore, the overall RER was used as a proxy for the sectoral RER, and an increase in this indicator means a real depreciation. So, it is expected to have a positive sign in export equations and a negative sign in import equations.

The statistical choice between fixed effects and random effects models lies in Hausman test which compares alternative estimating methods according to the following null hypothesis: $Cov(x_{it}, u_{it}) = 0$. Under H0, the RE model is the best (the GLS estimator is BLUE), while, under H1, the statistical properties of the GLS-RE estimator are lost. The FE estimator is consistent under both H0 and H1, but it is not efficient under H0. Hence, under H0, estimates will be similar from a statistical point of view and GLS-RE is preferable because efficient (and allows for estimating time-constant effects). Under H1 only FE is consistent (Wooldridge 2020).

So, for each of the estimations by category, we proceeded to a fixed effect (FE) estimation. Table 4.1 presents the results:

TABLE 4.1. Estimation results of the service category export and import functions estimated by FE: 1996-2019. Source: author's calculations.

Exports						
Service Cat.	**RER**	**GDPW**	**Constant**	**N of obs.**	**R2**	**Hausman test**
Modern Services	0.08	2.496***	-37.833***	507	0.51	25.48***
	(1.54)	(12.53)	(-10.49)			
Transportation	0.021	1.936***	-27.785***	508	0.489	20.46***
	(0.54)	(11.13)	(-8.91)			
Travel	0.053	2.049***	-29.311***	512	0.609	26.31***
	(0.63)	(14.03)	(-11.28)			
Other Services	0.082	1.790***	-26.184***	494	0.227	18.61***
	(1.02)	(7.18)	(-5.78)			
Imports						
Service Cat.	**RER**	**GDP**	**Constant**	**N of obs.**	**R2**	**Hausman test**
Modern Services	0.063*	0.756***	-1.6 (-0.79)	507	0.673	16.13**
	(2.25)	(4.08)				
Transportation	-0.017	1.046***	-4.322**	509	0.732	11.40*
	(-0.64)	(7.53)	(-2.85)			
Travel	-0.117	1.487***	-9.405***	511	0.617	20.12***
	(-1.96)	(6.89)	(-4.03)			
Other Services	0.065	2.100**	-18.268*	500	0.137	11.46 *
	(0.75)	(2.1)	(-1.6)			
Note: significant at *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$						

End of table

In all estimated equations (for exports and imports), the estimated price-elasticities have a low value, being less than one in absolute value. It is worth mentioning that in the case of exports, no price-elasticity is significant, and all of them have the expected (positive) sign. For import demand functions the price-elasticities are, in general, not significant, and only the transportation and travel categories have the expected (negative) sign.

Recent studies also find statistical insignificance associated with relative prices. Romero & McCombie (2018), using industry-level data for 13 sectors in seven European countries, found that the relative price variables have no significance once total factor productivity is included in both export and import regressions. Bottega & Romero (2021) reached the same conclusions using data for patents instead of total factor productivity. Caglayan & Demir (2019) showed that a higher RER has a significant positive effect on low-medium export industries, but not in high-skill and primary products (Blecker 2022, p. 445). Hence, the sectoral results reveal that price-elasticities have a lower impact on the behavior of service exports and imports and, therefore, have a considerably lower effect on the long-run growth rate.

For all service sectors, the income-elasticities of exports are significant and have the expected (positive) sign. Modern services (2.496) present higher income-elasticities than traditional services. The "other services" sector is the one that presents the lowest levels of elasticity, being a sector that is less sensitive to external income variations (1.790). The same sector reveals high elasticities on the import side. However, the "other services" sector has almost a null impact on the MSTL growth rate because its share in exports or imports composition is negligible. It is also relevant to mention the low income-elasticity of modern service imports and the relatively high income-elasticity of travel, both in exports and imports.

4.4. Discussion of the results

After the income-elasticities for exports and imports of goods and services had been computed, we have measured the average share of each category of services, by country, over the period under analysis. This allows the computation of the weighted income-elasticities of exports and imports of each country. Table 4.2 shows the results, by country.

TABLE 4.2. BoP Equilibrium Growth Rates for 90 World economies, 1996-2019. Source: author's calculations.

Country Name	**MSTL (2)**	**(ϵ/π) (3)**	**GDP per capita (4)**	**Relative growth (Y/Z) (5)**	**Current account (% of real GDP) (6)**	**Balance of Services (% of real GDP) (7)**
Albania	1.56	1.51	4.86	2.58	-8.49	2.65
Argentina	1.89	1.83	1.16	0.62	-0.59	-1.03
Armenia	1.67	1.63	6.68	3.56	-9.67	-2.27

Continued on the next page

Table 4.2 – *Table Continued*

Country Name	MSTL (2)	(ϵ/π) (3)	GDP per capita (4)	Relative growth (Y/Z) (5)	Current account (% of real GDP) (6)	Balance of Services (% of real GDP) (7)
Australia	1.82	1.77	1.71	0.91	-4.11	-0.28
Bangladesh	1.86	1.80	4.33	2.31	0.21	-1.53
Belize	1.91	1.85	0.92	0.49	-9.09	12.67
Benin	2.02	1.96	1.60	0.85	-4.65	-1.93
Bolivia	1.74	1.69	2.31	1.23	0.31	-2.38
Botswana	1.85	1.80	2.52	1.34	5.61	-1.05
Brazil	2.15	2.09	1.16	0.62	-2.14	-1.32
Bulgaria	1.87	1.82	3.16	1.68	-4.19	4.04
Cabo Verde	1.74	1.69	4.50	2.39	-9.31	8.96
Cambodia	1.78	1.73	5.65	3.01	-6.76	6.35
Cameroon	2.04	1.98	1.48	0.79	-2.82	-2.34
Canada	2.12	2.06	1.71	0.91	-0.86	-0.84
Chile	2.11	2.06	2.73	1.45	-1.34	-0.88
China	1.83	1.78	8.25	4.39	3.25	0.21
Colombia	2.00	1.94	1.87	1.00	-2.85	-1.54
Costa Rica	2.09	2.03	2.60	1.38	-4.05	8.05
Croatia	1.91	1.86	2.85	1.51	-3.45	12.80
Cyprus	1.97	1.92	1.62	0.86	-4.50	20.15
Czechia	1.96	1.91	2.51	1.34	-2.36	3.00
Denmark	1.87	1.81	1.21	0.64	4.42	1.61
Dominican Rep.	1.89	1.84	3.91	2.08	-2.69	10.25
Ecuador	1.79	1.74	1.22	0.65	-0.12	-1.88
Egypt, Arab Rep.	1.88	1.83	2.53	1.34	-1.08	2.96
El Salvador	1.83	1.78	1.44	0.77	-3.65	2.41
Estonia	1.88	1.83	4.63	2.46	-4.69	9.48
Ethiopia	1.78	1.73	5.17	2.75	-5.65	-1.14
Finland	2.25	2.19	1.87	0.99	2.54	-1.86
France	2.07	2.01	1.13	0.60	0.20	0.95
Germany	2.05	1.99	1.34	0.71	4.36	-1.50
Ghana	2.08	2.02	3.27	1.74	-6.73	-3.07
Guatemala	1.94	1.88	1.52	0.81	-3.20	0.35
Honduras	1.77	1.72	1.51	0.80	-5.82	5.64
Hungary	2.05	1.99	2.88	1.53	-3.33	3.73
India	2.22	2.16	4.95	2.63	-1.33	1.58
Indonesia	2.08	2.02	3.02	1.61	0.35	-3.03
Israel	2.31	2.25	1.86	0.99	1.45	2.65
Italy	2.09	2.03	0.41	0.22	0.28	-0.13
Jamaica	2.07	2.01	-0.06	-0.03	-7.17	5.83
Japan	2.06	2.00	0.77	0.41	2.79	-0.73
Jordan	1.82	1.77	0.82	0.44	-5.34	2.43
Kenya	1.79	1.74	1.28	0.68	-6.13	3.62
Korea, Rep.	1.87	1.82	3.69	1.96	2.85	-0.78
Lithuania	1.77	1.73	5.48	2.91	-4.79	4.64

Continued on the next page

Table 4.2 – *Table Continued*

Country Name	**MSTL (2)**	**(ϵ/π) (3)**	**GDP per capita (4)**	**Relative growth (Y/Z) (5)**	**Current account (% of real GDP) (6)**	**Balance of Services (% of real GDP) (7)**
Malaysia	1.93	1.87	2.97	1.58	8.04	-1.39
Maldives	1.83	1.78	2.81	1.50	-12.23	41.66
Mali	1.68	1.63	2.00	1.07	-6.60	-7.98
Malta	2.70	2.62	3.60	1.91	-1.75	17.29
Mexico	1.92	1.86	1.22	0.65	-1.50	-0.63
Morocco	1.68	1.63	2.91	1.55	-2.09	7.05
Myanmar	1.99	1.93	8.39	4.46	-1.10	1.21
Namibia	1.80	1.75	1.89	1.01	-1.07	-0.35
Netherlands	2.30	2.24	1.54	0.82	6.49	-0.33
Nicaragua	1.88	1.82	2.04	1.09	-11.99	0.63
Niger	1.94	1.88	0.85	0.45	-9.30	-5.96
Nigeria	1.91	1.86	2.46	1.31	4.38	-3.97
North Macedonia	1.88	1.82	2.64	1.40	-4.21	2.99
Norway	1.93	1.88	1.14	0.60	10.22	-0.57
Oman	2.14	2.08	-0.19	-0.10	2.11	-7.80
Pakistan	1.86	1.81	1.68	0.89	-2.16	-1.59
Panama	2.00	1.95	3.91	2.08	-6.72	10.08
Paraguay	1.76	1.71	1.33	0.71	0.75	-1.10
Peru	2.01	1.95	3.16	1.68	-2.31	-1.63
Philippines	2.04	1.98	3.24	1.72	0.76	1.71
Poland	1.96	1.90	4.18	2.22	-3.52	1.83
Portugal	1.87	1.82	1.34	0.71	-5.56	4.35
Romania	2.04	1.98	3.92	2.09	-5.45	1.95
Saudi Arabia	1.42	1.38	0.44	0.24	9.98	-9.72
Seychelles	2.13	2.07	2.71	1.44	-16.78	20.55
Sierra Leone	2.22	2.16	2.16	1.15	-14.56	-6.71
Singapore	2.22	2.16	3.05	1.62	18.40	-2.15
Slovak Rep.	1.91	1.86	3.78	2.01	-4.00	1.14
Slovenia	1.89	1.84	2.56	1.36	0.53	3.50
South Africa	1.98	1.93	1.16	0.62	-2.45	-0.29
Spain	2.05	2.00	1.45	0.77	-2.33	3.84
Sri Lanka	1.96	1.91	4.30	2.29	-3.37	-0.58
Sweden	2.21	2.15	1.85	0.98	4.9	4 0.12
Switzerland	2.47	2.40	1.15	0.61	8.50	2.38
Tanzania	1.69	1.64	3.05	1.62	-6.07	0.74
Thailand	2.12	2.06	2.63	1.40	3.68	-0.04
Togo	2.05	1.99	1.25	0.67	-7.71	-1.70
Trinidad and Tobago	2.18	2.12	3.42	1.82	10.46	-0.35
Tunisia	1.66	1.61	2.51	1.34	-4.91	4.47
Turkiye	1.75	1.70	3.16	1.68	-3.14	3.33
Uganda	2.01	1.95	2.96	1.57	-4.61	-2.87
United Kingdom	2.14	2.08	1.48	0.79	-2.84	3.60

Continued on the next page

Table 4.2 – *Table Continued*

Country Name	MSTL (2)	(ϵ/π) (3)	GDP per capita (4)	Relative growth (Y/Z) (5)	Current account (% of real GDP) (6)	Balance of Services (% of real GDP) (7)
United States	2.07	2.01	1.57	0.84	-3.22	0.99
Uruguay	1.99	1.94	2.50	1.33	-1.34	1.95

End of table

From Table 4.2. we can identify Malta, Switzerland, Israel, the Netherlands, and Finland as the countries with the highest non-price external competitiveness ratio (ϵ/π – see column 3). The countries that grew the most (in terms of GDP per capita), between 1996 and 2019, relative to world growth (relative growth – Y/Z – column 5) were Myanmar, China, Armenia, Cambodia, and Lithuania.

As Eichengreen & Gupta (2011) conclude, there are two waves of service sector growth, and applying multi-sectoral Thirlwall's Law will help us understand this. Countries at a higher stage of development (as measured by GDP per capita levels) have a higher share of modern services exports (see Figure 4.2 – left side[1]). In contrast, less developed countries have a higher share of traditional services. This kind of relationships would be understood with simple Ordinary Least Squares econometric regressions (OLS).

Also interesting is to realize that there is a negative relationship between the current account and the balance of services (as a percentage of GDP), as Figure 4.2 – right side[2] also shows. This means that many surplus countries in the balance of services are net importers of goods in the current account – as, for instance, Seychelles, Maldives, Belize, Cyprus, Cabo Verde, Croatia, Dominican Republic, Panama, Estonia, Malta, or Portugal. In fact, for this group of countries, service exports represent only 30% of the exports recorded in the current account (which also includes the primary and secondary income account).

As the previous Section shows, higher non-price competitiveness (increasing ϵ/π) means investing more in modern services. However, this is done by the countries that are growing the least in relative terms, that is, the countries that are at a higher level of development or in a second wave of growth (see Figure 4.3 – left side[3]). That is, countries with a higher level of non-price external competitiveness in services are the ones that converge the least (the inverse of Thirlwall's Law) – as, for instance, Switzerland,

[1]Regression line: [GDP per capita (log)] = 7.653 + 3.468·[weight of modern services]. The slope coefficient is statistically significant (p-value: 4.56928E-05).
[2]Regression line: [Current account] = -1.3506 – 0.316·[balance of services as a % of GDP]. The slope coefficient is statistically significant (p-value: 0.000).
[3]Regression line: $\frac{Y}{Z}$ = 2.633 - 0.673·(ϵ/π). The slope coefficient is statistically significant (p-value: 0.044).

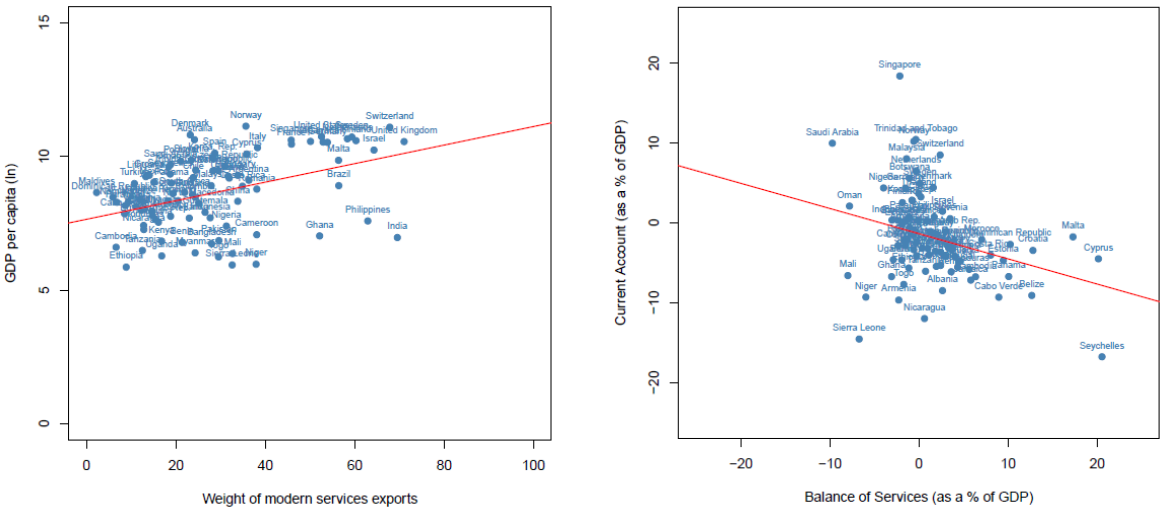


FIGURE 4.2. Relationship between GDP per capita level (in logs) and the weight of modern service in total exports (1996-2019) – left side. Relationship between current account and balance of services (as a % of GDP, 1996-2019) – right side. Source: author´s calculations on IMF and WDI data.

the Netherlands, Finland, Sweden, or United Kingdom. Countries in a catching-up process (where $\frac{Y}{Z} > 1$) are at a lower level of external non-price competitiveness – Albania, Armenia, Mali, Tanzania, or Cabo Verde.

Also, more developed countries are the ones that have a higher non-price competitiveness index in services, as expected (see Figure 4.3 – right side[4]). The fact that they do not grow faster is due to less increasing returns in services, as Kaldor argued.

If we focus on a small sample of only OECD countries (30 countries), seen as developed countries, the same pattern is observed (see Figure 4.4 – both sides[5]). This is because the countries that converge the most (inside the OECD) are the ones that have the largest share of exports of traditional services, such as tourism, and are, therefore, less competitive. Additionally, the last plot in Figure 4.4[6] shows that OECD countries with a higher level of non-price competitiveness in services have higher current account balances (as a percentage of GDP), which indicates that competitiveness in services is interdependent on competitiveness in manufacturing. The average value for the services non-price competitiveness index for OECD countries is 1.972, which compares with 1.904 for the total sample.

[4]Regression line: [GDP per capita (log)] = 3.485 + 2.710·(ϵ/π). The slope coefficient is statistically significant (p-value: 0.0004).
[5]Left side regression line: $\frac{Y}{Z}$ = 4.6026 - 1.7512·(ϵ/π). The slope coefficient is statistically significant (p-value: 0.013). Right side regression line: [GDP per capita (log)] = 6.104 + 1.980·(ϵ/π). The slope coefficient is statistically significant (p-value: 0.014).
[6]Regression line: [Current Account] = -24.642 + 12.412·(ϵ/π). The slope coefficient is statistically significant (p-value: 0.006).

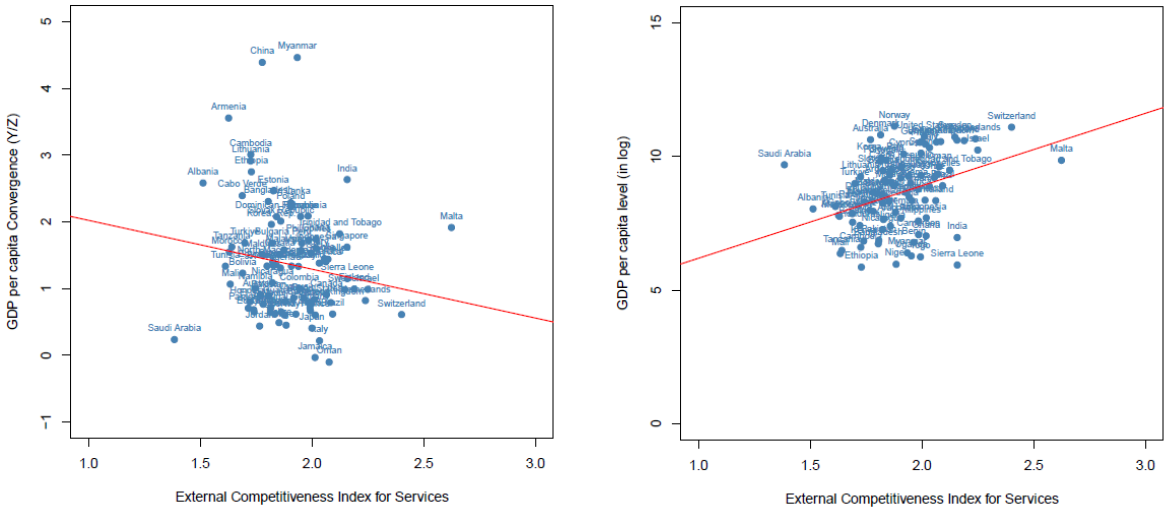


FIGURE 4.3. Relationship between external non-price competitiveness index (ϵ/π) and relative growth ($\frac{Y}{Z}$) – left side; and GDP per capita level – right side. Source: author´s calculations on IMF and WDI data.

The relationships in non-OECD countries are less linear than in OECD countries. We decided to separate these countries into two groups: the first group consisting on 30 non-OECD countries with the largest share of tourism exports. The second group includes the 30 non-OECD countries with the largest share of modern service exports.

In the first group (non-OECD touristic), there is a clear negative relationship between the balance of services and the current account balance. The shortfalls in competitiveness in the manufacturing sector are not offset by surpluses in the balance of services (dominated by tourism exports) – see Figure 4.5, left side[7]. The touristic countries outside the OECD that are most non-price competitive in services are those with the most significant current account deficits (because they are less competitive in the tradable sector) – see Figure 4.5, right side[8] – and are also those that are least converging with global economic growth – see Figure 4.5, bottom one[9]. Still, these two last regressions are not statistically significant, but put doubts on the tourism-led growth models.

In the second group (non-OECD Modern), there is a positive, but not statistically significant, relationship between the balance of services and the current account balance. The non-price competitiveness gains in the services sector are reflected positively in the external accounts of these countries – see Figure 4.6, left side[10].

[7]Regression line: [Current Account] = -2.683 - 0.324·[balance of services as a % of GDP]. The slope coefficient is statistically significant (p-value: 0.002).
[8]Regression line: [Current Account] = 3.166 - 3.845·(ϵ/π). The slope coefficient is not statistically significant (p-value: 0.559).
[9]Regression line: $\frac{Y}{Z}$ = 3.159 - 0.9811·(ϵ/π). The slope coefficient is not statistically significant (p-value: 0.2747).
[10]Regression line: [Current Account] = -1.362 + 0.036·[balance of services as a % of GDP]. The slope coefficient is not statistically significant (p-value: 0.862).

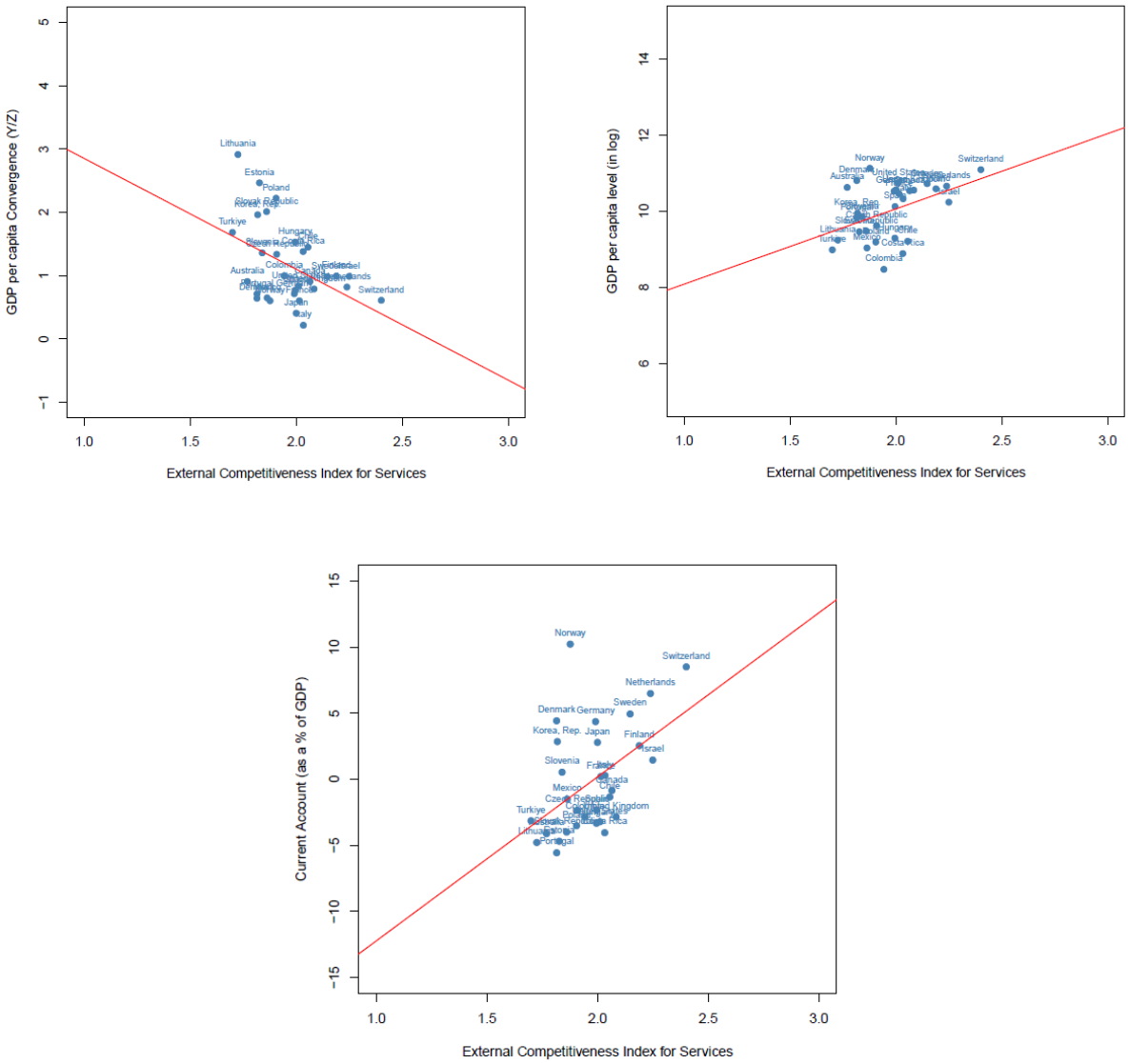


FIGURE 4.4. **OECD countries**: relationship between external non-price competitiveness index for services (ϵ/π) and relative growth ($\frac{Y}{Z}$) – left side; and GDP per capita level – right side; and current account balance (as a percentage of GDP) – bottom one. Source: author´s calculations on IMF and WDI data.

The modern countries outside the OECD that are most non-price competitive in services are those with the most significant current account surpluses (because they are competitive in the tradable sector) – see Figure 4.6, right side[11] – and that seems to be a guarantee to grow more in the face of world economic growth – see Figure 4.6, bottom one[12]. This last regression is not statistically significant. Still, within this group of countries, there is much heterogeneity.

[11]Regression line: [Current Account] = -9.906 + 4.352·(ϵ/π). The slope coefficient is not statistically significant (p-value: 0.514).
[12]Regression line: $\frac{Y}{Z}$ = 1.273 + 0.144·(ϵ/π). The slope coefficient is not statistically significant (p-value: 0.891).

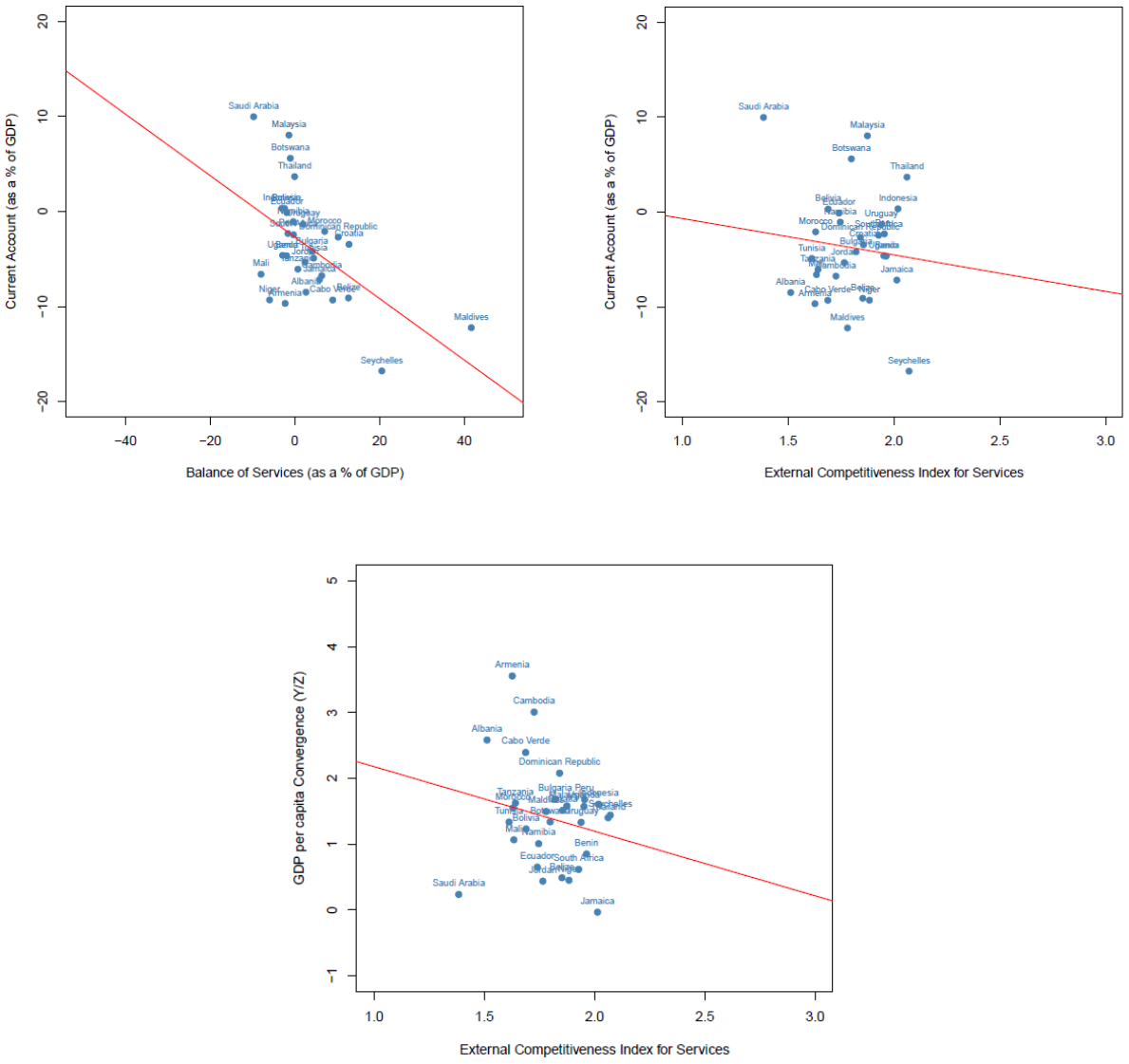


FIGURE 4.5. **Non-OECD touristic countries**: the relationship between current account and balance of services (as a % of GDP) – left side; external non-price competitiveness index for services (ϵ/π) and current account (as a % of GDP) – right side; and relative growth ($\frac{Y}{Z}$) – bottom one. Source: author´s calculations on IMF and WDI data.

Among those that are more competitive, countries with a higher propensity to export financial services (Malta), telecommunications (India), or business services (Singapore) stand out. Of those less competitive in the service sector, there are also countries with high levels of relative growth driven by the manufacturing sector (China, Myanmar).

4.5. Conclusions

The increasing schooling levels in societies, along with technological advances, has made economies more dependent on the modern service sector. The literature shows that services are increasingly tradable, overcoming the geographical disadvantage of goods, and can benefit from schooling investment, an adequate regulatory environment, and technological infrastructure.

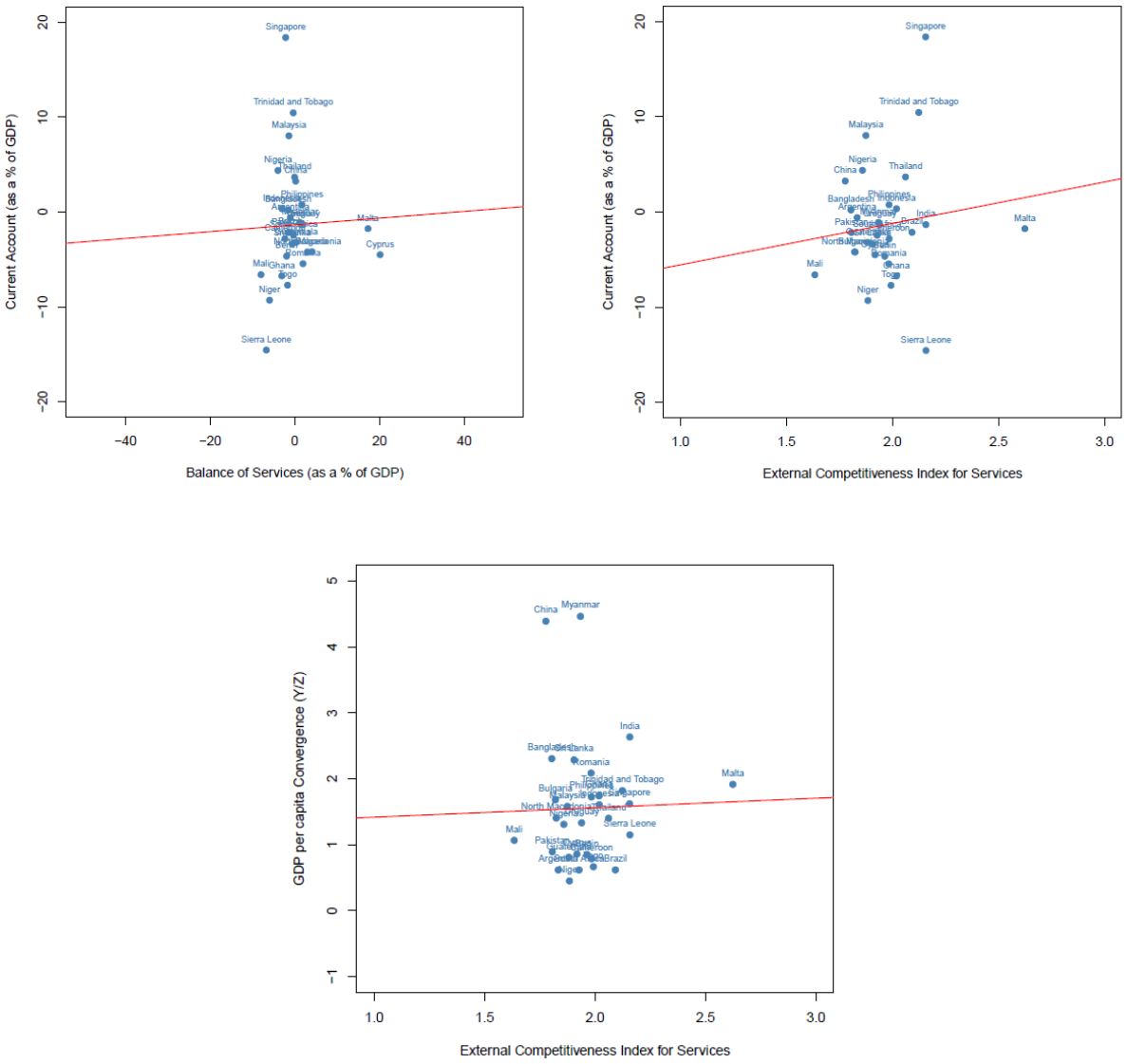


FIGURE 4.6. **Non-OECD Modern countries**: relationship between current account and balance of services (as a % of GDP) – left side; external non-price competitiveness index for services (ϵ/π) and current account (as a % of GDP) – right side; and relative growth ($\frac{Y}{Z}$) – bottom one. Source: author´s calculations on IMF and WDI data.

This work shows that price competitiveness is not significant in explaining the behavior of service exports and imports and that the increase in the weight of the modern service sector gives economies greater external competitiveness.

Does this translate into higher economic growth? Not necessarily. In many developing countries, relative growth is based on traditional sectors, such as tourism, with risks. International tourism has the disadvantage that, as it gets deeper, it contributes to the degradation of resources, which are the main reasons for international travelers to visit. Economists from IMF show that international tourist arrivals have a statistically and economically significant effect on CO2 emissions (Cevik 2023). Also, having a positive balance of services through tourism exports does not guarantee external surpluses. The

strong dependence of these countries on imported goods creates current account deficits and growth constraints – challenging the tourism-led growth model.

The hypothesis that there are two levels of services growth is validated: the higher the level of development, the higher the level of non-price competitiveness, and the greater the weight of the modern service sector. It is up to countries to strengthen national innovation systems and expand R&D investments so that the knowledge gained can be used to adjust to and benefit from the changes occurring in the international environment.

CHAPTER 5

Thirlwall's Law and human capital: what was different between Finland and Portugal?

5.1. Introduction

Finland and Portugal had similar real GDP levels in the early 1990s (see Figure 5.1). Compared to the other countries, only Greece and Ireland had comparable GDP levels, with the former having a higher growth trajectory in the first decade of the 2000s and the latter from 2015 onwards (see Figure C.1 in the appendix Section).

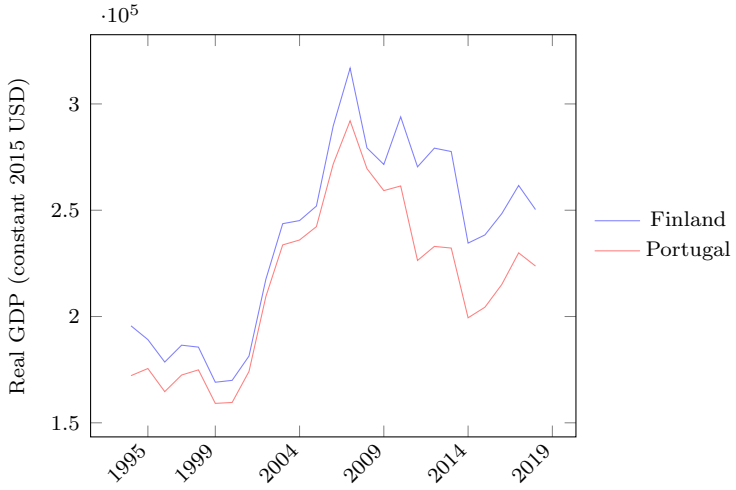


FIGURE 5.1. Real GDP (constant 2015 USD, in millions) for Portugal and Finland. Source: author´s calculations on WDI database.

Both countries joined the euro area simultaneously (in 1999) and under the same conditions and experienced both the GFC (in 2008-09) and the Eurozone crisis (in 2011-12). However, were the growth engines of the two countries the same between the preparatory phase of joining the euro (1996) and a more recent period (2019)?

The neoclassical theory of growth (Solow 1956) emphasizes the supply side conditions, ignoring elements of demand. A Cobb-Douglas-type function explains economic growth, which contains physical production factors (capital and labor) and a residual, non-physical factor, later attributed to technological progress ("Solow's residual" – Solow (1957)) as a determinant of productivity growth. The theory explains the coexistence of declining marginal productivity of the capital factor in much of the twentieth century in the US, with per capita output growth as being due to non-physical factors of production such as

[0]This chapter will be presented at the following conference "7º Encontro Anual de Economia Política" (January 2024, ISEG)

research and development (Romer 1986), human capital (Lucas 1988) or public capital (Barro 1990)[1].

Post-Keynesian Political Economy emerged precisely to respond to the simplifications of neoclassical mainstream economics, in particular the neoclassical synthesis. This approach rejects the exclusive supply-side view of how the economy works and criticizes its inability to incorporate the role of macroeconomic policies in economic growth (Hein & Stockhammer 2010, Lavoie 2014). Supply-based growth models do not explain the reason for the economic growth in the years 1953-70.

Within this framework, aggregate demand is the driver of growth, but there is a constraint created by the balance-of-payments (Thirlwall 1979, 2011). Under the assumption that real exchange rates are constant in the long-run (with no rising or falling trend), Thirlwall (1979) shows that the growth rate compatible with the balance-of-payments equilibrium is equal to the growth of exports – which in turn depends on the growth of external income and the foreign income-elasticity of exports – divided by the income-elasticity of imports.

The aim of this Essay is to explain the sources of growth in Finland and Portugal over a twenty-five-year period by using demand and supply forces in the same growth model. Variables related to foreign trade are introduced into the supply-driven growth model to achieve this. These variables will be combined with different proxies for human capital and foreign trade. One of the proxies for foreign trade is non-price competitiveness (the ratio of income-elasticities of exports and imports), calculated for both countries for the period under analysis, using the multi-sector Thirlwall's Law model (MSTL). These are the main innovations of this work concerning the previous works.

This chapter also uses trade data for goods and services by sector (using the UN's Comtrade database and IMF balance-of-payments data). It compares the countries' calculated non-price-competitiveness ratio and the external balance of each sector of activity.

Finland and Portugal were studied from 1996 to 2019, mostly using time series econometric techniques. The other variables employed in the growth regressions are the degree of openness and the annual change in the international investment position (both foreign trade variables), enrollment in tertiary education (represents high levels of human capital qualifications), the number of papers published per active population (a measure of the human capital efficiency of publications), and the number of patents registered (a measure of innovation).

The main findings are as follows. First, Finland's external accounts improved substantially between the two periods, while its human capital indicators remained high. Portugal saw its external accounts deteriorate, but its human capital indicators showed sharp growth. Second, the productive sectors with the most technology incorporated have the highest export income-elasticity in both countries. Third, sectors with greater

[1]To the extent that some Government expenditures in public non-rival sectors, like transport and communication infrastructures, Barro (1990) found some evidence that this type of investment can serve as a further engine for growth.

non-price competitiveness traditionally show higher external balances, which attests to the importance of non-price competitiveness in the performance of external accounts. For Finland, the pattern of evolution of the current account balance and the non-price competitiveness indicator (which has deteriorated since the drop in Nokia's business) is similar. Overall, human capital indicators are not particularly relevant in explaining the real GDP growth of the two countries, neither in size nor significance.

This chapter is organized into four Sections not including the introduction and the concluding remarks: Section 5.2 theorizes about the role of technology, foreign trade, and economic growth constrained by external demand. Section 5.3 analyzes the historical behavior of some human capital and foreign trade variables for the two countries and presents the data used. Next, the multi-sectoral Thirlwall's Law model is applied to determine the total and sectoral non-price competitiveness (Section 5.4). Then, Section 5.5 discusses and analyzes the results of the estimations of the growth equations for the two countries. The final Section concludes with the main results of this study.

5.2. Literature review

The model applied in this chapter, concerning the work of Barro & Sala-i Martin (2004), is based on the conditional convergence hypothesis, an extension to the Solow's model (Solow 1956), using human capital and technological progress as endogenous variables in the model and with increasing marginal returns, as opposed to the decreasing marginal productivity of the physical factors included in the production function. Economies converge to different steady states of income, and physical and human capital as well as technological progress assume determining roles.

Human capital stock, as a measure of labor force skills, is traditionally measured by the years of education and training that workers acquire over their lifetime. However, it may also be affected by the family's environment or the resources available and the institutional conditions of the educational system (Hanushek & Woessmann 2012). Several authors have criticized this neoclassical approach to human capital as it limits the analysis to economic factors, ignoring political, socioeconomic, and cultural dimensions, and therefore they propose a more inclusive approach.

The empirical application is similar to that carried out by Soukiazis & Antunes (2012*b*), who use the variables of foreign trade and human capital in the growth equation, and the terms of interaction between them. Despite having a very similar level of real GDP in the 1990s, Finland and Portugal's economies were structurally very different.

Finland had stable growth and reduced inequality levels from WW II until the 1990s due to exports to the Soviet Union, a state-sponsored program of capital investments, some devaluations, and a centralized wage bargaining system, as well as the indirect role of the influence of the Government, with some elements of Keynesianism (Andersson & Mjøsset 1987). Low interest rates, a net saver public sector, and a high capital accumulation rate for the manufacturing industries made this an economy comparable to the Asian tigers (Jäntti et al. 2006).

During Finland's economic recession in the 1990s, and also in preparation for joining the European Monetary Union, this policy of depreciation was ended, and there was a *competitive corporatist* agreement in which wage moderation to support exports and a commitment to welfare policies was made between capital, labor and the state. Some cuts in social expenditure and taxes were made while there was a push for developing ICT technology (Nokia).

After 2007, growth and productivity slowed, while employers started questioning the corporatist bargaining by insisting on sector-level wage agreements. An ageing population, Nokia's loss of its market share (see The New York Times (2004)) and the GFC help to explain the downturn in the Finnish economy. Even so, Finland's participation in the EU, and in particular the euro, triggered foreign trade and inflows of direct investment (Oxford Economics 2019).

Since the mid-1990s, the Portuguese economy has experienced constant external imbalances. Along with the low skill levels of the workforce, the opening up to foreign capital markets, increasing privatizations in the banking sector, de-industrialization, and the transition to the non-tradable sector help explain the worsening of the country's net external position (Reis 2020). Since the setting up of the euro (1999), the financial flows that have entered Portugal have found an unsophisticated financial system that has misallocated the credit granted, favoring non-tradable sectors (such as tourism and real estate), speeding up the process of financialization of the economy (Barradas et al. 2018).

On the one hand, authors point to weak factor productivity, a relatively small business sector, unbalanced public accounts, and rigidities in the labor market (Reis et al. 2013). Other authors argue that the weak growth recorded until 2008 was due to factors such as the credit boom, China's accession to the WTO in 2001 and the accession of Eastern European countries to the EU in 2004, or the appreciation of the euro against the dollar between 2000 and 2008 (Mamede 2020).

The euro crisis led the Portuguese economy to suffer an external intervention that involved a strong adjustment program. If, on the one hand, the conditions were back in place for the state to finance itself on the market at lower interest rates than before the intervention, in terms of macroeconomic performance, *"the program seems to be a failure, with real GDP per capita 4.9 percent lower in 2014 than it was in 2010, and total employment falling from 4.9 million to 4.5 million"* (Reis 2015, p.435). Internal devaluation also achieved the goal of reducing the current account deficit, but this adjustment process created permanent features in the Portuguese economy: real wages, productivity, and the labor share in income have stagnated since then (Teles, Caldas & Martins 2020).

5.2.1. The role of human capital on growth

The first contributions to the study of human capital and its impact on economic performance came from Nelson & Phelps (1966) and Welch (1970), who agreed that improvements in the stock of human capital influenced the rate that countries absorbed and

implemented new technologies. Later, Lucas (1988) made a relevant theoretical contribution to this issue. According to this author, there are two types of productive factors: the physical and accumulating factors, capital and labor – developed in the neoclassical growth model – and human capital, which improves the productivity of all physical factors and is increased at a constant rate, that is, a constant level of effort produces a constant growth of the stock, regardless of the level of stock already reached, thus affecting both current and future production.

However, in this context, alternative empirical literature that directly links the level of human capital (and not its rate of accumulation) to the rate of economic growth has emerged. For example, Barro (1991) has highlighted the positive relationship between the average number of years of schooling in a given year and the per capita output growth in subsequent years, while Romer (1989) has shown empirically that the initial education levels help explain the subsequent investment rate, which in turn explains the subsequent output growth rate. As a measure of the labor force's accumulation of skills and abilities, human capital is determined by formal education and acquired experience, and positively correlates with economic growth (Mankiw et al. 1992).

More recent studies continue to show that countries with higher levels of education have experienced faster growth in gross value-added and employment (Ciccone & Papaioannou 2009). Other authors show that the contribution of human capital is shown by indicators of educational performance (international achievement tests such as PISA) that serve as a measure to differentiate the quality (and not the quantity) of education (Hanushek & Kimko 2000, Jamison et al. 2007, Hanushek 2013). Another measure of the quality of education has to do with the ability to publish articles in indexed journals, or the capacity for innovation, measured by the registration of patents. Romer (1990) establishes this link within the framework of an endogenous growth model where the engine of growth is the R&D activity carried out by firms, but whose fundamental productive factor is human capital.

Yet, some authors have criticized the narrow perspective of the neoclassical approach to human capital. The link between human capital and productivity, and productivity and wages is weaker than neoclassical theory suggests. Alternative approaches propose a more interdisciplinary view that considers the relevance of the socioeconomic and gender context, inequalities in access to education (often reproduced by the education system itself), or cultural and psychological dimensions. Assuming that students depend on their parents, peers, or social context to develop, "human capital" undermines the meritocratic principle of neoclassical theory that the market gives individuals what they deserve (Folbre 2012).

For example, Bourdieu & Passeron (1973) pointed out the role of school systems in reproducing social and cultural inequalities. From a Marxist point of view, the workers' collective negotiation power is the primary determinant of wages. Schools cannot be assigned an outcomes-generating role since they are not meritocratic and mirror how the

capitalist system works (see Bowles & Gintis (1971)). In later work, Bowles et al. (2001) pointed out that economists have neglected individual preferences, psychological aspects, and social interaction in the school context, which can affect the outcome. Even so, school can be seen as a place of resistance to inequalities, challenging dominant ideologies and transforming the scenario suggested above by Bourdieu and Passeron (Giroux 1983).

5.2.2. The balance-of-payments constrained growth (BPCG) and its multi-sectorial approach (MSTL)

In 1979, Anthony Thirlwall drew up the stylized, post-Keynesian-inspired concept of balance-of-payments constrained economic growth (Thirlwall 1979, 2011). In its simplified version (see equation 5.1), starting from the equilibrium observed between exports and imports, he concluded that long-term economic growth depends on the income-elasticity of exports (ϵ), income-elasticity of imports (π) and the economic growth of external trade partners ($\hat{Y}_f$):

$$\hat{Y}_d^B = \frac{\epsilon \cdot \hat{Y}_f}{\pi} \tag{5.1}$$

This is a relation that predicts that a country will experience faster growth than the rest-of-the-world ($\hat{Y}_d^B > \hat{Y}_f$) if its income-elasticity of demand for exports is higher than its income-elasticity of imports ($\epsilon > \pi$). Also, this relationship guarantees that the country grows without deteriorating its foreign balance. Thus, the ratio of the income-elasticity of foreign trade (ϵ/π) reflects the balance-of-payments constrained growth hypothesis. This ratio captures the non-price competitiveness of the economy associated with quality, design, innovation, and variety, among other supply characteristics of the goods and services produced – which means that Thirlwall's model, although directed toward demand forces, does not neglect supply-side elements (Greenhalgh 1990).

The multi-sectoral version of TL (Araujo & Lima 2007) asserts that a country's balance-of-payments equilibrium growth rate of per capita income (when long-term external equilibrium is equivalent to current account equilibrium) is directly proportional to the growth rate of its exports, with such proportionality being inversely (directly) related to sectoral income-elasticities of demand for imports (exports). These income-elasticities, in turn, are weighted by coefficients that measure the share of each sector in total exports and imports, respectively. The advantage of this extended version of the simple Thirlwall's Law is that it captures income-elasticities by sector. From a policy point of view, this allows the identification of strategic export sectors that are key to promoting growth, and import sectors where import substitution should be promoted.

The idea, for this work, is to apply the multi-sectoral Thirlwall's Law to a set of export and import sectors for goods and services, using time series regressions for Finland and Portugal. There are several applications of this model using disaggregated goods data

(Cimoli et al. 2010, Gouvêa & Lima 2010, 2013, Soukiazis et al. 2017). However, to the best of our knowledge, there are no such applications that includes separated items of services categories. What these studies have in common is that they find a higher level of export income-elasticity in high-tech intensive goods.

There are also some particular research studies applying the original version of Thirlwall's Law for Portugal (Mendes & Thirlwall 1989, Soukiazis & Antunes 2012*a*), but studies have yet to be found for Finland in particular. However, some analyses have been done for a panel that include the two countries under consideration here (Bagnai 2010, Soukiazis & Antunes 2012*b*, Romero & McCombie 2016).

5.3. Historical evidence and the variables used in the model

As seen in Figure 5.1, Finland and Portugal started from similar levels of real GDP in the mid-1990s. By 2019, both countries had adopted the euro as their official currency (1999) and experienced the GFC in 2008-09 and the EZC in 2011-12. However, it is important to stress that the two countries had quite different levels of GDP per capita (see Figure C.2 in the appendix Section). In addition, there were fundamental changes to some macroeconomic variables, such as the degree of openness to trade, the current account balance, or the net international investment position – IIP (see Table 5.1).

TABLE 5.1. Degree of openness, current account balance and net international investment position (as a percentage of GDP). Source: WDI and IMF.

Country	**Degree of Openness (%)**		**CA Balance (%)**		**Net IIP (%)**	
	1996	2019	1996	2019	1996	2019
Finland	56.1	74.4	3.2	-0.3	-33.5	4.3
Portugal	43.7	95.7	-3.1	0.4	-6.3	-94.5

End of table

If, in terms of real GDP the two countries were similar in 1996, the same cannot be said regarding foreign trade. Looking only at the current account balance of two years can be misleading in a time series since it only reflects what happened in those years, unlike the net IIP, which is an end-of-period stock, and therefore reflects all the foreign balances accumulated in the past.

In 1996, Finland was more open to foreign trade and had a surplus external balance, but a negative net IIP that showed an accumulation of external deficits from previous periods. Portugal had less trade openness and an external deficit, but a relatively balanced net IIP. In 2019, Finland increased its foreign trade openness – but less than Portugal – and showed a negative external balance (unlike Portugal) but had a relatively balanced net IIP. On the contrary, Portugal saw the net IIP become negative (almost reaching the level of GDP) due to the successive external deficits recorded until 2012.

The export and import sectors used to apply the MSTL in the next Section are as follows: primary products (PP), resource-based manufacturing (RB), low-technology manufacturing (LT), medium-technology manufacturing (MT), high-technology manufacturing (HT) – all data from UN Comtrade database[2] –, transportation services (SC), travel services (SD), and other services (OS) – data from the IMF database. Table 5.2 shows the weight of each sector in Finland and Portugal's exports and imports in 1996 and 2019, as well as the average weight over the 24 years.

TABLE 5.2. Share of each sector in the exports and imports of Finland and Portugal (in percentage). Source: UN Comtrade Database and IMF.

	EXPORTS						**IMPORTS**					
	Finland			**Portugal**			**Finland**			**Portugal**		
Sector	1996	2019	Avg.	1996	2019	Avg.	1996	2019	Avg.	1996	2019	Avg.
HT	16.1	7.7	15.7	3.7	4.3	4.4	14.8	10.3	13.2	8.0	11.6	9.5
LT	10.3	8.0	8.9	23.3	16.2	19.2	10.4	9.5	10.0	14.5	14.5	15.2
MT	20.1	22.1	20.4	21.0	21.1	20.3	20.7	20.0	19.6	28.4	25.4	25.3
PP	3.8	4.1	4.1	1.8	4.2	3.4	10.0	10.6	11.6	13.6	16.2	17.6
RB	28.4	24.1	27.0	13.6	17.2	17.2	12.3	13.1	14.3	13.0	14.0	13.9
SD	4.9	3.7	3.9	20.3	19.0	17.5	8.2	5.7	5.9	7.8	5.3	5.5
SC	5.8	5.0	4.5	5.7	7.8	7.3	7.4	6.8	7.2	4.9	4.4	4.7
OS	10.6	25.3	15.6	10.7	10.3	10.6	16.1	24.0	18.1	9.8	8.7	8.2

End of table

There was an increase in the share of other services (OS) in exports between 1996 and 2019 in Finland (mainly telecommunication, computer, and information services) at the expense of high-technology manufacturing and resource-based products. Still, the weight of the three manufacturing sectors averaged 45%. In relation to imports, the share of other services (OS) also increased (other business services, mainly) at the expense of high-tech industrial goods. The average share of primary products is more meaningful in imports (11.6%) than in exports (4.1%).

In Portugal, there was an increase in the share of resource-based products on the export side and a decrease in low-tech manufacturing exports. The weight of the three manufacturing sectors averaged 44%. However, the share of the high-tech sector averaged 4.4% (in Finland, it was 15.7%), and the average weight of tourism exports was 17.5% (in Finland, it stood at 3.9%). On the import side, a 50% average weight is associated with manufacturing products.

[2]Lall (2000) technological classification is used. Lall classified trade data at the three-digit SITC (Standard International Trade Classification) revision 2 according to their technological intensity.

TABLE 5.3. Statistical data on human capital for Finland and Portugal. Source: Scimago Journal & Country Rank; WDI; Eurostat.

Country	**educ**		**art**		**pat**		**pat/art**	
Year	1996	2019	1996	2019	1996	2019	1996	2019
Finland	70.4	92.9	3199.1	7586.8	873.3	480.4	0.275	0.063
Portugal	38.7	67.9	593.2	5142.1	18.1	133.9	0.031	0.026

End of table

As may be observed in Table 5.3, Finland started with higher levels in all human capital indicators in 1996. Four proxies were used to measure labor force skills: enrollment in tertiary education (*educ*) – retrieved from the WDI database, reflecting the qualifications of labor force; submission of citable articles per active population (*art*) – retrieved from *Scimago Journal & Country Ranking* and Eurostat, respectively – as a measure of scientific production; patenting per active population (*pat*) – retrieved from the WDI database and Eurostat, respectively – as a measure of R&D and innovation; and a patent/article ratio that measures the ability to transform scientific production into innovation.

It is worth mentioning that Portugal experienced a very sharp growth of all indicators. However, Portugal's significant advance in the indicator *educ* related to qualifications, until 2019, was not enough to reach the value that Finland recorded in 1996. In Finland, not only did the human capital indicators grow at a lower rate than in Portugal, but there was also a decline in innovation activities (patent ratio).

It will therefore be interesting to analyze the impact of these variables on real output growth. To this end, a growth regression *à la* Barro was used that is intended to explain the growth of output per capita (in this case, the independent variable "real GDP growth" is tested) through explanatory variables such as: the lagged level of real income (the convergence factor); the annual growth rate of population, η; the saving ratio, s (all variables retrieved from the WDI database); and the different levels of human capital and measures of foreign trade already mentioned. The empirical analysis is based on time series regressions described in the following Sections.

5.4. A Thirlwall's Law multi-sectoral application (MSTL)

Araujo & Lima (2007) derived a multi-sectoral version of equation 5.1. One simplified (and empirically implementable) way of formally representing the MSTL is as follows:

$$\hat{Y}_d^{MB} = \frac{\sum_{j=1}^{n} a_j \cdot \epsilon_j \cdot \hat{Y}_f}{\sum_{j=1}^{n} b_j \cdot \pi_j} \tag{5.2}$$

where $\hat{Y}_d^{MB}$ is the rate of growth of domestic income consistent with long-run current account equilibrium, ϵ_j is the income-elasticity of demand for exports of sector j (J=1,2,

..., n), π_j is the income-elasticity of demand for imports of sector j, α_j is the share of sector j in total exports, and b_j is the share of sector j in total imports.

For each country and sector individually, using time series regressions, the following equations for sectoral exports and imports demand functions were estimated:

$$X_t = \beta + \epsilon \cdot (\text{gdpw}_t) + \eta \cdot (\text{rpx}_t) + \delta \cdot \text{d}_t + \varphi_t \tag{5.3}$$

$$M_t = \alpha + \pi \cdot (\text{gdp}_t) + \psi \cdot (\text{rpm}_t) + \theta \cdot \text{d}_t + \omega_t \tag{5.4}$$

Growth in real exports is a function of growth in real foreign income $gdpw_t$ (average GDP growth in all world countries) and growth in relative prices rpx_t, defined as the difference between the growth in export and import prices. Higher growth in foreign income is expected to stimulate growth in domestic exports, and higher relative prices are expected to have a negative impact on exports, therefore $\epsilon > 0$ and $\eta < 0$.

Growth in real imports is a function of growth in real domestic income gdp_t and growth in relative prices rpm_t, defined as the difference between the growth in domestic and import prices. Higher growth in domestic income is expected to stimulate growth in domestic imports, and higher relative prices are expected to have a positive impact on imports, therefore $\pi > 0$ and $\psi > 0$. A dummy variable (d_t) was added to equations (5.3) and (5.4), which is set to 1 for the period between 2008 and 2013 (covering the GFC and the EZC) and zero for the remaining periods.

The export and import demand functions for each sector were estimated by ordinary least squares (OLS), following the same approach as Gouvêa & Lima (2010). The descriptive statistics of the variables employed, for Finland and Portugal, can be found in Table C.1 and Table C.2, as well as in Figure C.3 to C.10, in the appendix Section. The results are shown in Table 5.4 and 5.5 for exports and Table 5.6 and 5.7 for imports.

Before estimation, the data were deflated (using the US GDP deflator, base year 2015) and converted to logarithmic first differences to avoid issues of non-stationarity (see Table C.3 and C.4 in the appendix). Data on the US GDP deflator and real GDP in USD were retrieved from the WDI database. Data on relative prices for exports and imports of goods and services (price deflators) were retrieved from the Ameco database. According to multiple studies, the period under analysis from 1996 to 2019 is considered sufficiently broad.

TABLE 5.4. Estimated export demand results for Finland. Source: author's calculations.[a]

	PP	RB	MT	LT	HT	SD	SC	OS
Constant	-0.029	-0.061**	-0.01	-0.067*	-0.132**	-0.043**	-0.013	0.003
	(-0.77)	(-2.61)	(-0.41)	(-1.81)	(-2.16)	(-2.10)	(-0.68)	(0.05)
rpx	-2.224	-0.206	0.955	0.022	-1.53	0.77	2.762***	-3.063
	(-1.38)	(-0.20)	(0.94)	(0.01)	(-1.37)	(0.87)	(3.49)	(-1.10)
gdpw	2.126**	2.616***	2.582***	3.770***	6.040**	2.435***	2.825***	0.872
	(2.5)	(4.89)	(4.81)	(4.45)	(2.6)	(5.18)	(6.74)	(0.59)
dt	-0.081	-0.023	-	-0.109	-0.086	0.014	-0.087**	0.075
	(-1.18)	(-0.53)	0.127***	(-1.59)	(-1.29)	(0.36)	(-2.56)	(0.63)
			(-2.92)					
OBS	24	24	24	24	24	24	24	24
R2	0.522	0.68	0.645	0.632	0.622	0.654	0.713	0.185
F(3,20)	7.291	14.172	12.113	11.461	10.952	12.599	16.553	1.515
Breusch-Godfrey LM test for autocor-relation	0.928 (0.3353)	0.256 (0.6130)	1.981 (0.1593)	1.312 (0.2520)	1.493 (0.2217)	1.081 (0.2984)	1.271 (0.2595)	0.330 (0.5655)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

TABLE 5.5. Estimated export demand results for Portugal. Source: author's calculations.[a]

	PP	RB	MT	LT	HT	SD	SC	OS
Constant	0.025	-0.035*	0.03	-0.028	0.009	0.038*	0.043	0.027
	(1.06)	(-1.98)	(1.5)	(-1.70)	(-0.23)	(2.00)	(1.49)	(1.04)
rpx	-0.659	0.989	-1.203	0.655	-1.907	-0.467	-1.675	1.18
	(-0.59)	(1.17)	(-1.26)	(0.82)	(-1.03)	(-0.51)	(-1.20)	(0.96)
gdpw	2.051***	2.671***	1.519***	1.725***	2.145**	0.952**	1.643**	2.063***
	(4.31)	(7.36)	(3.7)	(5.04)	(2.69)	(2.45)	(2.75)	(3.92)
dt	-0.063	0 (0)	-0.06	-0.016	-0.127*	-0.053	-0.059	-0.079
	(-1.49)		(-1.64)	(-0.52)	(-1.80)	(-1.54)	(-1.12)	(-1.69)
OBS	24	24	24	24	24	24	24	24
R2	0.62	0.771	0.611	0.608	0.488	0.391	0.491	0.486
F(3,20)	10.891	22.491	10.453	10.361	6.361	4.284	6.428	6.3

Breusch-Godfrey LM test for autocor-relation	4.716 (0.0299)	1.789 (0.1811)	0.064 (0.8006)	0.143 (0.7057)	0.629 (0.4277)	0.426 (0.5141)	0.439 (0.5075)	1.853 (0.1734)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

Table 5.4 shows that, on the export side, technological sectors assume higher income-elasticities in Finland as was expected. Only the category of other services (OS) assumes no statistical significance.

For Portugal (Table 5.5), resource-based, high-technology, and primary products have higher income-elasticities. Surprisingly, although significant, the category of tourism services has an income-elasticity less than the unit. The sign is always positive for all categories of goods and services in both countries. The relative price of exports has a negative (expected) sign in some of the regressions.

In general, relative price change is not statistically significant, and sometimes the coefficient is higher than the unit. The dummy associated with the crisis episodes (2008-2013) is negative and has little significance. The Breusch-Godfrey test is a statistical test used in time series analysis to test for the presence of serial correlation (autocorrelation) in the residuals of a regression model. In this case, the p-values (in parentheses) indicate the non-rejection of the null hypothesis of no serial correlation in the residuals at least at 1% of significance, meaning that the error terms are not correlated over time.

TABLE 5.6. Estimated import demand results for Finland. Source: author's calculations.[a]

	PP	RB	MT	LT	HT	SD	SC	OS
Constant	0.047** (2.44)	0.03* (1.75)	0.042** (2.33)	0.023* (1.98)	0.041** (2.28)	0.001 (0.15)	0.043** (2.22)	0.041 (1.18)
rpm	- 3.265*** (-9.66)	- 2.245*** (-7.63)	- 1.484*** (-4.71)	- 0.929*** (-4.60)	- 1.151*** (-3.68)	-0.021 (-0.13)	- 1.788*** (-5.29)	-0.474 (-0.79)
gdp	1.132*** (5.54)	1.459*** (8.19)	1.160*** (6.09)	1.040*** (8.52)	0.598*** (3.16)	0.902*** (9.44)	1.109*** (5.43)	0.768** (2.1)
dt	0.039 (1.06)	0.025 (0.77)	-0.063* (-1.83)	-0.03 (-1.38)	- 0.112*** (-3.29)	0.036** (2.11)	0 (-0.00)	0.015 (0.23)
OBS	24	24	24	24	24	24	24	24
R2	0.889	0.893	0.811	0.864	0.695	0.828	0.794	0.238
F(3,20)	53.605	55.636	28.519	42.394	15.164	32.181	25.692	2.084

Estimated import demand results for Finland. Source: author's calculations.[a]

	PP	RB	MT	LT	HT	SD	SC	OS
Breusch-Godfrey LM test for autocor-relation	3.595 (0.0579)	0.000 (0.9891)	0.304 (0.5813)	1.125 (0.2888)	0.493 (0.493)	3.723 (0.0537)	0.696 (0.4040)	0.003 (0.9550)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

TABLE 5.7. Estimated import demand results for Portugal. Source: author's calculations.[a]

	PP	RB	MT	LT	HT	SD	SC	OS
Constant	0.057*** (3.02)	0.032*** (3.37)	0.034 (1.62)	0.028* (1.94)	0.064* (2.7)	0.045** (2.43)	0.037* (1.94)	0.032* (1.85)
rpm	-2.553*** (-7.70)	-1.320*** (-8.01)	-0.551 (-1.52)	-0.733*** (-2.92)	-0.712 (-1.72)	-0.713** (-2.20)	-1.102*** (-3.32)	0.069 (0.23)
gdp	1.059*** (5.46)	1.080*** (11.2)	0.959*** (4.51)	1.018*** (6.94)	0.939*** (3.87)	0.813*** (4.29)	0.962*** (4.95)	1.077*** (6.2)
dt	-0.011 (-0.30)	-0.004 (-0.23)	-0.07* (-1.78)	-0.04 (-1.48)	-0.128** (-2.84)	-0.041 (-1.18)	0.008 (0.22)	-0.02 (-0.61)
OBS	24	24	24	24	24	24	24	24
R2	0.827	0.911	0.613	0.773	0.622	0.588	0.656	0.69
F(3,20)	31.8	68.502	10.557	22.697	10.958	9.517	12.702	14.813
Breusch-Godfrey LM test for autocor-relation	1.443 (0.2297)	3.166 (0.0752)	0.190 (0.6627)	0.717 (0.3971)	0.082 (0.7747)	0.347 (0.5557)	0.835 (0.3609)	0.464 (0.4958)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

Tables 5.6 and 5.7 show that, on the import side, price-elasticities assume a negative sign with some statistical significance. This means that an increase in domestic prices more noteworthy than the change in import prices leads to a reduction in imports, contrary to expectations. The highest price-elasticities are found in primary products associated with energy – the increase in domestic prices reduces consumption, and imports may decrease

because there are no domestic alternatives (inelastic demand). The income-elasticities of imports are positive and significant for all categories of goods and services in both countries. The dummy is particularly significant for technology products, showing that the crisis affected this sector negativelly.

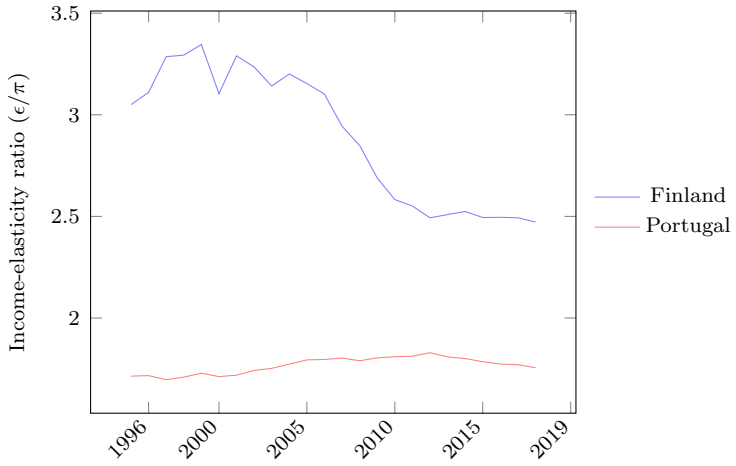


FIGURE 5.2. Weighted income-elasticity ratio (ϵ/π) for Finland and Portugal. Source: author's calculations.

Considering the share of each sector for each year and country, for exports and imports, the weighted income-elasticity ratio (ϵ/π) can be compiled, showed in Figure 5.2. For Finland, the fall in the non-price competitiveness indicator is notable from mid-2008, which coincides both with the GFC and Nokia's loss of global market power. The Portuguese economy has seen an increasing trend in non-price competitiveness ratio after joining the euro. The 2008 financial crisis negativelly affected the weighted ratios in both economies and the Portuguese economy was again disrupted by the euro crisis (2011-12) and has not recovered from the peak reached in 2012.

As can be seen in Table C.5 (appendix Section), the reduction in ϵ was more significant than in π (remained almost constant) in Finland. In Portugal, the average growth of ϵ was small but greater than that in π, revealing small non-price competitiveness gains.

It is worth analyzing the same ratio, averaged sector by sector, and comparing it to the average external balance for each sector. Tables 5.8 and 5.9 show a positive relationship between the average weighted ratio of income-elasticities (ϵ/π) and the average of the external balance for each sector. This means that the weighted ratio of income-elasticities per sector will be as small as the lower external balance of that sector.

TABLE 5.8. Disaggregated sectoral weighted income-elasticity ratios for Finland. Source: author's calculations.

	PP	RB	MT	LT	HT	SD	SC	OS	**TOTAL**
ϵ	0.087	0.706	0.526	0.333	0.945	0.095	0.125	0.136	**2.957**
π	0.130	0.208	0.228	0.104	0.079	0.054	0.080	0.139	**1.023**
ϵ/π	0.676	3.403	2.313	3.212	11.95	1.749	1.563	0.974	**2.89**

Continued on the next page

Table 5.8 – *Table Continued*

	PP	RB	MT	LT	HT	SD	SC	OS	**TOTAL**
Trade Balance (as a % of GDP)	-2.7	5.3	0.8	-0.1	1.4	-0.6	-0.8	-0.7	**1.5**
World GDP observed growth rate									**2.47**
GDP observed growth rate									**1.03**
MSTL GDP predicted growth rate									**7.11**

End of table

In the case of Finland, higher non-price competitiveness is observed in the resource-based (RB) sectors (paper and cardboard production) and, especially, high-technology manufacturing (HT). Regarding other services (OS) and primary products (PP), the weak non-price competitiveness is mirrored by the ratio (ϵ/π) and the external deficit recorded in the period.

Looking at the difference between the GDP predicted (by the MSTL) and the actual value, it is positive, revealing that Finland grew at a lower rate than that consistent with the balance-of-payments equilibrium, and this is in line with the current account surpluses accumulated over time. The country was on a path of sustainable divergence, according to Cimoli et al. (2010), which occurs when the country grows less than the rest-of-the-world (GDP<GDPW) while keeping the current account in equilibrium or with a surplus ($\epsilon/\pi \geq (GDP/GDPW) < 1$). The sector that contributed most to the downtrend in ϵ was the high-tech sector.

For Portugal, weak non-price competitiveness was observed in primary products (PP – mainly oil products), medium technology (MT), and high technology sectors (HT). In these sectors, the Portuguese economy had external deficits during the period. The most significant competitive strength was in the traditional and unskilled labor-intensive sectors, such as resource-based products (RB), tourism services (SD), and transportation (SC). These last sectors have made an essential contribution to the economy on a path of sustainable divergence[3]. The sector that contributed most to the uptrend in ϵ was the resource-based sector.

Overall, the GDP growth rate predicted by the MSTL model for Portugal overestimates the growth rate actually observed. One would expect external deficits to lead to an even higher GDP growth rate than that estimated by the model, meaning that the country may have internal supply constraints that prevent it from growing, as in the case of Italy – see Soukiazis et al. (2015) – or is using its recent current-account surplus to cancel debts it contracted in previous periods. The country may not yet have benefited from the development of some proxy variables for labor force skills, which constrained

[3]This type of divergence appears when a small open economy grows less than its trade partners. The current account shows a surplus or equilibrium (Cimoli et al. 2010). In the case of Portugal, there is an external deficit on average for the period considered, but the Portuguese economy has had an external surplus since 2013.

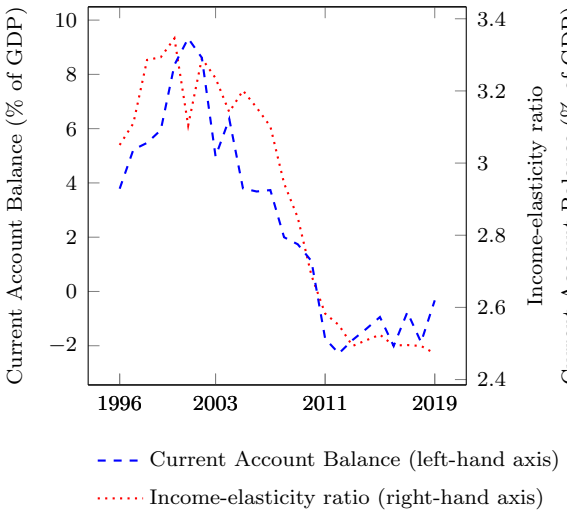


FIGURE 5.3. **Finland:** Current account balance as a % of GDP – left hand axis – and the non-price competitiveness ratio (ϵ/π) – right hand axis. **Correl.: 0.93**. 1996-2019. Source: AMECO and author´s calculations.

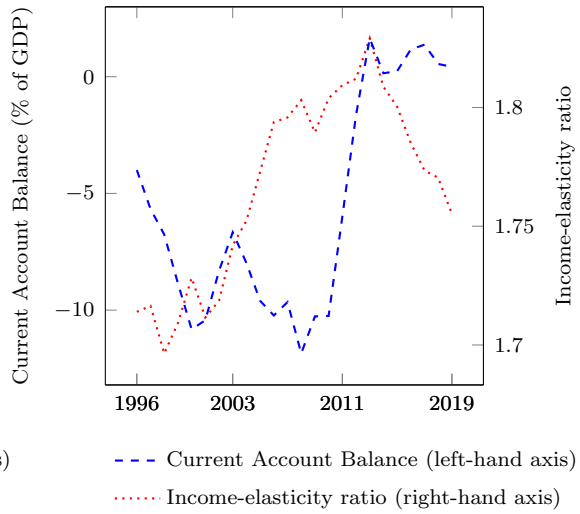


FIGURE 5.4. **Portugal:** Current account balance as a % of GDP – left hand axis – and the non-price competitiveness ratio (ϵ/π) – right hand axis. **Correl.: 0.28**. 1996-2019. Source: AMECO and author´s calculations.

the growth of the Portuguese economy between 1996 and 2019. This hypothesis will be analyzed in the next Section.

TABLE 5.9. Disaggregated sectoral weighted income-elasticity ratios for Portugal. Source: author's calculations.

	PP	RB	MT	LT	HT	SD	SC	OS	**TOTAL**
ϵ	0.071	0.460	0.309	0.331	0.095	0.166	0.119	0.218	**1.771**
π	0.185	0.150	0.243	0.154	0.089	0.045	0.045	0.089	**1.002**
ϵ/π	0.382	3.065	1.269	2.142	1.072	3.667	2.640	2.440	**1.767**
Trade Balance (as % of GDP)	-5.9	0.7	-3.0	0.7	-2.3	3.5	0.8	0.5	**-3.9**
World GDP observed growth rate									**2.47**
GDP observed growth rate									**1.09**
MSTL GDP predicted growth rate									**4.36**

End of table

Finally, Figures 5.3 and 5.4 show graphs that allow us to analyze the evolution of the current account balance and the non-price competitiveness ratio (ϵ/π) for Finland and Portugal, respectively. In the case of Finland, it can be seen that the deterioration in the external balance, which has been sharp since 2007, goes hand in hand with the deterioration in non-price external competitiveness. For Portugal, there is no direct relationship between the evolution of the external balance (which has evolved positively since

2010) and non-price competitiveness (which has tended to grow slightly since 1996). This suggests that other factors may have affected the external accounts and not just the trade balance, such as changes in gross capital flows (see Chapters 2 and 3), after Portugal joined the Eurozone.

5.5. Empirical evidence from growth regressions

The objective of this Section is to explain the annual growth of real GDP, using the independent variables studied in the previous Sections and associated with foreign trade and human capital. The work of Caselli et al. (1996) and Soukiazis & Antunes (2012*b*) inspired this study. However, we make use of uses time series techniques instead of panel data since the intention is to analyze only two countries. Cross-section studies obscure inter-country differences and tend to mask information about dynamic behaviors within countries. To avoid non-stationary problems, log variables and performed first differences are used (see the unit root tests in Table C.6 and C.8, in the appendix Section).

The general specification of the growth equation (with no interaction terms) is as follows:

$$gy_t = b \cdot ln(y_{t-1}) + c_1 \cdot ln(\eta_t + g_t + \delta_t) + c_2 \cdot ln(s_t) + c_3 \cdot ln(HC_t) + c_4 \cdot ln(FT_t) + u_t \quad (5.5)$$

The u_t term refers to the idiosyncratic error, and the subscript t refers to time ($t = 1997, \ldots, 2019$). The dependent variable is the annual growth rate of real income. The growth regressions can be adapted to consider each of the four human capital proxies separately, combining them alternatively with the international trade variables. Following this approach, the most relevant combinations are shown in Tables 5.10 and 5.11.

The proxies for human capital (HC) used are: the enrollment in tertiary education ($educ$), submission of citable articles per active population (art), the patenting per active population (pat), and a patent/article ratio (pat_art). As foreign trade (FT) variables there are: foreign trade openness (op), the annual change in international investment position (iip), the weighted income-elasticity of exports (ϵ) and imports (π), and the weighted income-elasticity ratio of exports to imports (ϵ/π), reflecting the non-price competitiveness. To avoid problems of multicollinearity between independent variables in the regressions, the correlation matrix between them was drawn (see Tables C.7 and C.9 in the appendix Section). The results for the regressions illustrated in Tables 5.10 and 5.11 only show combinations of uncorrelated independent variables.

In all the growth regressions, the lagged real income growth (y_{t-1}) – a convergence factor – and the gross saving ratio (s_t) were used as common in all regressions. In these

regressions, the variable annual growth of population $(\eta_t + g + \delta)$[4] was not used due to problems of non-stationarity (as reported in Tables C.6 and C.8 in the appendix Section). As for the remaining variables, their relevance was tested by assuming alternative combinations of human capital and foreign trade proxies. The regressions were run by Stata using simple OLS methods. All variables were placed in logarithms, to which the first differences were applied (second logarithm differences were applied to variable *educ* to avoid problems of non-stationarity).

TABLE 5.10. Time series growth regressions for Finland. 1997-2019. Dependent variable: annual growth rate of real GDP. Source: author's calculations.[a]

	(1)	(2)	(3)	(4)	(5)	(6)
$y_{(t-1)}$	0.303*	0.298***	0.331***	0.832***	0.727***	0.824***
	(2.07)	(3.19)	(3.48)	(4.83)	(4.27)	(4.71)
s	0.348***	0.257***	0.286***	0.279***	0.247***	0.298***
	(4.8)	(5.53)	(5.61)	(4.98)	(4.56)	(5.43)
pat	-0.076		-0.075	-0.061		-0.066
	(-1.03)		(-1.54)	(-1.13)		(-1.20)
educ	0.354*			0.181	0.222	
	(1.88)			(1.25)	(1.47)	
art	0.04		0.008	0.188*		0.205*
	(0.3)		(0.09)	(1.75)		(1.91)
iip		0.004**	0.004*			
		(2.11)	(2.16)			
ϵ		0.302***	0.287**			
		(2.95)	(2.8)			
π		1.016***	1.013***			
		(5.17)	(5.21)			
$op * (\epsilon/\pi)$				3.608***	3.137***	3.954***
				(3.93)	(3.48)	(4.44)
cons	0.01	0.017***	0.013**	-0.005	0.006	-0.005
	(1.33)	(5.02)	(2.47)	(-0.66)	(1.4)	(-0.73)
OBS	23	23	23	23	23	23
R2	0.744	0.885	0.901	0.87	0.837	0.857
F (5, 17)	9.884	26.247	19.516	17.796	23.164	20.385
Breusch-Godfrey LM test for autocorrelation	2.517 (0.1126)	0.003 (0.9572)	0.003 (0.9541)	0.000 (0.998)	0.640 (0.4236)	0.177 (0.6739)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

[4]We added $(g + \delta) = 0.05$, with g as the rate of technological progress and δ as the rate of (human and physical) capital depreciation, equal across countries and through time, to the annual population growth rate η_t, following Islam (1995) and Soukiazis & Antunes (2012*b*).

Among the variables common to all regressions, both the growth in the immediate previous period (the partial adjustment mechanism) and growth of the gross saving ratio are statistically significant in explaining the dependent variable for the case of Finland. As for the human capital variables, only the growth of school enrollment in tertiary education (*educ*) is statistically significant, with the expected (positive) sign (see column (1)).

As for the foreign trade variables (column (2)), the weighted income-elasticities and the change in IIP have statistical significance, with positive signs: improving the international investment position and increasing the marginal propensity to export and import are associated with a positive growth in real GDP. Columns (3) to (6) show that combining the variables of external demand with human capital conditions indicates a greater statistical relevance in the first group. Columns (4) to (6) show that the variable combining the change in openness to foreign markets with the non-price competitiveness ratio has a significant and highly positive effect on the change in real GDP. Changes in trade intensification and economic competitiveness were significant growth drivers for Finland during the period under analysis.

TABLE 5.11. Time series growth regressions for Portugal. 1997-2019. Dependent variable: annual growth rate of real GDP. Source: author's calculations.[a]

	(1)	(2)	(3)	(4)	(5)	(6)
$y_{(t-1)}$	0.498***	0.594***	0.385**	0.405*	0.510***	0.410**
	(3.16)	(3.45)	(2.21)	(1.81)	(3.23)	(2.14)
s	-0.05	-0.033	-0.045	-0.046	-0.057	-0.002
	(-1.13)	(-0.77)	(-1.05)	(-1.03)	(-1.27)	(-0.05)
pat	-0.045**		-0.038*	-0.048*	-	
	(-2.33)		(-1.97)	(-2.03)	0.062***	
					(-3.05)	
educ	0.056		0.103			0.249*
	(0.45)		(0.82)			(1.93)
art	-0.137*		-0.153*	-0.148*		
	(-1.76)		(-1.99)	(-2.03)		
op		-0.096**				
		(-2.78)				
iip		-0.01	-0.023			-0.026
		(-0.63)	(-1.37)			(-1.44)
ϵ/π				-0.086		
				(-0.62)		
$iip * (\epsilon/\pi)$					2.974*	
					(1.74)	
cons	0.023*	0.007	0.022**	0.177*	0.012**	0.004
	(2.62)	(1.42)	(2.51)	(0.72)	(2.69)	(0.74)
OBS	23	23	23	23	23	23
R2	0.609	0.568	0.65	0.613	0.581	0.489
F (5, 17)	5.302	5.925	4.959	5.40	6.251	4.301

Time series growth regressions for Portugal. 1997-2019. Dependent variable: Annual growth rate of real GDP. Source: author's calculations.[a]

	(1)	(2)	(3)	(4)	(5)	(6)
Breusch-Godfrey LM test for autocorrelation	1.29 (0.2561)	1.095 (0.2954)	2.608 (0.1063)	0.411 (0.5217)	0.057 (0.8114)	0.059 (0.8082)

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Values in parentheses correspond to t-statistics, except for the LM test. Critical values are provided by Stata.

Regarding Portugal, only the growth in the immediate previous period is statistically significant in explaining the dependent variable, among the variables common to all regressions. Gross savings have not been a driver of growth in Portugal in these years, and curiously, the coefficient is negative.

For human capital variables (column (1)), although they are significant (especially *pat* and *art*), they have a coefficient close to zero, and the negative sign is not as expected. It is possible that the benefits associated with the growth of these indicators will only be visible in the long term. The variable of *educ* only assumes significance by also controlling the annual variation of the IIP (column (6)).

As for the external trade variables (column (2)), only trade openness is statistically significant, with a negative sign: the growth in the share of exports and imports in GDP of 1% is associated with the negative real GDP growth of 0.09% (also controlling the change in the IIP). The non-price competitiveness indicator only assumes statistical significance combined with the change in IIP (column (5)). The non-significance associated with the gross savings of the economy and the little significance associated with external competitiveness suggests that other mechanisms led to the growth of the Portuguese economy, such as external capital flows. This last hypothesis was explored in Chapter 3 of this dissertation. The improvements regarding enrollments in tertiary education in Portugal, in recent years, although only significant in one of the regressions, always assume a positive coefficient.

5.6. Conclusions

This chapter explores the hypothesis that economic growth was constrained by the balance-of-payments in two countries, Finland and Portugal, with quite similar levels of real GDP during the 1990s, and which since then had grown less than the world average. Despite this, the two countries had different GDP per capita, different levels of schooling skills and innovation, and external accounts with contrasting trajectories, with Finland standing out positively. Finland also had a higher share of foreign trade in high-tech sectors, which gave it a higher level of non-price competitiveness than Portugal.

The evolution of Finland's external accounts went hand in hand with the country's non-price competitiveness, marked by Nokia's loss of market share following the smartphone boom led by other competing firms. The Finnish economy was also growing at a good pace until then.

Although Portugal's non-price competitiveness ratio is higher than one, this does not mean the country's external accounts are sustainable. Portugal shows weak competitiveness in medium and high-tech sectors and concentrates its competitiveness in more traditional and less technology-intensive sectors, such as tourism, with a high import content. The deterioration of external accounts reflects this and a strong dependence on primary energy products. The fact that the non-price competitiveness index does not keep pace with the Portuguese economy's external balance raises the possibility that it has been impacted by other factors, such as the massive capital inflows after joining the euro.

This Essay also tests the hypothesis that demand and supply forces explain real GDP growth in the two countries in an attempt to reconcile the post-Keynesian and neoclassical approaches to economic growth. Bearing in mind the neoclassical literature that points to the role of human capital in economic growth, and the critical literature on human capital, the results show that these indicators are not particularly significant nor have high elasticity levels. This may indicate that their effect is reflected more in economic growth in the long-term, which could be investigated in the future. The positive impact of growth in the previous year leads us to suggest that growth dynamics follow a path dependency and partial adjustment process.

The conditions for growth in both countries are constrained by non-price competitiveness, so policy guidelines should focus on factors such as the incorporation and design of technology, and productive innovation – conditions close to the supply-side. Also, regarding policy implications, the declining trend in the non-price competitiveness ratio (especially in high-tech manufacturing) should be a cause for concern in Finland, given the long-term implications. For Portugal, there are progress in human capital indicators – which may become relevant for the pace of real GDP growth in the medium term, – and in the non-price competitiveness, since the economy started to run external surpluses from 2013 onwards. However, the latter has been concentrated in low-tech sectors (tourism export-led), putting at risk the retention of highly qualified employees in the country.

CHAPTER 6

Conclusions

6.1. Summary of the Thesis: General Conclusions

Neglecting the balance-of-payments figures or merely looking at the current account balance implies *losing relevant information* for policy design. Situations of financial instability, poverty or uneven development can be avoided by taking a critical look at this macroeconomic instrument. This PhD thesis demonstrates the usefulness and richness of the external statistics.

This work is part of the field of Political Economy studies, as it gives relevance to issues left aside by mainstream economics, considering historical perspectives, invoking a plurality of methods (some of which are validated by neoclassical economics), and putting different currents of literature into confrontation. All the chapters highlight different ideas on a given topic involving the BoP.

Why is it necessary to study the relevance of the balance-of-payments? Among the actions of institutions, observers in general, and in the reference literature, there is evidence that the BoP was *somewhat neglected* during the setting up of the euro and its first years in force. This action was highly influenced by the dominant mainstream agenda, which attributed a null or limited role to the balance-of-payments in a monetary union, either because the Eurozone would converge towards an optimal currency area, or because deficits would be resolved through efficient market mechanisms, or even because a deficit today is a result of an optimal decision by agents between consumption and savings.

The role of external imbalances, which accumulated in the EMU until 2008, is not consensual in the literature, even among authors who follow the same theoretical approaches (mainstream or heterodox). However, it is a debate that intersects with the relevance of the balance-of-payments in a monetary union. It is interesting to observe that the dominant ideas, by not giving the necessary importance to the balance-of-payments, were confronted with the fact that the *countries which accumulated external deficits* until the euro crisis were precisely those which *suffered the most* from the effects of that crisis, and those which made the greatest sacrifices to reverse that situation (which has still not been fully done).

Institutions and observers in general gave more importance to the Government failures than to the macroeconomic gaps exposed by the BoP. The imbalances revealed by the balance-of-payments mirrored the different growth models, the institutional failures of the euro, and are key to the EZC. After this event, all the countries in the Eurozone began to follow an *export-led model based on external surpluses*. However, repressing

growth models based on consumption and public investment can have severe consequences regarding people's quality of life, business productivity, or democratic stability (Johnston & Matthijs, 2022).

In order to organize a body of literature that has sought to explain the external imbalances in the euro area, that have occurred since 1996, three *fundamental causes* have been separated to help explain the EZC:

- An external (price) competitiveness problem.
- Financial flows from the North (in surplus) to the South (in deficit).
- Excessive spending over savings in the public and/or private sectors of the deficit countries.

It is possible to separate conventional and heterodox theoretical approaches within each of these explanations. The same division can be made when analyzing the role of the balance-of-payments in a monetary union. However, in this case, the authors are divided between those who defend a null or limited role for the BoP (market mechanisms resolve imbalances – mainstream version; except in limited cases, TARGET2 is a counterpart to external deficits – heterodox approach); and those who attribute relevance to this instrument (the EZC is the result of a sudden stop typical of a classic BoP crisis – mainstream version; gross financial flows reveal potential instabilities for the real economy – heterodox version).

Another of the starting questions was: *Which mechanisms were behind the external imbalances in the early years of the EMU*? *Essay 1* starts answering this question. The results suggest Granger-causality, from 1996 to 2007, between the convergence of nominal sovereign interest rates and subsequent changes in the current account balance, for peripheral countries after one year. This is an exercise of statistical correlation, which helps to reinforce the mechanisms listed by the theory or the empirical information that supports it.

Interest rate convergence affects the current account balance through three interrelated mechanisms, which are summarized here:

(1) More accessible access to credit through ever lower interest rates leads to an increase in the supply of money in the economy and real appreciation against other countries, which causes disruptions in the market for goods and services, affecting the external balance.
(2) Lower interest rates, resulting from expectations of convergence in the peripherals, lead to net capital flows from the North to the South (recycling of Surpluses), which result in the future payment of income abroad, further contributing to the deterioration of the current account balance.
(3) In an environment of lower interest rates and easier access to credit, banks tended to lend to sectors less exposed to external competitiveness, such as real estate or tourism, and which guaranteed them safer collateral, thus generating dependence on foreign markets for tradable goods, and jeopardizing external accounts.

This chapter makes another significant contribution by clearly separating core and periphery countries using quantitative clustering techniques. The former are Germany and Finland, and the latter are Greece, Portugal, Spain, and Ireland. This last country is in a separate cluster, which makes sense given the macroeconomic differences between the other three countries. Ireland is not a net exporter of tourism services, and does not have high levels of real appreciation based on ULC.

Furthermore, to what extent could balance-of-payments analysis be more valuable? The work done so far makes it possible to defend the thesis that the BoP is a much richer tool than merely interpreting the current account balance or net capital flows. As it results from the difference between the change in net foreign assets and the change in net foreign liabilities of an economy, net inflows can remain relatively balanced. However, the domestic economy is faced with a situation of a continuous increase in net responsibilities. This accumulation can be associated with subsequent sudden stops, financial vulnerabilities, and uneven development, depending on the nature of the accumulation of liabilities in terms of the instrument (loans, debt, or equity securities), the sector, and the residence of the holder of these liabilities, the denomination of the liabilities in terms of currency, or the maturity of the contracts signed.

Which role have international institutions and observers in general attributed to external statistics? Which ideas lie behind the narrative of these institutions, and what are the alternative visions?

Returning to *Essay 1*, the current account balance has been an element that identified the countries that *suffered most* from the crisis, in the form of rising nominal interest rates and severe austerity policies, giving rise to theories that the euro crisis was a balance-of-payments crisis. Nevertheless, according to a monetary post-Keynesian perspective, the external balance cannot be read as a causal mechanism. It is a consequence of other mechanisms, in this case, the interest rate convergence mechanism that occurred in the euro's early years, which boosted the credit demand.

Using IMF publications (taken as an example of a mainstream institution) for the Portuguese economy (an example of a peripheral country that saw its external debt exploding during and after joining the euro), it is possible to observe the null or limited role attributed to external accounts. External deficits were seen as the result of inter-temporal rational consumer agent decisions; the priority would be to stabilize public accounts; limiting external deficits was nonsense because it would mean limiting the free movement of capital, which was the spirit of the monetary union; imbalances would automatically re-establish themselves through efficient market mechanisms; and what mattered above all was looking at the union's balance-of-payments and not what was happening in a particular country.

The focus was on the current account balance, resulting from domestic savings, which triggers financing from countries in deficit (*loanable funds theory*), disregarding the signals given by the various items of the balance-of-payments. Price competitiveness would be

a key instrument for adjusting external deficits without an exchange rate policy. If the markets did not spontaneously correct this imbalance, *internal depreciation* would have to be promoted to reduce unit labor costs, with distributive consequences, ignoring non-price competitiveness factors.

Which other items are worth looking at besides the current account balance? Still, for the Portuguese case, *Essay 2* points to two mechanisms in this economy, explored in Kohler (2023), through which gross capital flows can affect the real economy, imports and exports. The first involves the inter-bank capital flows, driven by high asset yields or expectations of economic convergence, increasing the money supply and aggregate demand, leading to external deficits.

The second mechanism concerns portfolio investment of a speculative nature in the domestic economy, which increases asset prices and lowers yields, translating into greater demand for credit, further increasing asset prices and bank collateral. The boost in economic activity results in an increase in imports and inter-bank transactions. These mechanisms are occurring in the Portuguese economy, as shown in Chapter 3, drawing on data from Banco de Portugal. There is evidence of a speculative attack since there is no credible lender of last resort, contradicting the hypothesis of a sudden stop typical of a classic BoP crisis.

Analyzing correlations between gross capital flows in the Portuguese balance-of-payments allows us to structure *four stylized facts*, that help us understand the Portuguese crisis and the path followed after that event:

(1) Gross capital foreign inflows and outflows by banks are correlated.
(2) Gross capital inflows and outflows from banks and the public sector, and vice versa, are correlated.
(3) Trade flows have little correlation with gross capital flows, except after the GFC (Foreign Direct Investment inflows into non-financial corporations strongly correlated with exports, imports, and current account dynamics).
(4) Gross capital flows of the public sector are generally negatively correlated with those of the non-financial private sector.

In a nutshell, the first fact sheds some light in the role of banks as a liquidity intermediary vis-á-vis the rest-of-the-world. In the second fact, banks and the public sector act differently towards the external sector, which reveals the role of the public sector (especially the Central bank) as a force that acts according to the behavior of domestic sectors.

These two correlation patterns are evidence of the process of financialization in Portugal, which has accelerated with integration into the single market, the convergence of real interest rates, the end of currency risk, the deregulation of the financial system, or the free movement of capital.

The third fact is relevant to reinforce the argument (both in the literature that uses balance-sheet approaches and in the post-Keynesian one) that gross flows in the financial account are independent of the current account balance (despite affecting the real economy). The last stylized fact reinforces the second by demonstrating that the public sector behaves oppositely to all other domestic sectors regarding financial flows with the rest-of-the-world. This can also be observed by regularly looking at the flows of funds in the national financial accounts data.

Another BoP item – the balance of services – is worth looking at, and *Essay 3* does so by applying the multi-sectoral Thirlwall's model exclusively for service items. In recent decades, international trade in services has grown enormously, both in developed and developing economies. For a wide range of countries with external statistics available on the IMF website, and the period between 1996 and 2019, the real exchange rate does not, in general, assume statistical significance in determining exports and imports of various types of services. It is interesting to link this conclusion with the first two Essays. One of the most fundamental premises of the monetary PK approach is that asset price dynamics are critical drivers of financial instability. It follows that macroeconomic imbalances are not created by changes in the prices of non-financial assets (such as goods and services) but by changes in the prices of *financial assets*.

Essay 3 also finds a negative correlation between the balance of services and the current account balance, especially in countries that are highly specialized in tourism services. The same is identified in *Essay 1* for the starting countries of the EMU. This conclusion calls into question the tourism-led growth model and others that question the environmental, social, and territory planning effects associated with this growth model.

Also, economies with a higher share of modern services have a *higher non-price competitiveness ratio*. This index is derived from the computation of the income-elasticities of exports and imports, and measures the level of competitiveness of economies determined by non-price factors linked to supply conditions, such as innovation, design, or incorporated technology. Being more competitive in services is usually indicative of economic convergence and development. There is evidence of two waves of growth in the services sector: countries at a higher stage of development (as measured by GDP per capita levels) have a higher share of modern services exports, and less developed countries have a higher share of traditional services exports. Moreover, the negative correlation between the balance of services and the current account, in a large group of countries, raises even more doubts about the meaning of the current account balance.

Still, on the application of the balance-of-payments constrained growth model, *Essay 4* takes two countries, Finland and Portugal, with the same level of real GDP in the 1990s, in the framework of the euro area, and which, since then, have grown less than the world average. These are also countries that are in the core and peripheral clusters, respectively (recalling *Essay 1*). The non-price competitiveness ratio in Finland, calculated for the period between 1996 and 2019, by applying the multi-sector Thirlwall's Law

using data on goods and services, is considerably higher than that for Portugal. Finland also outperforms Portugal regarding labor force skills, especially those linked to schooling (despite developments in the latter country between 1996 and 2019).

For Finland, the development of the current account balance follows quite close the evolution of the income-elasticity ratio, which is not the case for Portugal. In the first country, both the external balance and the non-price competitiveness ratio are affected by the rise and fall of Nokia's business.

Portugal has lower non-price competitiveness indices in sectors where it is in deficit towards the rest-of-the-world (medium and high-technology sectors). The low level of non-price competitiveness, when compared to Finland, reflects dependence on the latter group of products and primary energy goods. For Portugal, it is important to note that there is no correlation between the current account balance and the non-price competitiveness index. This conclusion suggests that factors other than non-price competitiveness have affected economic activity, such as the massive gross capital inflows from abroad (as developed in the first two Essays).

In an attempt to reconcile the neoclassical and post-Keynesian approaches to explaining economic growth, econometric regressions were run for the two countries to determine the real GDP growth, using elements of external demand (such as the previously computed non-price competitiveness index) and supply (human capital indicators, mainly associated with schooling). The latter group of variables was not particularly significant in explaining output growth, except when combined with external demand variables.

Other starting questions can also be addressed. What constraints are placed on economic growth by the balance-of-payments? The empirical application of the Thirlwall's model, in Essays 3 and 4, did not seek an equality between the observed growth rate and the one predicted by the model. However, it is possible to assume that, given the impact and mechanisms associated with the trade and financial flows of the BoP on the real economy, it does constrain economic growth, even in a country belonging to a monetary union.

Instead of joining a monetary union and sharing most of their sovereignty, other countries also took the balance-of-payments problems, exchange rate volatility, and the inflow and outflow of speculative investment flows from abroad seriously. Overall, the results presented in this dissertation indicate that BoP figures matter, that relying exclusively on the current account balance is limited, and that paying more attention to all balance-of-payments phenomena and mechanisms is a good idea.

6.2. Policy implications

The first two chapters of this thesis show that the EMU was conceived with no room for bailouts (which would oblige debt transfers or mutualization mechanisms), lack of banking supervision, and only limiting fiscal policy. This should create incentives for solid monitoring of external accounts. The trade integration process, which increased the elasticity of substitution between domestic and external products, should reinforce that

need. However, limiting current account deficits goes against the principle of the free movement of capital and constrains the economic policy of governments, creating even more rules. Limiting unit labor costs and real exchange rates would create distributional problems: there is a risk of perpetuating the internal depreciation policies, which benefit the vested interests. That leaves:

(1) Transfer mechanisms between countries to avoid asymmetric shocks and liquidity crises, implementing a solidarity union not based exclusively on an export-led strategy. The political responses to the Covid-19 pandemic are moving in this direction, such as the SURE or the Next Generation EU programs[1], both provided by the European Commission, or the PEPP[2] provided by the ECB.

(2) Industrial and regional policy, which governments should carry out to restore non-price competitiveness and export diversification – the international institutions themselves already admit the latter as a possibility (Irwin 2023).

Linked to industrial policy, non-price competitiveness can also be boosted by attracting foreign direct investment. This should be aimed at strengthening the country's technological capacity, providing qualified employment, creating competition between firms, boosting the productive sectors around this investment, increasing physical capital and infrastructure, and reducing dependencies on tourism (with little potential for increasing productivity) and primary products associated with fossil fuels. The example given in *Essay 4* is paradigmatic for Finland, whose non-price competitiveness depended on the dynamism of Nokia's high-tech activity.

Countries with a higher development position have the highest levels of non-price competitiveness in the services sector and have the highest share of modern services. This reinforces the need to enable more public and private investment in science, in mission-oriented research and development, and in national innovation systems (see European Commission (2018)). An economy dependent on sectors with low-technological incorporation, such as tourism, is unlikely to guarantee current account surpluses and jeopardize the retention of skilled labor in the country.

Essay 2 shows the mechanisms through which gross capital flows, purely financial, affect the real economy and the role of banks as intermediaries of liquidity from abroad. Macro-prudential regulation of inter-bank flows based on external account figures is needed. Also, it is necessary to put a definitive end to incentives to import capital of a speculative and inflation-generating nature, such as "golden visa" programs to attract real estate investment, or the creation of non-habitual tax resident statuses (Financial Times 2023). Again, trade policies are also a way for developing countries to deal with the growing weight of purely financial transactions at the international level (Botta et al. 2023).

[1]See: `https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19#E`

[2]Pandemic Emergency Purchase Program was created in March 2020 to extend the ECB's bond-buying program and inject liquidity into the euro area. See `https://www.europarl.europa.eu/thinktank/en/document/IPOL_BRI(2020)648787`

There are no spontaneous and efficient market mechanisms to correct current account imbalances. That is why policymakers and researchers should have started paying more attention to this indicator and address it in depth. A more comprehensive approach to external accounts is needed. The absence of this interpretation demonstrates a mistake by orthodox policies. The mere monitoring of the current account balance hides disruptive phenomena that, for example, the analysis of gross portfolio investment flows or trade by product make it possible to reveal.

6.3. Limitations of the Thesis

Regarding the *first Essay*, conclusions about Granger-causality should be viewed with particular care. These are statistical correlations between two time series to infer causality between them. It is a method widely validated by neoclassical theory. However, its application should always be done considering that causality can only be established at the level of theory or with empirical information that supports the hypotheses.

The Thirlwall's model, applied on *Essay 3 and 4*, has proved to be helpful in determining the economy's non-price competitiveness index, especially given other empirical applications in the literature. However, the model is limited in predicting observed growth, which has occupied much of the literature in this area over the last 40 years. In other words, economic growth is not strictly constrained by the trade balance, as invoked by the original Thirlwall's model and some of its extensions, but the balance-of-payments as a whole constrains it. The predominance of the dollar, monetary unions between countries/regions, or modern settlement systems allow economies to grow thanks to the free movement of capital. Symmetrically, a country with relatively stable current account balances can reveal internal vulnerabilities or be subject to financial instability from abroad.

In addiction, the multi-sector Thirlwall's Law application, in *Essay 3*, considers very different countries, which can be questioned. Even if we separate developed and developing countries, the same panel analyzes countries that belong and do not belong to monetary unions, with different exchange rate regimes and different macroeconomic policies. We know from the first three chapters of this work that this changes the dynamics of trade and financial relations with the rest-of-the-world. The definition of the boundary between what is considered goods and what are services, in the context of national accounts, has also been the subject of intense debate in the literature (see critical contributions from Christophers (2013) or Mazzucato (2018)).

The suggestions in the next Section for future research also hint at what could have been done here and still needs to be completed.

6.4. Suggestions for further research

In order to strengthen the literature on the Political Economy of the balance-of-payments, giving more relevance to the various items of this indicator, this Section suggests some avenues for future work.

Firstly, the causal mechanisms for the convergence of sovereign interest rates in the Eurozone up to 2007 should be further investigated. What would be the role of monetary policy, macroeconomic fundamentals, investors' perceptions and their outlook on the convergence of countries, or the endogeneity of the currency (taking into account the ease of access to a large and liquid monetary market)?

Secondly, studies in Comparative Political Economy have become increasingly receptive to introducing macroeconomic fundamentals in their analysis. Adding the role of gross capital flows needs to be improved in this field of studies, as evidenced by the results in *Essay 2*, and has vast untapped potential. Added to this is the need for more analysis based on the balance sheet approach. Financial globalization and the relocation of firms and banks to various regions make this last suggestion even more pressing.

Thirdly, it is worth testing the application of Thirlwall's model exclusively for countries in a monetary union, and taking capital flows into account. The balance-of-payments constrained growth model has been challenged, or is being challenged, by trends in the international monetary system in recent years. According to Thirlwall (1979), no country can keep permanent external deficits without jeopardizing economic growth. The US, and its "exorbitant privilege", has challenged this theory, which has nevertheless been widely studied in the literature, and has helped to understand the constraints imposed by the external balance, the role of prices, non-price competitiveness and capital flows.

Fourthly, the "Dutch disease" concept, also explored in *Essay 1*, applied to tourism-exporting economies can be further investigated. *Essay 3* shows that the relationship between the services balance and the current account balance is negative in developing economies, specially in those that are more dependent on tourism (given the natural resources, underlying climatic conditions, and more). These conclusions raise the hypothesis that the capital inflows, as a counterpart to tourism exports, are overheating the economy and drying up the external competitiveness of the manufacturing sectors of tradable goods. Gross capital inflows may also be associated with the "Dutch disease", which could be explored in more detail. Gabrisch & Staehr (2014) found Granger-causality between current account deficits and increases in ULC, which is explained by imported inflation through foreign capital inflows.

Specifically for Portugal, it is worth looking at the research done on the basis of *Essay 2*. The stylized facts/correlations can give hints about Portugal's possible transition, after the troika's intervention, from a consumption-led growth model to an export-led model. The link between recent foreign direct investment in Portugal and the payment of investment income abroad could also be explored further. This link will give insights into whether part of this investment is retained and strengthens domestic productive capacity or whether it only serves to extract profits.

Finally, the extent to which the non-price competitiveness index is a variable that leads to future economic growth remains to be studied. In other words, it is suggested to

add the income-elasticity ratio, with time lags, to the growth model presented in *Essay 4*, and the same is proposed for the labor force skills indicators.

References

Abrigo, M. & Love, I. (2016), 'Estimation of panel vector autoregression in Stata', *The Stata Journal* **16**(3), 778–804.
URL: *https://doi.org/10.1177/1536867X16016003*

Al-Safar, Y., Ridinger, W. & Whitaker, S. (2013), 'The role of external balance sheets in the financial crisis', *Financial Stability Paper No 24, Bank of England, October* .

Alberola, E. & Benigno, G. (2017), 'Revisiting the commodity curse: A financial perspective', *Journal of International Economics* **108**(S1), 87–106.
URL: *https://doi.org/10.1016/j.jinteco.2017.02.001*

Alesina, A. & Ardagna, S. (2010), 'Large changes in fiscal policy: taxes versus spending', *Tax policy and the economy* **24**(1), 35–68.
URL: *https://doi.org/10.1086/649828*

Alesina, A. F. & Perotti, R. (1994), The political economy of budget deficits. NBER Working Paper No. 4637.
URL: *https://doi.org/10.2307/3867338*

Alfaro, L., Kalemli-Ozcan, S. & Volosovych, V. (2014), 'Sovereigns, Upstream Capital Flows, and Global Imbalances', *Journal of the European Economic Association* **12**(5), 1240–1284.
URL: *https://doi.org/10.1111/jeea.12106*

Allard, C. & Everaert, L. (2010), 'Lifting Euro Area Growth: Priorities for Structural Reforms and Governance', *IMF Staff Position Notes* **10**(19).
URL: *https://doi.org/10.5089/9781462302109.004*

Alonso, J. A. (1999), 'Growth and the external constraint: Lessons from the Spanish case', *Applied Economics* **31**(2), 245–253.
URL: *https://doi.org/10.1080/000368499324471*

Amado, G. (2016), 'Determinants of Educational Attainment: Projections of its Long-Term Effects on the Portuguese Economy'.
URL: *https://repositorio-aberto.up.pt/bitstream/10216/87995/2/158861.pdf*

Amado, G. (2019), Analysis of international services in Portugal, *in* 'Driven by data: Papers presented at national and international conferences', Banco de Portugal, Lisboa, chapter VI, pp. 80–81.
URL: *https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/driven_by_data_2018.pdf*

Amado, G. (2023*a*), 'A thirlwall's law application to international trade in services', *Investigación Económica* **82**(326), 212–239.

URL: *https://doi.org/10.22201/fe.01851667p.2023.326.86115*

Amado, G. (2023*b*), 'Revisiting the Debate on the Eurozone Crisis: Causes, Clustering Periphery and Core, and the Role of Interest Rate Convergence', *International Review of Applied Economics* **37**(5), 642–666.
URL: *https://doi.org/10.1080/02692171.2023.2240269*

Andersson, J. O. & Mjøsset, L. (1987), 'The Transformation of the Nordic Models', *Co-operation and Conflict* **22**(2), 227–243.
URL: *https://doi.org/10.1177/001083678702200209*

Araujo, R. A. & Lima, G. T. (2007), 'A structural economic dynamics approach to balance-of-payments-constrained growth', *Cambridge Journal of Economics* **31**(5), 755–774.
URL: *https://doi.org/10.1093/cje/bem006*

Artus, J. R. & Knight, M. D. (1984), 'Issues in the Assessment of the Exchange Rates of Industrial Countries: A Study', *International Monetary Fund* **29**.
URL: *https://doi.org/10.5089/9781451868593.001*

Avdjiev, S., Hardy, B., Kalemli-Özcan, S. & Serven, L. (2018), Gross Capital Flows by Banks, Corporates, and Sovereigns. BIS Working Papers No 760.
URL: *https://www.bis.org/publ/work760.pdf*

Baccaro, L., Blyth, M. & Pontusson, J. (2022), Introduction: Rethinking Comparative Capitalism, *in* L. Baccaro, M. Blyth & J. Pontusson, eds, 'Diminishing Returns: The New Politics of Growth and Stagnation', Oxford University Press, Oxford, pp. 1–52.
URL: *https://doi.org/10.1093/ oso/ 9780197607855.001.0001*

Baccaro, L. & Höpner, M. (2022), The Political-Economic Foundations of Export- Led Growth: An Analysis of the German Case, *in* L. Baccaro, M. Blyth & J. Pontusson, eds, 'Diminishing Returns: The New Politics of Growth and Stagnation', 1 edn, Oxford University Press, Oxford, chapter 9, pp. 238–267.

Baccaro, L. & Pontusson, J. (2016), 'Rethinking Comparative Political Economy: The Growth Model Perspective', *Politics and Society* **44**(2), 175–207.
URL: *https://doi.org/10.1177/0032329216638053*

Bagnai, A. (2010), 'Structural changes, cointegration and the empirics of Thirlwall's law', *Applied Economics* **42**(10), 1315–1329.
URL: *https://doi.org/10.1080/00036840701721299*

Bairam, E. I. (1988), 'Balance of payments, the Harrod foreign trade multiplier and economic growth: The European and North American experience, 1970-85', *Applied Economics* **20**(12), 1635–1642.
URL: *https://doi.org/10.1080/00036848800000093*

Baldwin, R. & Forslid, R. (2020), Globotics and Development: When Manufacturing is Jobless and Services are Tradable. NBER Working Paper No. 26731.
URL: *http://www.nber.org/papers/w26731*

Banco de Portugal (2009), Relatório do Conselho de Administração - Relatório e Contas 2008, Technical report. Lisboa.
URL: *https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/rel_08_p.pdf*

Barbosa-Filho, N. (2002), The Balance-of-payments Constraint: From Balanced Trade to Sustainable Debt. CEPA Working Paper 2001.06.
URL: *https://doi.org/10.13133/2037-3643/9952*

Barradas, R., Lagoa, S., Leão, E. & Mamede, R. P. (2018), 'Financialization in the European Periphery and the Sovereign Debt Crisis: The Portuguese Case', *Journal of Economic Issues* **52**(4), 1056–1083.
URL: *https://doi.org/10.1080/00213624.2018.1527589*

Barro, R. J. (1990), 'Government spending in a simple model of endogenous growth', *The Journal of Political Economy* **98**(5), S130–S125.
URL: *https://doi.org/10.1086/261726*

Barro, R. J. (1991), 'Economic growth in a cross section of countries', *The Quarterly Journal of Economics* **106**(2), 407–443.
URL: *https://doi.org/10.2307/2937943*

Barro, R. J. & Sala-i Martin, X. (2004), *Economic growth*, 2 edn, MIT Press, Cambridge, MA.

Baumol, W. & Bowen, W. (1966), *Performing Arts, the Economic Dilemma: A Study of Problems Common to Theater, Opera, Music, and Dance*, Cambridge, MA: MIT Press.
URL: *https://doi.org/10.1017/S0770451800055287*

Belke, A. & Dreger, C. (2013), 'Current Account Imbalances in the Euro Area: Does Catching up Explain the Development?', *Review of International Economics* **21**(1), 6–17.
URL: *https://doi.org/10.1111/roie.12016*

Bellofiore, R., Garibaldo, F. & Mortágua, M. (2016), A structural and monetary perspective of the euro crisis, *in* N. Levy & E. Ortiz, eds, 'The Financialization Response to Economic Disequilibria', Edward Elgar Publishing, Northampton, MA, chapter 1, pp. 15–33.
URL: *https://doi.org/10.4337/9781785364761.00008*

Bibow, J. (2013), 'The Euroland crisis and Germany's euro trilemma', *International Review of Applied Economics* **27**(3), 360–385.
URL: *https://doi.org/10.4337/9781785364761.00008*

Bird, G., Pentecost, E. & Yang, Y. (2019), 'The Twin Deficits Hypothesis: An Empirical Examination', *Open Economies Review* **30**(4), 759–777.
URL: *https://doi.org/10.1007/s11079-019-09541-x*

Blanchard, O. (2006), A Macroeconomic Survey of Europe, *in* 'seminar presentation for the World Economic Laboratory, Massachusetts Institute of Technology', pp. 1–23.
URL: *https://doi.org/10.1257/0895330042632735*

Blanchard, O. & Giavazzi, F. (2002), 'Current account deficits in the Euro area: The end of the Feldstein-Horioka puzzle?', *Brookings Papers on Economic Activity* **209**(2), 147–209.
URL: *https://doi.org/10.1353/eca.2003.000*

Blanchard, O. & Katz, L. (1992), 'Regional Evolutions', *Brookings Papers on Economic Activity* **2**, 1–61.

Blecker, R. A. (2016), 'The debate over 'Thirlwall's law': Balance-ofpayments-constrained growth reconsidered', *European Journal of Economics and Economic Policies* **13**(3), 275–290.
URL: *https://doi.org/10.4337/ejeep.2016.03.03*

Blecker, R. A. (2022), 'New advances and controversies in the framework of balance-of-payments-constrained growth', *Journal of Economic Surveys* **36**(2), 429–467.
URL: *https://doi.org/10.1111/joes.12463*

Blecker, R. A. & Setterfield, M. (2019), *Heterodox macroeconomics: Models of demand, distribution and growth*, Edward Elgar Publishing, Northampton, MA.
URL: *https://doi.org/10.4337/9781784718909*

Blyth, M. (2009), An approach to comparative analysis or a subfield within a subfield? Political economy, *in* 'Comparative Politics: Rationality, Culture, and Structure, Second Edition'.

Blyth, M. (2013), *Austerity: The history of a dangerous idea*, 1 edn, Oxford University Press, Oxford.
URL: *https://doi.org/10.1080/09692290.2014.953352*

Bofinger, P. (2015), 'German wage moderation and the EZ Crisis'. VoxEU.org. November 30 2015. Date accessed: March 20 2020.
URL: *https://voxeu.org/article/german-wage-moderation-and-ez-crisis*

Bolukoglu, A. (2020), 'Capital flows, real exchange rate appreciation, and income distribution in an open economy post Keynesian model of distribution and growth', *Journal of Post Keynesian Economics* **43**(4), 608–633.
URL: *https://doi.org/10.1080/01603477.2020.1811125*

Borio, C. & Disyatat, P. (2011), Global Imbalances and the Financial Crisis: Link or No Link? BIS Working Papers No 346.
URL: *https://www.bis.org/publ/work346.pdf*

Borio, C. & Disyatat, P. (2015), Capital flows and the current account: Taking financing (more) seriously. BIS Working Papers No 525.
URL: *https://www.bis.org/publ/work525.pdf*

Botta, A. (2015), The Macroeconomics of a Financial Dutch Disease. Levy Economics Institute of Bard College, Working Paper No. 850.
URL: *https://dx.doi.org/10.2139/ssrn.2682644*

Botta, A., Porcile, G., Spinola, D. & Yajima, G. T. (2023), 'Financial integration, productive development and fiscal policy space in developing countries', *Structural Change*

and Economic Dynamics **66**, 175–188.
URL: *https://doi.org/10.1016/j.strueco.2023.04.016*

Bottega, A. & Romero, J. P. (2021), 'Innovation, export performance and trade elasticities across different sectors', *Structural Change and Economic Dynamics* **58**(September 2021), 174–184.
URL: *https://doi.org/10.1016/j.strueco.2021.05.008*

Bourdieu, P. & Passeron, J.-C. (1973), Cultural Reproduction and Social Reproduction, *in* R. Brown, ed., 'Knowledge, Education, and Cultural Change: Papers in the Sociology of Education', Routledge, London and New York, pp. 71–112.

Bowles, S. & Gintis, H. (1971), *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*, Basic Books, New York.

Bowles, S., Gintis, H. & Osborne, M. (2001), 'Incentive-enhancing preferences: Personal, behavior, and earnings', *The American Economic Review* **91**(2), 155–158.
URL: *ttps://doi.org/10.1257/aer.91.2.155*

Boyer, R. (2018), Comparative Political Economy, *in* I. Cardinale & R. Scazzieri, eds, 'The Palgrave Handbook of Political Economy', Palgrave Macmillan, London, chapter 16, pp. 543–603.
URL: *https://doi.org/10.1057/978-1-137-44254-3_16*

Broner, F., Didier, T., Erce, A. & Schmukler, S. (2013), 'Gross capital flows: Dynamics and crises', *Journal of Monetary Economics* **60**(1), 113–133.
URL: *https://doi.org/10.1016/j.jmoneco.2012.12.004*

Buera, F. J. & Kaboski, J. P. (2012), 'The rise of the service economy', *American Economic Review* **102**(6), 2540–2569.
URL: *https://doi.org/10.1257/aer.102.6.2540*

Burgisser, R. & Di Carlo, D. (2023), 'Blessing or Curse? The Rise of Tourism-Led Growth in Europe's Southern Periphery', *Journal of Common Market Studies* **61**(1), 236–258.
URL: *https://doi.org/10.1111/jcms.13368*

Caglayan, M. & Demir, F. (2019), 'Exchange rate movements, export sophistication and direction of trade: the development channel and North–South trade flows', *Cambridge Journal of Economics* **43**(6), 1623–1652.
URL: *https://doi.org/10.1093/cje/bez005*

Canova, F. & Ciccarelli, M. (2013), Panel Vector Autoregressive Models: A Survey, *in* 'VAR Models in Macroeconomics – New Developments and Applications: Essays in Honor of Christopher A. Sims (Advances in Econometrics, Vol. 32)', Emerald Group Publishing Limited, Bingley, pp. 205–246.
URL: *https://doi.org/10.1108/S0731-9053(2013)0000031006*

Caselli, F., Esquivel, G. & Lefort, F. (1996), 'Reopening the convergence debate: a new look at cross-country growth empirics', *Journal of Economic Growth* **1**(3), 363–389.
URL: *https://doi.org/10.1007/BF00141044*

Catão, L. A. & Milesi-Ferretti, G. M. (2014), 'External liabilities and crises', *Journal of International Economics* **94**(1), 18–32.
URL: *http://dx.doi.org/10.1016/j.jinteco.2014.05.003*

Catte, P. (1998), Current Accounts: Are they Still Relevant for and within a Monetary Union?, *in* O. Radzyner & A. Schubert, eds, 'Current Account Imbalances in East and West: Do They Matter?', Oesterreichische Nationalbank, Vienna, pp. 144–168.
URL: *https://ssrn.com/abstract=1707898*

Cavallo, D. & Cottani, J. (2010), 'For Greece, a "fiscal devaluation" is a better solution than a "temporary holiday" from the Eurozone'. VoxEU.org. February 21 2013. Date accessed: April 16 2020.
URL: *http://www.voxeu.org/article/greece-should-try-fiscal-devaluation-not-holiday-eurozone*

Cesaratto, S. (2013), 'The implications of TARGET2 in the European balance of payments crisis and beyond', *European Journal of Economics and Economic Policy: Intervention* **10**(3), 359–382.
URL: *https://doi.org/10.4337/ejeep.2013.03.09*

Cesaratto, S. (2015), 'Balance of Payments or Monetary Sovereignty? In Search of the EMU's Original Sin: Comments on Marc Lavoie's "The Eurozone: Similarities to and Differences from Keynes's Plan"', *International Journal of Political Economy* **44**(2), 142–156.
URL: *https://doi.org/10.1080/08911916.2015.1060830*

Cesaratto, S. (2017), 'Alternative interpretations of a stateless currency crisis', *Cambridge Journal of Economics* **41**(4), 977–998.
URL: *https://doi.org/10.1093/cje/bew065*

Cevik, S. (2023), 'Dirty dance: tourism and environment', *International Review of Applied Economics* **37**(1), 168185.
URL: *https://doi.org/10.1080/02692171.2022.2117282*

Chen, R., Milesi-Ferretti, G. M. & Tressel, T. (2013), 'External imbalances in the euro-zone', *Economic Policy* **28**(73), 101–142.
URL: *https://doi.org/10.1111/1468-0327.12004*

Christophers, B. (2013), *Banking Across Boundaries: Placing Finance in Capitalism*, John Wiley & Sons, Oxford.
URL: *https://doi.org/10.1002/9781118295496*

Ciccone, A. & Papaioannou, E. (2009), 'Human capital, the structure of production, and growth', *Review of Economics and Statistics* **91**(1), 66–82.
URL: *https://doi.org/10.1162/rest.91.1.66*

Cimoli, M., Porcile, G. & Rovira, S. (2010), 'Structural change and the BOP-constraint: why did Latin America fail to converge?', *Cambridge Journal of Economics* **34**(2), 389–411.
URL: *https://doi.org/10.1093/cje/ben060*

Clarke, P. (2022), The Keynes Plan and the White Plan at Bretton Woods, *in* J. Osiatynski & J. Toporowski, eds, 'International Equilibrium and Bretton Woods', Oxford University Press, pp. 44–57.
URL: *https://doi.org/10.1093/oso/9780192856401.003.0003*

Constâncio, V. (2000), 'Discurso de tomada de posse do Governador'.
URL: *https://www.bportugal.pt/intervencoes/discurso-de-tomada-de-posse-do-governador-0*

Constâncio, V. (2014), 'The European Crisis and the Role of the Financial System', *Journal of Macroeconomics* **39**, 250–259.
URL: *https://doi.org/10.1016/j.jmacro.2013.08.009*

Croissant, Y. & Millo, G. (2019), *Panel Data Econometrics with R*, John Wiley & Sons, Hoboken, NJ, USA.
URL: *http://doi.org/10.1002/9781119504641*

Dardot, P. & Laval, C. (2013), *The New Way of the World: On Neoliberal Society*, Verso Books, London.

Davidson, P. (2012), 'Is economics a science? Should economics be rigorous?', *Journal of Post Keynesian Economics* (59), 58–66.
URL: *https://doi.org/10.3389/fams.2015.00007*

De Grauwe, P. (2006), 'What have we learnt about monetary integration since the Maastricht Treaty?', *Journal of Common Market Studies* **44**(4), 711–730.
URL: *https://doi.org/10.1111/j.1468-5965.2006.00659.x*

De Grauwe, P. (2011), The Governance of a Fragile Eurozone. CEPS Working Documents. Brussels.
URL: *http://www.ceps.eu/book/governance-fragile-eurozone*

De Grauwe, P. (2013), Design Failures in the Eurozone: Can they be fixed? (LEQS Paper 57/2013).
URL: *https://dx.doi.org/10.2139/ssrn.2215762*

De Grauwe, P. & Ji, Y. (2012), What Germany should fear most is its own fear: An Analysis of Target2 and Current Account Imbalances. CEPS Working Documents.
URL: *https://ssrn.com/abstract=2145926*

De Grauwe, P. & Ji, Y. (2013), 'Self-fulfilling crises in the Eurozone: An empirical test', *Journal of International Money and Finance* **34**(April 2013), 15–36.
URL: *https://doi.org/10.1016/j.jimonfin.2012.11.003*

Decressin, J. & Disyatat, P. (2000), Capital Markets and External Current Accounts: What to Expect from the Euro. IMF Working Papers (WP/02/6).

Di Meglio, G., Gallego, J., Maroto, A. & Savona, M. (2015), Services in Developing Economies: A new chance for catching-up? SPRU Working Paper Series 2015-32.
URL: *https://dx.doi.org/10.2139/ssrn.2744647*

Diaz-Sanchez, J. L. & Varoudakis, A. (2016), 'Tracking the causes of eurozone external imbalances: new evidence and some policy implications', *International Economics and*

Economic Policy **13**(4), 641–668.
URL: *https://doi.org/10.1007/s10368-015-0316-0*

Draghi, M. (2012), Competitiveness of the euro area and within the euro area. Colloquium "Les défis de la compétitivité", organised by Le Monde and l'Association Française des Entreprises Privées (AFEP). 13 March 2012 Paris.
URL: *https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp139.pdf*

ECB (2021), The paradox of banknotes: understanding the demand for cash beyond transactional use. Economic Bulletin Issue 2, 2021. Prepared by Alejandro Zamora-Pérez.
URL: *https://www.ecb.europa.eu/pub/economic-bulletin/articles/2021/html/ecb.ebart202102_03 58c*

Eichengreen, B. & Gupta, P. (2011), 'The Two Waves of Service-Sector Growth', *Oxford Economic Papers* **65**(1), 96–123.
URL: *http://www.jstor.org/stable/23463413*

European Commission (1990), 'One Market, One Money: An evaluation if the potential benefits and costs of forming a monetary union', *European Economy* **44**.
URL: *https://ec.europa.eu/economy_finance/publications/pages/publication_summary7520_en.htm*

European Commission (1998), 'Euro 1999: Report on Progress Toward Convergence and Recommendation with a View to the Transition to the Third Stage of Economic and Monetary Union'.
URL: *http://aei.pitt.edu/4901/*

European Commission (2010), *European System of Accounts 2010 (ESA 2010).*
URL: *https://ec.europa.eu/eurostat/web/national-accounts/methodology*

European Commission (2018), Mission-oriented research & innovation in the European Union: a problem-solving approach to fuel innovation-led growth, Technical report. Directorate-General for Research and Innovation - Mazzucato, Mariana.
URL: *https://data.europa.eu/doi/10.2777/360325*

European Commission (2023), 'Macroeconomic Imbalance Procedure Scoreboard published'. 21 November 2023. Eurostat.
URL: *https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20231121-1*

Febrero, E., Uxó, J. & Bermejo, F. (2018), 'The financial crisis in the eurozone: A balance-of-payments crisis with a single currency?', *Review of Keynesian Economics* **6**(2), 221–239.
URL: *https://doi.org/10.4337/roke.2018.02.04*

Feldstein, M. (2011), The Euro and European Economic Conditions. NBER Working Paper Series No. 17617.
URL: *http://www.nber.org/papers/w17617*

Felipe, J. & Kumar, U. (2014), 'Unit labor costs in the Eurozone: the competitiveness debate again', *Review of Keynesian Economics* **2**(4), 490–507.
URL: *https://doi.org/10.4337/roke.2014.04.07*

Financial Times (2011), 'Portugal and Ireland debt yields hit fresh highs'. June 23 2011. Date accessed: November 20 2023.
URL: *https://www.ft.com/content/9beb9248-9db4-11e0-b30c-00144feabdc0*

Financial Times (2023), 'Portugal joins clampdown on 'golden visas' for wealthy'. February 16 2023. Date accessed: February 20 2023.
URL: *https://www.ft.com/content/3a5b00a0-fb24-4216-9c7e-4fb1413e1f88*

Flaaen, A., Ghani, S. & Mishra, S. (2013), How to avoid middle income traps? Evidence from Malaysia. Policy Research Working Paper Series - World Bank.
URL: *https://doi.org/10.1596/1813-9450-6427*

Flassbeck, H. & Lapavitsas, C. (2013), 'The systemic crisis of the euro - true causes and effective therapies', *Rosa-Luxemburg-Stiftung* .

Flassbeck, H. & Lapavitsas, C. (2016), 'Wage Moderation and Productivity in Europe', *Institute for New Economic Thinking* .
URL: *https://www.ineteconomics.org/perspectives/blog/wage-moderation-and-productivity-in-europe*

Folbre, N. (2012), 'The Political Economy of Human Capital', *Review of Radical Political Economics* **44**(3), 281–292.
URL: *https://doi.org/10.1177/0486613412440240*

Forbes, K. J. & Warnock, F. E. (2012), 'Capital flow waves: Surges, stops, flight, and retrenchment', *Journal of International Economics* **88**(2), 235–251.
URL: *https://doi.org/10.1016/j.jinteco.2012.03.006*

Frankel, J. A. & Rose, A. K. (1997), 'Is EMU more justifiable ex post than ex ante?', *European Economic Review* **41**(3-5), 753–760.
URL: *https://doi.org/10.1016/S0014-2921(97)00034-2*

Freund, C. & Warnock, F. (2007), 'Current account deficits in industrial countries: the bigger they are, the harder they fall?', *G7 current account imbalances: sustainability and adjustment. University of Chicago Press* pp. 133–168.
URL: *https://doi.org/10.3386/w11823*

Froot, K. A. & Rogoff, K. (1991), 'The EMS, the EMU, and the Transition to a Common Currency', *NBER Macroeconomics Annual* **6**, 269–317.
URL: *https://doi.org/10.1086/654171*

Fuller, G. W. (2017), 'Exporting Assets: EMU and the Financial Drivers of European Macroeconomic Imbalances', *New Political Economy* **23**(2), 174–191.
URL: *https://doi.org/10.1080/13563467.2017.1370444*

Gabrisch, H. & Staehr, K. (2014), 'The Euro Plus Pact: Competitiveness and External Capital Flows in the EU Countries', *Journal of Common Market Studies* **53**(3), 558–577.
URL: *https://doi.org/10.1111/jcms.12220*

Garber, P. M. (1998), Notes on the Role of TARGET in a Stage III Crisis. National Bureau of Economic Research, Working paper no. 6619.

URL: *https://www.nber.org/papers/w6619*

Garcimartin, C., Kvedaras, V. & Rivas, L. (2016), 'Business cycles in a balance-of-payments constrained growth framework', *Economic Modelling* **57**, 120–132.
URL: *http://dx.doi.org/10.1016/j.econmod.2016.04.013*

Gaspar, V. & Fagan, G. (2006), Adjusting to the euro. European Central Bank Working Paper 716.
URL: *https://dx.doi.org/10.2139/ssrn.955771*

Gaulier, G. & Vicard, V. (2012), 'Current account imbalances in the euro area: competitiveness or demand shock?', *Banque de France - Quarterly Selection of Articles (Autumn)* **27**, 5–26.

Giavazzi, F. & Spaventa, L. (2010), Why the current account may matter in a monetary union: Lessons from the financial crisis in the euro area. Discussion Paper 8008 (Washington, DC: Center for Economic and Policy Research).
URL: *https://doi.org/10.1017/CBO9781139044554.015*

Ginzburg, A. & Simonazzi, A. (2017), 'Out of the Crisis. A radical change of strategy for the Eurozone', *European Journal of Comparative Economics* **14**(1), 13–37.
URL: *https://doi.org/10.25428/1824-2979/201701-13-37*

Giroux, H. (1983), *Theory and Resistance in Education: A Pedagogy for the Opposition*, Bergin & Garvey, South Hadley, Mass.

Gourinchas, P. O. & Obstfeld, M. (2012), 'Stories of the twentieth century for the twenty-first', *American Economic Journal: Macroeconomics* **4**(1), 226–265.
URL: *https://doi.org/10.1257/mac.4.1.226*

Gourinchas, P.-O. & Rey, H. (2007), 'International Financial Adjustment', *Journal of Political Economy* **115**(4), 665–703.
URL: *https://doi.org/10.1086/521966*

Gourinchas, P.-O., Rey, H. & Sauzet, M. (2019), 'The International Monetary and Financial System', *Annual Review of Economics* **11**, 859–893.
URL: *https://doi.org/10.1146/annurev-economics-080217-053518*

Gouvêa, R. R. & Lima, G. T. (2010), 'Structural change, balance-of-payments constraint, and economic growth: Evidence from the multisectoral Thirlwall's law', *Journal of Post Keynesian Economics* **33**(1), 169–204.
URL: *https://doi.org/10.2753/PKE0160-3477330109*

Gouvêa, R. R. & Lima, G. T. (2013), 'Balance-of-payments-constrained growth in a multisectoral framework: A panel data investigation', *Journal of Economic Studies* **40**(2), 240–254.
URL: *https://doi.org/10.1108/01443581311283691*

Gräbner, C., Heimberger, P., Kapeller, J. & Schütz, B. (2020), 'Structural change in times of increasing openness: assessing path dependency in European economic integration', *Journal of Evolutionary Economics* **30**(5), 1467–1495.
URL: *https://doi.org/10.1007/s00191-019-00639-6*

Granger, C. W. J. (1969), 'Investigating causal relations by econometric models and cross-spectral methods', *Econometrica* **37**(3), 424–438.
URL: *https://doi.org/10.2307/1912791*

Greenhalgh, C. (1990), 'Innovation and trade performance in the United Kingdom', *Economic Journal* **100**(400), 105–118.
URL: *https://doi.org/10.2307/2234188*

Grilli, V. & Masciandaro, Donato Tabellini, G. (1991), 'Political and monetary institutions and public financial policies in the industrial countries', *Economic policy* **6**(13), 341–392.
URL: *https://doi.org/10.2307/1344630*

Gros, D. (2011), 'External versus domestic debt in the euro crisis'. VoxEU.org. May 24 2011. Date accessed: March 16 2020.
URL: *https://voxeu.org/article/external-versus-domestic-debt-euro-crisis*

Gros, D. (2015*a*), The Eurozone crisis and foreign debt, *in* R. Baldwin & F. Giavazzi, eds, 'The Eurozone Crisis: A Consensus View of the Causes and a Few Possible Remedies', CEPR Press, Paris & London, pp. 121–128.

Gros, D. (2015*b*), 'The Eurozone crisis as a sudden stop: it is the foreign debt which matters'. VoxEU.org. September 07 2015. Date accessed: November 16 2023.
URL: *https://cepr.org/voxeu/columns/eurozone-crisis-sudden-stop-it-foreign-debt-which-matters*

Gülagiz, F. K. & Sahin, S. (2017), 'Comparison of hierarchical and non-hierarchical clustering algorithms', *International Journal of Computer Engineering and Information Technology* **9**(1), 6–14.

Hall, P. A. (1997), The role of interests, institutions and ideas in the comparative political economy of industrialised nations, *in* M. Lichbach & A. Zuckerman, eds, 'Comparative Politics: Rationality Culture and Structure', Cambridge University Press, New York, pp. 174–207.

Hall, P. A. (2014), 'Varieties of Capitalism and the Euro Crisis', *West European Politics* **37**(6), 1223–1243.
URL: *https://doi.org/10.1080/01402382.2014.929352*

Hall, P. A. (2018), 'Varieties of capitalism in light of the euro crisis', *Journal of European Public Policy* **25**(1), 7–30.
URL: *https://doi.org/10.1080/13501763.2017.1310278*

Hall, P. A. & Soskice, D. (2001), An Introduction to Varieties of Capitalism, *in* 'Varieties of Capitalism: The Institutional Foundations of Comparative Advantage', Oxford University Press, Oxford, pp. 1–68.
URL: *https://doi.org/10.1017/CBO9781107415324.004*

Hanushek, E. A. (2013), 'Economic growth in developing countries: The role of human capital', *Economics of Education Review* **37**, 204–212.
URL: *http://dx.doi.org/10.1016/j.econedurev.2013.04.005*

Hanushek, E. A. & Kimko, D. (2000), 'Schooling, Labor-Force Quality, and the Growth of Nations', *American Economic Review* **90**(5), 1184–1208.

Hanushek, E. A. & Woessmann, L. (2012), 'Do better schools lead to more growth? Cognitive skills, economic outcomes, and causation', *Journal of Economic Growth* **17**(4), 267–321.

Harrod, R. (1933), *International Economics*, Cambridge Economics Handbooks, Cambridge.

Hein, E. (2017), 'Post-keynesian macroeconomics since the mid 1990s: Main developments', *European Journal of Economics and Economic Policies: Intervention* **14**(2), 131–172.
URL: *https://doi.org/10.4337/ejeep.2017.02.01*

Hein, E. & Stockhammer, E. (2010), 'Macroeconomic policy mix, employment and inflation in a Post-Keynesian alternative to the New Consensus Model', *Review of Political Economy* **22**(3), 317–354.
URL: *https://doi.org/10.1080/09538259.2010.491283*

Hennig, C. & Liao, T. F. (2013), 'How to find an appropriate clustering for mixed-type variables with application to socio-economic stratification', *Journal of the Royal Statistical Society. Series C: Applied Statistics* **62**(3), 309–369.
URL: *https://doi.org/10.1111/j.1467-9876.2012.01066.x*

Holinski, N., Kool, C. & Muysken, J. (2012), 'Persistent macroeconomic imbalances in the euro area: Causes and consequences', *Federal Reserve Bank of St. Louis Review* **94**(1), 1–20.
URL: *https://doi.org/10.20955/r.94.1-20*

Hope, D. & Soskice, D. (2016), 'Growth Models, Varieties of Capitalism, and Macroeconomics', *Politics and Society* **44**(2), 209–226.
URL: *https://doi.org/10.1177/0032329216638054*

Hume, D. (1752), *Political Discourses*, 2 edn, R. Fleming, Edinburgh.
URL: *https://doi.org/10.1017/S0003055420000726*

Imbs, J. & Mejean, I. (2015), 'Elasticity optimism', *American Economic Journal: Macroeconomics* **7**(3), 43–83.
URL: *https://doi.org/10.1257/mac.20130231*

IMF (1997), 'Portugal - Selected issues'. IMF Staff Country Report No. 97/121. International Monetary Fund.

IMF (2000), Portugal: Staff Report Consultation - 2000 - Article IV, Technical report. IMF Staff Country Report No. 00/152. International Monetary Fund.

IMF (2003), Portugal: Staff Report Consultation - 2002 - Article IV, Technical report. IMF Staff Country Report No. 03/99. International Monetary Fund.

IMF (2004), Portugal: Staff Report Consultation - 2004 - Article IV, Technical report. IMF Staff Country Report No. 04/80. International Monetary Fund.

IMF (2006), Portugal: Staff Report Consultation - 2006 - Article IV, Technical report. IMF Staff Country Report No. 06/386. International Monetary Fund.

IMF (2007*a*), Portugal: Staff Report Consultation - 2007 - Article IV, Technical report. IMF Staff Country Report No. 07/341. International Monetary Fund.

IMF (2007*b*), Portugal: Staff Report Consultation - 2007 - Article IV, Technical report. IMF Staff Country Report No. 07/342. International Monetary Fund.

IMF (2009), *Balance of Payments and International Investment Position Manual*, 6 edn, Washington, DC. International Monetary Fund.

IMF (2011), Separated at Birth? The Twin Budget and Trade Balances, Technical Report September, International Monetary Fund, Washington, DC.
URL: *http://fingazeta.ru/upload/iblock/33a/Chapter4.pdf*

Ingram, J. C. (1973), 'The Case for European Monetary Integration', *International Finance Section, Princeton University* .
URL: *https://doi.org/10.1017/S0770451800007284*

Irwin, D. (2023), The Return of Industrial Policy - Finance and Development - International Monetary Fund, Technical report.

Islam, N. (1995), 'Growth empirics: a panel data approach', *The Quarterly Journal of Economics* **110**(4), 1127–1170.
URL: *https://doi.org/10.2307/2946651*

Issing, O. (2009), Why a common eurozone bond isn't such a good idea. White Paper No. III. Center for Financial Studies.
URL: *https://doi.org/10.15358/9783800652570-68*

Iversen, T. & Soskice, D. (2006), 'New macroeconomics and political science', *Annual Review of Political Science* **9**, 425–453.
URL: *https://doi.org/10.1146/annurev.polisci.9.072004.085858*

Iversen, T., Soskice, D. & Hope, D. (2016), 'The Eurozone and Political Economic Institutions', *Annual Review of Political Science* **19**(1), 163–185.

Jamison, E., Jamison, D. & Hanushek, E. (2007), 'The effects of education quality on income growth and mortality decline', *Economics of Education Review* **26**(6), 771–788.
URL: *https://doi.org/10.1016/j.econedurev.2007.07.001*

Jäntti, M., Saari, J. & Vartiainen, J. (2006), 'Growth and Equity in Finland', *Discussion Paper No. 2006/06. United Nations University - World Institute for Development Economics Research* .

Johnston, A., Hancke, B. & Pant, S. (2013), 'Comparative Institutional Advantage in the European Sovereign Debt Crisis', *SSRN Electronic Journal* .
URL: *https://doi.org/10.2139/ssrn.2319435*

Johnston, A. & Matthijs, M. (2022), The Political Economy of the Eurozone's Post-Crisis Growth Model, *in* L. Baccaro, M. Blyth & J. Pontusson, eds, 'Diminishing Returns: The New Politics of Growth and Stagnation', Oxford University Press, Oxford, chapter 4, pp. 117–142.

URL: *https://doi.org/10.1093/ oso/ 9780197607855.001.0001*

Johnston, A. & Regan, A. (2016), 'European Monetary Integration and the Incompatibility of National Varieties of Capitalism', *Journal of Common Market Studies* **54**(2), 318–336.
URL: *https://doi.org/10.1111/jcms.12289*

Kaldor, N. (1957), 'A Model of Economic Growth', *The Economic Journal* **67**(268), 591–624.
URL: *https://doi.org/10.2307/2227704*

Kaldor, N. (1966), *Causes of the Slow Rate of Economic Growth of the United Kingdom*, Cambridge University Press, Cambridge.
URL: *https://doi.org/10.1017/S0770451800040616*

Kaldor, N. (1967), *Strategic Factors in Economic Development*, New York State School of Industrial and Labour Relations, Cornell University, Ithaca NY.
URL: *https://doi.org/10.1086/450356*

Kaldor, N. (1982), *The Scourge of Monetarism*, Oxford University Press, Oxford.

Keynes, J. M. (1937), 'The General Theory of Employment', *The Quarterly Journal of Economics* **51**(2), 209–223.
URL: *https://doi.org/10.1007/978-3-319-70344-2*

Kindleberger, C. P. (1969), 'Measuring Equilibrium in the Balance of Payments', *Journal of Political Economy* **77**(6), 873–891.
URL: *https://doi.org/10.1086/259576*

Knight, M. & Scacciavillani, F. (1998), Current Accounts: What is their Relevance for Policymaking, *in* O. Radzyner & A. Schubert, eds, 'Current Account Imbalances in East and West: Do They Matter?', Oesterreichische Nationalbank, Vienna, pp. 28–60.
URL: *https://doi.org/10.5089/9781451849219.001*

Kohler, K. (2020), Gross capital flows and the balance-of-payments: a balance sheet perspective. Post-Keynesian Economics Society, Working Paper 2019.
URL: *https://www.postkeynesian.net/downloads/working-papers/PKWP2019_QQtbngA.pdf*

Kohler, K. (2022), 'Capital flows and geographically uneven economic dynamics: A monetary perspective', *Economy and Space* **54**(8), 1510–1531.
URL: *https://doi.org/10.1177/0308518X221120823*

Kohler, K. (2023), 'Capital Flows and the Eurozone's North-South Divide', *Politics & Society* **0**(0), 1–27.
URL: *https://doi.org/10.1177/00323292231168251*

Kohler, K., Bonizzi, B. & Kaltenbrunner, A. (2023), 'Global financial uncertainty shocks and external monetary vulnerability: The role of dominance, exposure, and history', *Journal of International Financial Markets, Institutions and Money* **88**(101818).
URL: *https://doi.org/10.1016/j.intfin.2023.101818*

Kohler, K. & Stockhammer, E. (2020), Growth models in advanced countries before and after the 2008 crisis: competitiveness, financial cycles and austerity. Post-Keynesian Economics Society, Working Paper 2008.
URL: *https://www.postkeynesian.net/downloads/working-papers/Kohler_Stockhammer_2020_PKES-WP_-_Growth_models_after_2008_qNpvogn.pdf*

Krugman, P. (1989), 'Differences in income elasticities and trends in real exchange rates', *European Economic Review* **33**(5), 1031–1046.
URL: *https://doi.org/10.1016/0014-2921(89)90013-5*

Krugman, P. (2013), 'Revenge of the optimum currency area', *NBER Macroeconomics Annual* **27**(1), 439–448.
URL: *https://doi.org/10.1086/669188*

Kuznets, S. (1957), 'Quantitative aspects of the economic growth of nations: II, industrial distribution of national product and labor force', *Economic Development and Cultural Change* **5**(54), 1–111.
URL: *https://doi.org/10.1086/449740*

Lall, S. (2000), 'The Technological Structure and Performance of Developing Country Manufactured Exports, 1985–98.', *Oxford Development Studies* **28**(3), 337–369.
URL: *https://doi.org/10.1080/713688318*

Lane, P. R. (2012), 'The European sovereign debt crisis', *Journal of Economic Perspectives* **26**(3), 49–68.
URL: *https://doi.org/10.1257/jep.26.3.49*

Lane, P. R. & Pels, B. (2011), 'Current Account Imbalances in Europe', *Paper prepared for the XXIV Moneda y Crédito Symposium, Madrid, November* .

Lapavitsas, C. (2013), The Eurozone crisis through the prism of world money, *in* 'The Handbook of the Political Economy of Financial Crises', Oxford/New York, pp. 378–392.

Lapavitsas, C., Kaltenbrunner, A., Lindo, D., Michell, J., Painceira, J. P., Pires, E., Powell, J., Stenfors, A. & Teles, N. (2010), 'Eurozone crisis: Beggar thyself and thy neighbour', *Journal of Balkan and Near Eastern Studies* **12**(4), 321–373.
URL: *https://doi.org/10.1080/19448953.2010.510012*

Lavoie, M. (2009), *Introduction to post-Keynesian economics*, 1 edn, Palgrave Macmillan, London.
URL: *https://doi.org/10.1057/9780230626300*

Lavoie, M. (2014), *Post-Keynesian Economics - New Foundations*, Edward Elgar, Cheltenham (UK), Northampton (MA, USA).
URL: *https://doi.org/10.4337/9781839109621*

Lavoie, M. (2015), 'The Eurozone Crisis A Balance-of-Payments Problem or a Crisis Due to a Flawed Monetary Design?', *International Journal of Political Economy* **44**(2), 157–160.
URL: *https://doi.org/10.1080/08911916.2015.1060831*

Loungani, P. & Mishra, S. (2014), 'Not Your Father's Service Sector', *Finance and Development* **51**(2), 51–54.
URL: *https://www.imf.org/external/pubs/ft/fandd/2014/06/pdf/fd0614.pdf*

Loungani, P., Mishra, S., Papageorgiou, C. & Wang, K. (2017), 'World Trade in Services: Evidence from A New Dataset', *IMF Working Papers* **17**(77), 1.
URL: *https://doi.org/10.5089/9781475589887.001*

Lucas, R. E. (1988), 'On the mechanics of economic development', *Journal of Monetary Economics* **22**, 3–42.
URL: *https://doi.org/10.1016/0304-3932(88)90168-7*

Maggiori, M., Neiman, B. & Schreger, J. (2019), The Rise of the Dollar and Fall of the Euro as International Currencies. AEA Papers and Proceedings.
URL: *doi: 10.1257/pandp.20191007*

Mamede, R. P. (2020), Financialisation and structural change in Portugal, *in* A. C. Santos & N. Teles, eds, 'Financialisation in the European Periphery', 1 edn, Routledge, London and New York, chapter 4, pp. 64–81.
URL: *http://dx.doi.org/10.4324/9780429439902-5*

Mamede, R. P., Lagoa, S., Leão, E. & Barradas, R. (2016), The long boom and the early bust: the Portuguese economy in the era of financialization, *in* E. Hein, D. Detzer & N. Dodig, eds, 'Financialization and the financial and economic crises', Edward Elgar Publishing Limited, Northampton, MA, chapter 11.
URL: *https://doi.org/10.4337/9781785362385.00016*

Mankiw, N. G. (2008), *Principles of economics*, 5 edn, Thomson South-Western.

Mankiw, N. G., Romer, D. & Weil, D. N. (1992), 'A contribution to the empirics of economic growth', *The Quarterly Journal of Economics* **107**(2), 407–437.
URL: *https://doi.org/10.2307/2118477*

Martos, L., García-Vico, Á., González, P. & Carmona, C. (2023), 'Clustering: an R library to facilitate the analysis and comparison of cluster algorithms.', *Progress in Artificial Intelligence* **12**, 33–44.
URL: *https://doi.org/10.1007/s13748-022-00294-2*

Marzinotto, B., Pisani-Ferry, J. & Sapir, A. (2010), 'Two crisis, two responses', *Bruegel Policy Brief* pp. 1–8.

Mazzocchi, R. & Tamborini, R. (2021), *Current account imbalances and the Euro Area. Controversies and policy lessons*, Vol. 38, Springer International Publishing.
URL: *https://doi.org/10.1007/s40888-021-00214-y*

Mazzucato, M. (2018), *The value of everything. Making and taking in the global economy*, 1 edn, PublicAffairs, New York.

McCloskey, D. & Zecher, R. (1976), How the gold standard worked: 1880-1913, *in* J. A. Frankel & H. Johnson, eds, 'The monetary approach to the balance of payments', Allen and Unwin, London.
URL: *https://doi.org/10.1016/j.jinteco.2004.08.007*

McCombie, J. S. L. (1989), ''Thirlwall´s Law' and balance of payments constrained growth - a comment on the debate', *Applied Economics* **21**, 611–629.
URL: *https://doi.org/10.1080/758524894*

McCombie, J. S. L. & Thirlwall, A. P. (1997), 'The dynamic Harrod foreign trade multiplier and the demand-orientated approach to economic growth: An evaluation', *International Review of Applied Economics* **11**(1), 5–26.
URL: *https://doi.org/10.1080/02692179700000001*

McCombie, J. S. L. & Thirlwall, A. P. (1999), Growth in an international context: a Post Keynesian view, *in* J. Deprez & J. T. Harvey, eds, 'Foundations of International Economics - Post-Keynesian perspectives', Routledge, London and New York, pp. 35–90.
URL: *https://doi.org/10.4324/9780203017760*

McGregor, P. G. & Swales, J. K. (1986), 'Balance of payments constrained growth: A rejoinder to Professor Thirlwall', *Applied Economics* **18**(12), 1265–1274.
URL: *https://doi.org/10.1080/00036848600000002*

McKinnon, R. (1963), 'Optimum currency areas', *American Economic Review* **53**, 717–725.
URL: *https://doi.org/10.1007/978-1-349-21315-3_70*

Mendes, A. M. & Thirlwall, A. P. (1989), The Balance of Payments Constraint and Growth in Portugal: 1951–1984, *in* G. N. Yannopoulos, ed., 'Palgrave Macmillan Books', Palgrave Macmillan, London, chapter European I, pp. 21–39.
URL: *https://doi.org/10.1007/978-1-349-09712-8_2*

Merler, S. & Pisani-Ferry, J. (2012), 'Sudden Stops in Euro Area', *Bruegel Policy Brief, 2012/06, March* .
URL: *https://www.bruegel.org/policy-brief/sudden-stops-euro-area*

Milesi-Ferretti, G.-M. & Blanchard, O. (2009), 'Global Imbalances: In Midstream?', *IMF Staff Position Notes* (29), 1.
URL: *https://doi.org/10.5089/9781462333387.004*

Milonakis, D. & Fine, B. (2009), *From Political Economy to Economics: method, the social and the historical in the evolution of economic theory*, Routledge, London and New York.

Moreno-Brid, J. C. (1999), 'On Capital Flows and the Balance-of-Payments-Constrained Growth Model', *Journal of Post Keynesian Economics* **21**(2), 283–298.
URL: *https://doi.org/10.1080/01603477.1998.11490194*

Mundell, R. (1961), 'A Theory of Optimal Currency Areas', *American Economic Review* **5**, 657–665.

Nelson, R. R. & Phelps, E. S. (1966), 'Investment in humans, technological diffusion, and economic growth', *American Economic Review* **56**(2), 69–75.

Nikiforos, M., Carvalho, L. & Schoder, C. (2015), '"Twin deficits" in Greece: In search of causality', *Journal of Post Keynesian Economics* **38**(2), 302–330.

URL: *https://doi.org/10.1080/01603477.2015.1065675*

Nölke, A. (2016), 'Economic causes of the Eurozone crisis: The analytical contribution of comparative capitalism', *Socio-Economic Review* **14**(1), 141–161.
URL: *https://doi.org/10.1093/ser/mwv031*

Obstfeld, M. (2012), 'Does the current account still matter?', *American Economic Review* **102**(3), 1–23.
URL: *https://doi.org/10.1257/aer.102.3.1*

Obstfeld, M. (2013), 'Finance at center stage: Some lessons of the Euro Crisis', *European Economy, Economic Paper No. 493.* .
URL: *http://dx.doi.org/10.2765/43215*

Oxford Economics (2019), 'Assessing the Macroeconomic Impact of EU Membership for Finland', *Akava* .
URL: *https://akavaworks.fi/wp-content/uploads/sites/2/2019/08/Assessing-the-macroeconomic-impact-of-EU-membership-for-Finland_22082019.pdf*

Pérez, S. A. (2019), 'A Europe of creditor and debtor states: explaining the north/south divide in the Eurozone', *West European Politics* **42**(5), 989–1014.
URL: *https://doi.org/10.1080/01402382.2019.1573403*

Pérez, S. A. & Matsaganis, M. (2019), 'Export or Perish: Can Internal Devaluation Create Enough Good Jobs in Southern Europe?', *South European Society and Politics* **24**(2), 259–285.
URL: *https://doi.org/10.1080/13608746.2019.1644813*

Perraton, J. (2003), 'Balance of payments constrained growth and developing countries: An examination of Thirlwall's hypothesis', *International Review of Applied Economics* **17**(1), 1–22.
URL: *https://doi.org/10.1080/713673169*

Razin, A. & Milesi-Ferretti, G. M. (1998), Sharp Reductions in Current Account Deficits: An Empirical Analysis, *in* O. Radzyner & A. Schubert, eds, 'Current Account Imbalances in East and West: Do They Matter?', Oesterreichische Nationalbank, Vienna, pp. 14–27.
URL: *https://doi.org/10.3386/w6310*

Razmi, A. (2016), 'Correctly Analyzing the Balance of Payments Constraint on Growth', *Cambridge Journal of Economics* **40**, 1581–1608.
URL: *https://doi.org/10.1093/cje/bev069*

Regan, A. (2017), 'The imbalance of capitalisms in the Eurozone: Can the north and south of Europe converge?', *Comparative European Politics* **15**(6), 969–990.
URL: *http://dx.doi.org/10.1057/cep.2015.5*

Reinhart, C. M. & Rogoff, K. S. (2010), 'Growth in a time of debt', *American Economic Review* **100**(2), 573–578.
URL: *https://doi.org/10.1257/aer.100.2.573*

Reis, J. (2018), *A economia portuguesa: formas de economia politica numa periferia persistente (1960-2017)*, 1 edn, Almedina, Coimbra.

Reis, J. (2020), Portugal as a European periphery: Imbalances, dependency, and trajectories, *in* A. C. Santos & N. Teles, eds, 'Financialisation in the European Periphery', 1 edn, Routledge, London and New York, chapter 3, pp. 50–63.

Reis, J., Rodrigues, J., Santos, A. & Teles, N. (2013), Compreender a Crise: A economia portuguesa num quadro europeu desfavorável, *in* 'A anatomia da Crise: Identificar os problemas para construir as alternativas', Observatório sobre crises e alternativas, pp. 12–71.

Reis, R. (2013), The Portuguese Slump and Crash and the Euro Crisis. CEPR Discussion Paper No. DP9591 August.
URL: *https://ssrn.com/abstract=2309235*

Reis, R. (2015), Looking for a success in the Euro crisis adjustment programs: The case of Portugal. Brookings Papers on Economic Activity.
URL: *https://doi.org/10.1353/eca.2015.0010*

Ricardo, D. (1817), *On the Principles of Political Economy and Taxation*, 3 edn, Batoche Books - Kitchener - 2001, Ontario, Canada.
URL: *https://doi.org/10.1017/CBO9781107589421*

Rodrik, D. (2011), 'The Manufacturing Imperative'.
URL: *https://www.project-syndicate.org/commentary/the-manufacturing-imperative?barrier=accesspaylog*

Romer, P. M. (1986), 'Increasing Returns and Long-run Growth', *Journal of Political Economy* **94**(5), 1002–37.
URL: *https://doi.org/10.1086/261420*

Romer, P. M. (1989), Human capital and growth: theory and evidence. NBER Working Paper Series No. 3173.
URL: *https://www.nber.org/papers/w3173*

Romer, P. M. (1990), 'Endogenous technological change', *Journal of Political Economy* **98**(5), 71–102.
URL: *https://doi.org/10.1086/261725*

Romero, J. P. & McCombie, J. S. L. (2016), 'The Multi-Sectoral Thirlwall's Law: evidence from 14 developed European countries using product-level data', *International Review of Applied Economics* **30**(3), 301–325.
URL: *http://dx.doi.org/10.1080/02692171.2015.1102207*

Romero, J. P. & McCombie, J. S. L. (2018), 'Thirlwall' s Law and the specification of export and import demand functions', *Metroeconomica* **69**(2), 366–395.
URL: *https://doi.org/10.1111/meca.12185*

Salem, M. B. & Castelletti-Font, B. (2016), 'Which combination of fiscal and external imbalances to determine the long-run dynamics of sovereign bond yields?', *Document de travail Banque de France No. 606* .

URL: *https://dx.doi.org/10.2139/ssrn.2866447*

Samuelson, P. A. (1994), 'Facets of Balassa-Samuelson thirty years later', *Review of International Economics* **2**(3), 201–226.
URL: *https://doi.org/10.1111/j.1467-9396.1994.tb00041.x*

Schäuble, W. (2011), 'Why austerity is only cure for the Eurozone'. Financial Times 5(09), 2011-09-5.
URL: *https://www.ft.com/content/97b826e2-d7ab-11e0-a06b-00144feabdc0*

Schäuble, W. (2013), 'Ignore the doomsayers: Europe is being fixed'.
URL: *https://www.ft.com/content/e88c842a-1c67-11e3-a8a3-00144feab7de*

Schelkle, W. (2017), *The political economy of monetary solidarity: understanding the euro experiment*, Oxford University Press, Oxford.
URL: *https://doi.org/10.1093/acprof:oso/9780198717935.001.0001*

Schmitz, B. & von Hagen, J. (2011), 'Current account imbalances and financial integration in the euro area', *Journal of International Money and Finance* **30**(8), 1676–1695.
URL: *https://doi.org/10.1016/j.jimonfin.2011.08.003*

Schwarzer, D. & Dullien, S. (2009), The euro zone needs an external stability pact. SWP Comments, No. 9/2009, Stiftung Wissenschaft und Politik (SWP), Berlin.

Shambaugh, J. C. (2012), The Euro's three crises. Brookings Papers on Economic Activity.
URL: *https://doi.org/10.1353/eca.2012.0006*

Shin, H. S. (2011), Global banking glut and loan risk premium, Technical report. Paper presented at the 12th Jacques Polak Annual Research Conference. Hosted by the International Monetary Fund Washington, DCNovember 10–11, 2011.
URL: *https://www.imf.org/external/np/res/seminars/2011/arc/pdf/hss.pdf*

Simonazzi, A., Ginzburg, A. & Nocella, G. (2013), 'Economic relations between Germany and southern Europe', *Cambridge Journal of Economics* **37**(3), 653–675.
URL: *https://doi.org/10.1093/cje/bet010*

Sinn, H. W. (2011), 'The ECB's stealth bailout'. http://voxeu.org/. June 01 2011. Date accessed: March 02 2020.
URL: *https://voxeu.org/article/ecb-s-stealth-bailout*

Sinn, H. W. (2012), *The European Union Balance of Payments Crisis*, CESInfo Forum, Munich.

Sinn, H. W. (2014), 'Austerity, growth and inflation: remarks on the Eurozone's unresolved competitiveness problem', *The World Economy* **37**(1), 1–13.
URL: *https://doi.org/10.1111/twec.12130*

Sinn, H. W. & Wollmershäuser, T. (2012), 'Target loans, current account balances and capital flows: The ECB's rescue facility', *International Tax and Public Finance* **19**(4), 468–508.
URL: *https://doi.org/10.1007/s10797-012-9236-x*

Smith, A. (1776), *An Inquiry into the Nature and Causes ofthe Wealth of Nations*, Random House, 1937, NewYork.

Snaith, H. (2014), 'Narratives of Optimum Currency Area Theory and Eurozone Governance', *New Political Economy* **19**(2), 183–200.
URL: *https://doi.org/10.1080/13563467.2013.779653*

Soares, R., Sousa-Leite, J., Filipe, J. & Nóbrega, N. (2020), Banco de Portugal TARGET balance: evolution and main drivers. Banco de Portugal Occasional papers 01.

Sodsriwiboon, P. & Jaumotte, M. F. (2010), Current account imbalances in the southern euro area. IMF Working Paper No. 10/139. Washington, DC: International Monetary Fund.
URL: *http://www.imf.org/external/pubs/cat/longres.aspx?sk=23940*

Solow, R. M. (1956), 'A Contribution to the Theory of Economic Growth', *The Quarterly Journal of Economics* **70**(1), 65–94.
URL: *https://doi.org/10.2307/1884513*

Solow, R. M. (1957), 'Technical Change and the Aggregate Production Function', *The Review of Economics and Statistics* **39**(3), 312–320.
URL: *https://doi.org/10.2307/1926047*

Soukiazis, E. & Antunes, M. (2012*a*), 'Application of the balance-of-payments-constrained growth model to Portugal, 1965-2008', *Journal of Post Keynesian Economics* **34**(2), 353–380.
URL: *https://doi.org/10.2753/PKE0160-3477340209*

Soukiazis, E. & Antunes, M. (2012*b*), 'Foreign trade, human capital and economic growth: An empirical approach for the European Union countries.', *The Journal of International Trade & Economic Development* **21**(1), 3–24.
URL: *https://doi.org/10.1080/09638199.2012.643013*

Soukiazis, E., Cerqueira, P. A. & Antunes, M. (2012), 'Modelling economic growth with internal and external imbalances: Empirical evidence from Portugal', *Economic Modelling* **29**(2), 478–486.
URL: *https://doi.org/10.1016/j.econmod.2011.12.001*

Soukiazis, E., Cerqueira, P. & Antunes, M. (2015), 'Causes of the decline of economic growth in Italy and the responsibility of euro. A balance-of-payments approach', *Review of Keynesian Economics* **3**(4), 491–516.
URL: *https://econpapers.repec.org/RePEc:gmf:wpaper:2012-03*

Soukiazis, E., Muchová, E. & Leško, P. (2017), 'Are the Transition Economies Balance-of-Payments Constrained? An Aggregate and Multisector Approach Applied to Central and Eastern Europe', *Eastern European Economics* **55**(5), 453–476.
URL: *https://doi.org/10.1080/00128775.2017.1326289*

Stockhammer, E. (2011), 'Peripheral Europe's debt and German wages: The role of wage policy in the Euro area', *International Journal of Public Policy* **7**(1-3), 83–96.
URL: *https://doi.org/10.1504/IJPP.2011.039577*

Stockhammer, E. (2016), 'Neoliberal growth models, monetary union and the Euro crisis. A post-Keynesian perspective', *New Political Economy* **21**(4), 365–379.

URL: *https://doi.org/10.1080/13563467.2016.1115826*

Storm, S. (2016*a*), 'Rejoinder to Flassbeck and Lapavitsas', *Institute for New Economic Thinking* .

URL: *https://www.ineteconomics.org/perspectives/blog/rejoinder-to-flassbeck-and-lapavitsas*

Storm, S. (2016*b*), 'Response to Peter Bofinger's "Friendly Fire"', *Institute for New Economic Thinking* .

URL: *https://www.ineteconomics.org/perspectives/blog/response-to-peter-bofinger*

Storm, S. & Naastepad, C. (2015), 'Crisis and recovery in the German economy: The real lessons', *Structural Change and Economic Dynamics* **32**(10), 11–24.

Storm, S. & Naastepad, C. (2016), 'Myths, Mix-ups, and Mishandlings: Understanding the Eurozone Crisis', *International Journal of Political Economy* **45**(1), 46–71.

URL: *https://doi.org/10.1080/08911916.2016.1159084*

Tatom, J. A. (1998), A Note on Assessing the Sources and Effects of Current Account "Imbalances", *in* O. Radzyner & A. Schubert, eds, 'Current Account Imbalances in East and West: Do They Matter?', Oesterreichische Nationalbank, Vienna, pp. 61–72.

URL: *https://doi.org/10.1007/978-94-009-2520-5*

Teles, N., Caldas, J. C. & Martins, D. (2020), Financialisation, labour and structural change, *in* A. Santos & N. Teles, eds, 'Financialisation in the European Periphery', 1 edn, Routledge, London and New York, chapter 7, pp. 127–162.

URL: *http://dx.doi.org/10.4324/9780429439902-9*

Teles, N., Santos, A. C. & Rodrigues, J. (2016), *A financeirização do capitalismo em Portugal*, Conjuntura Actual Editora, Coimbra. Observatório sobre Crises e Alternativas.

Teles, N., Santos, A. C. & Rodrigues, J. (2020), Revisiting the concept of semi-peripheral financialisation, *in* A. C. Santos & N. Teles, eds, 'Financialisation in the European Periphery', 1 edn, Routledge, London and New York, chapter 2, pp. 23–49.

The New York Times (2004), 'Nokia Falters, and the Finns Take Stock'. 2004-09-04. Date accessed: August 04 2023.

URL: *https://www.nytimes.com/2004/09/04/technology/nokia-falters-and-the-finns-take-stock.html*

Thirlwall, A. P. (1979), 'The Balance of Payments Constraint as an Explanation of International Growth Rate Differences', *Banca Nazionale del Lavoro Quarterly Review* **128**(1), 45–53.

URL: *https://doi.org/10.13133/2037-3643/12804*

Thirlwall, A. P. (2011), 'Balance of payments constrained growth models: History and overview', *PSL Quarterly Review* **64**(259), 307–351.

URL: *https://doi.org/10.1057/9781137023957*

Thirlwall, A. P. & Dixon, R. J. (1979), A model of export-led growth with a balance of payments constraint, *in* J. Bowers, ed., 'Inflation, Development and Integration. Essays in Honour of A.J. Brown', Leeds University Press, Leeds, pp. 173–192.

Thirlwall, A. P. & Hussain, M. N. (1982), 'The Balance of Payments Constraint, Capital Flows and Growth Rate Differences between Developing Countries', *Oxford Economic Papers* **34**(3), 498–510.
URL: *https://doi.org/10.1093/oxfordjournals.oep.a041565*

Thirlwall, A. P. & León-Ledesma, M. A. (2002), 'The endogeneity of the natural rate of growth', *Cambridge Journal of Economics* **26**(4), 441–459.
URL: *https://doi.org/10.1093/cje/26.4.441*

Toporowski, J. (2022), International Debt and the Problem of Equilibrium, *in* J. Osiatynski & J. Toporowski, eds, 'International Equilibrium and Bretton Woods', Oxford University Press, Oxford, pp. 153–169.
URL: *https://doi.org/10.1093/oso/9780192856401.003.0009*

Trichet, J. C. (2010), Lessons from the crisis, *in* 'European American Press Club (Paris, 3 December 2010)'.
URL: *https://www.ecb.europa.eu/press/key/date/2010/html/sp101203.en.html*

Trigo Pereira, P. (1997), 'A teoria da escolha pública (public choice): uma abordagem neoliberal?', **xxxii**(141), 419–442.
URL: *https://www.jstor.org/stable/41011271*

UN (2021), World Economic Situation and Prospects 2021, Technical report, New York.
URL: *https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-2019/*

Uxó, J., Paul, J. & Febrero, E. (2014), 'Internal devaluation in the European periphery: the story of a failure'.

Ward, J. (1963), 'Hierarchical grouping to optimize an objective function', *Journal of the American Statistical Association* **58**(301), 236–244.
URL: *https://doi.org/10.1080/01621459.1963.10500845*

Weingast, B. R. & Shepsle, Kenneth A. Johnsen, C. (1981), 'The political economy of benefits and costs: A neoclassical approach to distributive politics', *Journal of political Economy* **89**(4), 642–664.
URL: *https://doi.org/10.1086/260997*

Welch, F. (1970), 'Education in Production', *Journal of Political Economy* **78**(1), 35.

Werner, P. (1970), Report to the Council and the Commission on the realisation by stages of Economic and Monetary Union in the Community - "Werner Report" - (definitive text) [8 October 1970], Technical report, Bulletin of the European Communities, Supplement 11/1970.
URL: *https://doi.org/10.5089/9780300225631.071*

Wooldridge, J. M. (2020), *Introductory Econometrics, a Modern Approach*, 7 edn, Cengage Learning, London.
URL: *https://doi.org/10.1002/jae.665*

Wyplosz, C. (2010), 'Germany, current accounts and competitiveness'. VoxEU.org. March 31 2010. Date accessed: March 16 2020.

URL: *https://voxeu.org/article/germany-current-accounts-and-competitiveness*

Wyplosz, C. (2013*a*), Europe's Quest for Fiscal Discipline Fellowship Initiative: The Future of EMU. European Economy Economic Papers (498).
URL: *https://doi.org/10.2765/43864*

Wyplosz, C. (2013*b*), 'The eurozone crisis and the competitiveness legend', *Asian Economic Papers* **12**(3), 63–81.
URL: *https://doi.org/10.1162/ASEP_a_00238*

APPENDIX A

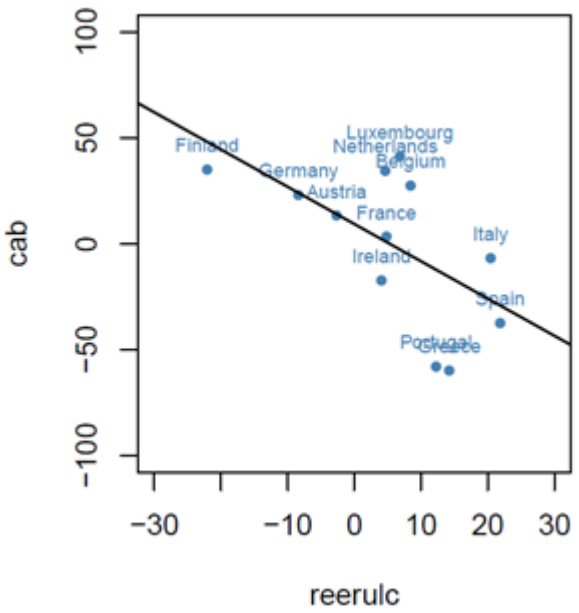


FIGURE A.1. Changes in real effective exchange rates, based on unit labor costs terms (*reerulc*) and accumulated current account as % of GDP (1999-2007) – *cab*. Source: author's calculations on AMECO and IMF database.

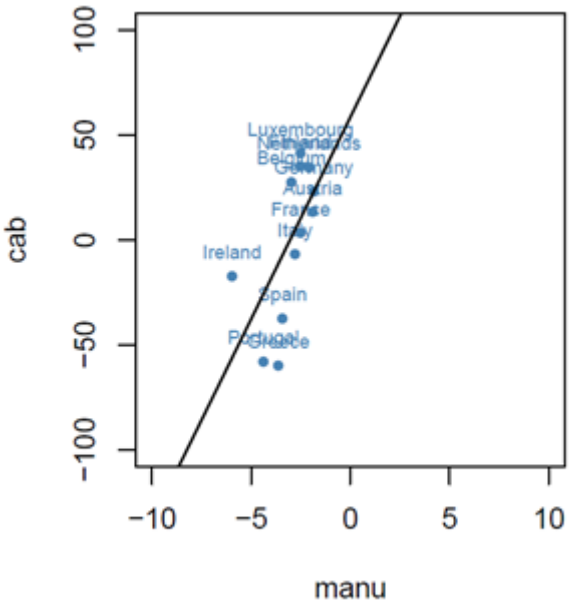


FIGURE A.2. Changes in total weight of employment in the manufacturing sector (*manu*) and accumulated current account as % of GDP (1999-2007) – *cab*. Source: author's calculations on AMECO and KLEIM database.

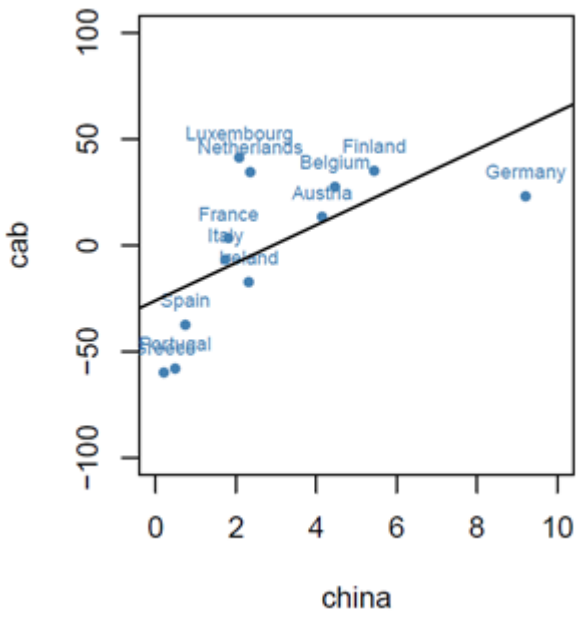


FIGURE A.3. Changes in accumulated exports of goods to China as % of GDP (*china*) and accumulated current account as % of GDP (1999-2007) – *cab*. Source: author's calculations on AMECO and UN Comtrade database.

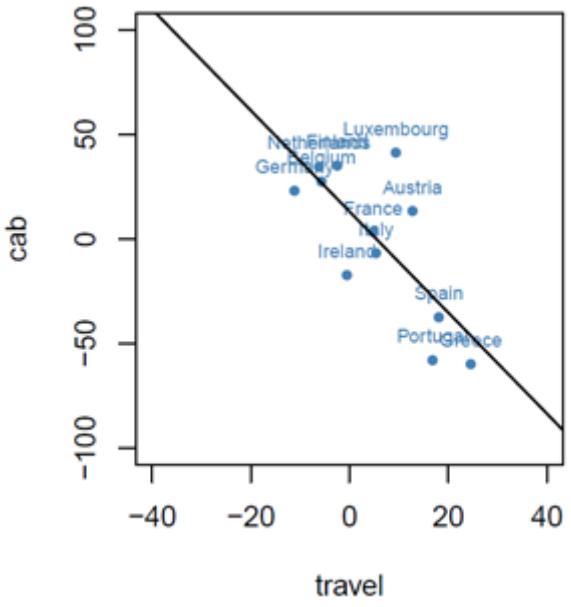


FIGURE A.4. Changes in accumulated travel net exports as a % of GDP (travel) and accumulated current account as a % of GDP (1999-2007) – *cab*. Sources: author's calculations on AMECO and Eurostat database.

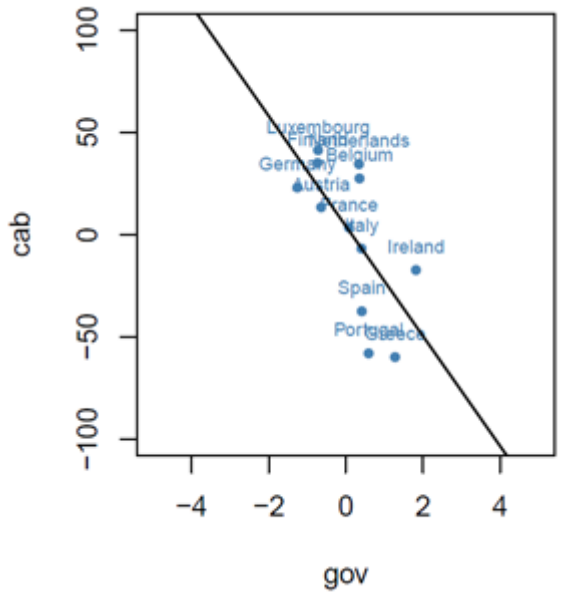


FIGURE A.5. Average annual changes in Government spending (less interests payable) in % of GDP (*gov*), and changes in the accumulated current account, as % of GDP (1999-2007) – *cab*. Source: author's calculations on AMECO and Eurostat database.

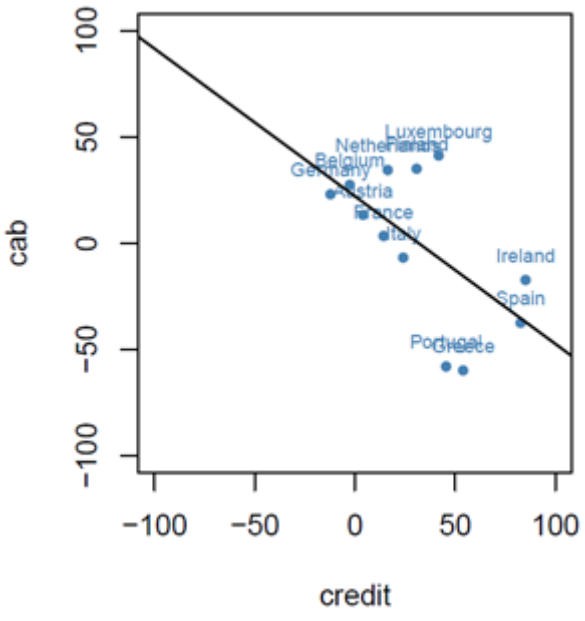
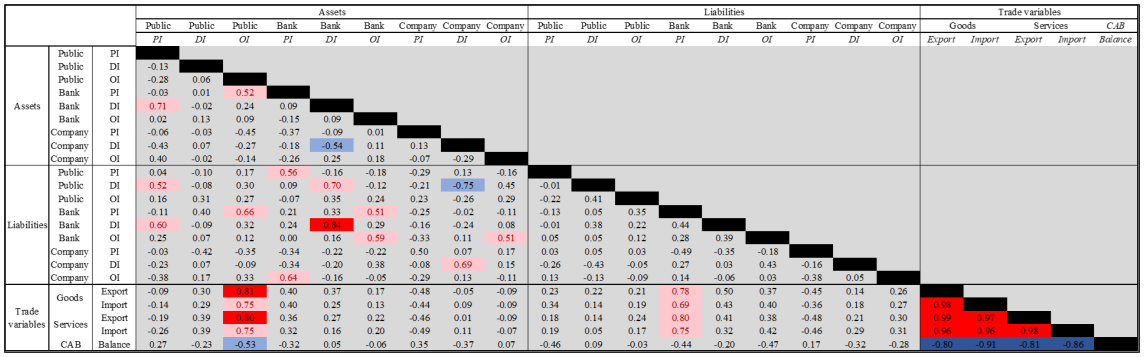


FIGURE A.6. Changes in accumulated travel net exports as a % of GDP (*travel*) and accumulated current account as a % of GDP (1999-2007) – *cab*. Sources: author's calculations on AMECO and Eurostat database.

APPENDIX B



			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods		Services		CAB
			PI	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*Export*	*Import*	*Export*	*Import*	*Balance*
Assets	Public	PI																							
	Public	DI	-0.13																						
	Public	OI	-0.28	0.06																					
	Bank	PI	-0.03	0.01	0.52																				
	Bank	DI	0.71	-0.02	0.24	0.09																			
	Bank	OI	0.02	0.13	0.09	-0.15	0.09																		
	Company	PI	-0.06	-0.03	-0.45	-0.37	-0.09	0.01																	
	Company	DI	-0.43	0.07	-0.27	-0.18	-0.54	0.11	0.13																
	Company	OI	0.40	-0.02	-0.14	-0.26	0.25	0.18	-0.07	-0.29															
Liabilities	Public	PI	0.04	-0.10	0.17	0.56	-0.16	-0.18	-0.29	0.13	-0.16														
	Public	DI	0.52	-0.08	0.30	0.09	0.70	-0.12	-0.21	-0.75	0.45	-0.01													
	Public	OI	0.16	0.31	0.27	-0.07	0.35	0.24	0.23	-0.26	0.29	-0.22	0.41												
	Bank	PI	-0.11	0.40	0.66	0.21	0.33	0.51	-0.25	-0.02	-0.11	-0.13	0.05	0.35											
	Bank	DI	0.60	-0.09	0.32	0.24	0.84	0.29	-0.16	-0.24	0.08	-0.01	0.38	0.22	0.44										
	Bank	OI	0.25	0.07	0.12	0.00	0.16	0.59	-0.33	0.11	0.51	0.05	0.05	0.12	0.28	0.39									
	Company	PI	-0.03	-0.42	-0.35	-0.34	-0.22	-0.22	0.50	0.07	0.17	0.03	0.05	0.03	-0.49	-0.35	-0.18								
	Company	DI	-0.23	0.07	-0.09	-0.34	-0.20	0.38	-0.08	0.69	0.15	-0.26	-0.43	-0.05	0.27	0.03	0.43	-0.16							
	Company	OI	-0.38	0.17	0.33	0.64	-0.16	-0.05	-0.29	0.13	-0.11	0.13	-0.13	-0.09	0.14	-0.06	0.03	-0.38	0.05						
Trade variables	Goods	Export	-0.09	0.30	0.81	0.40	0.37	0.17	-0.48	-0.05	-0.09	0.23	0.22	0.21	0.78	0.50	0.37	-0.45	0.14	0.26					
		Import	-0.14	0.29	0.75	0.40	0.25	0.13	-0.44	0.09	-0.09	0.34	0.14	0.19	0.69	0.43	0.40	-0.36	0.18	0.27	0.98				
	Services	Export	-0.19	0.39	0.80	0.36	0.27	0.22	-0.46	0.01	-0.09	0.18	0.14	0.24	0.80	0.41	0.38	-0.48	0.21	0.30	0.99	0.97			
		Import	-0.26	0.39	0.75	0.32	0.16	0.20	-0.49	0.11	-0.07	0.19	0.05	0.17	0.75	0.32	0.42	-0.46	0.29	0.31	0.96	0.96	0.98		
	CAB	Balance	0.27	-0.23	-0.53	-0.32	0.05	-0.06	0.35	-0.37	0.07	-0.46	0.09	-0.03	-0.44	-0.20	-0.47	0.17	-0.32	-0.28	-0.80	-0.91	-0.81	-0.86	

FIGURE B.1. Correlation matrix for gross capital flows in Portugal (1996-2007). Source: author's calculations on Banco de Portugal database.

			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods		Services		CAB
			PI	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*Export*	*Import*	*Export*	*Import*	*Balance*
Assets	Public	PI																							
	Public	DI	-0.14																						
	Public	OI	-0.69	-0.33																					
	Bank	PI	0.46	0.17	-0.49																				
	Bank	DI	-0.29	0.06	0.10	-0.22																			
	Bank	OI	-0.14	0.37	0.22	0.01	-0.24																		
	Company	PI	0.19	-0.24	0.10	-0.19	-0.37	0.40																	
	Company	DI	0.65	-0.07	-0.25	0.10	0.05	0.05	0.10																
	Company	OI	-0.16	0.52	0.04	-0.29	0.00	0.02	-0.04	-0.09															
Liabilities	Public	PI	0.49	0.29	-0.59	0.80	-0.50	-0.10	-0.24	-0.02	0.03														
	Public	DI	0.29	0.17	-0.08	0.36	-0.31	-0.22	-0.09	0.23	0.42	0.55													
	Public	OI	0.02	-0.39	0.08	-0.22	0.38	-0.21	0.02	0.23	-0.44	-0.30	-0.17												
	Bank	PI	0.46	0.40	-0.59	0.89	-0.16	-0.07	-0.27	0.13	0.03	0.87	0.55	-0.17											
	Bank	DI	-0.07	-0.20	0.06	0.34	-0.32	-0.07	-0.05	-0.46	-0.35	0.41	0.20	0.22	0.31										
	Bank	OI	-0.18	0.75	-0.07	0.49	-0.19	0.57	-0.21	-0.18	0.23	0.47	0.24	-0.41	0.56	0.23									
	Company	PI	0.37	-0.23	0.06	-0.26	0.00	0.13	0.53	0.47	0.06	-0.20	0.23	0.41	-0.13	-0.11	-0.33								
	Company	DI	-0.40	-0.28	0.24	-0.38	0.39	-0.17	-0.15	-0.21	-0.26	-0.59	-0.73	-0.03	-0.63	-0.43	-0.42	-0.46							
	Company	OI	0.09	0.06	0.32	-0.29	-0.42	0.59	0.58	0.18	0.39	-0.18	0.19	-0.30	-0.27	-0.16	0.10	0.50	-0.34						
Trade variables	Goods	Export	-0.62	-0.04	0.35	-0.68	0.45	-0.24	-0.19	-0.36	0.27	-0.65	-0.47	-0.12	-0.70	-0.50	-0.36	-0.33	0.80	-0.17					
		Import	0.04	0.64	-0.31	-0.21	0.00	0.09	0.06	0.04	0.83	0.08	0.27	-0.41	0.14	-0.39	0.21	0.09	-0.30	0.30	0.14				
	Services	Export	-0.57	-0.16	0.34	-0.54	0.45	-0.43	-0.29	-0.41	0.15	-0.54	-0.40	-0.08	-0.61	-0.37	-0.42	-0.41	0.82	-0.33	0.96	-0.04			
		Import	-0.08	-0.37	0.43	-0.77	0.05	-0.17	0.41	0.14	0.27	-0.62	0.09	0.22	-0.66	-0.26	-0.63	0.59	0.07	0.45	0.35	0.18	0.27		
	CAB	Balance	-0.57	-0.34	0.42	-0.45	0.39	-0.36	-0.28	-0.40	-0.17	-0.56	-0.53	0.07	-0.65	-0.21	-0.42	-0.44	0.89	-0.39	0.84	-0.39	0.93	0.15	

FIGURE B.2. Correlation matrix for gross capital flows in Portugal (2008-2013). Source: author's calculations on Banco de Portugal database.

			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods		Services		CAB
			PI	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*PI*	*DI*	*OI*	*Export*	*Import*	*Export*	*Import*	*Balance*
Assets	Public	PI																							
	Public	DI	-0.64																						
	Public	OI	-0.13	-0.08																					
	Bank	PI	0.01	0.42	-0.18																				
	Bank	DI	0.17	-0.07	0.15	-0.25																			
	Bank	OI	-0.29	0.23	0.13	0.56	-0.24																		
	Company	PI	0.41	-0.21	-0.19	-0.07	0.75	-0.48																	
	Company	DI	-0.09	-0.03	0.18	0.36	-0.49	0.47	-0.33																
	Company	OI	-0.52	0.32	0.28	-0.26	0.39	-0.04	0.01	-0.44															
Liabilities	Public	PI	-0.17	0.52	0.25	0.69	-0.09	0.61	-0.31	0.13	0.10														
	Public	DI	0.63	-0.18	-0.16	0.57	0.24	0.14	0.44	0.00	-0.44	0.22													
	Public	OI	-0.26	0.23	0.56	-0.02	0.47	0.16	0.09	0.04	0.64	0.34	-0.24												
	Bank	PI	0.45	-0.02	-0.12	0.56	0.05	0.30	0.27	0.37	-0.33	0.38	0.59	0.10											
	Bank	DI	-0.03	0.09	0.49	0.03	0.26	0.28	-0.06	0.33	0.37	0.35	-0.16	0.84	0.38										
	Bank	OI	-0.05	-0.10	-0.22	0.34	-0.42	0.61	-0.38	0.35	-0.34	0.01	0.25	-0.48	-0.06	-0.33									
	Company	PI	-0.48	0.36	0.07	0.16	-0.58	0.27	-0.60	0.28	-0.08	0.39	-0.49	0.07	-0.07	0.06	-0.07								
	Company	DI	0.39	-0.20	-0.39	0.32	0.17	-0.07	0.45	-0.21	-0.45	-0.13	0.72	-0.56	0.14	-0.68	0.30	-0.45							
	Company	OI	-0.31	0.15	-0.61	0.12	0.06	0.02	0.32	-0.11	-0.12	-0.30	0.12	-0.42	-0.09	-0.60	0.29	-0.03	0.51						
Trade variables	Goods	Export	0.03	0.09	-0.33	0.66	-0.19	0.45	0.03	0.19	-0.44	0.20	0.64	-0.48	0.19	-0.53	0.72	-0.09	0.74	0.55					
		Import	0.01	0.11	-0.30	0.69	-0.18	0.48	0.02	0.20	-0.43	0.24	0.64	-0.45	0.20	-0.49	0.71	-0.06	0.72	0.54	1.00				
	Services	Export	0.09	0.02	-0.36	0.65	-0.18	0.44	0.07	0.21	-0.49	0.16	0.66	-0.52	0.22	-0.54	0.72	-0.10	0.76	0.58	0.99	0.99			
		Import	-0.01	0.03	-0.35	0.63	-0.22	0.47	0.02	0.25	-0.48	0.16	0.56	-0.49	0.15	-0.54	0.73	-0.01	0.71	0.61	0.98	0.98	0.99		
	CAB	Balance	0.72	-0.35	-0.02	-0.05	0.63	-0.32	0.69	-0.28	0.03	-0.12	0.55	0.15	0.44	0.22	-0.29	-0.75	0.28	-0.26	-0.14	-0.15	-0.11	-0.22	

FIGURE B.3. Correlation matrix for gross capital flows in Portugal (2014-2019). Source: author's calculations on Banco de Portugal database.

APPENDIX C

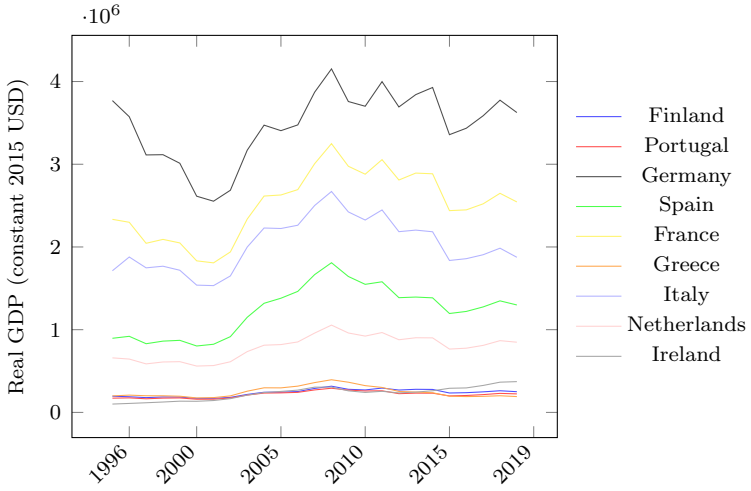


FIGURE C.1. Real GDP (constant 2015 USD, in millions) for the first group of euro area countries. Source: WDI.

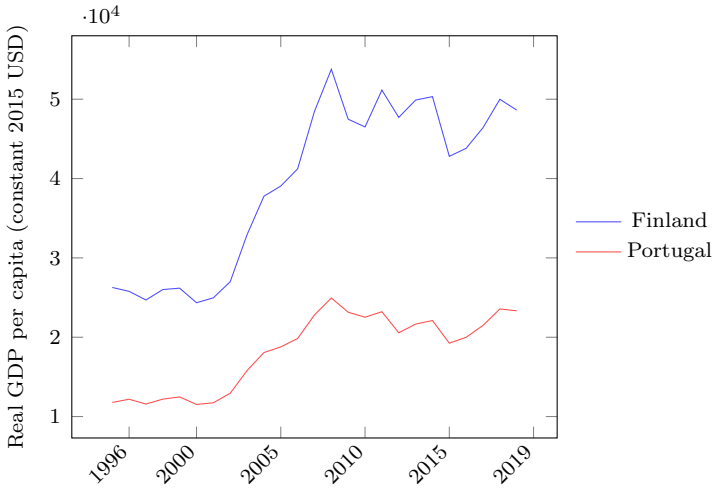


FIGURE C.2. Real GDP per capita (constant 2015 USD) for Finland and Portugal. Source: WDI

TABLE C.1. Descriptive statistics of variables, for Finland (annual growth rates). Source: author's calculations based on IMF, AMECO and UN Comtrade database.

Variable	Obs	Mean	Std.Dev.	Min	Max
HT: x	24	-0.0177	0.164	-0.568	0.193
HT: m	24	0.00274	0.122	-0.375	0.207

Continued on the next page

Table C.1 – *Table Continued*

Variable	Obs	Mean	Std.Dev.	Min	Max
MT: x	24	0.0165	0.143	-0.482	0.227
MT: m	24	0.0173	0.156	-0.568	0.209
LT: x	24	-0.00175	0.222	-0.718	0.490
LT: m	24	0.0129	0.118	-0.286	0.189
RB: x	24	-0.00101	0.151	-0.430	0.254
RB: m	24	0.0191	0.193	-0.528	0.287
PP: x	24	0.0171	0.196	-0.432	0.475
PP: m	24	0.0227	0.218	-0.540	0.303
SD: x	24	0.0155	0.127	-0.361	0.231
SD: m	24	0.0194	0.0820	-0.117	0.173
SC: x	24	0.0184	0.125	-0.300	0.177
SC: m	24	0.0293	0.160	-0.455	0.271
OS: x	24	0.0624	0.260	-0.654	0.712
OS: m	24	0.0458	0.149	-0.227	0.364
gdp	24	0.0103	0.083	-0.169	0.1814
gdpw	24	0.0246	0.0464	-0.0681	0.0946
rpm	24	0.0141	0.0496	-0.0706	0.124
rpx	24	-0.00615	0.0244	-0.0463	0.0451

End of table

Table C.2. Descriptive statistics of variables, for Portugal (annual growth rates). Source: author's calculations based on IMF, AMECO and UN Comtrade database.

Variable	Obs	Mean	Std.Dev.	Min	Max
HT: x	24	0.0296	0.191	-0.723	0.373
HT: m	24	0.0308	0.136	-0.319	0.224
MT: x	24	0.0521	0.113	-0.237	0.277
MT: m	24	0.0176	0.117	-0.265	0.187
LT: x	24	0.0105	0.0941	-0.181	0.151
LT: m	24	0.0168	0.106	-0.241	0.160
RB: x	24	0.0313	0.130	-0.218	0.244
RB: m	24	0.0206	0.111	-0.239	0.186
PP: x	24	0.0593	0.133	-0.260	0.252
PP: m	24	0.0237	0.160	-0.396	0.206
SD: x	24	0.0479	0.0858	-0.131	0.203
SD: m	24	0.0318	0.102	-0.142	0.276
SC: x	24	0.0684	0.144	-0.193	0.324
SC: m	24	0.0311	0.114	-0.207	0.184
OS: x	24	0.0582	0.126	-0.124	0.272
OS: m	24	0.0395	0.107	-0.212	0.198
gdp	24	0.0109	0.079	-0.1523	0.1840
gdpw	24	0.0247	0.0464	-0.0682	0.0946
rpm	24	0.0167	0.0461	-0.0835	0.122
rpx	24	0.000307	0.0199	-0.0483	0.0499

End of table

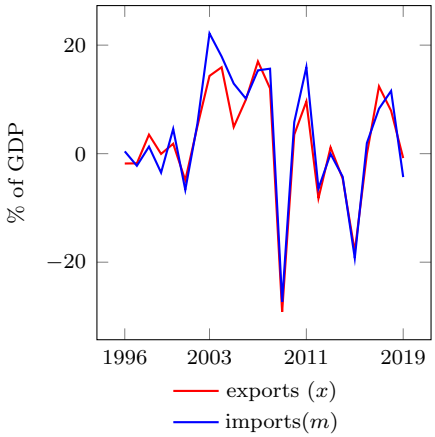


FIGURE C.3. Finland: Annual growth rate of exports (x) and imports (m), 1996-2019. Source: AMECO.

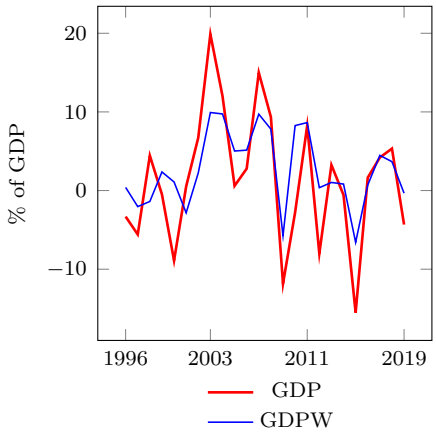


FIGURE C.4. Finland: Annual growth rate of domestic (gdp) and foreign income ($gdpw$). 1996-2019. Source: AMECO.

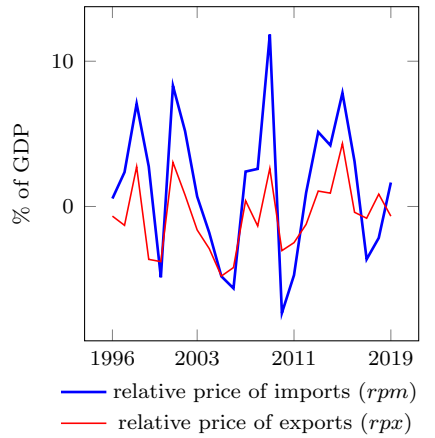


FIGURE C.5. Finland: Annual growth rate of relative price of imports (rpm) and exports (rpx). 1996-2019. Source: AMECO.

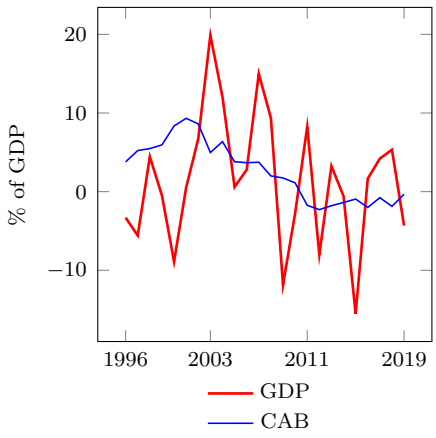


FIGURE C.6. Finland: Evolution of actual growth rate (gdp) and the current account as a % of GDP (CAB). 1996-2019. Source: AMECO.

TABLE C.3. Unit root tests, 1996-2019 (variables in first log differences) for Finland. Source: author's calculations. [a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
HT: x	-3.195***	-3.903***	-2.630	-2.630
HT: m	-3.771***	-3.744***	-2.630	-2.630
MT: x	-5.278***	-5.573***	-2.630	-2.630
MT: m	-4.779***	-4.811***	-2.630	-2.630
LT: x	-5.252***	-5.378***	-2.630	-2.630
LT: m	-4.154***	-4.107***	-2.630	-2.630
RB: x	-5.332***	-5.470***	-2.630	-2.630
RB: m	-4.625***	-4.623***	-2.630	-2.630
PP: x	-4.256***	-4.226***	-2.630	-2.630
PP: m	-4.483***	-4.472***	-2.630	-2.630

Unit root tests, 1996-2019 (variables in first log differences) for Finland. Source: author's calculations.

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
SD: x	-3.623***	-3.547***	-2.630	-2.630
SD: m	-3.059**	-2.999**	-2.630	-2.630
SC: x	-4.777***	-4.811***	-2.630	-2.630
SC: m	-5.378***	-5.495***	-2.630	-2.630
OS: x	-5.055***	-5.252***	-2.630	-2.630
OS: m	-3.624***	-3.582***	-2.630	-2.630
gdp	-3.848**	-3.776***	-3.240	-3.240
gdpw	-3.452**	-3.357*	-3.240	-3.240
rpm	-3.905***	-3.877***	-1.600	-1.600
rpx	-3.998***	-3.987***	-1.600	-1.600

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Critical values are provided by Stata. Regression without constant and trend for: *rpm*, *rpx*. Regression with constant and with no trend for: *m*, *x*. Regression with constant and trend for: *gdp* and *gdpw*.

TABLE C.4. Unit root tests, 1996-2019 (variables in first log differences) for Portugal. Source: author's calculations. [a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
HT: x	-4.906***	-4.957***	-2.630	-2.630
HT: m	-3.503***	-3.497***	-2.630	-2.630
MT: x	-4.455***	-4.462***	-2.630	-2.630
MT: m	-4.607***	-4.604***	-2.630	-2.630
LT: x	-4.750***	-4.774***	-2.630	-2.630
LT: m	-4.699***	-4.700***	-2.630	-2.630
RB: x	-3.914***	-3.858***	-2.630	-2.630
RB: m	-4.371***	-4.346***	-2.630	-2.630
PP: x	-5.236***	-5.235***	-2.630	-2.630
PP: m	-4.438***	-4.411***	-2.630	-2.630
SD: x	-5.423***	-5.641***	-2.630	-2.630
SD: m	-5.762***	-5.646***	-2.630	-2.630
SC: x	-4.352***	-4.361***	-2.630	-2.630
SC: m	-5.112***	-5.153***	-2.630	-2.630
OS: x	-4.375***	-4.355***	-2.630	-2.630
OS: m	-3.763***	-3.733***	-2.630	-2.630
gdp	-3.626**	-3.568**	-3.240	-3.240
gdpw	-3.452**	-3.357*	-3.240	-3.240
rpm	-4.153***	-4.128***	-1.600	-1.600
rpx	-6.524***	-7.189***	-1.600	-1.600

Unit root tests, 1996-2019 (variables in first log differences) for Portugal. Source: author's calculations.

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Critical values are provided by Stata. Regression without constant and trend for: *rpm*, *rpx*. Regression with constant and with no trend for: *m*, *x*. Regression with constant and trend for: *gdp* and *gdpw*.

TABLE C.5. Time series for export and import income-elasticities, and non-competitiveness ratio, for Finland and Portugal. Source: author's calculations.

	Finland			Portugal		
Year	ϵ	π	ϵ/π	ϵ	π	ϵ/π
1996	3.08	1.01	3.05	1.71	1.00	1.71
1997	3.16	1.01	3.11	1.71	1.00	1.72
1998	3.32	1.01	3.29	1.69	0.99	1.70
1999	3.32	1.01	3.29	1.70	0.99	1.71
2000	3.36	1.00	3.35	1.72	1.00	1.73
2001	3.16	1.02	3.10	1.71	1.00	1.71
2002	3.32	1.01	3.29	1.72	1.00	1.72
2003	3.31	1.02	3.24	1.74	1.00	1.74
2004	3.23	1.03	3.14	1.75	1.00	1.75
2005	3.27	1.02	3.20	1.77	1.00	1.77
2006	3.25	1.03	3.15	1.80	1.00	1.79
2007	3.21	1.03	3.10	1.80	1.00	1.80
2008	3.05	1.03	2.94	1.81	1.01	1.80
2009	2.84	1.00	2.85	1.80	1.00	1.79
2010	2.78	1.03	2.69	1.81	1.01	1.80
2011	2.72	1.05	2.58	1.83	1.01	1.81
2012	2.66	1.04	2.55	1.83	1.01	1.81
2013	2.62	1.05	2.49	1.85	1.01	1.83
2014	2.63	1.05	2.51	1.83	1.01	1.81
2015	2.57	1.02	2.52	1.81	1.01	1.80
2016	2.53	1.01	2.49	1.79	1.00	1.79
2017	2.55	1.02	2.50	1.78	1.00	1.77
2018	2.55	1.02	2.49	1.78	1.00	1.77
2019	2.51	1.01	2.47	1.76	1.00	1.76

End of table

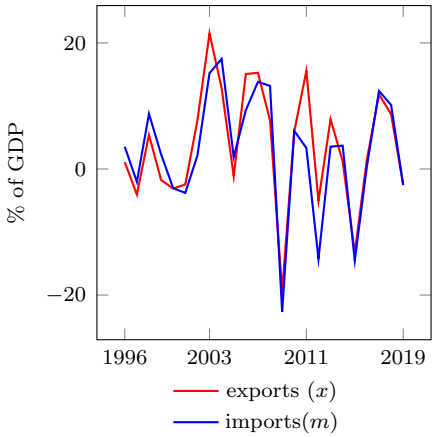


FIGURE C.7. Portugal: Annual growth rate of exports (x) and imports (m), 1996-2019. Source: AMECO.

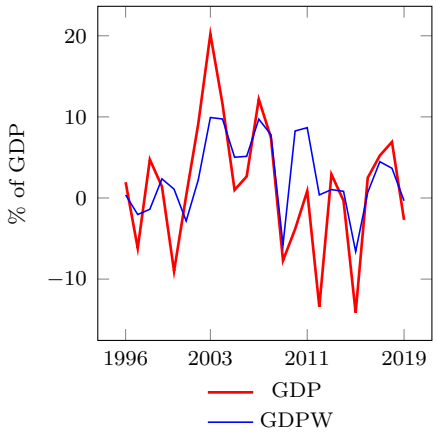


FIGURE C.8. Portugal: Annual growth rate of domestic (gdp) and foreign income ($gdpw$). 1996-2019. Source: AMECO.

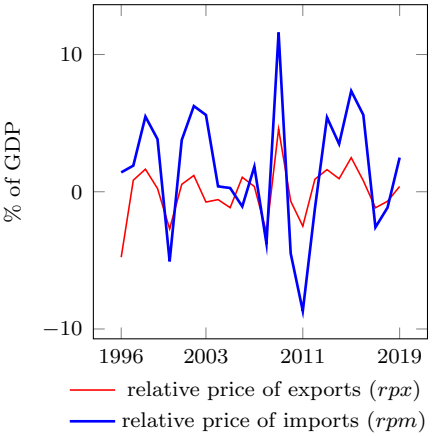


FIGURE C.9. Portugal: Annual growth rate of relative price of imports (rpm) and exports (rpx). 1996-2019. Source: AMECO.

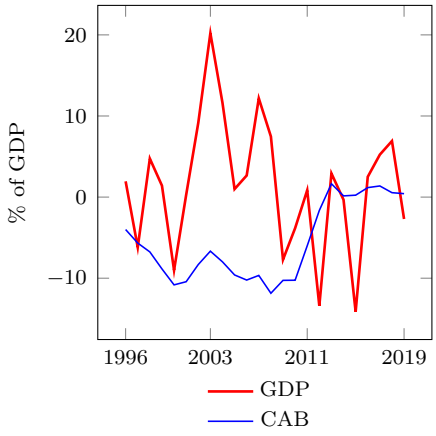


FIGURE C.10. Portugal: Evolution of actual growth rate (gdp) and the current account as a % of GDP (CAB). 1996-2019. Source: AMECO.

TABLE C.6. Unit root tests, 1996-2019 (variables in first log differences) for Finland. Source: author's calculations.[a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
art	-4.499***	-4.499***	-3.240	-3.240
pat	-3.720**	-3.720**	-3.240	-3.240
pat/art	-3.057	-3.057	-3.240	-3.240
educ	-6.393***	-6.393***	-3.240	-3.240
s	-3.585**	-3.585**	-3.240	-3.240
pop	-2.295	-2.295	-3.240	-3.240
ϵ	-4.245***	-4.245***	-3.240	-3.240
π	-5.189***	-5.189***	-3.240	-3.240
ϵ/π	-4.587***	-4.587***	-3.240	-3.240
op	-4.650***	-4.650***	-3.240	-3.240

Unit root tests, 1996-2019 (variables in first log differences) for Finland. Source: author's calculations.[a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
iip	-4.274***	-4.274***	-3.240	-3.240

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Critical values are provided by Stata. Regression with constant and trend for all variables. Variable educ is in second differences.

TABLE C.7. Matrix of variance-covariance with significance, for Finland (1997-2019). Source: author's calculations.

	art	***pat***	*pat/art*	***educ***	***s***	***pop***	ϵ	π	ϵ/π	***op***	***iip***
art	1										
pat	-0.01	1									
pat/art	-0.46**	0.89***	1								
educ	0.00	-0.04	-0.04	1							
s	-0.27	0.40*	0.48**	0.28	1						
pop	0.25	-0.08	-0.18	-0.24	-0.30	1					
ϵ	-0.10	0.11	0.14	0.12	0.46**	-0.25	1				
π	-0.08	0.04	0.07	0.56***	0.27	0.14	0.07	1			
ϵ/π	-0.05	0.08	0.10	-0.14	0.30	-0.29	0.89***	-0.39*	1		
op	0.15	0.02	-0.05	-0.58***	-0.36*	0.40*	-0.30	-0.46*	-0.08	1	
iip	0.31	-0.08	-0.21	0.02	-0.30	0.33	-0.41*	-0.21	-0.28	-0.13	1

End of table

TABLE C.8. Unit root tests, 1996-2019 (variables in first log differences) for Portugal. Source: author's calculations.[a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
art	-4.536***	-4.536***	-3.240	-3.240
pat	-4.278***	-4.278***	-3.240	-3.240
pat/art	-5.146***	-5.146***	-3.240	-3.240
educ	-6.445***	-6.445***	-3.240	-3.240
s	-4.637***	-4.101***	-3.240	-3.240
pop	-1.376	-1.376	-3.240	-3.240
ϵ	-3.915**	-3.915**	-3.240	-3.240
π	-2.703	-2.703	-3.240	-3.240

Unit root tests, 1996-2019 (variables in first log differences) for Portugal. Source: author's calculations.[a]

	Z(t)		10% critical value	
Variable	**ADF**	**PP**	**ADF**	**PP**
ϵ/π	-4.263***	-4.263***	-3.240	-3.240
op	-4.101***	-4.101***	-3.240	-3.240
iip	-3.463**	-3.463***	-3.240	-3.240

[a] ***, **, and * indicate statistical significance at the 1, 5, and 10 percent confidence levels, respectively. Critical values are provided by Stata. Regression with constant and trend for all variables. Variable educ is in second differences.

TABLE C.9. Matrix of variance-covariance with significance, for Portugal (1997-2019). Source: author's calculations.

	art	***pat***	*pat/art*	***educ***	***s***	***pop***	ϵ	π	ϵ/π	***op***	***iip***
art	1										
pat	0.03	1									
pat/art	-0.23	0.97***	1								
educ	-0.29	-0.27	-0.19	1							
s	-0.28	-0.12*	0.04	-0.10	1						
pop	-0.47**	-0.19	-0.06	0.37*	-0.14	1					
ϵ	0.63***	-0.13	-0.29	-0.11	-0.30	-0.49**	1				
π	0.59***	0.08	-0.08	-0.08	-0.05	-0.64***	0.75***	1			
ϵ/π	0.60***	-0.17	-0.32	-0.11	-0.34	-0.43**	0.99***	0.64***	1		
op	0.30	0.49**	0.40*	-0.35	-0.20	-0.19	0.07	0.17	0.04	1	
iip	-0.16	0.14	0.18	0.15	0.15	-0.02	-0.11	-0.10	-0.10	0.05	1

End of table