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Gender Diversity Within Top-Management and Corporate Social Responsibility in Portugal

Hélène Léandre Jeanne Himmer

Master of Science in Business Administration

Supervisor:
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BUSINESS
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Department of Marketing, Strategy and Operations

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[1] Comissão para a igualdade no trabalho e no emprego: www.cite.gov.pt

Resumo

O objetivo deste estudo é compreender a relação entre a Diversidade de Género e a Responsabilidade Social Empresarial (RSE) ao nível da gestão de topo no contexto das grandes empresas em Portugal.

A investigação utilizou uma análise quantitativa da proporção de mulheres em instâncias de liderança, como conselho de administração, e relacionou-as com medidas do desempenho das empresas em atividades de RSE, relatórios de RSE e considerações sobre questões de alterações climáticas. Os dados de mais de 200 empresas foram recolhidos e processados através de análises comparativas, para analisar em que proporção o género dos gestores de topo impacta na existência de relatórios de RSE em Portugal.

Os resultados demonstraram uma correlação fraca - quase insignificante - entre a representação das mulheres na gestão de topo e o desempenho de RSE, e não mostram nenhuma relação entre a proporção de mulheres na gestão de topo e progressos no que toca às alterações climáticas. Adicionalmente, a análise comparativa revelou uma interação significativa entre a proporção de mulheres nos quadros superiores e o processo de reporte de RSE, e a pesquisa revela uma inegável falta de chefias femininas nos escalões superiores das grandes empresas em Portugal, atingindo no máximo 25% de mulheres nas instâncias de gestão de topo.

Palavras-chave: Responsabilidade Social Corporativa, Diversidade de Gênero, Alta gestão, Portugal

Sistema de Classificação JEL:
M14 - Cultura Corporativa • Diversidade • Responsabilidade Social
M12 - Gestão de Pessoas • Executivos; Remuneração Executiva

Abstract

The purpose of this study is to understand the relationship between gender diversity and Corporate Social Responsibility (CSR) at top-management level in the context of large companies in Portugal.

The research investigation used a quantitative analysis of the ratio of women in leadership instances such as board of directors, and related these to measures of companies' performance on CSR activities, CSR reporting and Climate Change. Data from over 200 companies have been gathered and processed through comparison analysis in order to analyse to what extent gender diversity in top-management impacts CSR reporting in Portugal.

The findings demonstrated a weak– almost negligible - correlation between female representation in top-management and CSR performance, and no relationship between the ratio of women in top-management and Climate Change progress. Additionally, the comparative analysis revealed a significant interaction between proportion of women in senior-management and CSR reporting process and the research show an undeniable lack of female leaders at the upper levels of large companies in Portugal reaching at the highest 25% of female within top-management instances.

Key words: Corporate Social Responsibility, Gender Diversity, Top-management, Portugal

JEL Classification System:

M14 – Corporate Culture • Diversity • Social Responsibility

M12 – Personnel Management • Executives; Executive Compensation

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Glossary of acronyms

ADBI	Asian Development Bank Institute
ANOVA	Analysis of Variance
BoD	Boards of Directors
CC	Climate Change
CECOA	Centro de Formação Profissional para o Comércio e Afins
CEE	Central and Eastern Europe
CEO(s)	Chief executive officer(s)
CITE	Commission for Equality in Labour and Employment
COVID-19	Coronavirus Disease 2019
CSR	Corporate Social Responsibility
DSI	Domini Social Index
EC	European Commission
EEC	European Economic Community
EIGE	European Institute for Gender Equality
ENEGE	European Network of Experts on Gender Equality
EU	European Union
GE	Gender Equality
GRI	Global Reporting Initiative
HR	Human resources
ILO	International Labour Organisation
IR	Investor relations
ISSP	International Social Survey Programme
ITRC	Interstate Technology & Regulatory Council
KLD	Kinder, Lydenberg, Domini Index
KPMG	Klynveld Peat Marwick Goerdeler
MORI	Market & Opinion Research International
MS	Member States
OECD	Organisation for Economic Co-operation and Development
OE SMEs	Observatory of European Small and Medium-sized Enterprises
p.p.	percentage points
RSE	Responsabilidade Social Empresarial
SBF 120 index	“Société des Bourses Françaises” Index / French Stock Market Index
SDG(s)	Social Development Goal(s)
SME(s)	Small and Medium enterprise(s)
S&P	Standards & Poor’s stock market index
SRD	Social Responsibility Disclosure
TMT(s)	Top-management team(s)
UET	Upper Echelons Theory
UN	United Nations
UNEP	United Nations Environment Programme
UNGC	United Nations Global Compact
UNICEF	United Nations Children's Fund
UK	United Kingdom

WEF	World Economic Forum

1. Introduction

Within the European Union (EU), only 30% of senior-management roles are occupied by women (Thornton, 2020). According to the EU, gender equality (GE) refers to the equal rights, responsibilities and opportunities of women and men and girls and boys, it implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. In the fourth edition of the Gender Equality Index (EIGE, 2019), the Index measures gender equalities in the domains of work, money, knowledge, time, power, health and violence, as well as intersecting inequalities. Under the domain of power, the European Institute for Gender Equality (EIGE) rated the representation of women in decision-making positions within three sub-areas (the political, social and economic spheres) on a scale of 0 to 100 (EIGE, 2019: 51). The sub-domain of economic decision-making is measured by the proportion of women and men on corporate boards of the largest nationally registered companies listed on stock exchanges and national central banks (EIGE, 2019: 51). The results show that the domain of power at a glance, has seen the biggest advances in gender equality - it made the biggest improvement: a 13-point increase since 2005 - but remains the most worrying area, as it is still the most gender unequal (51.9 points) in the Index (EIGE, 2019: 14). Moreover, one of the major challenges is to stimulate more progress on the part of social partners, and in particular companies (Grosser, 2009). Gender issues also arise in the context of the pursuit of social justice and social inclusion according to Grosser (2009).

Women are suffering from this gender gap – which is defined by the European Institute for Gender Equality (EIGE) as "a gap in any area between women and men in terms of their levels of participation, access, rights, remuneration or benefits"[2] – in various contexts and situations; businesses and workplaces are part of them. Despite the laws and the values of equality, the gender gap persist worldwide: 58 per cent of women who are employed are in the informal economy earning low wages and lacking social protection; women aged 25-34 globally are 25 per cent more likely than men to live in extreme poverty; men also hold 73 per cent of

[2] European Institute for Gender Equality (EIGE). (n.d.). Glossary of terms A-Z Index. "Gender gap" [consulted on 11/09/2020]

management positions and are 70 per cent of climate negotiators; and 80 per cent of women-owned businesses with credit needs are underserved[3].

Looking at women representation in the top-management matters because of contributing to better and broader changes in society, but also because of the sheer value you get from diversity of thinking. In the management literature, terms such as "top management" and "senior management" are used synonymously; and refer to a group of managers who occupy formally defined positions of authority and have decision-making responsibilities within the organisation (Hambrick, 2007; Pettigrew, 1992). Grant Thornton (2020: 1) even affirm that "*if you have a group of people leading a firm who come from a similar background, similar culture, the same gender, you're missing something in the market*".

McKinsey & Company' (2015) point of view point out that diversity matters because we increasingly live in a global world that has become deeply interconnected. Diversity undeniably contribute to making the society to be more open-minded and embrace understanding of others for who they are going beyond differences (McKinsey & Company, 2015). It should come as no surprise that more diverse companies and institutions are achieving better performance. Indeed, diversity increases employee satisfaction and reduces conflicts between groups, improving collaboration and loyalty and strengthen customer orientation as women and minority groups are key consumer decision makers - for example, women make 80% of consumer purchases in the UK. Companies have work to do in taking full advantage of the opportunity that a more diverse leadership team represents also because diversity enhance the company's image and that Social Responsibility is becoming increasingly important and able to provide those opportunities.

Corporate Social Responsibility (CSR) is defined by the European Commission (EC) as the "*the responsibility of enterprises for their impacts on society*" (EC, 2019: 6). To fully meet their social responsibility, companies "*should have in place a process to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders, with the aim of maximising the creation of shared value for their owners/shareholders and civil society at large and identifying, preventing and mitigating possible adverse impacts*" (EC, 2019: 3). Corporate Social Performance is defined "as the performance benefits to the firm (often measured in traditional

[3] United Nations (n.d.). Women and Girls closing the Gender Gap. [consulted on 24-11-2020]

financial or accounting metrics) gained from the implementation of its CSR program" (Werther & Chandler, 2014: xvii*)*. Corporate Social Responsibility is considered as a valuable tool to create gender equality in work environments. Equality and diversity in the workplace are among the main pillars of CSR (Kaur, 2013). In 2018, a study conducted by Arraiano and Hategan (2019) showed that CSR in EU-Central and Eastern Europe (CEE) countries is still in a very embryonic state and that managers of companies based in countries of the region observed[4] – excepted Poland and Hungary which stand out as leading countries in social responsibility and sustainability strategies in the CEE region – have not yet understood the advantages of adopting this strategy in their management. Even if it is not representative of all EU countries, this study demonstrates that there is still a long way to go to reach and maintain good CSR standards.

In a recent survey from Clutch (2019) in the United States, 71% of those polled indicated they think it is important for businesses to support social movements and that they expect businesses to lean into controversy and take unwavering stances on issues related to the environment, human rights, gender, and politics. More and more, companies are considering social and environmental issues in their strategies and policies, due to the public opinion pressure, because of the states' constraints or due to ethical considerations related to corporate culture and philanthropic motives (Stojanovic-Aleksic & Boskovic, 2017). According to Grosser (2009), companies are increasingly addressing the gender equality agenda and including it within their CSR programs.

Gender equality issues became a topic under the spotlight in the last decade[5], due to a rising awareness of ending gender gap and the increasing laws and policy trying to attend gender equality worldwide. The Sustainable Development Goals[6] (SDGs) of the United Nations (UN) address the global challenges that we are facing; and targets have also been established in order to achieve these goals by 2030. Goal number 5 is achieving gender equality (UN Development Programme, n.d.), and target 5.5 specifically aims to "*Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life*"[7]. In February 2020, UN Secretary-General António Guterres said that

[4] List of the countries in the sample observation: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia.
[5] Google Analytics Trends. (2019). Keyword: Gender Equality. [consulted on 01-11-2019]
[6] United Nations. (n.d.). Sustainable Development Goals. [consulted on 01-11-2019]
[7] United Nations. (n.d.). SDG5: Gender Equality. [consulted on 15-09-2020]

the 21st century must be the century of women's equality[8]. However, gender gaps remain and in the labour market women are still over-represented in lower paid sectors and under-represented in decision-making positions at EU level[9].

SDG 12 addresses Responsible consumption and production, which concerns particularly the destructive impacts on the planet of the global economy[10]. Target 12.6 aims to "*encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle*" (UN, SDG 12, n.d.). The UN' Sustainable Development Goals Report (2018) states that 93 per cent of the world's 250 largest companies are now reporting on sustainability (UN statistics, 2018), which is a positive progress, considering that the actions of companies have significant impacts on the lives of citizens in the countries in which they operate. The European Union has also integrated CSR within its policies; and the European Commission adopted a strategy for CSR in 2011, where enterprises are encouraged to adhere to international guidelines and principles European Commission (2011).

It is a collective responsibility to contribute to GE and CSR progress, and "Business is a vital partner in achieving the Sustainable Development Goals" as stated by Ban Ki-moon, ex-UN Secretary-General (SDG Compass, 2015: 4). In 2011, the United Nations have specifically tackled companies' role through establishing a Guiding Principles on Business and Human Rights (United Nations, 2011) in which it points that *"The responsibility of business enterprises to respect human rights applies to all enterprises regardless of their size, sector, operational context, ownership and structure*" (United Nations, 2011: 20).

In addition, many studies demonstrated the positive relationship of gender diversity on decision-making and financial performance, but few have tackled gender diversity impact on CSR performance (Rao & Tilt, 2016). Research addressing the correlation between more female top-managers and CSR performance are only recent (Calabrese et al., 2018) and have found mixed results. Alonso-Almeida et al. (2014), for instance, show that gender can be considered

[8] The UN Secretary-general pointed out that Gender inequality is fundamentally a question of power, and urging to change unequal power structures that underpin everything from national economies, to political systems, to the corporate world and beyond. https://news.un.org/en/story/2020/02/1058271 [consulted on 15-09-2020]

[9] European Commission. (n.d.). Gender equality policies. [consulted on 15-09-2020]

[10] United Nations. (n.d.). SDG 12: Responsible Production and Consumption. [consulted on 15-09-2020]

as one of the most powerful factors explaining differences in the CSR perception of Business students in the sense that women give more importance to CSR and take consideration that those will keep this perception when being future managers. On the other hand, Calabrese et al. (2018) results surprisingly showed that the highest presence of female CSR managers was associated with the lowest presence of sustainable companies, signifying that gender equality among CSR managers is not an absolute driving factor of a sustainability-oriented approach to management although, CSR managers' role is distinct from that of top-managers (e.g. board of directors) and from Chief executive officers' (CEOs) impact on CSR programs performance.

Economic, social and environmental issues were already on the global agenda, but became even more urgent since the beginning of the current Coronavirus Disease (COVID-19) crisis (United Nations, 2020b). The United Nations noted that now we must try to understand and appreciate the limits to which humans can push nature, before the impact is negative; and those limits must be reflected in our consumption and production patterns (UN, SDG12, n.d.). Same concerning SDG 5, the UN stated that women and girls must be put at the centre of economies, which will fundamentally drive better and more sustainable development outcomes for all and support a more rapid recovery from the pandemic (UN, SDG5, n.d.).

As diversity and Human Rights is one of the pillar of the conceptualization of Corporate Social Responsibility, we often hear about CSR practices in relationship with gender equality; but what about gender-inclusive companies associated to sustainable, social and environmental performant results? What is the role of female top-managers for leading to better CSR performance? In which proportion women at senior-management positions impact CSR results?

Considering as exposed above, that gender equality and CSR are topics of interest because of their inherent global, societal and under the spotlight characters, increasing concerns of consumers, stakeholders and institutions but there is still much to be done in both fields, and it is imperative that large companies play their full potential towards this progress. Furthermore, although much has been studied about each one of these topics, individually, much less is known about the interaction between them. It is well-known that CSR integrate diversity area but not really that diversity – hereby gender diversity – can drive to CSR improvement. Additionally, both GE and CSR topics have been identified as areas where progress margin remain important at Portugal country-level.

Indeed, the 2019 Europe Sustainable Development Report which compares the performance of the EU and its Member States (MS) on all 17 SDGs, gave Portugal the ranking

score of 15 (out of the 28 EU countries). When looking specifically at Portugal' progress on SDG 5 – gender equality – the indicator assessing women in senior-management positions been classified under the category "significant challenges remain" (Sustainable Development Solutions Network and Institute for European Environmental Policy, 2019: 106-107). Concerning the country's progress on SDG 12 - tackling "Responsible consumption and production" - the necessary data to evaluate were not available for Portugal that year according to Sustainable Development Solutions Network and the Institute for Environmental Policy (2019: 106-107). Those observations give relevance to the fact that this research work will focus geographically on Portugal, as it demonstrates that much challenges persists in the country.

Therefore, we want to study the relation between the two areas gender equality and CSR focusing on top-management because top-leadership instances have been identified as under-representing women at global and EU levels. At country-level, Portugal was identified as the second worth ratio of women in board (16.2%) in Europe for the year 2017 before Greece (11.3%%) (Martinez, 2019). This, low score motivates the choice to focus this study at Portuguese scale. Moreover, top-management positions are those able to have impact on strategies adopted at corporate level. A survey research established a positive relationship between the size of the enterprises and their degree of involvement into external social activities, social involvement increase according to the size of the SMEs sampled (OE SMEs, 2002). Thus, the research will limit its frame to large companies[11] - operating in Portugal - as they are those with the highest capitals (e.g. financial, human, cultural) being able to implement CSR programs and if considering the OE SMEs reasoning, large companies should also demonstrate higher involvement towards social activities. Additionally, the choice to geographically focus to Portugal is also motivated by the fact that the relationship between gender equality and corporate social responsibility in Portugal has not very been sufficiently studied; whereas gender equality and CSR challenges were clearly identified as those which still remain within Portuguese context.

Consequently, this study aims to answer the following research question: Is higher representation of women within top-management of Portuguese large companies associated to better Corporate Social Responsibility?

[11] Organisation for Economic Co-operation and Development (OECD). (n.d.). Definition of "large companies" as « enterprises employing 250 or more people ». [consulted on 15-11-2020]

It matters to understand the link between gender representation in top-management positions and performance of CSR activities at Portugal level as it can explain the efficiency or failure in the progress toward SDGs. Additionally, identifying trends in the Portuguese context can allow designing appropriate and accurate solutions to reinforce CSR and women participation in Economic life.

The next section of this research will present some of the main relevant literature related to gender diversity and Corporate Social Responsibility (Chapter 2). The following part will address the data collection and methodology of analysis used (Chapter 3). Logically the next step will describe the data and present the analysis' results (Chapter 4). Those results will be discussed in the spotlight of the context, literature and other relevant factors under Chapter 5. Finally, the last Chapter will offer some concluding remarks, including limitations and future research perspectives (Chapter 6).

2. Literature review

2.1. Gender Diversity and Business

2.1.1 Gender, Gender Equality & Diversity

The literature firstly need to define the notion of gender, according to Ahl (2006) it is a concept going beyond the biological sex of individual's but described through the social feminist theory as a social construction. Gender is something that is "done," "accomplished," or "performed" rather than something that "is" (Alh, 2006). According to social role theory, authors such as Dheer et al. (2019) state that gender is socially constructed and, as such, is based on an institutionalized system of social stratification that considers women and men different. This system allocates different roles and responsibilities to women and men and prescribes behaviours that are forbidden or encouraged (Dheer, & Treviño, 2019). From Nehere (2016) view, the private sphere is oppressing the role of women in the household and equal opportunities for women in the public sphere. Socialist feminists are devoted to improve the social conditions of women through protection especially at workplace (Bressey, 2010).

Other authors (Fischer, 1993) defend the liberal feminist theory, according to which men and women are seen as totally equally able and deny the existence of social barriers. Fischer (1993) affirmed that for the liberals, the theoretical justification for observed differences in the achievements of men and women is that women have less frequently realized their full capabilities only because they were deprived of essential opportunities such as education. The liberal feminists recognized that men have access to more lucrative and prestigious jobs in the formal sectors of the economy (Saptarshi & Bhagat, 2005). The literature (Bandarage, 1984) stated that those observations have created situations where women are forced to accept jobs with low quality, dignity, paid.

Gender equality is defined by UNICEF (2017) as "*the concept that women and men, girls and boys have equal conditions, treatment and opportunities for realizing their full potential, human rights and dignity, and for contributing to (and benefitting from) economic, social, cultural and political development*". Backhans (2007) consider gender equality, as another form of women empowerment, means affording women equality of opportunity and removing obstacles that hinder women from participating fully in business, education, politics and culture.

Diversity is defined by Kaur and Arora (2020) as the existence of differences among a group based upon their colour, ethnicity, gender, age, social class, physical attributes, nationality, education, personality, skills and knowledge. Even if the terms 'diversity' and 'inclusion' are commonly used interchangeable, there is wide difference between the two concepts (Kaur & Arora, 2020). Jordan (2011: 1) point out that "*Inclusion involves bringing together and harnessing these diverse forces and resources, in a way that is beneficial. Inclusion puts the concept and practice of diversity into action by creating an environment of involvement, respect and connection – where the richness of ideas, backgrounds, and perspectives are harnessed to create business value*".

Gender is one of the aspects of diversity in organisations, and gender diversity in the workplace most commonly refers to the equal and/or balanced representation of men and women among employees (Wieczorek-Szymańska, 2020). According to EIGE[12], Gender relations intersect with all other influences on social relations – age, ethnicity, race, religion, etc. – to determine the position and identity of people in a social group. For Wieczorek-Szymańska (2020), work-team is a social group within which people should work collectively to achieve a synergic effect. EIGE assume in its glossary, that since gender relations are a social construct, they can be transformed over time to become more equitable.

The difference between gender and diversity, according to Lunghi (2009), consists in the fact that gender represents a social construct while diversity is the virtuous means of combating discrimination based on any kind including on gender. This social and cultural construction of gender is not fixed: it varies according to eras, countries, situations, internal factors and influences external to societies (Lunghi, 2009). The author, Lunghi (2009), recall that professional equality between women and men is unlike diversity, a legal concept that has been framed for a very long time at EU level, it is so a principle of law. Unlike diversity and consequently gender diversity has no legal definition. It is a notion, a concept often understood as a preventive tool against discrimination Lunghi (2009). According to Association Adéquations (2017), while equality exists formally in principle, it is far from being achieved in practice. Equality *de jure* (of rights) does not automatically lead to equality *de facto* (in fact), hence the need to implement procedures and policies, often through implementing the notion

[12] European Institute for Gender Equality (EIGE). (n.d.). Glossary of terms A-Z Index. "Gender relations" [consulted on 11/09/2020]

of diversity – and thus, gender diversity. If this relationship between gender equality and gender diversity is based on the social construct of gender, it applies to all sphere of the society; thus, it is right to pay further attention to gender diversity ins and outs when restricting the field only to work environment.

2.1.2 Gender Diversity in Work Environment

Gender Equality in a work place means, according to Skills4 enterprise[13], that men and women are hired at a similar and consistent rate, are paid equally and are given the same working opportunities with the same promotional opportunities when gender diversity in work environment refers essentially to the diverse representation of women and men within the workforce of an organisation. However, managing diversity – on any criteria, including gender - means enabling the diverse workforce to perform its full potential in an equitable work environment where no one group has an advantage or disadvantage (Torres & Bruxelles, 1992). This equal opportunity philosophy shared by Ongori et al. (2007) is aimed at ensuring that organizations make the most out of the difference from a diverse workforce rather than losing talent which might assist the organization to be more efficient and effective.

Before the 1990s', gender diversity and status of women at the workplace have been widely ignored by both employers and management practitioners mainly because the majority of the companies were focused on the themes such as discrimination and cultural bias, and not on the very less representation of women in the workforce (Shore et al., 2009). But some researchers such as Yadav et al. (2020) had shown more interest in the representation of women in the workplace regardless of gender discrimination after the 1990s. Several extensive types of literature have been conducted, especially on gender diversity in management literature (Yadav et al., 2020).

As of January 2020, female employees are 44,7% of the labour force for *Fortune 500* Companies, which is nearly approaching the half of the workforce under a study of Catalyst enterprise (Catalyst, 2020). However, the percentages of women progressively decline at each level of management. Women are 36.9% of first- and middle-level managers, 26.5% of executive and senior-level managers, and 5,8% of CEOs (Catalyst, 2020).

[13] Skills4. (n.d.) What is Gender diversity?. [consulted on 19-09-2020]

The state of play of gender diversity within workforce is heterogenic from a market activity to another; Indeed, Skills4 enterprise affirm in his paper questioning "What is gender diversity?" (Skills4, n.d.) that some of the most common industry areas sees a dominance in male employees over female which mainly computing, engineering, medicine and science.

The "glass ceiling[14]" is commonly used to describe the widespread phenomenon of women's inability to advance from middle management to senior or executive management (Eagly,2009). Indeed, Eagly (2009) point out that in the last years, a "labyrinth" is cited as a metaphor for the difficulties associated with navigating the complexities of one's career as a woman in business; comparing to men unhindered by those obstacles, who have a clearer, straighter path to leadership than their female peers. However, some of the theories such as the *Upper Echelon Theory* (Hambrick & Mason, 1984) and resource dependence theory (Pfeffer & Salancik, 2003) have suggested that gender diversity has positive effects on the top-management team.

2.1.3 Gender Diversity in Leadership and Top-management

2.1.3.1 Women in Top-management impact on decision-making

First of all, it is necessary to be clear about what we called "top-management". It is defined by the Business Dictionary, as "*the highest ranking executives responsible for the entire enterprise*", for example chairman/chairwoman, chief executive officer, managing director, president, executive directors, executive vice-presidents, etc. The Business Dictionary precise that top-management's purpose is to translate policies, previously formulated, into goals, objectives, and strategies, as well as project a shared-vision of the future for the firm[15]. Top-managers' decisions affect the entire company, and are fully responsible for the success or failure of the enterprise (Business dictionary, n.d.).

[14] EIGE Glossary definition: "Artificial impediments and invisible barriers that militate against women's access to top decision-making and managerial positions in an organisation, whether public or private and in whatever domain" [consulted on 15-11-2020]

[15] Business dictionary. (n.d.). Definition: Top-management. [consulted on 26-09-2020]

In comparison to Chief executive officer, top-management teams (TMTs) get much less attention from academic discourse and day-to-day conversation according to Purkayastha et al. (2015). This is a serious problem, taking into consideration that leadership of large and complex corporations is rarely a solo endeavour (Purkayastha et al., 2015). In 1984, two authors (Hambrick & Mason, 1984) defined the foundations of top-management research, or what is named the '*Upper Echelons Theory*' (UET), this theory explains how the strategies and effectiveness of firms are linked to top managers' characteristics. Hambrick and Mason (1984) argue that complex decisions cannot be economically optimized, and that behaviour dominates. In other words, this significate that regarding complex decisions, the solution won't be motivated by economic factors but by behavioural determinants related to the decision-maker characteristics. So, for Hambrick and Mason (1984) the more complex the decision the more the singularity of the decision makers matter, and specified, that the characteristics related to the composition of the entire top-management team matters, not only to the CEO.

Some authors have demonstrated that top-management decision-making is influenced by its gender composition (Bear et al, 2010; Nielson & Huse, 2010). It has been shown by Burke (2000) that women presence in the top-management improves decision-making by adding information, perspectives and debate. According to several researchers, including Fondas (2000), women directors are usually more objective and independent and are more likely to take decisions anticipating negative consequences in the view of Hillman (2015).

The sensitivity of women in decision-making positions to CSR topics has been advanced by several studies (Hudson & Miller, 2005; Lämsä et al., 2008, Backaus et al., 2002; Adams & Funk, 2012), one even argued (Marx, 2000) that female directors are more inclined to promote their companies' charitable giving programs due to the sense of empowerment received through the giving act.

Indeed, the gender-based literature affirm that men and women are different in their leadership behaviour. To understand the important aspects of gender differences, it is necessary to pay attention to agentic and communal attributes (Eagly et al., 2003). Agentic refers to attitude such as being assertive, ambitious, aggressive, independent, self-confident, daring, and competitive are most commonly asserted to men. Although, communal attributes are for example being, affectionate, helpful, kind, sympathetic, etc. and which are generally ascribed to women (Eagly & Johannesen-Schmidt, 2001). Eagly et al. (2003) have previously developed a comparison between both attributes (agentic and communal) and gender in leadership context. The results of Eagly et al. (2003) research show that men are more strongly ascribed to agentic

characteristics than women. In a working context, this means to adopt behaviours such as speaking assertively, competing for attention, influencing others and making problem-focused suggestions. Whereas communal ones are more attributed to women than men which describe characteristics such as a concern in welfare of others people and being affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturing and gentle. Translated into work environment, communal attributes refer to speaking tentatively, not drawing attention oneself, accepting others' positions, supporting and soothing others, and last but not least, contributing to the solution of relational and interpersonal problems (Eagly & Johannesen-Schmidt, 2001).

Consistent efforts were done to provide an explanation on why diversity may lead to positive outcomes such as attitudinal outcomes related to increasing satisfaction and commitment to the company, as well as to process losses (i.e. conflict and miscommunication); and positive behavioural outcomes such as innovation and creativity, lower absenteeism and reduced turnover (Joshi & Roh, 2009). The main explanation exposed earlier by Jackson et al. (2003) used the social categorization theory - which is the process by which people categorize themselves and others into differentiated groups - and the social identity theory that focuses on how group memberships guide intergroup behaviour and influence an individual's self-concept (Trepte et al., 2017); and point that diversity through those approach impact first team processes – consisting in the interactions that occur among team members while performing the team task and combine individual efforts into collective results[16] – before to reflect this relation into team performance; which thus concern also more specifically gender diversity.

In the twenty-first century, companies are becoming more diverse due to globalization, technological advances and the increasing power of emerging economies, added to workforce demographic profile changing rapidly (Ciocirlan & Petterson, 2012) which change the way to govern a firm and manage workforces. Consequently, in the last decade, there has been increasing pressure from society and investors to diversify companies' upper echelon (Grosser & Moon, 2005; Burgess & Tharenou, 2002), which has increased women, minorities and persons with disabilities representation in positions of strategic responsibility and decision-making (Burke & Mattis, 2005). Nevertheless, Setò-Pamies (2013) affirms that the lack of female representation on corporate boards of directors is a global phenomenon. The author states that the issue of gender diversity, especially at top-management level, is capturing the

[16] IGI Global dictionary. (n.d.) Definition of team processes. [consulted on 30-10-2020]

attention of companies considering the need to take steps in this area and reflecting on the positive consequences of increasing the presence of women in management positions (Setò-Pamies, 2013), probably because women leadership impact on firms' benefits have been demonstrated.

2.1.3.2 Gender Diversity in Top-management and firm benefits

Carter et al. (2003) argue that gender diversity creates a positive impact on firm value because of the following reasons: diversity – which also include gender diversity - promotes a better understanding of the market place, as it increases the potential customers and suppliers through market penetration; board diversity increases creativity and innovation; it produces more effective problem- solving and finally it enhances the effectiveness of corporate leadership and promotes effective global relationships. It has been recognized that diversity within the board is linked to a better governance performance, more attention to innovation and creativity, contributing to a certain competitive advantage (Gul et al., 2011).

There is much research on the impact of diversity – in general, not only gender diversity – within firms on outcomes, the list includes increased market share, attracting and retaining talent, and lower turnover and absenteeism (Lockwood, 2005). One of the main explanatory factors is how it shape the Culture of the company. Sheryl Lyons - Founder & President, Culture Spark, LLC. – explained in a 2017 Forbes newspaper interview (Lyons, 2019), that "*Culture is the sum of our collective behaviors*", it's how we treat one another, it is how leaders treat each other and their people. Thus, the innovative and financial benefits of diversity start with a company mind-set and commitment to day-to-day behaviours that foster diversity and cultivate a culture where team members feel respected, valued and confident in their contributions (Lyons, Forbes, 2017). Moreover, Lyons (2017) states that "*a diverse employee population excels best under a diverse leadership team, but hiring for diversity is only the beginning*".

Many recent studies have determined that gender diversity influences positively corporate financial performances (Low et al., 2015; Conyon & He, 2017), although other research concluded the opposite by affirming the absence of significant positive relationship between female presence on boards and financial performance (Velte, 2017). According to Miles (2014), higher representation of women, minorities and disabled people in the Upper Echelon of the firm may increase adoption of CSR practices within the company. Such sustainable practices are likely to influence discretionary employee behaviours which may lead to higher profitability

for the firm. The explanation of Miles (2014) is that top-management diversity lead to Firm performance through the adoption of CSR practices such as Work-life balance policies likely to create favourable employee behaviours that can be translated into company profitability. After analysing a sample of 403 firms, the research (Miles, 2014) demonstrated that companies committed to diversity – including gender diversity - presents clear differences with the comparison group. Indeed, firms performed better throughout the time frame (from 2000 to 2011) than those lacking diversity commitment which give credence to the CSR perspectives assuring that companies reach benefits by focusing on different positive outcomes.

Other authors affirmed that firms with higher percentage of women in Boards of Directors (BoD) are significantly more likely to appear on "*Fortunes'* Best companies to work for" [17] (Bernardi et al., 2006) and "*Ethisphere's* Most ethical companies list" (Bernardi et al., 2009). Nevertheless, it has been suggested that female leadership is more likely to be positively related to firm performance in more gender egalitarian cultures, which means in climates that hold more progressive attitudes toward women (Hoobler et al., 2018).

A large body of studies has examined the impact of gender diversity on a firm's performance (Richard et al., 2004; Gonzalez & DeNisi, 2009). However, if there is much less research about the impact of female leadership on Corporate Social Responsibility but the following section will expose that still some authors addressed this thematic and the literature presents mixed findings.

2.2 Gender Diversity and Corporate Social Responsibility

2.2.1 Corporate Social Responsibility

Numerous definition of Corporate Social Responsibility exists, Matten and Moon (2004) proposed to consider CSR as an umbrella term reflecting relations between business and society. Although, several authors have already defined CSR as the economic, legal, ethical and discretionary responsibilities firms assume towards their stakeholders (Carroll, 1995; Maignan & Ferrell, 2000). Carroll' (1998) definition of CSR includes four main social responsibilities. One of them is named as firm's ethical responsibilities, stating that companies have an

[17] Fortune. (2020a). 100 Best Companies to Work For. [consulted on 15-11-2020]

obligation to abide by moral rules defining appropriate behaviours in society. The work of Carroll (1998) and Montiel (2008) demonstrated that CSR and all its related concepts such as corporate citizenship - which refers to a company's responsibilities toward society[18]; corporate social responsiveness – which identifies how organisations and their stakeholders dynamically interact and care for social and environmental causes[19] - or again corporate social performance - which is the stakeholders' assessment of the CSR and corporate citizenship over time in comparison to competition[20] – are dynamic phenomena.

DiMaggio and Powell (1983), determined long time ago that demands for Corporate Social Responsibility is generally coming from external stakeholders, such as governments with explicit requirements or communities with general expectations of social legitimacy. The basic thematic of CSR, according to Matten and Moon (2008: 405), is "*the idea that it reflects the social imperatives and the social consequences of business success*" and that CSR manifestation and direction are largely at the discretion of the firm. The major causes of CSR implementation depend upon those conditions identified by Campbell (2007) as economic and institutional conditions considered as the primary basis for firms to act in a socially responsible way. In more details, the economic conditions include financial performance, the level of industry competition, and the state of the economic environment. The institutional conditions involve regulation and enforcement, the presence of independent monitoring organisations, such as non-governmental organisations and the media, institutionalized normative calls, as well trade unions and industry associations (Campbell, 2007).

As seen above, the driver to adopt CSR practices is most of the time coming from external stakeholders, but the perception differs from an industry to another. Some authors noted that "*firms pursuing product differentiation, image, or reputation-building will have an incentive to be socially responsible"* (Waldman et al., 2006: 1704). For Porter and Kramer (2011), the major purpose of a company is to satisfy the customer by delivering a distinctive value proposition. Already in 2004, polls evocated that the majority of customers consider CSR as an important factor taken into account while making their purchasing decisions (Bhattacharya & Sen, 2004).

[18] Investopedia (n.d.) Understanding Corporate Citizenship. [consulted on 30-10-2020]
[19] IGI Global dictionary. (n.d.). Definition: Corporate Social Responsiveness. [consulted on 30-10-2020]
[20] Study (n.d.). Corporate Social Performance. [consulted on 30-10-2020]

McWilliams (2006) have emphasized that major corporations such as Wal-Mart, Nike and Starbucks have started to integrate CSR procedures into their firm' strategy as a response to stakeholder demand. Some companies respond to external demand like Wal-Mart while creating the "green" rating to respond stakeholder demand through requiring sourcing information from its suppliers (Keegan, 2011). Other firms make the choice to implement CSR practices proactively such as the well-known ice-cream producer Ben & Jerry's or the brand Body Shop. Indeed, those two examples have based their business models on CSR-driven strategies (Waldman et al., 2006). This shows that CSR is a strategic choice allowing companies to create shared value managers between personal interests of managers and the social cause (Huang, 2012); but as all strategic choice it has to be well-reflected and in the business world that is synonym to be based on numbers and forecasting. In another word, CSR needs to be beneficial for the firm and for that it must be measured.

2.2.2 Corporate Social Responsibility Performance

In the Corporate Social Responsibility literature, several approaches were identified to measure CSR. Most of the previous studies used four distinctive methodologies to measure CSR, which are: the disclosure method, the reputational indices or scales, the forced-choice questionnaire surveys, and finally the single dimension-based measure (Ehsan et al., 2018).

Orlitzky et al. (2003) tell that the first and most used method to measure CSR is "social ratings" which is based on various reputational indices compiled by several social agencies, these agencies investigate the companies' CSR performance and rate them in accordance with their various social, environmental, and other CSR-related practices. The data collected come from different sources of information, it can be through surveys and interviews from the various public respondents, knowledgeable observers, business professionals, company employees, or to analysing documents such as the firm website, firm financial annual reports, and newspapers (Orlitzky et al., 2003).

Huang (2012) defines CSR performance as "a firm's consistent appearance in CSR ranking". The most widely used and recognized indices are *Moskowitz*'s tripartite ratings, the *Kinder, Lydenberg, Domini* (KLD) index, the *Domini Social Index* (DSI), and *Fortune* magazine's reputational ratings (Ehsan et al., 2018).

Empirical studies have evidenced that CSR becomes a major concern for companies and managers, through analysing that numerous for-profit organisations now regularly report a wide array of social and environmental initiatives that they have taken to improve their CSR performance (Harrison et al., 1999; Hillman, 2001). Over the past decade or two, researchers have witnessed that CSR rose to its prominence, "*becoming a more and more legitimate element of management philosophy*" (Hyun et al., 2016: 3) and that firms take CSR much more seriously nowadays than they used to. Based on the legitimacy theory, CSR performance are view as the reflection of a firm's moral legitimacy and as an extent to the way a firm is accepted by its stakeholders as a moral corporate citizen (Scherer & Palazzo, 2007).

Indeed, since its foundation in 1997 the Global Reporting Initiative (GRI)[21] have promoted worldwide and at the EU level, supported by the UN Environment Programme[22], "*a future in which reporting on impacts is common practice*". GRI exists to help organizations be transparent and take responsibility for their impacts so that we can create a sustainable future. GRI creates the global common language for organizations to report their impacts through providing global standards (GRI, n.d.).

Few researchers observed that the role of corporate leaders in formulating and implementing CSR policies have been ignored from studies (Waldman & Siegel, 2008) and there is a lack of investigation into relevant managerial variables affecting CSR performance (Angus-Leppan et al., 2010; Manner, 2010). Hyun (2016) affirmed that for a firm to prepare and implement effective CSR policies and practices, "*concerns about non-shareholding stakeholder issues should be broadly shared among board members and other members of the organisation*" (Hyun et al., 2016: 6). From this observation, the next question rising in this literature review is how increasing female representation within top-management lead to better CSR concerns within the organisation?

[21] Global Reporting Initiative. (n.d.). GRI Mission and History. [consulted on 15-11-2020]
[22] United Nations Environment Programme (n.d.) https://www.unep.org/ [consulted on 15-11-2020]

2.2.3 Gender Diversity and Corporate Social Responsibility

2.2.3.1 Gender Diversity drivers' factors on CSR

Some psychological studies analysed that women directors tend to have values that are more aligned with corporate social performance. Several Meta-analyses support this view as they found small but consistent evidence of sex differences in moral orientation – both in care and justice reasoning – (Jaffee & Hyde, 2000) and also in ethical attitudes – defined as areas of practical concern to the business community – (Borkowski & Ugras, 1998) where those characteristics were identified as stronger for women than men. Women have the tend to be more concerned about social performance issues in comparison to men (Backaus et al., 2002). Others authors such as Adams and Funk (2012) noted that female directors are systematically more benevolent and inclusive than their men counterparts.

At the political and scientific level, concern about climate change is rising at the same time. *Fortune* 500 companies are getting involved in the fight against climate change to a higher extent than in the past (Ciocirlan & Petterson, 2012). In 2010 already, PricewaterhouseCoopers declared that all issues connected to Corporate Social Responsibility will turn to take a greater importance on Boards of Directors' agendas (PricewaterhouseCoopers. 2010). From those observations, it is even more important to understand whether there is a relation between the presence of women on BoD and CSR is a question of particular interest because women could play a key role in driving CSR (Setò-Pamies, 2013). In early 2000', 'hiring women directors' were already identified as a growing concern for firms (Gutner, 2001).

In 2012, Zhang et al. (2012) found empirical evidence to affirm that a greater presence of women directors is linked to better CSR performance within a firm's industry. The researchers advanced that female directors tend to possess certain characteristics (e.g. communal traits: affectionate, helpful, interpersonally sensitive, concerned about others' welfare) at the psychological level that supposedly make them more sensitive to certain stakeholders' (e.g. not-for-profit organisations) claims and thus heighten their salience.

Some empirical evidence demonstrated the existence of a certain pro-environmental behaviour held by women. Through analysing a sample from the *Fortune* 500 companies list (Fortune, 2020b) belonging to different type of industries, Ciocirlan and Petterson (2012)

concludes that firms with more women employees exhibit higher concern for climate change issues.

Shoham et al. (2017) studied a cross-country sample of firms from multiple industries and for multiple years, their findings are edifying, thus, the presence of even one woman on the board of directors positively encourages organisations toward environmental sustainability and this regardless of the local culture. At the contrary, few years before some researchers advanced after analysing data from a *Klynveld Peat Marwick Goerdeler'* (KPMG) survey on firms from 22 countries and several industries, that companies in countries where a higher proportion of Boards of Directors reach at least three women within the board, the level of CSR reporting is higher (Fernandez-Feijoo et al., 2014).

The explanation for the CSR-promoting women as role leaders is rooted in the long-standing idea that women, in general, are more ethically sensitive, empathetic and have stronger moral standards than men (Bear et al., 2010). Another justification to the fact that female independent directors are compelled to pay more attention to their firm's CSR due to reputational concerns; some authors (Ibrahim et al., 2009) even demonstrated that women managers tend to exhibit more positive attitudes toward ethics code' adoption within their firm and are more confident that the ethics code will increase moral standards in their business operations.

Others empirical studies (Tindall et al., 2003; Hunter et al., 2004), conducted at international level show that women exhibit more environmentally friendly attitudes and engage in private sector environmental behaviours to a higher extent than men. Although, all those observations must somehow explain a possible impact of gender diversity on the implementation of CSR activities.

2.2.3.2 Gender Diversity impact on CSR

According to Nadeem et al. (2017), only few studies focused on the association of gender diversity with Corporate Sustainability Practices. Even if some researches supports a positive relationship between having women at the direction of the firm and CSR performance (Webb, 2004; Williams, 2003), others studies reveals mixed or no effects (Post et al., 2011; Stanwick & Stanwick, 1998).

After reviewing 200 precedent scientific studies, Velte (2017) revealed that the presence of women on board of directors has a positive impact on CSR performance. Previously, Hyun et al. (2016) analysed a sample of 1500 indexed firms from 2000 to 2009, which resulted in finding that women presence on board is positively related with firms' CSR ratings.

In 2017, a study of a sample composed of French listed companies belonging to the *SBF 120 index*[23] from 2001 to 2011 has been analysed to control for characteristics differences between firms with and without female board membership by using propensity score matching. The researchers (Nekhili et al., 2017) demonstrated that CSR reporting is more relevant in terms of market value when the proportion of women on board increases. It is specified that Female directors "enhance credibility of information" which is "leading CSR reporting to be more economically viable" (Nekhili et al., 2017: 82).

An Italian analysis of two case studies revealed the hidden role of female directors and female top-managers in promoting CSR and sustainability, which have to be understood in terms of "*implementation of strategies, action and accountability tools, as well as in contributing to CSR resilience, producing innovation and overcoming social, ecological and economic challenges of disruptive markets*" (Baldarelli & Del Baldo, 2016: 142).

In the Australian context, Galbreath (2018) demonstrated that women presence in boards is correlated to CSR practices contributing to financial performance. Moreover, another researcher finds a significant positive correlation between women presence in Australian companies' boards and CSR practices between 2010-2014, after Australian legislation required to listed companies to implement policies for increasing board diversity and CSR practices (Nadeem et al., 2017).

In Malaysia, a study (Alazzani et al., 2017) revealed a positive correlation between female directors' presence on boards and social performance, but not with environmental performance. For the authors, women directors of Malaysian companies are more sensitive to social issues than to environmental ones.

In Japan other factors have to be taken into account when looking at the correlation between women presence on boards and CSR performance. A study (Mun & Jung, 2017) of more than

[23] The SBF 120 (*Société des Bourses Françaises 120 Index*) is a French stock market index. The index is based on the 120 most actively traded stocks listed in Paris.

800 Japanese companies in the period 2001-2009 show that women in boards and managerial roles has increased in response to CSR normative, but also to guarantee a good reputation with foreign institutional investors. Mun and Jung (2017) pointed out the lack of real cultural change towards CSR and sustainability due to normative pressure that urges reform of discriminatory employment practices. Local CSR experts have promoted gender diversity as a way for Japanese firms to remain on good terms with foreign institutional investors and pushed for limited changes acceptable to other groups (Mun & Jung, 2017). Thus, Mun and Jung (2017) show that they have promoted gender diversity only above the glass ceiling where positions are most visible to external constituents — women on corporate boards and in managerial positions mainly in Investor relations (IR) and Human resources (HR) — without challenging the foundation of gender inequality at lower ranks.

A recent study conducted by Calabrese et al. (2018) on gender equality among CSR managers and its influence on Sustainable Development, in Italy, Spain and United Kingdom (UK) concluded that it is not a completely appropriate indicator of a sustainability-oriented approach to management. Surprisingly, Italy presents the highest proportion of women among CSR managers but the lowest number of sustainable companies for all the year examined between 2014 and 2018. Inversely, UK have the highest percentage of sustainable companies and contemporarily the lowest share of women CSR managers study (Calabrese et al., 2018).

At the contrary of the idea that women at the top echelon of the organisation leads to better sustainable results, a study declared that "*it is not only gender diversity on the board that matters for sustainability but diversity throughout the organisation*" (Kassinis et al., 2016: 408). However, a recent study limited to the bank sector revealed that there is only a nonlinear relationship between gender diversity within board and the environmental performance of banks (Birindelli et al., 2019).

Similarly, Zhang et al. (2012) warned the importance that firm's moral legitimacy is rooted in its industry context, they explain that stakeholders' judgement and expectations of moral principles are often industry-specific (Zhang et al., 2012: 383). Firms from different industries may interact with different stakeholders; and different stakeholders may carry different moral principles (Cooper et al., 2001), suggesting that the relationship between gender equality and CSR should be analysed according to the industry sector. Since our study is focused on Portugal, the situation regarding gender diversity and corporate social responsibility in Portugal, as well as previous studies undertaken in this field in the country will be address in

the next section, in order to understand the state-of-play of both topics (e.g. gender equality and CSR) and their interactions within Portuguese context.

2.3 Gender Diversity and Corporate Social Responsibility within Portuguese context

2.3.1 Gender Diversity in Portuguese Businesses

The sub-index *Economic Participation and Opportunity*, constructed by the World Economic Forum (WEF) (2018a), captures three concepts of disparity: advancement, remuneration and participation. Using hard data – such as ratio of estimated female-to-male earned income, ratio of women to men among legislator, etc. (WEF, 2018b) - and a qualitative indicator. According to Taghizadeh-Hesary (2019) from the Asian Development Bank Institute (ADBI) this indicator allow global comparisons of Gender Inequality in the corporate sector can be made across countries.

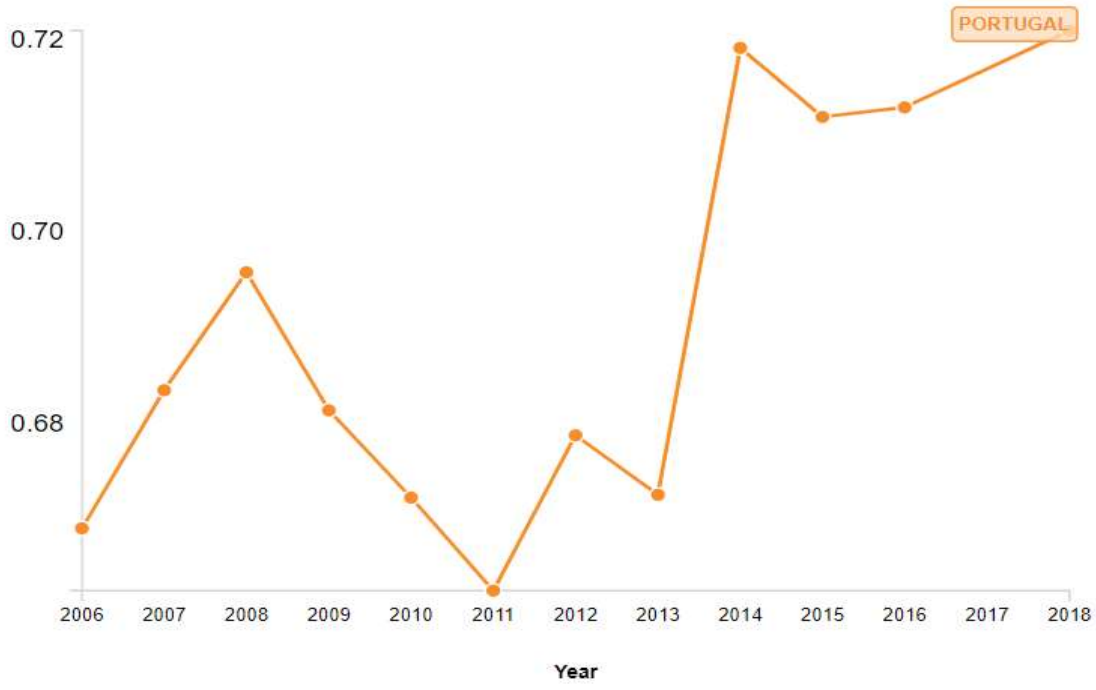
In this indicator the gap between the advancement of women and men in Economic sphere is captured through two ratios. For the first ratio, comparing women and men proportion among legislators, senior officials and managers; in 2018, Portugal is ranked 58 out of 142 countries. Concerning the second ratio, measuring the presence of women among technical and professional workers, data were not available to monitor Portugal in 2018.

The qualitative indicator gathered through the WEF's annual Executive Opinion Survey (WEF, 2018c); this index allows gender disparity within a country to be quantified on a value from 0.00 (imparity) to 1.00 (parity) to rank countries analysed between themselves. This index reveals that Portugal obtained the score of 0.582 and the rank position of 103 over 136 countries evaluated, regarding wage equality between women and men for similar work, whereas the world median is identified at the 70 rank position (over the 136 countries sampled). In 2016 for the same index, Portugal was ranked in 97 position – which is a decreasing of six points between 2016 and 2018 (WEF, 2018a).

According to this index, assessing the global gender gap in economic participation and opportunity, Portugal experienced a year-on-year average growth rate of 0.67% for the time period 2006 to 2018. Portugal achieved the score of 0.72 for the year 2018; it is important to notify that index score significantly decreased after 2008 until 2011 corresponding to the post financial crisis period that the country faced (See Figure 2.1). This mean that gender gap

decrease was related to crisis' consequences, suggesting that women are the ones losing more participation and opportunities in the economic life of the country in time of crisis – and this should warn us about the possible consequences of the current COVID-19 crisis on gender gap in Portugal.

Figure 2.1 : Global Gender Gap Economic Participation and Opportunity Sub-Index of Portugal from 2006 to 2018



Data Source: World Economic Forum - Global Gender Gap Report 2018

In 2015, the Commission for Equality in Labour and Employment (CITE, 2017) observed that over half the population of Portugal aged 15 and over (58.5%) was employed in the labour market, with the activity rate for men being 64% and for women 54% (CITE, 2017). When looking more precisely at the labour market in Portugal, CITE (2017) reveal similar patterns to those in other European countries. Particularly in terms of the horizontal segregation of occupations (i.e. the segmentation of occupational activities into strongly male and strongly female sectors). Those patterns refer also to the difference in the activity rate of men and women which reflects the reality of an ageing population, in which one main factor is the inactive female population. Additionally, the greater presence of men in the labour market reveals the persistence of the traditional idea of the man as family provider (CITE, 2017).

Although the Commission for Equality in Labour and Employment (CITE, 2017) declared that in Portugal women are in general terms better qualified than men and mostly work full time, but there is still evident vertical segregation in the Portuguese labour market between women and men. Indeed, Portuguese women reach higher levels of education and qualification than men but there are fewer women than men in high-ranking and managerial positions (33.9 % compared to 66.1 % in favour of men) (European Commission, 2020); This type of segregation can be observed in the relative differences between male and female salaries and in the unequal numbers of men and women in decision-making positions in the CITE' (2017) view. The Commission (CITE, 2017) affirmed that in 2013, monthly earnings of men in salaries jobs represented 26 percentage points (abbreviated in "p.p.") - of disparity - more than those of women in Portugal. However, the trend identified by CITE (2017) in average monthly earnings over recent decades shows a reduction in the disparity between men and women: in 1985, men had average monthly earnings 37.2 p.p. higher than those of women, a disparity which was still at 38 points p.p. in 1995, but which has declined since 2000, reaching 27 points p.p. in 2010.

Some possible solutions for changes in this area were evaluated through *the International Social Survey Programme* (ISSP 2012, applied in Portugal in 2014), which provided insight into the attitudes of men and women resident in Portugal to a set of questions related to the division of labour and gender roles, as well as to measures incentivizing equality between men and women in the labour market (CITE, 2017). The introduction of measures to promote equal pay for men and women received the highest consensus, which is strongly supported by men and women of all ages (91.3%). The introduction of quotas for women in positions of power and decision-making was positively welcomed by over half of those interviewed (53.3%), regardless of age (CITE, 2017). Men were slightly less positive towards this measure than women. However, CITE (2017) showed that it was mainly women who agreed most with the possibility to introduce quotas for men in positions where men are under-represented (e.g. kindergarten teachers, basic school teachers, health professionals); younger interviewees were more favourable to the introduction of quotas for men.

The impact of the austerity measures imposed on Portuguese society after 2011 were particularly harsh on the most vulnerable sectors of society, namely youth, elderly and women (Ferrerira & Coelho, 2013). To compensate the National Programme for Microcredit

(*Programa Nacional de Microcrédito*[24]) gives support to entrepreneurship including women entrepreneurs through easier access to microcredit. Additionally, in the state-run firms, equality plans are mandatory in Portugal. In 2007, the previous Portuguese government launched funding programmes to support ministries, municipalities, businesses and voluntary organizations to design and implement gender equality plans (European Parliament, 2013). Unfortunately, no data is available to assess the impact of these plans according to the European Parliament (2013).

Recently, the Portuguese National Parliament approved Law No.62/2017 (*Assembleia da República Portuguesa, Lei nº* 62/2017, 1st August 2017), concerning women on company boards. This law is applicable to public companies and public institutions (on central, regional or local level), and to listed private companies (Palma-Ramalho, 2017). It establishes a minimum representation of women on executive company boards and surveillance boards. Palma-Ramalho (2017) explain that for public companies, the required minimum of female board members became of 33,3% as off 1 January 2018. For private listed companies, the set minimum was 20% from 1 January 2018, but growing towards 33,3% from 1 January 2020. According to Palma-Ramalho (2017), this was the first time in Portugal that a mandatory minimum quota for women on decision-making boards for private listed companies was established. One explanation could be, according to Martinez et al. (2019), that in 2017 the percentage of women in companies' boards in Portugal was one of the lowest in Europe (16,2%) – excepted from Greece (11,3%) which reached an even lower ratio of women in boards. The poor performance of Portugal regarding women presence in boards were pointed out and probably motivated the necessity to introduce such legislation regulating female presence on boards through quotas.

Previously to this legislation, only public companies were submitted to such a rule and private companies were merely recommended to facilitate the access of women to board positions (Martinez et al.,2019). The recent character of this legislation, make complicated to already assess its impact. Nevertheless, some literature (Webb, 2004; Williams, 2003) suggest a relation between gender equality and corporate social responsibility, which is the research point address through this study, and this impact can already be question. Thus, it is interesting

[24] Agencià para o desenvolvimento e a coesão. (n.d.). https://www.adcoesao.pt/content/programa-nacional-de-microcredito [consulted on 14-11-2020]

to first present the state-of-play of CSR area in Portugal in the next sub-section (sub-section 2.3.2), before to describe the relation between both topics (e.g. gender equality and CSR) within Portuguese context (sub-section 2.3.3).

2.3.2 Corporate Social Responsibility Performance in Portugal

In 2000, the project "*European Attitudes towards Social Responsibility*", for CSR Europe revealed that according to a study carried out in 12 countries (12,162 surveys, of which 1,019 in Portugal), the concept of CSR is little known to the Portuguese public (MORI, 2000). However, 66% think that companies should pay more attention to the topic (European average of 58%); 20% say they would recommend a socially responsible company to others (European average 25%) and 70% admits that its purchasing decisions could be influenced by the social behaviour of a company; 28% indicate they would be willing to pay more for a socially and environmentally friendly product (European average of 44%), against 36% who would not be (European average of 37%). MORI' (2000) survey show that the percentage of consumers who can be considered "CSR activists" were very low (3%, against a European average of 26%).

According to the 2001 observatory survey (OE SMEs, 2002: 25), the results show that in Portugal firms developed regular activities related to CSR, which are unrelated to the strategy of the firm (Abreu & David, 2004). Also, the observatory (OE SMEs, 2002: 21) noticed that ''*there is a positive relationship between the size of the enterprises and their degree of involvement in the different types of external social activities''*. The main finding demonstrated that a majority of firms show this behaviour and they are concerned with preservation of the environment. This is consistent with other examinations of social responsibility in Portuguese firms, which also affirmed that in Portugal enterprises have a tendency to be more interested in environmental projects (EXAME, 2003).

Although, a variety of motivations for CSR action at Portuguese-level have been identified and are consistent with the literature on the topic addressed through this study (e.g. gender equality and CSR). Indeed, research has shown that in Portugal CSR is motivated by dimensions such as legal issues and requirements, or by ethical and social motivations (Fernandes et al., 2012); because it is what the companies must do (Rego et al., 2003); by imitation of competition trying to nullify a possible competitive advantage (Kastenholz et al., 2004); for moral reasons (Proença & Branco, 2014); and external, market and operational factors (Abreu et al., 2005). For their part, entrepreneurs are increasingly aware of the benefits of CSR (Proença & Branco,

2014), incorporating in its decisions criteria that go beyond economic requirements (Moreira et al., 2003), either on its own initiative, or as a necessity imposed by consumers, stakeholders or society in general (Kastenholz et al., 2004).

For large companies, the relationship with the community, the support to the most disadvantaged and interventions with youngest generations (Gago et al., 2005) are the most important practices at the external level of CSR; while SMEs value the suitability of the product to the customer's needs and the fair management of complaints (Santos et al. 2007). Internally, large companies and SMEs are oriented towards its employees, and some bet on corporate volunteering (Gago et al., 2005) and equal opportunities (Santos et al., 2007). Finally, the main type of CSR action is done through sponsorships and donations to cultural, social, educational and sports (Santos et al., 2007; Gago et al., 2005).

Looking at corporate responsibility reporting, Dias (2009: 112), stated that in 2005 "*only 45% of the listed companies in Portugal provide reports on issues relating to its sustainability whilst hinting that the sustainability corporate report is not their major concern*". Branco et al. (2014) detected for the period of the crisis (2008-2011), a decrease in CSR through sustainability reporting. However, in 2017 a survey allowed to observe that 80% of the N100[25] companies in Portugal issued a CSR report (KPMG, 2017). This represents a slight decrease to the 81% rate obverse in 2015 (KPMG, 2017) but remain an important increase when comparing to the percentage observed by Dias (2009) previously in 2005 (e.g. 45%).

Considering that reporting about social and environmental issues in Portugal was voluntary at this time these results could be seen as positive ones (KPMG, 2017: 112). Although, the researchers point out that those reports had almost no numeric indicators, which suggests they may have been made more as a marketing tool than as a reproduction of a real engagement to social responsibility (KPMG, 2017: 143).

Thus, the state of play regarding CSR issues and reporting in Portugal have certainly evolved in the recent years, and the raising point here is to evaluate if CSR performance is associated to gender diversity within top-management within Portuguese context, and if previous studies address this question in somehow.

[25] The N100 refers to a worldwide sample of 4,900 companies comprising the top 100 companies by revenue in each of the 49 countries researched in this study.

2.3.3 Gender Diversity and CSR Performance in Portugal

Martinez et al (2019), using the data from top Spanish listed companies, between 2003 and 2017, tested if the higher number of women on their board influences corporate social responsibility (CSR), through the disclosure of reports following the Global Reporting Initiative (GRI) guidelines and the inclusion in the *Dow Jones Sustainability* Index. The authors (Martinez et al, 2019) found that the female presence in management positions is positively linked to a voluntary disclosure of CSR reports and the inclusion in a sustainability index, which supports gender legislation. Portugal context is not the same as the Spanish one, but the two countries shares several common parameters (e.g. regional location, economic patterns, EU adhesion….) suggesting that the positive findings regarding female presence in management related to CSR disclosure for companies in Spain could be potentially find among companies in Portugal as well.

Those observations could suppose a similar pattern for Portugal, although the literature did not provide such analysis at the Portuguese scale. Nevertheless, a study from Branco and Rodrigues (2008) compared the Internet (corporate web pages) and annual reports as media of social responsibility disclosure (SRD) and analysed what influences disclosure. The results suggested that a theoretical framework combining legitimacy theory and a resource-based perspective provides an explanatory basis for SRD by Portuguese listed companies, but Gender Diversity was not identified as an influencing factor for disclosure in the study (Branco & Rodrigues, 2008). On the contrary, Branco and Rodrigues (2008) findings reveals that under the "Human resources disclosure" category, information relative to "employment of minorities or women" was been mentioned only in two annual reports out of the 49 companies in the sample analysed, representing 4.08% of the total disclosure items.

Nevertheless, a recent study from Martinez-Ferrero et al., (2020) aimed at drawing on the board perspective of the firm, to examine the effect of gender diversity and the effect the mediating effect of the existence of a CSR committee both on United Nations Global Compact' (UNGC) affiliation. To test those objectives, the authors used an international sample of 29,951 firm-year observations from 2012 to 2018 (Martinez-Ferrero et al., 2020). The results suggested that female directors on the board significantly encourage the firm's affiliation with the

UNGC[26] and that women in boards support the mediating effect of the existence of a CSR committee.

The higher likelihood of affiliation to the UN GC as a result of greater gender diversity was mediated by the existence of a specialized committee for social and environmental issues. However, when looking at the which is the frequency percentage affiliation of firms to UNGC by country; it appeared that a noticeably greater participation of firms to UNGC was reached in Portugal (78.72%) of frequency – obtained among the only 47 firms in Portugal that were included in the sample (Martinez-Ferrero et al., 2020). In comparison, the other high proportion of firms to UNGC were identified in Denmark (almost 70% of frequency), France (63.97%), and Spain (63.06%). The low level of participation of USA firms (6.53%) and UK firms (17.92%) to UNGC initiative were highlighted in this paper (Martinez-Ferrero et al., 2020). Thus, Portugal is well-participating to UNGC, and a positive relation have been identified between gender diversity and UNGC affiliation mediated by the existence of a CSR committee within the firm. Therefore, these findings could indirectly suppose that this greater score of frequency affiliation can be associated to a greater gender diversity within boards of companies in Portugal but do not answer this point clearly.

The literature regarding the relation between gender-diverse top-management and Corporate Social Responsibility in Portugal remains sparse and has not yet established any clear links between these variables. Thus, the following chapter of this study will present the analysis methodology used to examine female proportion in Portuguese top-management teams of large companies in relation with Corporate Social Responsibility performance and CSR reporting.

[26] The UN Global Compact (n.d.): is a UN initiative that supports companies to : do business responsibly by aligning their strategies and operations with Ten Principles on human rights, labour, environment and anti-corruption ; and take strategic actions to advance broader societal goals, such as the UN SDGs, with an emphasis on collaboration and innovation." [consulted on 17-11-2020]

3. Methodology

The aim of the research is proceeding through a quantitative analysis to examine the relationship between gender diversity and Corporate Social Responsibility within top-management of large companies in the context of Portugal. In order to achieve this aim, data were collected and lists of samples were established then analysis of correlation were conduct on gender composition of top-management in association with CSR performance and with climate change performance. In addition, a log-linear analysis was also conducted for both samples, using a median split of the proportion of women in top-management. For Sample C, a one-way ANOVA was conducted – after testing the ANOVA assumptions - to test for differences in gender diversity in top-management among that show CSR reporting, CSR commitment or no action taken on CSR. Additionally, in order to get a clearer picture of these differences, T-tests for independent samples were conducted between the means of each group and the rest of the sample (e.g. Sample C).

Therefore, this Methodology chapter will first present the data collection process (section 3.1) especially explaining how the companies listed in the different samples were selected, which data sources were used to collect which necessary data. The data analysis process will then be presented (section 3.2), explaining which statistical tests were conduct on which sample and presenting the appropriate formulas.

3.1 Data Collection

3.1.1 Sample selection

The population that we want to observe is that of large Portuguese companies and large companies operating in Portugal, in order to analyse the relation between women in top-management and CSR performance. Assessing CSR performance remain a challenge as it takes a lot of elements into account whereas evaluating gender diversity in top-management can only be based on women ratio in the top instances of the firm. In order to cover the largest aspect of CSR performance as possible, three different samples were selected for this analysis to address three different elements of CSR: first CSR performance at a glance, then more precisely only looking at Climate Change performance and finally at CSR reporting compliance which is mostly considered by the literature as a crucial tool toward CSR implementation.

Thus, Samples A & B were used to compare the data with external rankings/ratings respectively on CSR performance and Climate Change performance. Sample C is composed of three different groups (e.g. firms that reported CSR, firms that committed to CSR, and firms that neither reported nor committed to CSR), this sample was selected in order to compare those groups – included in a single sample - between themselves. Thus, this research carried two types of analysis: first correlation tests for Sample A and B between the proportion of women in their TMTs and respectively CSR performance and Climate change performance ratings. Secondly log-linear analysis between categorical data based on appurtenance below or above the median number of women in TMT of the sample. The analysis addressing Sample C consisted in an Analysis of Variance (ANOVA) test – after testing ANOVA assumptions (i.e. independence, scale of measurement, normality and homogeneity of variance) - of the proportion of women in TMTs, according to companies' level of commitment to CSR; i.e. those who reported CSR (Group1), committed to CSR (Group 2) and those who neither reported nor committed (Group 3). Additionally, T-tests for independent samples were run based on each group to measure equal variance between and within groups.

3.1.1.1 Sample A

Sample A was composed of 15 companies founded and based in Portugal (See Annex A) from a CSR Hub rating, which is a private organisation providing access to CSR and sustainability ratings and information on more than 17,268 companies from 134 industries in 143 countries. Their data come from socially responsible investing research firms, well-known indices publications, "best of" or "worst of" lists, Non-Governmental Organisations, crowd sources and government agencies, classified in 618 sources (CSR Hub, 2019).

They use 12 rating indicators classified under four categories: employee, environment, community and governance performance[27]. CSR Hub uses a 0 to 100 scale (100 = the most positive rating), and this ranking is updated frequently – at least once a year. The CSR Hub (2019) rating included 15 Portuguese companies that were selected to constitute Sample A and all obtained a rating score between 44 at the lowest and 70 at the highest on a 0-100 scale[28].

[27] CSR Hub. (n.d.). Data schema. [consulted on 24-10-2020]
[28] CSR Hub (n.d.). Rating methodology. [consulted on 24-10-2020]

Weaver and Koopman (2014) demonstrated that, in the framework of Pearson's analysis, computation of the *p*-value requires $n \geq 3$ and computation of the Confidence Interval for Spearman' *rho* requires $n \geq 4$. Technically, a sample size above four ($n \geq 4$) can reflect a statistically acceptable correlation. Even so, the authors warn about the normal approximation being poor for $n < 10$, based on Kirk' (2007) discussion of Confidence Intervals for *rho*; but none of our samples counts below 10 observations (e.g. Sample A: 15 firms; Sample B: 11 firms, Sample C: 205 firms). Statisticians (Interstate Technology & Regulatory Council (ITRC), 2013) have even defined a minimum of sample observation according to the type of correlation analysis. Under the Pearson' method ITCR's (2013) experts recommend that a minimum of two variables with at least three observations for each variable are needed in order for the test to be meaningful. For Spearman' coefficient, a minimum of two variables with at least 8 to 10 observations for each variable is recommended. Although it is possible to apply the test with fewer observations, such applications may provide a less meaningful result, as the degree of confidence in detecting patterns in the data increases with larger sample sizes (ITRC, 2013). Thus, based on these recommendations, notwithstanding the two samples (Samples A & B) with small sizes ($n \leq 15$), the sufficient requirement of observations was gathered to provide meaningful results under Pearson and Spearman' methods.

3.1.1.2 Sample B

The Sample B counts a list of 11 companies founded and based in Portugal (See Annex B) rated within the Carbon Disclosure Project (CDP)'s annual A List (Carbon Disclosure Project, 2019). CDP is an international non-profit organisation which aims to build a sustainable economy by measuring and understanding companies' environmental impact. CDP has rated over 8,400 companies, which reported through CDP on climate change, water security and forests.

The CDP's list includes 11 large Portuguese companies, which formed Sample B - Samples A & B have 8 firms in common. These were all rated on their performance on climate change by the CDP, albeit based on their disclosure. CDP uses a rating scale identifying different levels on the achievement process, based on the information disclosed by firms, which CDP collects and analyses. The 11 Portuguese companies were rated from D to A-, with six firms reaching the A- level. Thirty other companies in Portugal were listed under category "F" or "not scored" by CDP. Those 30 firms were not included in Sample B as "Failure to provide sufficient

information to be evaluated" – meaning of F score - is not relevant to estimate their climate change performance in this study.

Table 3.1: CDP list on Climate change performance' Rating scale meaning and number of firms per level

CDP' Rating Scale		Number of firms per level
A and A-	Leadership level	6 firms
B and B-	Management level	3 firms
C and C-	Awareness level	1 firms
D and D-	Disclosure level	1 firms
F	Failure to provide sufficient information to be evaluated	30 firms (not included in Sample B)

3.1.1.3 Sample C

Sample C counts a list of 205 companies operating in Portugal (See Annex C), taken from the business magazine EXAME's *500 largest and best companies* list in Portugal (EXAME, 2019). The EXAME list ranked the companies according to their sales revenue in the year 2019. As the sales revenue indicator is less relevant to this study, the EXAME' (2019) list was sorted by total number of employees (from higher to lowest). All the companies counting 250 or more employees and for which the data on both gender compositions of TMTs and CSR reporting information were selected to compose Sample C which ranges firms with a total number of employees from 250 at the lowest – to fulfil the category of "large companies" and to 26 857 at the highest.

Thus, 205 Portuguese and operating in Portugal companies were selected to compose Sample C, and then divided into three groups depending if the company reported CSR (Group1), committed to CSR (Group 2) or neither reported nor committed (Group 3). (See Table 3.2)

Table 3.2: Group division categories meaning and numbers of firms per group of Sample C

Group categories of Sample C		Number of firms per group
Group 1	Companies who publicly reported CSR practices	117 firms (27 firms in common with group 2)
Group 2	Companies who legally committed to CSR values	38 firms (27 firms in common with group 1)
Group 3	Companies who did not neither reported, neither committed yet regarding CSR	77 firms

The Group 1 is composed of the companies who published a public CSR report on their website and for which the data relative on gender composition of top-management instance were available. Group 2 was composed of the companies' list of signatories to the *Manifesto on "sustainable development"* launched by the Business Council for Sustainable Development' (BCSD) (2020) on the 24th June 2020, in response to the current Covid-19 crisis. The Manifesto aims to "take advantage of the crisis to launch a new sustainable development paradigm" in Portugal. Finally, Group 3 is simply composed of the firms who neither reported CSR activities nor committed to the CSR manifesto.

3.1.2 Data sources

The methodology used in this research was quantitative and aimed to analyse the relationship between gender diversity within top-management and Corporate Social Responsibility performance, based on secondary data. The process used was the same for the three samples, and consisted of an Internet research to reach the official website of the company and/or the group official website to which the company belongs. Therefore, all the data collected were public data, purposely published by the firms themselves. Thus, it was not necessary to request any authorization for using those data.

The main data source providing us the data required were the last annual consolidated reports, which combined both financial and managerial data. From the annual consolidated reports, we got the data about the names' list of the top-management members, the name of the

Chief Executive Officer (CEO), the total number of employees and the business value (in Euros).

The other data source – used only for Sample C - was the available Sustainability Report of the firms, which provided us data on the compliance to CSR reporting process or not. As CSR reporting is one of the factors used in this analysis, it was considered that when any CSR report were publicly available on the firm' website, this organisation was performing CSR reporting process. For both annual consolidated and sustainability reports, when the 2019 reports were not yet available, but earlier versions were, the latest report available was taken into consideration. This was the case for 30 companies for which only more ancient version of CSR reports (e.g. not the 2019 CSR report version) were available out of the 117 companies (composing Group 1 of Sample C,) which reported CSR.

The other data source was the official websites of the companies which allow us to collect data on the firm' headquarter location, the foundation date of the organisation, and the industry sector of activities.

3.1.3 Data

When the list of firms for each sample, the process been to go through the annual reports and the CSR reports to collect data; aiming first to know the company / group better, with regard to date of foundation, industry sector, exact number of total employees and headquarter location.

The second type of data needed aimed was in regard to gender diversity within the top-management of the firms. This was obtained by collecting the names of the CEOs, to identify their gender, the number of women in the TMTs, the number of men in TMTs and the total number of members in TMTs, in order to calculate the proportion of women in the top-management. When the top-management name list of a company was encountered, the process consisted in extracting the number of female and male within by counting the gender proportion of members based on the consonance of their first name when no photography was published to identify members' gender. Thus, in order to have a precise number of women and men within the top-management instance, each feminine first names have been counted under the female category and same process for masculine first names included under the male category.

The third type of data collected concerned the managerial and financial situation of the companies, by looking for the value of business in euros as presented in the annual financial reports, and if the firms implemented CSR activities, based on the existence of not of a CSR report.

3.2 Data Analysis

3.2.1 Analysis methods

Different statistical methods were used according to the aim of the analysis. The first two analyses aimed to examine the association between women proportion in top-management and CSR performance, and so were correlational in nature; then another test was conducted, after a median split, to test the interaction between the proportion of women in top management (high vs low) and firms' CSR/climate change performance. Another type of analysis aimed at identifying differences in the proportion of women in top-management based on companies' level of action taken toward CSR (e.g. CSR reporting, CSR commitment, neither reported nor committed to CSR) and a last type of analysis tested the equal variance of the groups – between and within groups.

3.2.1.1 Correlation analysis

The study of Sample A aimed to examine a potential relationship between the proportion of women in top-management teams and a company's CSR performance. In the second analysis (of Sample B) the aim was to examine the relationship between the proportion of women in top-management teams and this time the Climate change performance of the firms.

Therefore, the first step of the analysis was to transpose the numbers of male and female within TMTs into proportion presence of each gender data in percentages (%) before calculating their means. According to Statistics Solutions (2019a), It is appropriate to use correlation coefficient (e.g. Pearson method) when the two variables of interest are scored using interval or ratio measures. A second statistics resources for academics and researchers, states regarding the assumptions on types of data to run a correlation test that we need two variables that are either ordinal, interval or ratio for Spearman' test, and confirmed that to use a Pearson correlation product should be based on interval or ratio data (Lærd Statistics, 2018).

Thus, the second step consisted into a correlation analysis which has been conduct between the proportion of female members within the TMTs and the CSR Hub ranking data for Sample A and between the proportion of female top-managers and the firms' performance on Climate change issues from CDP' list for sample B.

The CDP annual rating (2019) is a scale expressed nominally with letters and symbols (See Table 3.1). Consequently, this original rating scale had to be transposed into a numerical scale, of 0 to 100. Taking the A grade as the highest (i.e. 100) and the F grade as the lowest (i.e. 0) the remaining grades were defined as follow:

Table 3.3: CDP rating scale conversion table

CDP rating scale meaning converted into numbers
A = 100
A- = 87,5
B = 75
B- = 62,5
C = 50
C- = 37,5
D = 25
D- = 12,5
F = 0

Two correlation tools were used, the coefficient of correlation also known as "Spearman's rank correlation" with the following Formula (Statistics Solutions, 2019b):

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2-1)} \tag{3.1}$$

Secondly, the "Karl Pearson correlation" Formula (Statistics How To, n.d.), commonly used in linear regression, and expressed as:

$$r_{xy} = \frac{s_{xy}}{s_x s_y} \tag{3.2}$$

The results will express the strength of the relationship between the standard deviation and the sample covariance, hereby gender diversity proportion within TMTs and CSR performance rate.

3.2.1.2 Log-linear analysis

To determine the nature of the relationship between firms with a high vs low (i.e. above or below median) ratio of women in top management and firms' CSR/climate change performance, an additional analysis was conducted, the log-linear analysis. For both samples (Sample A and Sample B), these were divided into two groups, based on a median split of the proportion of in TMT in each sample. The median for Sample A is 23% women, and 25% for Sample B. Firms below the median of in their sample constituted one group, firms with a representativeness of women equal or above the median formed another group.

The first step in a log-linear analysis is to apply a *K-way and Higher Order effects* methods, which test the significance of the one-way or two-way interaction between the variables. Those tests will tell us whether removing the one-way (K=1) or the two-way (K=2) effects and any higher-order effects will significantly affect the fit of the model. Second test is known as *Parameter Estimate Test* for its purpose which allow to obtain estimates of the population parameters along with the amount of error associated with these estimates using the following formula (Collins, 2011):

$$\sum_{i=1n} \log p(y_{(i)}|x_{(i)};v) \tag{3.3}$$

The final step is a *Goodness-of-fit Test* which is an indicator about the fit quality of your data to a population. Through analysing if the observed distribution is different from the expected distribution, the model that the data follow can be determined (e.g. normal distribution, skewed distribution…). The Goodness-of-fit may be tested using either of two chi-square statistics formulas:

The Pearson Chi-Square statistic (Statistics Solutions, 2020):

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e} \tag{3.4}$$

And the Likelihood-ratio statistic (Glen, 2016):

$$\mathbf{LRT} = -2 \log_e \left(\frac{\mathcal{L}_s(\hat{\theta})}{\mathcal{L}_g(\hat{\theta})} \right) \tag{3.5}$$

3.2.1.3 Comparative group analysis

The aim of this analysis was to compare the different groups identified within Sample C, based on their commitment to CSR, and look for differences among them in terms of the proportion of women in top-management. I.e. would this proportion be higher in companies that reported CSR activities, vs those who were committed to CSR, or those that had neither.

The study of Sample C proceeded with the same method of transposing numbers of female and male in TMTs into percentages. The second step was to separate the sample into three distinct groups of companies according to the fact that they reported, committed or neither reported/committed to CSR. The third step was to compare the percentages of gender diversity within TMTs for each respective group.

Four ANOVA assumptions were tested, two were analysed from observing the data characteristics, in order to assess the *Independence* and the *Scale of measurement* assumptions. The *Normality assumption* required a statistical test to be assess, calculating the skewness and Kurtosis tools.

The formula for skewness is (NIST/Sematech, 2012):

$$g1=\sum Ni=1(Yi-\bar{Y})3/Ns3 \quad (3.6)$$

The formula for Kurtosis is (NIST/Sematech, 2012):

$$kurtosis=\sum Ni=1(Yi-\bar{Y})4/Ns4 \quad (3.7)$$

The *Homogeneity of variance* assumption was tested for each group in Sample C. This aims to test the assumption that the population variances (i.e., the distribution, or “spread,” of scores around the mean) of the three groups can be considered equal.

After testing assumptions, an ANOVA-Test was applied to measure variance of means within and between groups in relation to the sample means. The ANOVA statistical technique provides a F-value calculated by dividing two mean squares applying the following formula (Analytics Vidhya, n.d.):

$$SS_{within} = \Sigma(x_{i1} - \bar{x}_1)^2 + \Sigma(x_{i2} - \bar{x}_2)^2 + \ldots + \Sigma(x_{ik} - \bar{x}_k)^2 = \Sigma(x_{ij} - \bar{x}_j)^2 \quad (3.8)$$

Finally, T-tests for independent samples were run between the means of each group (e.g. CSR reporting group, CSR commitment group, and neither reported nor committed group) and the rest of Sample C. The method used is known as the *T-test for Equality Means*. Those coefficients will reveal the difference between the variances in the population and give a *Confidence Interval* which complements the significance test results.

3.2.2 Data processing

The processing of the data was done using the statistical program IBM SPSS 27 software version and database spreadsheets were initially constructed under Excel as the analysis mainly use descriptive statistics.

4. Results

4.1 Sample A

4.1.1 Descriptive statistics

The data contained in Sample A reveals that the mean presence of women at senior-management position within Sample A is around 20%. Male exclusive board of directors exist in the sample - three over 15 firms have an only-male board, whereas an exclusively female top-management team was not identified. The mean number of women in TMTs is two (and the mean number of total TMT members is 10). The highest female proportion within the top-management institutions of the companies at stake is approximately 33%. (Table 4.1)

Table 4.1: Descriptive Statistics of the results – Sample A

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Number of women in TMT	15	0,00	7,00	2,13	1,9223
Number of men in TMT	15	2	21	8,00	4,826
Total number of TMT members	15	3,00	28,00	10,13	6,4571
% of women in TMT	15	0,00%	33,33%	19,95%	11,97%
% of men in TMT	15	66,67%	100,00%	80,04%	11,97%

4.1.2 Correlation analysis results

The correlations between the proportion of women in the TMT and companies' CSR Hub ranking was computed for the 15 companies for which this data was available in Portugal. The results show that the correlation was not statistically significant under the Pearson method ($r = .174$, $p = .534$, two-tailed), nor using the Spearman rank method ($r = .124$, $p = .659$, two-tailed) as both *p*-values are above the significant level ($p > .05$).

In summary, the relation between the presence of women in the senior-management and the performance of the firms regarding corporate social responsibility activities is a weak positive correlation according to Gogtay et al. (2017)' *spectrum of the correlation coefficient* (Table 4.2 & Table 4.3). The authors Gogtay et al. (2017) defined a -1 to 1 scale to interpret correlation results according to the correlation coefficient value which identified four

categories. According to this spectrum, correlation coefficient between -1 and -0,5 are negatively strong; between -0,5 and 0,00 are negatively weak; between 0,00 and 0,5 are positively weak; and between 0,5 and 1 are positively strong. For Sample A, both Pearson (r = .174) and Spearman' (r = .124) methods demonstrated a positively weak correlation.

Greener (2008) affirmed that small samples, below 30, are more likely to show an unacceptable *p* value i.e. above 0,05 probabilities that the difference is caused by chance. The lack of significance expressed by the high *p* value is thus not surprising and can likely be explained due to the small sample size.

Table 4.2: Pearson correlation analysis results of Sample A

Correlations

		% of women in TMT	CSR Hub ranking
% of women in TMT	Pearson Correlation	1	,174
	Sig. (2-tailed)		,534
	N	15	15
CSR Hub ranking	Pearson Correlation	,174	1
	Sig. (2-tailed)	,534	
	N	15	15

Table 4.3: Spearman's rho correlation analysis results of Sample A

Correlations

			% of women in TMT	CSR Hub ranking
Spearman's rho	% of women in TMT	Correlation Coefficient	1,000	,124
		Sig. (2-tailed)	.	,659
		N	15	15
	CSR Hub ranking	Correlation Coefficient	,124	1,000
		Sig. (2-tailed)	,659	.
		N	15	15

4.1.3 Log-linear analysis

A log-linear analysis was conducted on Sample A to describe the pattern of data and examine the relationship between two variables. Those two variables are the proportion of women in top management (high vs. low) and the level of CSR performance. The categorical data was obtained by dividing the firms in the sample based on a median split (where the median was of 23%).

A *K-way and Higher Order* test were carried out. These tests tell us the levels of terms that are likely to be significant. In this case, only two-way interactions are significant under both tests (p<0.0001) as the one-way interaction show a not significant value (p=0.935) (Table 4.4).

Table 4.4: K-way and Higher Order effects for firms < 23% of women and firms = > 23% women in TMT – Sample A

K-Way and Higher-Order Effects

			Likelihood Ratio		Pearson		Number of
	K	df	Chi-Square	Sig.	Chi-Square	Sig.	Iterations
K-way and Higher Order Effects[a]	1	3	20,861	,000	15,133	,002	0
	2	1	20,728	,000	15,000	,000	2
K-way Effects[b]	1	2	,133	,935	,133	,936	0
	2	1	20,728	,000	15,000	,000	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

In this case the estimate of the parameter (p = - 1.385) demonstrate a negative relationship between the two variables interactions on the fits of the model. The Z-value (z = -2.688; p =.007) tell us, with significance level (p < .05), how far from the mean the estimated parameter of the interaction between low and high women ratio in TMT is. (Table 4.5)

Table 4.5: Parameter estimate by firms < 23% of women and firms = > 23% women in TMT interaction – Sample A

Parameter Estimates

						95% Confidence Interval	
Effect	Parameter	Estimate	Std. Error	Z	Sig.	Lower Bound	Upper Bound
<23%ofwomeninTMT* =>23%ofwomeninTMT	1	-1,385	,515	-2,688	,007	-2,396	-,375
<23%ofwomeninTMT	1	,031	,515	,061	,952	-,979	1,042
=>23%ofwomeninTMT	1	-,031	,515	-,061	,952	-1,042	,979

The last step of the log-linear analysis consists in the Goodness-of-fits test, which determines how well sample data fit a distribution from a population with a normal distribution. In this case, SPSS was unable to calculate it as Chi-Square is .000 (*df* = 0) (Table 4.6)

Table 4.6: Goodness-of-fit tests statistics for firms < 23% of women and firms = > 23% women in TMT – Sample A

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	,000	0	.
Pearson	,000	0	.

The two-way log-linear analysis produced a final model that retained CSR performance X low proportion of women in top-management X high proportion of women in top-management interactions. The K-way tests results tell us that removing two-way interactions (e.g. CSR performance X low proportion of women in TMT; CSR performance X high proportion of women in TMT; low proportion of women in TMT X high proportion of women in TMT) would significantly reduce how well the model fits. However, if we remove one-way interactions of CSR performance, low proportion of women in TMT or high proportion of women in top-management from the model, it would not significantly affect it.

The parameter estimates test calculates the scale whether each parameter could affect the model. In this case, it confirmed that a change on the parameter representing low and high proportion of women in TMT would negatively affect the model (z= -2.688). The goodness-of-fits analysis tested the hypothesis that the expected frequencies produced by the model are significantly different from the observed frequencies in our data. According to Raykov et al. (2013), the results of 0.000 coefficients tell that our model fits the data perfectly meaning that it is a saturated model (e.g. when there are as many estimated parameters as data points in the model).

4.1.4 Other variables mean analysis results

While observing the mean of women in TMTs according to the location of the company headquarters, results surprisingly shows that Lisbon - although capital of Portugal - is not the

city where female top-managers proportion is in the first place (17%). The highest percentage of women in top-management have been reached in Mozelos (33%) and Maia (27%). (Table 4.7)

Table 4.7: Mean % women in TMT per HQ Location - Sample A

% women in TMT * Location of HQ

% of women in TMT

Location of HQ	Mean	N	Std. Deviation
Lisbon	17,71%	10	13,22%
Maia	27,77%	2	7,85%
Mozelos	33,33%	1	.
Porto	16,66%	2	0,00%
Total	19,95%	15	11,97%

The data also show that there are sectors where gender diversity is more present than in others. Indeed, the Energy & Natural Resources sector takes the lead (26%), followed closely by the Retail, IT and Telecommunication (23%), whereas the Financial Services sector scored the last position (14%). (Table 4.8)

Table 4.8: Mean % women in TMT per Industry sector - Sample A

% women in TMT * Industry sector

% of women in TMT

Industry	Mean	N	Std. Deviation
Energy & Natural Resources	26,73%	3	3,17%
Financial services	14,16%	5	9,12%
Paper & Forestry	18,51%	3	16,97%
Retail, IT, Telecommunication	23,18%	4	15,55%
Total	19,95%	15	11,97%

Regarding the mean of women in TMTs according to the total number of employees in the firm, the results show that the three largest companies with over 10,000 employees reached all a percentage of women top-managers over 28%. (Table 4.9)

Table 4.9: Mean % women in Total number of employees - Sample A

% women in TMT * Total number of employees

% of women in TMT

Total number of employees	Mean	N	Std. Deviation
50	0,00%	1	.
684	23,07%	1	.
2341	29,41%	1	.
3280	0,00%	1	.
3316	22,22%	1	.
4424	33,33%	1	.
4840	16,66%	1	.
4869	12,50%	1	.
5345	28,57%	1	.
6921	25,00%	1	.
7204	16,66%	1	.
7679	0,00%	1	.
11660	28,57%	1	.
45000	33,33%	1	.
115428	30,00%	1	.
Total	19,95%	15	11,97%

4.2 Sample B

4.2.1 Descriptive statistics

In Sample B, the mean presence of women in top-management positions reaches 22%. Again, male exclusive boards of directors exist in the sample, but an exclusively female top-management team does not. The mean of women in TMTs is two, and the mean of total members is nine. The maximum female proportion within the top-management institutions of the companies at stake is approximately 28%. (Table 4.10)

Table 4.10: Descriptive Statistics of the results – Sample B

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
number of women in TMT	11	0,00	7,00	2,09	1,97
number of men in TMT	11	2	21	7,00	5,06
total number of TMT members	11	3,00	28,00	9,09	6,78
% of women in TMT	11	0,00%	42,86%	21,87%	13,45%
% of men in TMT	11	57,14%	100,00%	78,12%	13,45%

4.2.2 Correlation analysis results

Correlational analyses were used to examine the relationship between the proportion of women in TMTs and the Climate Change rating (CDP) for the 11 companies operating in Portugal for which this data was available. The results suggest that the correlation was not statistically significant and negative for both Pearson test (r = .464, p = .151, two-tailed) and Spearman' method (r = .154, p = .652, two-tailed) – under the spotlight of Gogtay et al. (2017) *spectrum of the correlation coefficient.* In other words, the results suggest that the proportion of women in top-management institutions do not have relation on the company performance in Climate Change issues (Table 4.11 & Table 4.12).

Table 4.11: Pearson correlation analysis results of Sample B

Correlations

		% of women in TMT	CDP rating converted into numbers
% of women in TMT	Pearson Correlation	1	-,464
	Sig. (2-tailed)		,151
	N	11	11
CDP rating converted into numbers	Pearson Correlation	-,464	1
	Sig. (2-tailed)	,151	
	N	11	11

Table 4.12: Spearman's rho correlation analysis results of Sample B

Correlations

			% of women in TMT	CDP rating converted into numbers
Spearman's rho	% of women in TMT	Correlation Coefficient	1,000	-,154
		Sig. (2-tailed)	.	,652
		N	11	11
	CDP rating converted into numbers	Correlation Coefficient	-,154	1,000
		Sig. (2-tailed)	,652	.
		N	11	11

4.2.3 Log-linear analysis

A log-linear analysis was conducted on Sample B to describe the pattern of data and examine the relationship between two variables. Those two variables are the proportion of women in top management (high vs. low) and the level of Climate change performance. The categorical data was obtained by dividing the firms in the sample based on a median split (where the median was of 25%).

A *K-way and Higher Order* test were carried out. These tests tell us the levels of terms that are likely to be significant. In this case, only two-way interactions were significant ($p<0.0001$) under the two tests, as the one-way interaction show a not significant value ($p=0.913$). (Table 4.13).

Table 4.13: K-way and Higher Order effects for firms < 25% of women and firms = > 25% women in TMT – Sample B

K-Way and Higher-Order Effects

			Likelihood Ratio		Pearson		Number of
	K	df	Chi-Square	Sig.	Chi-Square	Sig.	Iterations
K-way and Higher Order Effects[a]	1	3	15,340	,002	11,182	,011	0
	2	1	15,158	,000	11,000	,001	2
K-way Effects[b]	1	2	,182	,913	,182	,913	0
	2	1	15,158	,000	11,000	,001	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

In this case the estimate of the parameter (p = - 1.241) demonstrate a negative relationship between the two variables on the fits of the model. The Z-value (z = -2.383; p =.017) tell us, with significance level (p < .05), how far from the mean the estimated parameter of the interaction between low and high women ratio in TMT is. (Table 4.14)

Table 4.14: Parameter estimate by firms < 25% of women and firms = > 25% women in TMT interaction – Sample B

Parameter Estimates

Effect	Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
<25%ofwomeninTMT*=>25%ofwomeninTMT	1	-1,241	,521	-2,383	,017	-2,261	-,220
<25%ofwomeninTMT	1	,042	,521	,080	,936	-,979	1,062
= >25%ofwomeninTMT	1	-,042	,521	-,080	,936	-1,062	,979

The ultimate step of the log-linear analysis is the *Goodness-of-fits test*, which determine how well sample dataset fit to a normal distribution population. In this case, SPSS was not able to calculate it value as Chi-Square is .000 (*df* = 0). (Table 4.15)

Table 4.15: Goodness-of-fit tests statistics for firms < 25% of women and firms = > 25% women in TMT – Sample B

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	,000	0	.
Pearson	,000	0	.

The two-way log-linear analysis produced a final model that retained Climate change performance X low proportion of women in top-management X high proportion of women in top-management interactions. The K-way tests results tell us that removing two-way interactions (e.g. Climate change performance X low proportion of women in TMT; Climate change X high proportion of women in TMT; low proportion of women in TMT X high proportion of women in TMT) would significantly reduce how well the model fits. However, if we remove one-way interactions of Climate change performance, low proportion of women in TMT or high proportion of women in top-management from the model, it would not significantly affect it.

The parameter estimates test calculates the scale whether each parameter could affect the model. In this case, it confirmed that a change on the parameter representing low and high proportion of women in TMT would negatively affect the model (z= -1.241). The goodness-of-fits analysis tested the hypothesis that the expected frequencies produced by the model are significantly different from the observed frequencies in our data. According to Raykov et al. (2013), the results of 0.000 coefficients tell that our model fits the data perfectly meaning that it is a saturated model (e.g. when there are as many estimated parameters as data points in the model).

4.2.4 Other variables mean analysis results

The mean proportion of women in TMTs by the location of the headquarters in Sample C, show that Maia is the city leading with 33% followed by Lisbon with more than 22% of women in senior-management positions. (Table 4.16)

Table 4.16: Mean % women in TMT per HQ Location – Sample B

% women in TMT * HQ Location

% of women in TMT

Location of HQ	Mean	N	Std. Deviation
Lisbon	22,25%	8	14,94%
Maia	33,33%	1	.
Porto	16,66%	1	.
Vila Nova de Gaia	12,50%	1	.
Total	21,87%	11	13,45%

In terms of proportion of women in top-management teams by industry, we can see that the sector with the highest proportion of women in their TMTs is Retail, IT and Telecommunication (31%), followed by the Energy and Natural Resources sector (26%) and the Paper & Forestry industry (21%). The last ranked sector is Transport Services (0% women in TMT), although this results in part from the fact that there is a single company in the sample operating in this industry. (Table 4.17)

Table 4.17: Mean % women in TMT per Industry sectors - Sample B

% women in TMT * Industry sectors

% of women in TMT

Industry sectors	Mean	N	Std. Deviation
Automobile	12,50%	1	.
Energy & Natural Resources	26,73%	3	3,17%
Financial services	20,83%	2	5,89%
Paper & forestry	21,42%	2	30,30%
Retail, IT, Telecommunication	31,66%	2	2,35%
Transport services	0,00%	1	.
Total	21,87%	11	13,45%

The largest company in Sample B, with more than 115,000 workers has 30% of women in its Board of Directors – which is still below the minimum legally required only for listed companies of 33,3% of women in board composition (See Law No.62/2017) - whereas the smallest one has 12,5% of women in its TMT (and more than 500 employees in total). The company with the highest women ratio (42%) hires around 1800 employees (Table 4.18).

Table 4.18: Mean % women per Total Number of employees - Sample B

% women in TMT * Total number employees

% of women in TMT

Total number of employees	Mean	N	Std. Deviation
115428	30,00%	1	.
11660	28,57%	1	.
12732	0,00%	1	.
1838	42,85%	1	.
3280	0,00%	1	.
45000	33,33%	1	.
533	12,50%	1	.
5345	28,57%	1	.
684	23,07%	1	.
6921	25,00%	1	.
7204	16,66%	1	.
Total	21,87%	11	13,45%

4.3 Sample C

4.3.1 Descriptive statistics

The analysis of the data collected in Sample C relative to female proportion within top-management teams of the companies reveals a mean of over 25% of women. The mean number of women in senior-management is two, and the total number of members in TMTs is seven and half. The maximum percentage of women in a TMT identified within this sample is 83% (Table 4.19).

Table 4.19: Descriptive Statistics of the results – Sample C

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Number of women in TMT	205	,00	9,00	2,05	1,88
Number of men in TMT	205	1,00	21,00	5,44	3,08
Total members in TMT	205	2,00	27,00	7,50	4,22
% of women in TMT	205	0,00%	83,33%	25,40%	18,35%
% of men in TMT	205	16,67%	100,00%	74,59%	18,35%
Total Number of employees	205	250,00	26857,00	1939,32	3230,91
Valid N (listwise)	205				

4.3.2 ANOVA-test analysis results

Prior to running an ANOVA test, four assumptions should be met (e.g. independence, scale of measurement, normality and homogeneity of variance). It is considering that this study met the *independence assumption* as each group in this analysis is independent (i.e. based on different factors) and the data do not influence each other. The *scale of measurement assumption* is met as the dependent variable (e.g. proportion of women in top-management) is based on a continuous scale because it is a ratio.

The *normality assumption* was tested using Skewness and Kurtosis formulas as well as using a histogram presenting the distribution of our data. In this case, both Skewness (s = 0.180) and Kurtosis (k = - 0.447) results are between minus one and one value [- 1; 1]. Additionally, from the histogram the data seems normally distributed even with few Skewness above, and few Kurtosis slightly below the normal curve. (Annex D)

The *homogeneity of variance* assumption tested the significance of the equality of variance for each group of the sample (i.e. Group 1: firms that reported CSR, Group 2: firms that committed to CSR; and Group 3: firms that neither reported nor committed to CSR). Group 1 (p = .025) and Group 3 (p = .028) met the assumption as values are $p < .05$; but the result for Group 3 (p = .074) is slightly above the maximum requirement, meaning that the equality of variance has not been met for this group. Nonetheless, since all the assumptions were met for at least two groups of the sample, and there was a marginal significance for the third, we proceeded to an ANOVA-test. (Annex D)

A one-way ANOVA was conducted to examine differences in the proportion of women in top-management among companies who reported CSR (Group 1), those who committed to CSR (Group 2) and those who did not either reported/committed to CSR (Group 3) for the 205 companies shortlisted from EXAME's list of *500 best and largest companies in Portugal*.

The results suggest that female proportion in TMTs hold a statistically significant interaction with firms that reported CSR (p = .008), but even more when they committed to CSR (p = .041) or did not reported neither committed to CSR (p = .003). The F-statistics for companies who reported CSR is F = 7.112; those who committed is F = 4.209; and for firms who neither reported or committed to CSR it is F = 8.795. According to MacKenzie' (2015) outputs interpretation, all results are statistically significant as all p-values are p < .05 and all F-ratios are F >1 (Table 4.20). In other words, each groups reveal a significant interaction with the proportion of women in TMTs. Even though the companies who did not neither reported or committed (Group 3) have the stronger significance level (p=.003), followed by those who reported CSR (Group 1) with (p= .008) and then firms who committed to CSR (Group 2) with the less significance value (p =.041). (Table 4.20)

Table 4.20: ANOVA Test - % of women in TMTs and sample' groups

ANOVA – Groups 1, 2 & 3

% of women in TMT

		Sum of Squares	df	Mean Square	F	Sig.
Group 1	Between Groups	2326,233	1	2326,233	7,112	,008
	Within Groups	66398,531	203	327,086		
	Total	68724,764	204			
Group 2	Between Groups	1396,090	1	1396,090	4,209	,041
	Within Groups	67328,674	203	331,668		
	Total	68724,764	204			
Group 3	Between Groups	2853,845	1	2853,845	8,795	,003
	Within Groups	65870,919	203	324,487		
	Total	68724,764	204			

4.3.3 T-tests for independent samples analysis results

The significant results of the ANOVA-test motivate the fact to conduct further analysis, thus, T-tests for independent samples were conducted for each group (e.g. Group 1: reported CSR; Group 2: committed to CSR; Group 3: neither reported nor committed to CSR) of Sample C; in order to determine if there is a significant difference between the means of each group and the rest of the sample; which group variate most from the others regarding proportion of women in top-management.

4.3.3.1 Group 1 (CSR reporting)

An independent-samples T-test was conducted to compare proportion of women in top-management within firms in CSR reporting and no CSR reporting conditions. There was a significant difference in the scores for companies showing no CSR reporting (M=29%; SD=20.6) and CSR reporting (M=22%; SD=15.9) conditions; t (203) =-2.66, p = 0.008. The mean difference is -6.805 with 158.57 degrees of freedom. The corresponding two-tailed p-value is 0.011, which is less than 0.05. We conclude that the difference of means in women top-managers proportion between CSR reporting and no CSR reporting firms is different from 0, allowing for differences in variances across groups.

These results suggest that no CSR reporting condition does have an effect on women proportion in top-management. Specifically, our results suggest that when companies do not report CSR, their proportion of women top-managers' increases. (See tables 4.21 & 4.22)

Table 4.21: T-test Group statistics (Group 1 – CSR reporting)

Group Statistics – Group 1 (i.e. CSR reporting)

	Group 1	N	Mean	Std. Deviation	Std. Error Mean
% of women in TMTs	Reported CSR	117	22,4821%	15,91979%	1,47178%
	Did not report CSR	88	29,2877%	20,62237%	2,19835%

Table 4.22: T-test independent samples (Group 1 – CSR reporting)

Independent Samples Test – Group 1 (i.e. CSR reporting)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
% of women in TMTs	Equal variances assumed	5,109	,025	-2,667	203	,008	-6,805%	2,551%	-11,837%	-1,773%
	Equal variances not assumed			-2,572	158,576	,011	-6,805%	2,645%	-12,030%	-1,580%

4.3.3.2 Group 2 (CSR commitment)

An independent-samples T-test was conducted to compare proportion of women in top-management within firms in CSR commitment and no CSR commitment conditions. There was a significant difference in the scores for companies showing no CSR commitment (M=26%; SD=19.3) and CSR commitment (M=19%; SD=13.9) conditions; t (203) = -2.05, p = 0.041. The mean difference is -6.715 with 72.03 degrees of freedom. The corresponding two-tailed p-value is 0.015, which is less than 0.05. We conclude that the difference of means in women

top-managers proportion between CSR commitment and no CSR commitment firms is different from 0, allowing for differences in variances across groups.

These results suggest that no CSR commitment condition does have an effect on women proportion in top-management. Specifically, our results suggest that when companies do not commit to CSR, their proportion of women top-managers' increases. (See tables 4.23 & 4.24)

Table 4.23: T-test Group statistics (Group 2 – CSR commitment)

Group Statistics - Group 2 (i.e. CSR commitment)

	Group 2	N	Mean	Std. Deviation	Std. Error Mean
% of women in TMTs	Committed to CSR	38	19,9328%	13,91573%	2,25743%
	Did not commit to CSR	167	26,6484%	19,03765%	1,47318%

Table 4.24: T-test independent samples (Group 2 – CSR commitment)

Independent Samples Test - Group 2 (ie. CSR commitment)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
% of women in TMTs	Equal variances assumed	3,220	,074	-2,052	203	,041	-6,715%	3,273%	-13,169%	-0,261%
	Equal variances not assumed			-2,491	72,302	,015	-6,715%	2,695%	-12,088%	-1,342%

4.3.3.3 Group 3 (No CSR reporting nor commitment)

An independent-samples T-test was conducted to compare proportion of women in top-management within firms in CSR reporting or commitment and no CSR reporting or commitment conditions. There was a significant difference in the scores for companies showing no CSR reporting or commitment (M=30%; SD=20.8) and CSR reporting or commitment

(M=22%; SD=16.4) conditions; t (203) = 2.966, p = 0.003. The mean difference is 7.704 with 129.754 degrees of freedom. The corresponding two-tailed p-value is 0.006, which is less than 0.05. We conclude that the difference of means in women top-managers proportion between CSR reporting or commitment and no CSR reporting or commitment firms is different from 0, allowing for differences in variances across groups.

These results suggest that no CSR reporting or commitment condition does have an effect on women proportion in top-management. Specifically, our results suggest that when companies do not report or commit to CSR, their proportion of women top-managers' increases. (See tables 4.25 & 4.26)

Table 4.25: T-test Group statistics (Group 3 – No CSR reporting nor commitment)

Group Statistics - Group 3 (i.e. No CSR reporting nor commitment)

	Group 3	N	Mean	Std. Deviation	Std. Error Mean
% of women in TMTs	Did not report nor commit to CSR	77	30,2141%	20,88974%	2,38061%
	Reported or committed to CSR	128	22,5097%	16,04766%	1,41843%

Table 4.26: T-test independent samples (Group 3 – No CSR reporting nor commitment)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
% of women in TMT	Equal variances assumed	4,915	,028	2,966	203	,003	7,704%	2,597%	2,582%	12,826%
	Equal variances not assumed			2,780	129,754	,006	7,704%	2,771%	2,221%	13,186%

4.3.3.4 T-tests Comparison within and between groups (in pairs)

The T-tests for independent samples ran over each group (e.g. CSR reporting, CSR commitment, neither CSR reporting nor commitment groups) determine the significance difference toward women proportion in top-management within the groups meaning within the firms that met or did not met the condition (e.g. when the determinant condition of the group is met or not – ex: CSR reporting vs. no CSR reporting conditions).

The T-tests for independent samples ran over each group show that in Group 3 when the "did not report nor commit to CSR" (M=30; p=0.003) condition is met the significance difference is highest revealing a significant higher proportion of women presence in top-management over the other groups. Indeed, the significance difference in Group 1 when the "no CSR reporting" (M=29; p=0.008) condition is met is a significantly higher proportion than Group 2, when the "no CSR commitment" (M=26; p=0.041) condition is met; but both Group 1 and Group 2 have less important significance difference than Group 3.

The T-test outputs allow us to look at the significance level of the difference observed within groups and use the p-values into a comparison between groups using pairs (e.g. G1 vs G2; G1 vs G3; G2 vs G3) to see which difference is most significance. When comparing G1 (M=29; p=0.008) and G2 (M=26; p=0.041), Group 1 has the most significance difference. Between G1 (M=29; p=0.008) and G3 (M=30; p=0.003), Group 3 demonstrate the highest significance difference. Looking at G2 (M=26; p=0.041) and G3 (M=30; p=0.003), demonstrate that Group 3 has the highest significance difference between both.

In other words, if we have to rank the significance difference effects of each group according to CSR level of involvement on the proportion of women in top-management. The firms that did not report nor commit to CSR demonstrate the highest significance difference (p=0.003, p< 0.005) over the all sample composed of 205 lar companies operating in Portugal. CSR reporting firms follow closely demonstrating the second most important significance difference (p=0.008, p< 0.01). The less important significance difference observed between the groups is coming from the CSR commitment group of companies (p=0.041, p< .05).

4.3.4 Other variables mean analysis results

The Metropolitan area of Lisbon accounts for 110 companies' headquarters, out of the 205 in Sample C and reaches a 25% ratio of women in TMTs. Surprisingly, the Azores and Madeira regions, which have only a few companies' HQ in their territories, both approximate a mean of 30% women within their top-leadership institutions. (Table 4.27)

Table 4.27: Mean % women in TMT per HQ region - Sample C

% women in TMT * HQ region

% of women in TMT

HQ region	Mean	N	Std. Deviation
Açores	32,93%	4	8,43%
Alentejo	35,41%	4	10,48%
Algarve	60,00%	1	.
Area Metropolitana de Lisboa	25,61%	110	16,61%
Centro	22,47%	25	22,89%
Madeira	30,00%	2	42,42%
Norte	24,31%	59	19,27%
Total	25,40%	205	18,35%

Regarding Industry, the Health sector has the highest number of companies operating in this market – 32 companies in the sample - and the highest ratio of women within their TMTs (40%). In the following positions, Professional services (37,5%), Consumption and Associated Services (35%), Textiles, Clothing and Leather (26%) and Food, Drinks & Tobacco (24%). The lowest rate of women in TMTs belongs to the Energy and Resources sector with approximately 15%. (Table 4.28)

Table 4.28: Mean % women in TMT per Industry sector - Sample C

% women in TMT * Industry sectors

% of women in TMT

Industry sectors	Mean	N	Std. Deviation
Automobile	17,34%	24	14,79%
Basic Materials	20,19%	21	14,90%
Construction and Real Estate	10,83%	8	15,50%
Consumption and Associated Services	35,34%	16	9,39%
Energy and Resources	15,89%	12	17,44%
Food, Drinks and Tobacco	24,47%	14	13,43%
Health	40,44%	32	21,60%
Metallomechanics and Equipment	18,05%	10	16,35%
Professional services	37,50%	11	7,91%
Technology, Media and Telecommunications	21,93%	18	16,79%
Textiles, Clothing and Leather	26,98%	12	23,20%
Tourism, Restaurants and Leisure	22,63%	7	13,20%
Transport and Logistics	20,85%	20	15,66%
Total	25,40%	205	18,35%

5. Discussions

The results of this study will be discussed, considering the context of large companies in Portugal and the literature under three main axes. The first axis of discussion will focus on the findings addressing gender diversity in top-management (sub-section 5.1), before discussing the perspective resulting from firms' CSR level-of-involvement (e.g. CSR reporting, CSR commitment and neither reporting nor commitment to CSR) and gender diversity in top-management (sub-section 5.2). The final point of discussion will address the relationship between gender diversity in top-management and Corporate Social Responsibility performance (sub-section 5.3).

5.1 Gender Diversity in top-management

While observing the different samples, the rate of women's presence within top-management oscillates between a 20% and 25% mean approximately. The study revealed that the mean of members of top-management boards varies between eight and ten across the different samples, but the mean of women siting in top management is constantly two and never more. This observation clearly shows a lack of women at top-management positions within Portuguese economic landscape.

Nevertheless, our results – between 20% and 25% of female top-managers - even though these remain low percentage, they are still higher than the literature results concerning women in boards in Portugal for the year 2017 (16.2%) (Martinez, 2019). However, they are still significantly below the quotas ratio of 33,3% women in boards implemented for public and private listed companies in Portugal since 1st January (*Assembleia da República Portuguesa, Lei nº* 62/2017, 1st August 2017).

In addition to have a numerically inferior representation of female among boards members of companies in Portugal; even though the literature suggest that women are more sensitive to CSR issues (Bear et al., 2010; Ben-Amar et al., 2017); female top-managers might encounter difficulties to turn their CSR concerns into CSR performance. Indeed, the obstacles faced by women in having their voices heard within top-management teams could potentially diminish their potential contribution to CSR strategies, implementation and consequently performance. According to Groysberg and Bell (2014), 87% of female directors reported facing gender-related hurdles in the boardroom. The obstacles fell into four major categories: 21% of women

noted not being heard and listened to; 20% of women said they were not accepted as an equal or as part of the "in" group; 20% of women pointed to establishing credibility as an obstacle; and 5% of women say they faced stereotyped expectations of women's behaviour (Groysberg & Bell, 2014). This assumption suggests that the relation between gender diversity in top-management and corporate social responsibility performance might not be direct and may encounter other parameters which can reduce the initial relationship effect between GE and CSR; this observation should constitute an avenue for future research on this thematic.

Through this research, the choice has been made to focus gender diversity exclusively at the top-management level, also because women face a certain glass-ceiling in work environment and that it requires more effort for a woman to reach top-management level (International Labour Organization, 2019). Our results did not reveal that companies with biggest sizes have less important presence of women in top-management whereas the literature demonstrated a relation between the size of SMEs and the firm involvement towards social activities (OE SMEs, 2002). The relation between company size and CSR involvement was not tested in this study but if this pattern exists, it did not influence gender diversity proportion in TMTs. However, the bigger a company is, the more hierarchical levels there are and consequently those layers of hierarchy could be seen as obstacles to be hired for top-management positions and/or to reach top-management instances (e.g. boards). This brings to the table the issue of the equal opportunities between women and men, especially career opportunities: if we intent to reach equal representations of gender in top-management, women and men should have same opportunities to evolve vertically within companies and this all along lifetime (e.g. starting from education).

Each industry sector demonstrated a different proportion of women in TMTs. Indeed, the results showed that the variation of female representation in TMTs between markets can reach a four times gap between the lowest and highest women presence in boards. Thus, the sector with lowest women proportion in TMTs counts 10% of female top-managers (e.g. Construction and Real estate sector) when the highest score observed in the samples is over 40% of women (e.g. Health sector) at top decision-making position.

The results can be explained by the characteristics specific to of each industry and might require a sectorial approach to address gender equality issues. Indeed, our results seems to

reflect the gender inequalities more broadly encountered in society due to gender norms[29] and stereotypes[30], influencing women to choose tertiary sectors such as social services, health etc. and men choosing technical areas such as automobiles, engineering, and so on (World Bank, 2019).

Indeed, our results are consistent with the literature, as the CITE (2017) affirmed that the labour market in Portugal demonstrates similar patterns as in European countries, especially in terms of the horizontal segregation of occupations, meaning that a segmentation of occupational activities into strongly male and strongly female sectors structure the Portuguese labour market. Therefore, those structural gender inequalities that seem to follow different patterns across industry sectors must be address through Education policies, Community dialogue and Media engagement, in order to impact the society and see its effects reflected in the business area as well. One pre-requisite to an equal proportion of women within top-management in sectors that are considered as "strongly-male oriented" is the availability of competent women leaders. Even though the literature affirmed that women are likely more qualified than men in Portugal (CITE, 2017), if only a few women study fields related and applicable to, for instance, the Automobile sector – as an example of a sector perceived as "strongly-male" –, it will not be surprising to find almost no women within firms' boards of this industry.

The next sub-section (sub-section 5.2) will discuss the lack of female top-managers observed in this study according to the firms' level-of-involvement, whether companies reported, committed or did not reported nor committed to CSR.

5.2 CSR level of involvement and Gender Diversity in top-management

The study addressed also gender diversity in top-management in regards to Corporate Social Responsibility levels of involvement (i.e. whether the firms reported CSR, committed to CSR or neither reported nor committed to CSR) and significant interaction between each CSR level of involvement and female top-managers' ratio in their firms were suggested.

Our research demonstrated that an important proportion of large companies in Portugal comply to CSR reporting process, 117 out of 205 firms. The analysis revealed a significant

[29] EIGE. (n.d.). Glossary of terms – Definition: Gender norms. [consulted on 25-10-2020]
[30] EIGE. (n.d.). Glossary of terms – Definition: Gender stereotypes. [consulted on 25-10-2020]

difference in the proportion of women in top management between firms who reported CSR and those that did not. CSR reporting firms had 6.8% less gender-diverse TMTs than firms that did not reported CSR. Even if the companies who reported CSR activities obtained the lowest women ratio in TMTs, it is important to highlight that the CSR reporting process is largely integrated in the firms' behaviours, as more than 57% of the companies in our Sample C published CSR reports.

These results can be explained by the literature establishing a relationship between the size of the enterprise and the involvement in social activities (OE SMEs, 2002); suggesting that large companies might have greater involvement in social activities which could be reflected through the publication of CSR reports on their social activities implemented.

However, our percentage result on CSR reporting firms in Portugal (57%) is between two results of the literature. At the same time, higher than Dias (2009) findings which demonstrated that in 2005 45% of the listed companies in Portugal reported CSR; but much lower than the findings of a KPMG' survey (KPMG, 2017) which revealed that in 2017, 80% of the N100 companies in Portugal issued a CSR report.

Even if this observation is not the principal axis of our research, the results supposed that CSR is at least taken into consideration in firms' strategies within Portuguese context; even though in Portugal, CSR reporting is not legally binding to all companies. The European Commission (EC) Directive 2014/95/EU[31] addresses only large public-interest companies with more than 500 employees, which covers approximately 6,000 large companies and groups across the EU[32]. Thus, our analysis reveals a high proportion of companies complying to CSR reporting even if they are legally free to not report CSR.

Nevertheless, even if those companies demonstrate concerns about CSR issues through the non-financial information reporting, this was not positively reflected into their board composition, as the ratio of women in TMTs of companies that reported CSR was of 22%. Another reflection brought by the research results is the efficiency of the CSR reporting process. CSR reporting is considered as helping investors, consumers, policy makers and other stakeholders to evaluate the non-financial performance of large companies[33]. First, when the

[31] European Union. (22nd October 2014). Directive 2014/95/EU. [consulted on 25-10-2020]
[32] European Commission. (n.d.). Non-Financial Reporting. [consulted on 25-10-2020]
[33] *Idem*

CSR reporting compliance been put in relation to the gender diversity in top-management, the results revealed that the firms reporting CSR show a low proportion of female top-managers. Secondly, this CSR reporting process is based on a voluntary procedure, which implies a wide range of content. As it is neither binding nor standardized, nor monitored by independent organisms mandated for, to report CSR activities, firms are free to show difference of standards, priorities – as identified by Gago et al. (2005) in Portugal (e.g. corporate volunteering, sponsorship and donations to cultural, social, educational and sports initiatives) - and degree of action towards Corporate Social Responsibility action.

The literature previously revealed that in Portugal, the CSR reports analysed in a survey (KPMG, 2017) had almost no numeric indicators, suggesting that firms perhaps use CSR reports more as a communication or marketing tool, than as an accurate/tangible reproduction of their engagement to social responsibility; even though some measurement tools exist (e.g. the Global Reporting Initiative (GRI) Index[34]). However, the high rate of companies complying to this procedure implies that if a binding regulation were adopted regarding CSR reporting, it could be largely well-accepted within the Portuguese business landscape.

Firms that reported (22%) or committed (19%) to CSR have a lower women representation within their top-management than companies who did not report and nor commit to CSR (29%).

However, these findings should be balanced by the fact that the largest sector represented in Sample C is Health. The health sector is the one performing the best regarding gender diversity in top-management (40%), but is at the same time over-represented in Group 3 (e.g. Group3: firms that neither report nor commit to CSR). Thus, one explanation for our results could come from the sample characteristics. In Sample C, the Health sector counts 23 hospitals. Amongst those 23 hospitals only three are part of the Group 1 (e.g. Group1: firms that reported CSR activities). Such a small number of hospitals complying to CSR reporting process is probably due to the character of their activity, which inherently provides social services, or due to their public interest character or perhaps because of their specific management system. Thus, the Health sector perform well on gender diversity performance but poorly on CSR performance – assessed here through CSR reporting.

[34] Global Reporting Initiative. (n.d.). GRI Index standards. [consulted on 25-10-2020]

CSR reporting process is presented in the literature (Ehsan et al., 2018) and by legislative regulation (European Union, Directive 2014/95/EU, 22nd October 2014) as one of the central tools and solutions toward CSR response. Thus, it was possible to expect a relation between CSR reporting rate and the ratio of women in top-management. However, it does not appear, from our results, that greater compliance to CSR reporting is associated to more women in top-management positions. Indeed, this suggests that the CSR reporting process might not be a determinant or such central element toward solving gender diversity issues in top-management, and that tools other than the CSR reporting process should be used to assess relationship between gender diversity in top-management and CSR in future research, as well as into future legislative and policies initiatives.

The study shows that less firms engaged in CSR commitment, 38 firms out of 205, rather than reporting CSR, 117 out of 205, which is a step forward in the CSR process. Indeed, surprisingly more companies reported CSR activities, than companies who merely committed to performing CSR activities. One of the main reasons explaining these results is that the commitment to CSR was assess only through being a signatory of the BSCD' manifesto, whereas more ways to commit to CSR can exist. Moreover, the recent character of this manifesto might justify that a low number of firms signed it. Additionally, signing a manifesto is first of all symbolic and can tell your stakeholders that you are willing to involve in CSR, but it is not a proof of performance. Some firms might find useless to commit to such manifesto when they are already implementing CSR activities and reporting it, which could justify our low results in assessing this "CSR commitment" group.

Nevertheless, the additional value of the BSCD' manifesto for sustainable development of companies in Portugal is that it was launched in response to the current pandemic. The research demonstrated that a low ratio of companies signed this text (38 firms out of 205), which should be analysed in light of past contexts to forecast future paradigms in the CSR and gender diversity area. Indeed, this manifesto aims to put CSR issues on the agenda during a crisis situation, which radically changed business conditions and priorities. The results of a maximum 25% women ratio in Portuguese TMTs gives an idea of the step forward which still needs to be taken to reach the goal of equal participation of women and men in economic life; but in the current context this appears to be even more at risk. Unfortunately, past observations show that the gender gap on economic participation in Portugal (World Economic Forum - Global Gender Gap Report, 2018) proved a significant increase after the last economic crisis starting from 2008. Therefore, it would have been reassuring to note a better commitment rate of Portuguese

firms to CSR values in the particular current COVID-19 situation. Thus, the gender diversity thematic and CSR performance is more than ever a subject at stake that requires special vigilance in the coming months and year in Portugal, keeping in the line the SDGs objectives to achieve by 2030, a decline of progression must not be a conceivable scenario.

The results of the relationship analysis between gender diversity in top-management and CSR performance may provide further elements and/or understandings susceptible to improve solving process of gender equality and CSR issues within the context of large firms operating in Portugal and those results will be discussed in the next sub-section (sub-section 5.3).

5.3 Relationship between Gender Diversity in top-management and CSR performance

The study revealed that a positive but very weak – almost negligible - relationships between the proportion of women in top-management and CSR performance. In the framework of this study, the weak relationship between CSR performance and gender diversity within top-management does not allow to establish any firm conclusions regarding women top-managers and CSR. The median percentage of women in TMT obtained from this sample was 23%.

The small sample size can explain the results. The sample used to test this relationship (between percentage of women in TMT and CSR performance) was constituted by firms who were rated by CSR Hub. Although, the participation within this rating is not conditioned by the firm agreement but requires the CSR data disclosure of the company. Corporate reputation concerns and the existence of such CSR global ratings might influence firms to publish perhaps only data that are in their favour. Thus, it might explain why companies assessed under such CSR ratings perform well, even without regards to gender diversity consideration in their top-management. The analysis that we conducted on gender diversity in top-management association to CSR performance did not provide clear answers.

Nevertheless, our results are consistent with the literature, as previous empirical studies revealed similar findings of mixed or even no effects between gender diversity and corporate social responsibility was found (Post et al., 2011; Stanwick & Stanwick, 1998). However, there is also research demonstrating the added value of women in top leadership to the performance of CSR activities (Bear et al., 2010; Bernardi et al., 2009; Zhang et al., 2013).

The literature and the contribution of this study show that a broader attention should be paid to the relation between women in TMTs and CSR performance, questioning the way to

enhance and generalise actions towards these issues (e.g. gender equality and CSR). In the eventuality that women in top-management do bring better CSR performance as suggested by a part of the literature, the reasoning should lead to the solution. So far, the establishment of gender quotas is the one of the solutions used to guarantee the equal representation of women and men. In France, a bill was passed in 2011 requiring 40% female directorship by 2016 and explained significant progress on women participation to the economic sphere (Zenou et al., 2017). Portugal recently adopted similar legislation requiring 33,3% of women in boards of public and private listed companies by 1st January 2020. The consequences of this law will be soon an interesting area of research, as we will soon reach the law' one-year of implementation. However, the results suggest, in the possibility of extending such law to all companies in Portugal (e.g. not exclusively listed firms), that it could be worth paying attention to the relation of gender equality and CSR. Indeed, addressing both could be a two-in-one gain, improving at the same time gender equality and CSR performance, in cases the relationship is significant.

The analysis demonstrates a negative correlation between women's representation within TMTs and Climate Change performance. The results suggesting a negative relationship do not allow to establish any firm conclusions between female top-managers proportion and Climate change performance. The median of women percentage in top-management obtained from this sample is 25%.

Due to the small sample size used to test the relationship between the ratio of women in top-management and Climate change performance, it seems inappropriate to make very conclusive statements. Nonetheless, the companies' Climate Change performance that were assessed by CDP reached all together a mean of 75 on a 0 to 100 scale, meaning that they perform quite well on Climate Change, even though those good score do not have a relation with their representation of women in top-management. This high value can explain the negative character of the relationship, since the firms in Sample B perform well on CC even without a high ratio of women in top-leadership positions. Another factor to take into consideration to interpret this result is that the two highest industry sectors represented in this sample are Energy & Natural Resources and Paper & Forestry.

The results are contrary to the observation of some studies affirming the existence of a relationship between women presence in boards and environmental issues performance (Ciorcilan et al., 2012; Birindelli et al., 2019). The almost absence of relationship between women proportion in top-management and Climate Change (CC) suggested from our results demonstrates that the presence of women in boards did not influence their CC performance.

Indeed, the inherent character of those firms' activities – highly represented in the Sample B – is their direct impact on the environment, which could justify such high rating on Climate change performance, because of the fact that they majorly operate in sectors linked to "Green" issues. Thus, those should be the first concerns at stake and might follow specific regulations (e.g. European Climate Law[35], Industry sectorial regulations…). Additionally, the firms belonging to the Energy and Resources sector might be under greater scrutiny, receive more pressure from external stakeholders to address environmental issues and conform to standards as they operate in such high impact areas in terms of Climate Change. Moreover, Green issues are not (and do not need to) be addressed in a uniform manner in all companies. The elaboration of a sectorial approach and evaluation method for different industries, according to what each sector faces in relation to environmental concerns can be applied to future research addressing gender diversity and CSR performance.

[35] European Commission. (n.d.). European Climate Law: policies and goals. [consulted on 25-10-2020]

6. Conclusion

6.1 Concluding remarks

Gender diversity and Corporate Social Responsibility are certainly both complex concepts that are undeniably under the spotlight of political, economic and social leaders since the last decade; furthermore, both have been identified as contributing to pave the path for achieving the Sustainable Development Goals' agenda by 2030.

Nevertheless, as pointed out in the literature (Webb, 2004; Williams, 2003) the way gender diversity and Corporate Social Responsibility interact remains understudied and is still not very understood; even more so in the specific context of Portugal. Therefore, this study started by highlighting the main issues at stake and the importance of gender equality and CSR for companies in our contemporary societies, particularly because it demonstrating gender equality concerns and CSR activities is becoming synonym of doing good to the community (Bhattacharya & Sen, 2004). Addressing Corporate Social Responsibility issues will sooner or later – through political, legal, brand reputation, or stakeholders' expectation – become a "must do" (Rego et al., 2003) for any firms who want to remain competitive. The review of the main literature allowed us to point out the key drivers and benefits of both gender diversity – especially within work environment, and particularly in top-management positions - and CSR with its performance measurement.

One of the principal arguments in the literature is based on the assumption that women are more ascribed to communal attributes – being affectionate, helpful, kind, sympathetic, interpersonally sensitive, nurturing and gentle - than men (Eagly et al., 2003); making them more aware, sensitive, concerned and willing to address social and environmental issues when they are in top decision-making positions (Zhang et al., 2012). Additionally, the literature also addresses the benefits of both gender diversity and Corporate Social Responsibility to firms in terms of innovation, creativity, human resources management (Carter et al., 2003; Baldarelli & Del Baldo, 2016) and even financial performance (Low et al., 2015; Galbreath, 2018).

However, Setò-Pamies (2013) pointed out the lack of female representation on corporate boards of directors as a global phenomenon and a lack of investigation on relevant managerial variables affecting CSR performance (Angus-Leppan et al., 2010; Manner, 2010). Even though, positive relationship (Bear et al., 2010; Bernardi et al., 2009; Zhang et al., 2013) and mixed or

no relationship (Post et al., 2011; Stanwick & Stanwick, 1998) were identified between gender diversity and CSR performance.

Looking further at the Portuguese context, there is no studies addressing the relationship between gender diversity and Corporate Social Responsibility and establishing a clear relation. However, the literature focusing on Portugal revealed the importance of the challenges remaining in what pertains to gender equality, including the presence of women in top-management (World Economic Forum, 2018), CSR issues (MORI, 2000) and CSR reporting compliance (Dias, 2009). Indeed, according to Martinez (2019) research, in 2017 the percentage of women in companies' boards in Portugal was significantly low (16,2%), performing as second worth score in Europe before Greece (11.3%). Regarding CSR issues, when UN assessed progress toward SGD 12 "Responsible consumption and production" for the year 2019, the necessary data to evaluate were not available for Portugal. Additionally, Branco et al. (2014) demonstrated that for the period of the crisis (2008-2011), Portugal showed a decrease in CSR through sustainability reporting of companies which highlighted in the current pandemic crisis context should attract our attention.

From those observation, this study intended to answer the following question: is higher representation of women within top-management of large companies in Portugal associated to better Corporate Social Responsibility?

The study used a correlation analysis between the proportion of women in top-management teams and, firstly, CSR performance then, secondly, climate change issues. Surprisingly, only a weak correlation was found between the presence of women in top-management and CSR performance in contrast with Bear et al., (2010) results. Similarly, a negative correlation between the proportion of female top-managers and companies' climate change concerns whereas Ciocirlan and Petterson (2012) established a correlated relation between higher women in workforce and higher Climate change issues concerns. On the other hand, when groups with differing levels of CSR commitment were compared with regard to the proportion of women in top management, whether they reported CSR (22%), committed to CSR (19%) and or neither reported not committed to CSR (29%); a significant mean difference was identified between each group.

The gender diversity issue, lacking female presence in top-management was reflected in our results. Indeed, low levels of female representation in top-management were observed in all the samples analysed, reaching at the highest a mean of 25% female top-managers. Taking

into consideration, that since the 1st January 2020, both public and private listed companies must demonstrate a minimum ratio of 33,3% women within their boards.; the eventuality to extend this legal requirement to all firms, will require much efforts to reach such quota from our findings view. Particularly in some industry sectors that in our analysis were identified with significant low female representation ratio in top-management, such as automobile (17%), Construction & Real Estate (10%), Energy & Resources (15%).

The results of this study should be analysed under the light of a broader picture. Both gender equality and Corporate Social Responsibility contribute to the UN's Sustainable Development Goals agenda. The particularity of the current period, with the COVID-19 pandemic has further highlighted the importance of gender diversity (World Bank, 2020) and sustainable development. In the past, gender equality has decreased in period of crisis. This study did not provide clear understandings related to gender equality and CSR performance relationship, but our results show that the state-of-play concerning women in top-management and CSR issues remains fragile in Portugal. Thus, the important contribution of this research in practices, could be to remind organisations to look at gender diversity if not done yet, and not take the status quo for granted, but rather work to improve female representation. First, because of all the benefits this has, for both companies themselves and broader for society will also return indirectly to businesses. An additional contribution come from the integration of this research in the current pandemic context in order to warn about potential negative impact of the coronavirus crisis on the gender equality and CSR situation in Portugal, as previous researchers show the important effect of the financial crisis increasing gender gap in economic participation and opportunities. The consequences of the austerity measures imposed to Portuguese society after 2011 in response to the crisis impacted the most vulnerable, namely youth, elderly and women. Indeed, taking into account the current COVID-19 crisis context, the fragile state-of-play of gender equality and CSR revealed from our study, those lessons-learned from the 2008 financial' negative impact on gender equality and CSR, and the possible beneficial effect of women in top-management identified through our literature review; gender diversity and CSR should never be more important and more at stake than today, keeping in mind the will to achieve SDGs by 2030.

The particular time that we are facing requires particular measures. Some media outlets have already pointed that countries with female leadership have dealt better with the crisis-management regarding the pandemic and have raised the question if there exist similar patterns which may be transferred from the political to the economic sphere for better management in

COVID-19 times (Goswani, 2020). This question will not be answered here, but it gives additional elements to justify why gender equality and Corporate Social Responsibility should be a priority for companies – and all stakeholders. Indeed, Mariana Vieira da Silva, Minister of State for the Presidency of Portugal, in voiced hope-giving statement in the framework of the last UN General Assembly addressing progress toward gender equality under threat. Minister Vieira da Silva said about the persisting gender pay gap and the stereotypes still influencing educational and professional choices - moving women away from better-paying careers in such areas as engineering and information and communications technology - that present inequalities must not project onto the future (Reliefweb, 2020).

6.2 Limitations and Future researches

The research is bound with the small sample size of samples A & B. This resulted from the fact that not all companies take part into global CSR ratings assessed by independent organisms explaining the samples size as they were selected from the rating list of companies operating in Portugal. The limitation is that no more companies than those included in our samples in Portugal are evaluated under CSR performance rating mechanisms, as all were included in this research. Indeed, it is a very interesting observation, because it shows that although there is a lot of firms reporting CSR (117 over 2015), it is always on the companies' terms and it is not standardized. When it comes to standardized evaluation process under the terms of external organisation (e.g. CSR Hub and CDP), only a small number of firms are concerned.

It's worth noting that in this study the relationship between gender diversity and CSR reporting underwent only through a quantitative analysis. The study looked at the number of companies reporting CSR and at the ratio of female in their top-management, but further research would do well to look qualitatively at the content of those CSR reports. As quantitative analysis can establish the existence of CSR reporting process in Portugal, but qualitative analysis would have provide further understanding on the CSR performance of the firms.

Additionally, not only CSR reports should be evaluated but CSR strategy documents (e.g. policies, regulations, plans, stakeholders' engagement log frames) related to gender equality and CSR. Looking qualitatively at the degree of implication toward CSR that reflect CSR strategies and compare those levels of CSR strategies (from least to most constraining) with female top-managers proportion of the firms.

In this study, we looked at association between gender diversity and Corporate Social Responsibility which is bound with the difficulty of assessing causation in such matters. Also explaining why most researches in the field are thus far correlational only. However, further research should address causality of the association between gender equality and CSR performance looking more precisely at the degree in which one factor affect the other.

A deepen analysis on the climate change performance of organisations related to gender diversity would be an interesting topic with a focus on the energy & resources sector, those companies faces particular context such as particular legislation and specific pressure and/or scrutiny from external stakeholders as they are at the frontend of the climate change path with is more than ever a contemporary issue in regards to impact of human activity on the planet. Especially considering that 70 per cent of climate negotiators are men according to the United Nations[36]. In such regards, women representation is a persisting issue as well as their full-participation in all spheres of the society which too often encounter a path strewn with more pitfalls than men.

Indeed, this study focus only women representation in top-management and did not looked at all about how women are considered within top-management instances. Female top-managers additionally to be numerically inferior in top-management may face barriers, due to several factors (e.g. gender norms, stereotypes, etc…) and their value not be used to their full potential. Understanding how women are voiced and treated within top-management instances in order to impact on CSR decisions is a very interesting raising point. As being represented is one step, being fully taken into consideration with same level than male-counterparts is another one and this further step of equal-treatment between women and men is a crucial point to assess to improve the path of companies toward gender equality. Thus, future researches should definitely focus on how women are voiced and considered within top-management instance in order to evaluate women impact within the decision-making process which could de facto influence adoption of CSR measures as well as influencing much more topics in businesses and within society at all scale.

[36] United Nations. (n.d.). *Women and Girls closing the Gender Gap*. [consulted on 24-11-2020]

The Bahá'í thought state that:

"*The world of humanity is possessed of two wings: the male and the female. So long as these two wings are not equivalent in strength, the bird will not fly. Until womankind reaches the same degree as man, until she enjoys the same arena of activity, extraordinary attainment for humanity will not be realized; humanity cannot wing its way to heights of real attainment."* (Bahá'í World Centre, 1985)

In the framework of the Gender Equality Index 2020 conference organised by EIGE on 29th October 2020, Minister Mariana Vieira da Silva highlighted the importance of gender equality and the full-participation of all when delivering concluding remarks of the "Digitalisation: consequences for gender equality" panel (EIGE, 2020). Minister Mariana Vieira da Silva affirmed that: "*Gender equality and ensuring both men and women are levered when choosing their paths is of the utmost importance; especially now that we see the social effects of the pandemic. We realise how it is important to ensure everyone, no matter the gender, make the most of their potential.*[37]*"*

The recently implemented legislation on women quotas in boards of listed companies (*Assembleia da Republica Portuguesa*, lei nº 62/2017, 1st August 2017), the progress towards women participation in Portuguese labour market and monthly earnings gap between women and men observed in the last years (CITE, 2017) and the recent statement of Minister Mariana Vieira da Silva toward gender equality gives good faith that Portuguese society is on the right path to turn full potential of its two wings and fly.

[37] European Institute for Gender Equality (EIGE) Youtube Page. (2020) Gender Equality Index 2020 Conference record. Mariana Vieira da Silva speech from minutes 03 :03.37 [consulted on 30-11-2020]

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9. Annexes

9.1 Annex A - List of companies Sample A

Table 9.1: List Sample A (Companies name, industry sector & proportion of women in TMTs)

Company name	Industry sector	% of women in TMT
GROUPAMA SEGUROS- UNA SEGUROS	Financial services	0%
CAIXA GERAL DE DEPOSITOS	Financial services	25%
ZON MULTIMEDIA SA (NOS)	Retail, financial services, IT, Telecommunication	29%
REDES ENERGETICAS NACIONAIS (REN)	Energy & Natural Resources	23%
ENERGIAS DE PORTUGAL (EDP)	Energy & Natural Resources	29%
GALP ENERGIA SGPS	Energy & Natural Resources	29%
SONAE SGPS SA	Retail, financial services, IT, Telecommunication	33%
MILLEMNIUM BANCO COMERCIAL PORTUGUES	Financial services	17%
PORTUCEL, S.A. - THE NAVIGATOR COMPANY	Paper & Forestry	0%
JERONIMO MARTINS SGPS SA	Retail, financial services, IT, Telecommunication	30%
BANCO ESPIRITO SANTO E-R- Novo Banco	Financial services	13%
CORTICEIRA AMORIM	Paper & Forestry	33%
SONAE INDUSTRIA SGPS SA	Paper & Forestry	22%
BANCO BPI SA	Financial services	17%
PORTUGAL TELECOM SGPS - ALTICE Portugal	Retail, financial services, IT, Telecommunication	0%
MEAN		**20%**

9.2 Annex B - List of companies Sample B

Table 9.2: List Sample B (Companies name, industry sector & proportion of women in TMTs)

Company name	Industry sector	% of women in TMT
CTT - CORREIOS DE PORTUGAL S.A.	Transport services	0%
ENERGIAS DE PORTUGAL (EDP)	Energy & Natural Resources	29%
THE NAVIGATOR COMPANY	Paper & forestry	0%
CAIXA GERAL DE DEPOSITOS	Financial services	25%
JERONIMO MARTINS SGPS SA	Retail, IT, Telecommunication	30%
SONAE SGPS SA	Retail, IT, Telecommunication	33%
TOYOTA CAETANO	Automobile	13%
BANCO COMERCIAL PORTUGUES SA	Financial services	17%
GALP ENERGIA SA	Energy & Natural Resources	29%
REDES ENERGETICAS NACIONAIS - REN	Energy & Natural Resources	23%
INAPA - INVESTIMENTOS, PARTICIPACOES E GESTAO, SA	Paper & forestry	43%
MEAN		**22%**

9.3 Annex C - List of companies Sample C

Table 9.3: List Sample C (Companies name, industry sector & proportion of women in TMTs)

Company name	Industry sector	% of women in TMT
MODELO CONTINENTE HIPERMERCADOS, S.A. (SONAE GROUP)	Consumption and Associated Services	33%
PINGO DOCE - DISTRIBUIÇÃO ALIMENTAR, S.A. (JERONIMO MARTINS GROUP)	Consumption and Associated Services	30%
RANDSTAD RECURSOS HUMANOS - EMPRESA DE TRABALHO TEMPORÁRIO, S.A.	Professional services	33%
RANDSTAD II - PRESTAÇÃO DE SERVIÇOS, LDA	Professional services	33%
CTT - CORREIOS DE PORTUGAL, S.A.	Transport and Logistics	0%
KELLY SERVICES - EMPRESA DE TRABALHO TEMPORÁRIO, UNIPESSOAL, LDA	Professional services	47%
AUCHAN RETAIL PORTUGAL, S.A.	Consumption and Associated Services	36%
TRANSPORTES AÉREOS PORTUGUESES, S.A.	Transport and Logistics	27%
MEO - SERVIÇOS DE COMUNICAÇÕES E MULTIMÉDIA, S.A. (ALTICE GROUP)	Technology, Media and Telecommunications	0%
CENTRO HOSPITALAR E UNIVERSITÁRIO DE COIMBRA, E.P.E.	Health	40%
TELEPERFORMANCE PORTUGAL, S.A.	Professional services	43%
CENTRO HOSPITALAR UNIVERSITÁRIO DE SÃO JOÃO, E.P.E.	Health	60%
VOLKSWAGEN AUTOEUROPA, LDA	Automobile	13%
PROSEGUR - COMPANHIA DE SEGURANÇA, LDA	Professional services	30%
MANPOWERGROUP SOLUTIONS, UNIPESSOAL, LDA	Professional services	45%
SECURITAS - SERVIÇOS E TECNOLOGIA DE SEGURANÇA, S.A.	Professional services	42%
ADECCO RECURSOS HUMANOS - EMPRESA DE TRABALHO TEMPORÁRIO, LDA	Professional services	43%
STRONG CHARON - SOLUÇÕES DE SEGURANÇA, S.A. (TRIVALOR)	Professional services	20%
SERVIÇO DE SAÚDE DA REGIÃO AUTÓNOMA DA MADEIRA, E.P.E.	Health	60%
CENTRO HOSPITALAR UNIVERSITÁRIO DO ALGARVE, E.P.E.	Health	60%

CENTRO HOSPITALAR UNIVERSITÁRIO DO PORTO, E.P.E.	Health	25%
CENTRO HOSPITALAR DE LISBOA OCIDENTAL, E.P.E.	Health	40%
CONTINENTE HIPERMERCADOS, S.A.	Consumption and Associated Services	33%
GERTAL - COMPANHIA GERAL DE RESTAURANTES E ALIMENTAÇÃO, S.A. (TRIVALOR)	Tourism, Restaurants and Leisure	20%
DIA PORTUGAL - SUPERMERCADOS, SOCIEDADE UNIPESSOAL, LDA	Consumption and Associated Services	17%
WORTEN - EQUIPAMENTOS PARA O LAR, S.A. (SONAE)	Consumption and Associated Services	33%
TEIXEIRA DUARTE - ENGENHARIA E CONSTRUÇÕES, S.A.	Construction and Real Estate	0%
INFRAESTRUTURAS DE PORTUGAL, S.A.	Transport and Logistics	33%
CENTRO HOSPITALAR DE VILA NOVA DE GAIA/ESPINHO, E.P.E.	Health	60%
BOSCH CAR MULTIMÉDIA PORTUGAL, S.A.	Technology, Media and Telecommunications	0%
EDP DISTRIBUIÇÃO - ENERGIA, S.A.	Energy and Resources	0%
EL CORTE INGLÊS - GRANDES ARMAZÉNS, S.A.	Consumption and Associated Services	40%
HOSPITAL PROFESSOR DOUTOR FERNANDO FONSECA, E.P.E.	Health	60%
EUREST (PORTUGAL) - SOCIEDADE EUROPEIA DE RESTAURANTES, LDA	Tourism, Restaurants and Leisure	38%
ESCALA BRAGA - SOCIEDADE GESTORA DO ESTABELECIMENTO, S.A.	Health	60%
HOSPITAL GARCIA DE ORTA, E.P.E.	Health	60%
CP - COMBOIOS DE PORTUGAL, E.P.E.	Transport and Logistics	40%
IBERUSA - HOTELARIA E RESTAURAÇÃO, S.A.	Tourism, Restaurants and Leisure	0%
UNIDADE LOCAL DE SAÚDE DO ALTO MINHO, E.P.E.	Health	67%
ITAU - INSTITUTO TÉCNICO DE ALIMENTAÇÃO HUMANA, S.A. (TRIVALOR)	Tourism, Restaurants and Leisure	20%
LOJAS PRIMARK PORTUGAL - (ASSOCIATED BRITISH FOODS)	Textiles, Clothing and Leather	25%
ZARA PORTUGAL - CONFECÇÕES, S.A.	Textiles, Clothing and Leather	30%
SPDH - SERVIÇOS PORTUGUESES DE HANDLING, S.A. (GROUNDFORCE)	Transport and Logistics	20%
IKEA PORTUGAL - MÓVEIS E DECORAÇÃO, LDA (INGKAGROUP)	Consumption and Associated Services	50%
MOTA-ENGIL- ENGENHARIA E CONSTRUÇÃO, S.A.	Construction and Real Estate	0%
CONDURIL - ENGENHARIA, S.A.	Construction and Real Estate	33%
CENTRO HOSPITALAR TONDELA-VISEU, E.P.E. (CHTV, E.P.E.)	Health	40%
YAZAKI SALTANO DE OVAR - PRODUTOS ELÉCTRICOS, LDA	Technology, Media and Telecommunications	0%

COMPANHIA CARRIS DE FERRO DE LISBOA, E.M., S.A.	Transport and Logistics	40%
INSTITUTO PORTUGUÊS DE ONCOLOGIA DO PORTO FRANCISCO GENTIL, E.P.E.	Health	60%
CONTINENTAL MABOR - INDÚSTRIA DE PNEUS, S.A.	Automobile	11%
CENTRO HOSPITALAR DE LEIRIA, E.P.E.	Health	60%
FAURECIA - ASSENTOS DE AUTOMÓVEL, LDA	Automobile	40%
RECHEIO - CASH & CARRY, S.A. (JERONIMO MARTINS)	Food, Drinks and Tobacco	30%
INSTITUTO PORTUGUÊS DE ONCOLOGIA DE LISBOA FRANCISCO GENTIL, E.P.E.	Health	50%
OGMA - INDÚSTRIA AERONÁUTICA DE PORTUGAL, S.A. (EMBRAER GROUP)	Transport and Logistics	17%
FARFETCH PORTUGAL, UNIPESSOAL, LDA	Textiles, Clothing and Leather	57%
NESTLÉ PORTUGAL, UNIPESSOAL, LDA	Food, Drinks and Tobacco	17%
SIEMENS, S.A.	Technology, Media and Telecommunications	25%
UNIDADE LOCAL DE SAÚDE DO BAIXO ALENTEJO, E.P.E.	Health	50%
PETROGAL, S.A. (GALP)	Energy and Resources	29%
LUSÍADAS, S.A.	Health	0%
SDSR - SPORTS DIVISION SR, S.A. (SONAE)	Consumption and Associated Services	33%
AQUINOS, S.A.	Consumption and Associated Services	20%
RÁDIO E TELEVISÃO DE PORTUGAL, S.A.	Technology, Media and Telecommunications	33%
IKEA INDUSTRY PORTUGAL, S.A. (INGKAGROUP)	Consumption and Associated Services	50%
GABOR PORTUGAL - INDÚSTRIA DE CALÇADO, LDA	Textiles, Clothing and Leather	0%
INSCO - INSULAR DE HIPERMERCADOS, S.A. (THE BENSAUDE GROUP)	Consumption and Associated Services	33%
UNIDADE LOCAL DE SAÚDE DA GUARDA, E.P.E.	Health	83%
METROPOLITANO DE LISBOA, E.P.E.	Transport and Logistics	33%
VODAFONE PORTUGAL - COMUNICAÇÕES PESSOAIS, S.A.	Technology, Media and Telecommunications	50%
FNAC PORTUGAL - ACTIVIDADES CULTURAIS E DISTRIBUIÇÃO DE LIVROS, DISCOS MULTIMÉDIA E PRODUTOS TÉCNICOS, LDA	Consumption and Associated Services	33%
APTIVPORT SERVICES, S.A.	Automobile	19%
HENNES & MAURITZ, LDA	Textiles, Clothing and Leather	69%
ANA - AEROPORTOS DE PORTUGAL, S.A.	Transport and Logistics	8%

SISTEMAS MCDONALD'S PORTUGAL, LDA	Tourism, Restaurants and Leisure	33%
VILA GALÉ - SOCIEDADE DE EMPREENDIMENTOS TURÍSTICOS, S.A.	Tourism, Restaurants and Leisure	33%
SUMOL+COMPAL - MARCAS, S.A.	Food, Drinks and Tobacco	10%
EFACEC ENERGIA - MÁQUINAS E EQUIPAMENTOS ELÉCTRICOS, S.A.	Technology, Media and Telecommunications	10%
SOMINCOR - SOCIEDADE MINEIRA DE NEVES-CORVO, S.A.	Basic Materials	25%
ECCO'LET (PORTUGAL) - FÁBRICA DE SAPATOS, LDA	Textiles, Clothing and Leather	0%
LUÍS SIMÕES - LOGÍSTICA INTEGRADA, S.A.	Transport and Logistics	43%
SIMOLDES - PLÁSTICOS, S.A.	Automobile	0%
RENAULT CACIA, S.A.	Automobile	38%
LUSÍADAS - PARCERIAS CASCAIS, S.A.	Health	17%
BA GLASS PORTUGAL, S.A.	Basic Materials	25%
BOSCH TERMOTECNOLOGIA, S.A.	Metallomechanics and Equipment	0%
NOS COMUNICAÇÕES, S.A.	Technology, Media and Telecommunications	29%
SOLVERDE - SOCIEDADE DE INVESTIMENTOS TURÍSTICOS DA COSTA VERDE, S.A.	Tourism, Restaurants and Leisure	14%
DELOITTE CONSULTORES, S.A.	Professional services	40%
BRISA O&M, S.A.	Transport and Logistics	0%
NEPHROCARE PORTUGAL, S.A.	Health	25%
C.M.E. - CONSTRUÇÃO E MANUTENÇÃO ELECTROMECÂNICA, S.A.	Construction and Real Estate	33%
MAKRO - CASH & CARRY PORTUGAL, S.A.	Food, Drinks and Tobacco	20%
HOVIONE FARMACIÊNCIA, S.A.	Health	29%
MODALFA - COMÉRCIO E SERVIÇOS, S.A. (SONAE GROUP)	Textiles, Clothing and Leather	33%
COLEP PORTUGAL, S.A.	Textiles, Clothing and Leather	0%
NAVEGAÇÃO AÉREA DE PORTUGAL - NAV PORTUGAL, E.P.E.	Transport and Logistics	33%
EDP - GESTÃO DA PRODUÇÃO DE ENERGIA, S.A.	Energy and Resources	29%
SONAE MC - SERVIÇOS PARTILHADOS, S.A.	Consumption and Associated Services	33%
LANKHORST EURONETE PORTUGAL, S.A.	Metallomechanics and Equipment	50%
AMORIM & IRMÃOS, S.A.	Basic Materials	33%
HOSPOR - HOSPITAIS PORTUGUESES, S.A.	Health	20%
CALZEDONIA PORTUGAL, LDA	Textiles, Clothing and Leather	0%

SUPER BOCK BEBIDAS, S.A.	Food, Drinks and Tobacco	9%
EUROPEAN SEAFOOD INVESTMENTS PORTUGAL, S.A. (THAI UNION GROUP)	Food, Drinks and Tobacco	0%
PEUGEOT CITRÖEN AUTOMÓVEIS PORTUGAL, S.A.	Automobile	0%
BERSHKA (PORTUGAL) - CONFECÇÕES, S.A. (INDITEX GROUP)	Textiles, Clothing and Leather	36%
RIA BLADES, S.A. (SIEMENS GAMESA GROUP)	Metallomechanics and Equipment	25%
EDA - ELECTRICIDADE DOS AÇORES, S.A.	Energy and Resources	22%
PREH PORTUGAL, LDA	Automobile	0%
MARTIFER - CONSTRUÇÕES METALOMECÂNICAS, S.A.	Metallomechanics and Equipment	25%
FAURÉCIA - SISTEMAS DE ESCAPE PORTUGAL, LDA	Automobile	40%
SONAE ARAUCO PORTUGAL, S.A.	Basic Materials	33%
ITALCO - MODA ITALIANA, S.A. (MASSIMO DUTTI)	Textiles, Clothing and Leather	36%
AMTROL-ALFA - METALOMECÂNICA, S.A.	Metallomechanics and Equipment	13%
COFINA MEDIA, S.A.	Technology, Media and Telecommunications	38%
PULL & BEAR (PORTUGAL) - CONFECÇÕES, S.A. (INDITEX GROUP)	Textiles, Clothing and Leather	36%
EEM - EMPRESA DE ELECTRICIDADE DA MADEIRA, S.A.	Energy and Resources	0%
GESTAMP AVEIRO - INDÚSTRIA DE ACESSÓRIOS DE AUTOMÓVEIS, S.A.	Automobile	21%
BOSCH SECURITY SYSTEMS - SISTEMAS DE SEGURANÇA, S.A.	Technology, Media and Telecommunications	33%
BORGWARNER EMISSIONS SYSTEMS PORTUGAL, UNIPESSOAL, LDA	Automobile	27%
PORTUGÁLIA - COMPANHIA PORTUGUESA DE TRANSPORTES AÉREOS, S.A.	Transport and Logistics	0%
ACCENTURE - CONSULTORES DE GESTÃO, S.A.	Professional services	36%
EPAL - EMPRESA PORTUGUESA DAS ÁGUAS LIVRES, S.A.	Energy and Resources	40%
SATA INTERNACIONAL - AZORES AIRLINES, S.A.	Transport and Logistics	43%
SAFEBAG - INDÚSTRIA COMPONENTES DE SEGURANÇA AUTOMÓVEL, S.A.	Automobile	14%
SCC - SOCIEDADE CENTRAL DE CERVEJAS E BEBIDAS, S.A.	Food, Drinks and Tobacco	29%
GROHE PORTUGAL - COMPONENTES SANITÁRIOS, LDA	Metallomechanics and Equipment	0%
THE NAVIGATOR COMPANY, S.A.	Basic Materials	0%
HIKMA FARMACÊUTICA (PORTUGAL), S.A.	Health	25%
CIN - CORPORAÇÃO INDUSTRIAL DO NORTE, S.A.	Basic Materials	29%

DHL EXPRESS PORTUGAL, LDA	Transport and Logistics	13%
SOGRAPE VINHOS, S.A.	Food, Drinks and Tobacco	20%
EDP - ENERGIAS DE PORTUGAL, S.A.	Energy and Resources	0%
FROMAGERIES BEL PORTUGAL, S.A.	Food, Drinks and Tobacco	33%
SANTOS BAROSA - VIDROS, S.A.	Basic Materials	27%
NAVIGATOR BRANDS, S.A.	Basic Materials	0%
GALP ENERGIA, S.A.	Energy and Resources	29%
SIC - SOCIEDADE INDEPENDENTE DE COMUNICAÇÃO, S.A.	Technology, Media and Telecommunications	29%
SAICA PACK PORTUGAL, S.A.	Basic Materials	25%
ÁGUAS DO NORTE, S.A.	Energy and Resources	43%
ALBERTO COUTO ALVES, S.A.	Construction and Real Estate	0%
CTT EXPRESSO - SERVIÇOS POSTAIS E LOGÍSTICA, S.A.	Transport and Logistics	0%
NOS TECHNOLOGY - CONCEPÇÃO, CONSTRUÇÃO E GESTÃO DE REDES DE COMUNICAÇÕES, S.A.	Technology, Media and Telecommunications	29%
MEDWAY - OPERADOR FERROVIÁRIO DE MERCADORIAS, S.A.	Transport and Logistics	0%
SCHAEFFLER PORTUGAL, UNIPESSOAL, LDA	Metallomechanics and Equipment	13%
REPSOL POLÍMEROS, S.A.	Basic Materials	33%
DOMINGOS DA SILVA TEIXEIRA, S.A.	Construction and Real Estate	0%
MSFT - SOFTWARE PARA MICROCOMPUTADORES, LDA	Technology, Media and Telecommunications	42%
EDP - SOLUÇÕES COMERCIAIS, S.A.	Energy and Resources	0%
KIRCHHOFF AUTOMOTIVE PORTUGAL, S.A.	Automobile	0%
TABAQUEIRA - EMPRESA INDUSTRIAL DE TABACOS, S.A.	Food, Drinks and Tobacco	30%
EFACEC - ENGENHARIA E SISTEMAS, S.A.	Technology, Media and Telecommunications	10%
ALVES BANDEIRA & CA., S.A.	Energy and Resources	0%
HANON SYSTEMS PORTUGAL, S.A.	Automobile	0%
ASCENZA AGRO, S.A.	Basic Materials	0%
T.V.I. - TELEVISÃO INDEPENDENTE, S.A.	Technology, Media and Telecommunications	33%
CEREALIS - PRODUTOS ALIMENTARES, S.A.	Food, Drinks and Tobacco	50%
AMORIM CORK COMPOSITES, S.A.	Basic Materials	33%

EXIDE TECHNOLOGIES, LDA	Technology, Media and Telecommunications	0%
COMPANHIA I.B.M. PORTUGUESA, S.A.	Technology, Media and Telecommunications	33%
CARCLASSE - COMÉRCIO DE AUTOMÓVEIS, S.A.	Automobile	33%
FERPINTA - INDÚSTRIAS DE TUBOS DE AÇO DE FERNANDO PINHO TEIXEIRA, S.A.	Metallomechanics and Equipment	0%
NOVARTIS FARMA - PRODUTOS FARMACÊUTICOS, S.A.	Health	33%
L'OREAL PORTUGAL, UNIPESSOAL, LDA	Consumo e Serviços Associados	50%
NAVARRA - EXTRUSÃO DE ALUMÍNIO, S.A.	Metallomechanics and Equipment	33%
HUF PORTUGUESA - FÁBRICA DE COMPONENTES PARA O AUTOMÓVEL, UNIPESSOAL, LDA	Automobile	0%
CONTINENTAL TEVES PORTUGAL - SISTEMAS DE TRAVAGEM, LDA	Automobile	11%
AMORIM FLORESTAL, S.A.	Basic Materials	33%
RENAULT RETAIL GROUP PORTUGAL, S.A.	Automobile	38%
BIAL - PORTELA & CA., S.A.	Health	13%
ALLIANCE HEALTHCARE, S.A.	Health	0%
TEKA PORTUGAL, S.A.	Metallomechanics and Equipment	22%
EUROATLANTIC AIRWAYS - TRANSPORTES AÉREOS, S.A.	Transport and Logistics	20%
AMORIM - REVESTIMENTOS, S.A.	Basic Materials	33%
NAVIGATOR PAPER SETÚBAL, S.A.	Basic Materials	0%
COCA-COLA EUROPEAN PARTNERS PORTUGAL, UNIPESSOAL, LDA	Food, Drinks and Tobacco	33%
ESSILOR PORTUGAL - SOCIEDADE INDUSTRIAL DE ÓPTICA, LDA	Health	44%
GESTAMP CERVEIRA, LDA	Automobile	21%
MITSUBISHI FUSO TRUCK EUROPE - SOCIEDADE EUROPEIA DE AUTOMÓVEIS, S.A.	Automobile	9%
BENTELER - INDÚSTRIA DE COMPONENTES PARA AUTOMÓVEIS, LDA	Automobile	33%
SOGENAVE - SOCIEDADE GERAL DE ABASTECIMENTOS À NAVEGAÇÃO E INDÚSTRIA HOTELEIRA, S.A.	Food, Drinks and Tobacco	20%
EUROPA&C - EMBALAGEM, S.A.	Basic Materials	30%
EDP COMERCIAL - COMERCIALIZAÇÃO DE ENERGIA, S.A.	Energy and Resources	0%
CASAIS - ENGENHARIA E CONSTRUÇÃO, S.A.	Construction and Real Estate	20%

EUROPCAR INTERNACIONAL - ALUGUER DE AUTOMÓVEIS, S.A.	Automobile	33%
ALTICE LABS, S.A.	Technology, Media and Telecommunications	0%
UNILEVER FIMA, LDA	Consumption and Associated Services	39%
SOCIEDADE COMERCIAL C.SANTOS, S.A.	Automobile	14%
SGL COMPOSITES, S.A.	Basic Materials	0%
LEASE PLAN PORTUGAL - COMÉRCIO E ALUGUER DE AUTOMÓVEIS E EQUIPAMENTOS, UNIPESSOAL, LDA	Automobile	0%
HOSPITAL CUF INFANTE SANTO, S.A.	Health	27%
MERCK SHARP & DOHME, LDA	Health	40%
CONSTRUÇÕES GABRIEL A.S.COUTO, S.A.	Construction and Real Estate	0%
OCP - PORTUGAL - PRODUTOS FARMACÊUTICOS, S.A.	Health	0%
WEST SEA - ESTALEIROS NAVAIS, UNIPESSOAL, LDA	Transport and Logistics	25%
HOSPITAL CUF DESCOBERTAS, S.A.	Health	27%
ADP FERTILIZANTES, S.A.	Basic Materials	0%
PLURAL - COOPERATIVA FARMACÊUTICA, C.R.L.	Health	60%
SECIL - COMPANHIA GERAL DE CAL E CIMENTO, S.A.	Basic Materials	0%
EUROPA&C KRAFT VIANA, S.A.	Basic Materials	30%
HI FLY - TRANSPORTES AÉREOS, S.A.	Transport and Logistics	22%
CELULOSE BEIRA INDUSTRIAL (CELBI), S.A.	Basic Materials	33%
MIDSID - SOCIEDADE PORTUGUESA DE DISTRIBUIÇÃO, S.A.	Food, Drinks and Tobacco	42%
MEAN		**25%**

9.4 Annex D – ANOVA-test assumptions results (Sample C)

9.4.1 Normality assumption

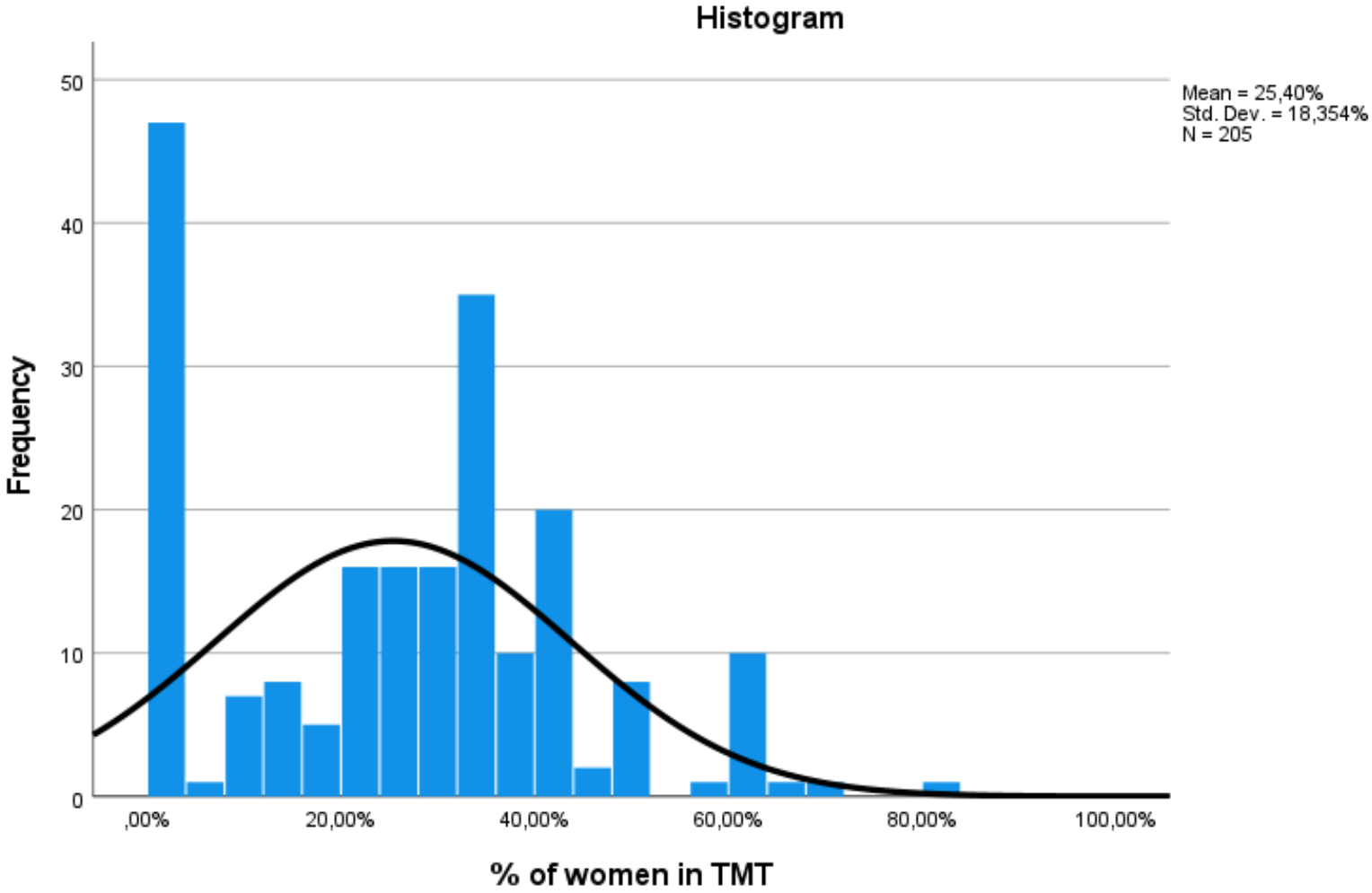
Table 9.4: Skewness and Kurtosis analysis – Sample C

Statistics

% of women in TMT

N	Valid	205
	Missing	16
Skewness		,180
Std. Error of Skewness		,170
Kurtosis		-,447
Std. Error of Kurtosis		,338

Figure 9.1: Histogram of Skewness and Kurtosis - Sample C



9.4.2 Homogeneity assumption

Table 9.5: Homogeneity variance – Sample C, Group 1

Test of Homogeneity of Variance – Group 1

		Levene Statistic	df1	df2	Sig.
% of women in TMT	Based on Mean	5,109	1	203	,025
	Based on Median	4,239	1	203	,041
	Based on Median and with adjusted df	4,239	1	180,407	,041
	Based on trimmed mean	5,216	1	203	,023

Table 9.6: Homogeneity variance – Sample C, Group 2

Test of Homogeneity of Variance – Group 2

		Levene Statistic	df1	df2	Sig.
% of women in TMT	Based on Mean	3,220	1	203	,074
	Based on Median	2,830	1	203	,094
	Based on Median and with adjusted df	2,830	1	188,878	,094
	Based on trimmed mean	3,422	1	203	,066

Table 9.7: Homogeneity variance – Sample C, Group 3

Test of Homogeneity of Variance – Group 3

		Levene Statistic	df1	df2	Sig.
% of women in TMT	Based on Mean	4,915	1	203	,028
	Based on Median	4,288	1	203	,040
	Based on Median and with adjusted df	4,288	1	180,643	,040
	Based on trimmed mean	4,955	1	203	,027