# THE IMPACT OF GENDER ON FINANCIAL PERFORMANCE: EVIDENCE FOR PORTUGUESE SMEs

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**Abstract:** The relationship between gender and profitability in the context of Small and Medium Enterprises (SMEs) is a less studied topic in the broader context of performance determinants. Thus, the objective of this paper is to examine whether women's leadership of the firms' board of directors and senior management teams enhances financial performance. Contributing to fill this research gap and based on the agency and stakeholder theories, it is used a balanced panel data of 4.806 Portuguese SMEs for the period from 2010 to 2019. The results from the random-effects model evidence the absence of a broad significant relationship, albeit with some slight evidence of a negative relation, moderated by firm age and present in some specific sectors of activity. Given the SMEs importance in the majority of countries, the results and implications of this paper can be generalized to other economies.

**Key-words**: Financial performance; Gender diversity; SMEs; Agency theory; Stakeholder theory

## 1. Introduction

In the last decades, Portugal witnessed an increasing participation of women in the labour market, but women presence in firms' leadership or top management teams increased slowly. According to D&B (2020), in 2020, women occupy 26,7% of leadership roles in Portuguese private firms and their presence in top management roles has increased in all sectors, but particularly in retail and general services. Women occupy one third of the firm's positions with decision power, mainly in the areas of human resources and marketing, albeit representing 49% of the labour force. Nevertheless, these numbers steadily increased in the last decade. Comparatively with other OECD countries, Portugal is slightly above the average in terms of the share of women managers and share of women seats on boards (OECD, 2020). Nevertheless, the high women participation rates in the labour force imply that the country still has a way to go.

The academic literature and the press both accompanied that evolution, increasingly discussing the greater participation and presence of women in top management positions. For instance, several countries implemented more or less mandatory quotas applied to quoted companies but the situation in the Small and Medium Enterprises (SMEs) is less researched. Apart from the benign characteristic of policies seeking to foster the advancement of women in business, it stands apart the question of the sign of the relationship between gender on boards or in top management teams and firm performance.

The specific case of women presence in senior management is part of the broader issue of board diversity and its impact in firm performance. Traditionally, most researchers in economics consider the board as a single entity, where the only heterogeneity considered is whether directors are independent from managers (Adams et al., 2010). As highlighted by Rose (2007), the composition of corporate boards is of

vital importance within corporate governance, where the aim is to promote the interests' alignment of managers and stakeholders. According to Van der Walt and Ingley (2003, p. 219), "the concept of diversity relates to board composition and the varied combination of attributes, characteristics and expertise contributed by individual board members in relation to board process and decision making". Diversity is valued and represents a strategic corporate issue (Campbell and Minguez-Vera, 2008). So, the question is if gender diversity is relevant, enhancing the board competencies and promoting firm financial performance. This question is less studied in the context of SMEs which form the majority of firms in any country.

The following section presents a literature review, ending with our main research question. Section three presents the variables, the data and the methodology to be used. Section four presents the empirical results and its discussion and the final section concludes the paper, presenting its limitations and future research avenues.

## 2. Literature review

The effects of the presence of women in corporate financial outcomes can be analyzed through the lens of two well-known theories: agency theory (Jensen and Meckling, 1976; Aguilera et al., 2008) and stakeholder theory (Donaldson and Preston, 1995; Carter et al., 2003).

On one hand, from an agency theory standpoint, where boards are considered to perform an important monitoring role, it is expected a neutral effect of women presence on firm performance. According to Tirole (2001), a good corporate governance structure should select the most capable managers to lead the firm in its particular context. If board membership choices or leadership positions in management selection are made according to gender rather than economic considerations, that could result in poor leadership with negative consequences in terms of firm performance. So, a priori, is impossible to tell whether promoting greater female participation will improve or impair financial performance.

On the other hand, firms are open systems interdependent with a broad set of stakeholders (e.g., shareholders, activists, politicians, consumers, etc.) that could exert pressure on firms to appoint women as directors or senior managers. Stakeholder theory (Donaldson and Preston, 1995) provides a useful framework to study the relationship between gender and performance. According to this theory, a diversified and heterogeneous board of directors or senior management team enhances creativity, judgement and the quality of decision-making. Thus, the role of the board or senior management is not restricted to maximising shareholder value but is also concerned with the other stakeholders' interests, promoting more sustainable global relationships. Institutional investors can compel firms to greater diversity (Gillan and Starks, 2000). Related to this, firms with higher shareholder concentration are under less pressure to promote board diversity (Kang et al., 2007). This resource dependence theory views firms as operating in an open system and needing to exchange and acquire certain resources in order to survive, creating a dependency between the firm and external units (Pfeffer and Salancik, 1978). According to these authors, organizations can accrue three specific benefits from board linkages with the surrounding community: i) advice and counsel, ii) legitimacy, and iii) channels for communicating information and for gaining preferential access to commitments or support from important elements outside the firm. Eventually, the higher diversity in the board of directors and senior management teams provides the firm the human, social and relational capital necessary to enhance firm performance (Hillman and Dalziel, 2003).

Considering that boards act as monitors and advisers of management, both agency and resource dependence perspectives should be taken in consideration when studying the possible relations between board diversity and firm performance (Adams and Ferreira, 2007).

The effect of board diversity on a firm's performance depends heavily on ownership configurations (Ben Amar et al., 2013). The relative strength of minority shareholders, family ownership and the presence of institutional shareholders exert all pressure for the appointment of women to the board (Nekhili and Gatfaoui, 2013). In Portugal, the civil law system, characterized to inadequately protect minority shareholders (La Porta et al., 1999; 2002), promotes high ownership concentration that together with a prevalence of family firms and institutional presence, could have conflicting effects on women presence in boards.

There are several arguments supporting a positive influence of a higher diversity in the board of directors or senior management teams in firm performance (Carter at al., 2003; Rose, 2007). Internally, a higher diversification enhances creativity and innovation by firm members, taking advantage of all the pool of skills, competencies and experiences available in the firm and giving lower management levels an incentive to put more effort in their work, since they observe opportunities to be promoted (Bilimoria, 2000; Fondas and Sassalos, 2000; Zelechowski and Bilimoria, 2004; Petersen and Philpot, 2007; Anderson et al., 2011; Gul et al., 2011; Ali et al., 2015; Opstrup and Villadsen, 2015; Perryman et al., 2016). Externally, a higher diversification sends a positive signal to the firm's stakeholders, such as suppliers, consumers and the entire community, improving the firms' image and reputation, linking it with important suppliers and attracting well qualified job applicants (e.g., Bilimoria, 2000; Singh and Vinnicombe, 2004; Kakabadse et al., 2015). Thus, gender diversity within boards or senior management teams increases firm's legitimacy in the view of the public, the media and the government, improving its access to resources. However, in a highly diversified context, emotional conflicts between directors or managers, decreased communication, entrenchment of opinions, individual or sub-groups' personal agendas and time-consuming process of decision-making could undermine firm performance (Adams and Ferreira, 2007; Hillman et al., 2007; Ali et al., 2015). These problems are even more important if the firm is operating in a highly competitive environment where the ability to react quickly to market shocks is an important issue. Nevertheless, in this paper we hypothesize that the benefits should outweigh the costs.

The presence of women on a board of directors or leading a firm is often seen as a good business decision because women directors are hypothesized to increase firm value through their performance (Simpson et al., 2010). If it is evidenced that women leaders provide an additional source of economic benefit to firms, comparatively to men of equal qualifications, firms should be willing to hire and promote women. This economic incentive would reinforce ethical and social pressure to give equal opportunities to women. However, there is no *a priori* theoretical link leading to a direct relation between gender and firm performance, with contributions to that link coming from different fields (e.g., organizational behaviour or social psychology). For instance, Daily and Dalton (2003) argue that women directors may have non-traditional backgrounds and provide unique perspectives, experiences and work styles as compared to their male counterparts. Other authors argue that women change the group dynamics of communication, interpersonal interaction, and decision-making in a positive way, leading to more creative and innovative decisions, with positive impacts on performance (McInerney-Lacombe et al., 2008).

Although conceptual arguments support a positive link between female leadership and performance, there are also reasons to expect either no relationship or even a negative relationship. As argued by Simpson et al. (2010, p. 10), "(…) the effect of board gender diversity on financial performance is contingent on the circumstances that exist for a particular company at a specific time". An important caveat pointed by Simpson et al. (2010), is that variables such as board characteristics, shareholding structure and performance are largely endogenous, thus creating estimation and interpretation problems (Adams et al., 2010). Also, Ferreira (2015, p. 108) is sceptical, arguing that "it is very hard to disentangle diversity effects from the effects of other individual and group characteristics that correlate with measures of diversity". Additionally, as argued

by Nekhili and Gatfaoui (2013), the presence of women may lead to stronger conflicts within the board if they are appointed following mandatory quotas or constrained by societal pressures rather than on the basis of their merit, skills and experience (Campbell and Minguez-Vera, 2008; Adams and Ferreira, 2009; Ahern and Dittmar, 2012).

Several papers have sought to analyze the relationship between firm performance and gender diversity in the boardroom. However, the results from these studies are mixed, with most earlier papers focused on US data and large and listed firms.

In the context of US firms, Shrader et al. (1997) found a negative relation between the share of women on boards and several financial indicators. On the contrary, several authors (e.g., Farrell and Hersch, 2005; Kochan et al., 2003) found no evidence of a significant link, whereas Adler (2001), Fenwick and Neal (2001), Carter et al. (2003), Erhardt et al. (2003), Welbourne et al. (2007), Simpson et al. (2010), Groysberg and Bell (2013) and Opstrup and Villadsen (2015), among others, evidenced a positive relationship between women presence in boards and firm performance. In a review of the literature, Post and Byron (2015) evidenced that although the relationship between female board representation and market performance is near zero the relationship is positive in countries with greater gender parity (and negative in countries with low gender parity).

In the European context the evidence is also mixed. Campbell and Minguez-Vera (2008) found a positive effect of gender diversity on firm value for quoted Spanish firms, but Du Rietz and Henrekson (2000), Smith et al. (2006) and Randøy et al. (2006) evidenced the absence of a significant relationship for, respectively, Sweden, Denmark and a sample of Scandinavian countries. Rose (2007) also found no significant relations on a sample of Danish quoted firms. Parrotta and Smith (2013), also employing Danish data, evidenced a negative association between female CEO and firm's risk attitudes, which is consistent with the theoretical assumption according to which women typically are more risk averse than men and put more efforts in monitoring firm activities. Arun et al. (2015) concluded that in the UK women presence in boards is associated to lower earnings, suggesting that women have a more conservative financial management. Lückerath-Rovers (2013) analysed the financial performance of 99 Dutch quoted firms with and without women in their boards of directors. Applying the Catalyst and McKinsey methods she concluded that women presence in the board enhances performance. Using a sample of non-financial Spanish SMEs for 2003-2008, Martín-Ugedo and Minguez-Vera (2014), found that the probability of women on the board increases with firm performance and family ownership, but decreases with corporate ownership and firm risk. The authors also found a positive effect of the presence of women board members on firm performance, thus confirming that the presence of women is positive for economic reasons. Boubaker et al. (2014) in a study for French firms in the period 2009-2011 evidenced a negative effect between women's percentage in boards and firm performance. These authors suggested that the negative effect could be explained by the women's higher risk aversion. On the contrary and more recently Nekhili et al. (2018), with a sample of French firms argued that women CEOs perform better in non-family firms.

Earlier evidence suggests that women are typically confronted by an invisible barrier preventing their rise into leadership ranks, the *glass ceiling effect* (Morrison, et al., 1987). Nevertheless, the last couple of decades witnessed remarkable examples of women breaking through that glass ceiling, with an increased female participation in senior management positions. The *glass cliff effect* coined by Ryan and Haslam (2005) means that women are likely to be placed in positions of leadership in problematic circumstances of general financial downturn and downturn in firm performance. So, this organizational context makes it harder for women to perform and be perceived to perform effectively, which could be a possible explanation for the negative link between gender diversity at the board and firm performance (Bruckmüller et al., 2014).

Nevertheless, several empirical studies do not support that hypothesis (Farrell and Hersch, 2005; Ryan and Haslam, 2006; Adams et al., 2009; Pacheco et al., 2020).
In sum, according to Adams and Ferreira (2009) and Adams et al. (2010), the impact of board diversity on performance is likely to be heterogeneous, with some firms benefiting from more diversity while others do not. Although the different studies indicate mixed results, in part due to different estimation methods, countries, types of firms and periods studied, this should not diminish the validity of the majority view that gender diversity in the boardroom is beneficial to shareholder or firm value.
Considering the literature review made above, we can now present our main research question: *Do SMEs where the president of the board of directors or the leader of the management team is a woman present higher levels of financial performance?*
Additionally, using a set of control variables it is also tested the potentially moderating role of some firm characteristics in influencing the gender-performance relationship and possible differences between industrial sectors.

## 3. Variables, data and methodology

### 3.1. Variables

Regarding performance, previous papers used a broad range of performance measures, from firm value (e.g., Tobin's *q*: Carter et al., 2003; Adams and Ferreira, 2009; Nekhili et al., 2018), to accounting measures (e.g., ROA or ROI: Erhardt et al., 2003; Martín-Ugedo and Minguez-Vera, 2014) as well as internationalization measures (Pergelova et al., 2018; Idris and Saridakis, 2020). Due to data availability, this paper uses the ratio EBIT to total assets (REBIT), easily available from financial statements and generally considered as a key performance indicator. Alternative measures such as ROA or the ratio between EBITDA and total assets (REBITDA) will also be tested.
Prior studies measured the variable gender in different ways: a dummy variable, indicating the presence of at least one woman on the board or that the board is led by a woman; women's proportion on the board; or index measures of gender diversity (e.g., Blau or Shannon indexes). Albeit diversity indexes are more suitable measurements of diversity than a dummy variable indicating the presence or women's proportion on the board, given the availability of data, the present paper uses a dummy variable. So, when the firm is led by a woman the dummy variable (WL) assumes the value of 1. Additionally, for the cases where also exists a board of directors, it will be used another dummy variable considering the gender of the firm's president of the board (WP).
Focusing on the links between gender diversity and financial performance, we need to consider potential disturbing factors, which could affect the quality or strength of such relation. Such factors are usually introduced as control variables, which may affect performance: these variables are firm leverage, size, age and export orientation. It is explored the potential moderating role of those firm characteristics in influencing the gender-performance relationship, because specific characteristics could affect the "gender bias" (Arzubiaga et al., 2018).
Leverage (LEV), computed as the ratio between total liabilities and total assets, is expected to have a negative impact in financial performance (Pacheco, 2020). It is also tested if indebtedness moderates the relation between gender and financial performance. Firm size (SIZ), computed as the log of total assets, is also included as a control variable and it is expected a negative sign. Size is also tested as a moderating variable. Larger and more visible organizations are likely to be under the most scrutiny, feeling more pressured to conform to societal expectations and thus increase female representation in their senior management (Hillman et al., 2007; Terjesen and Singh, 2008). So, it is tested if firm size positively moderates the relationship between gender and financial performance. Firm age (AGE) and export orientation (EXP) are included to counter potential moderating effects (e.g., inertia). The impact of age on profitability tends to be an empirical question (Coad et al., 2013; Capasso et al., 2015), but we expect that age has a negative influence and moderates the gender-performance

relationship. Empirical studies with SMEs evidence a general positive relationship between exports and profitability, albeit with the possibility of a "liability of foreignness" at earlier stages of the internationalisation process (e.g., Hsu et al., 2013).
Finally, variables measuring the number of shareholders (NS) and the number of managers/directors (NM) will also be tested, being expected negative relations with financial performance due to lower agency costs (Andres, 2008).
Because our data spans the period 2010-2019, we also include dummy variables to control for year fixed effects. Additionally, the nature of an industry is also likely to affect the relationship between gender and financial performance. There is a higher proportion of women managers in service sectors (e.g., retailing and banking) than in more industrial sectors (e.g., manufacturing or information technology) and even within the manufacturing sector there could exist significant differences between industries (Brammer et al., 2007; Hillman et al., 2007; Ferreira, 2010). Firms operating in certain industries face different kinds of pressure from stakeholders. For instance, industries with a large female employment base (e.g., textile and wearing) should benefit from a large pool of resources, with positive impacts on performance. Thus, the firm's industrial sector can moderate the relationship between gender and financial performance.

### 3.2. Data

After the identification of the hypothesis to be tested as well as the dependent and independent variables, it is necessary to describe the data collection process for the sample characterization over which our empirical study will be made. Our objective is to analyse a sample of Portuguese industrial SMEs pertaining to 22 industrial sectors, obtained from SABI, a financial database powered by Bureau van Dijk. In preparing the data, firstly, firms with less than 10 employees were excluded. Secondly, in order to obtain a robust sample, only firms with complete data and positive debt ratios or assets greater than liabilities were included. Thirdly, in order to eliminate outliers, observations below (and above) the 1$^{st}$ (and 99$^{th}$) percentile were winsorized. After applying all the above criteria, the data used in this study consists of a balanced panel data of 4.806 firms, observed in the 10-year period between 2010 and 2019.
Table 1 presents a detailed description of our sample. The sample accounts for a turnover over 18,5 billion Euros and total assets over 22 billion Euros in 2019. The sample presents 585 medium firms (12,2%) and all relevant sectors are represented. Table 1 allows to ascertain that there are relevant differences between sectors for some of the considered variables. As can be observed in Table 1, around 35% of firms are led by a woman, with relevant differences between sectors. For instance, there is a higher percentage of firms led by a woman in those sectors characterized by larger firms (e.g., sectors 17, 21 and 30). Table 1 presents values for 2019, but dividing our sample in two sub-periods (2010-2014 vs. 2015-2019), respectively associated with a period of negative economic growth versus a period with positive growth, we clearly see that in the second period firms present higher profitability (6,1% vs. 5,4%), lower debt (53,1% vs. 53,8%) and export more (34,2% vs. 29,8%).

Table 1 – **Distribution of the sample by industry classifications**

| Industry Classification (CAE) | Nr. of Firms | Profitab. (%) | Total Debt (%) | Average sales (th€) | Average age | Export to Sales ratio (%) | % of firms led by a woman |
|---|---|---|---|---|---|---|---|
| Beverages and tobacco (11/12) | 134 | 3,7% | 50,1% | 4.812 | 36 | 28,3% | 40,3% |
| Textiles (13) | 311 | 3,8% | 51,5% | 4.706 | 32 | 32,4% | 40,8% |
| Wearing apparel (14) | 456 | 4,1% | 53,9% | 3.940 | 29 | 62,4% | 44,3% |
| Leather and related products (15) | 353 | 3,4% | 52,4% | 3.766 | 30 | 52,6% | 31,4% |
| Wood and of products of wood and cork (16) | 310 | 5,3% | 43,6% | 3.023 | 28 | 22,6% | 24,1% |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Paper and paper products (17) | 104 | 4,5% | 54,9% | 7.016 | 32 | 15,7% | 49,0% |
| Printing and reproduction of recorded media (18) | 195 | 3,2% | 54,4% | 1.976 | 33 | 4,3% | 29,7% |
| Refined petroleum, chemicals and man-made fibers (19/20) | 135 | 6,9% | 48,2% | 6.828 | 35 | 18,0% | 47,0% |
| Pharmaceutical products (21) | 22 | 2,6% | 58,7% | 14.114 | 42 | 21,5% | 68,2% |
| Rubber and plastic products (22) | 307 | 6,1% | 50,2% | 5.397 | 30 | 22,8% | 37,5% |
| Other non-metallic mineral products (23) | 441 | 6,1% | 48,6% | 3.217 | 32 | 31,5% | 37,2% |
| Basic metals (24) | 55 | 7,1% | 49,4% | 7.092 | 33 | 31,0% | 38,2% |
| Fabricated metal products (25) | 978 | 5,8% | 51,8% | 2.973 | 29 | 27,6% | 30,3% |
| Computer, communication and electronic equip. (26) | 28 | 8,5% | 40,7% | 5.264 | 24 | 38,7% | 39,3% |
| Electrical equipment (27) | 110 | 6,6% | 45,5% | 4.030 | 32 | 28,4% | 39,1% |
| Machinery and equipment (28) | 271 | 7,1% | 47,6% | 4.160 | 32 | 34,2% | 36,9% |
| Motor vehicles, trailers and parts (29) | 87 | 5,6% | 49,4% | 5.028 | 30 | 37,8% | 32,2% |
| Other transport equipment (30) | 25 | 5,6% | 48,9% | 8.358 | 37 | 47,3% | 56,0% |
| Furniture (31) | 353 | 5,0% | 55,5% | 2.290 | 27 | 29,8% | 27,2% |
| Other manufacturing activities (32) | 131 | 5,5% | 48,0% | 2.579 | 29 | 23,2% | 38,9% |
| **All industries** | **4.806** | **5,3%** | **51,2%** | **3.855** | **31** | **32,3%** | **35,5%** |

Notes: Values for 2019. Sectors 11/12 and 19/20 are aggregated since the sample only comprises a very small number of firms in sectors 12 and 19. Profitability = EBIT/Total assets; Total debt = Total liabilities/Total assets.

### 3.3. Methodology

In order to attain our research objective, we apply a panel data methodology, which presents several advantages, namely better effects' detection and measurement, minimization in sample bias and control of individual heterogeneity (Gujarati and Porter, 2010). Panel data can be estimated trough three different regression models: Pooled Ordinary Least Squares (POLS), Fixed Effects Model (FEM) and Random Effects Model (REM). Applying the Breusch-Pagan and Hausman tests to choose the most appropriate regression technique, the Breusch-Pagan test leads to the rejection of the null hypothesis (LM = 20368,7; p-value = 0), indicating that REM is more appropriate than POLS and the Hausman test leads to the acceptance of the null hypothesis that REM is preferable to FEM (H = 1070,22, p-value = 0). The REM is estimated with robust standard errors (Arellano, 2003), which correct for residual heteroscedasticty issues and with year-dummies.

According to Baltagi (2005) and King and Santor (2008), a REM specification is more convenient than FEM when the number of cross-section units (4.806 firms) is greater than the length of time period (10 years), the sample does not cover the whole population, and a time-invariant variable like women leadership is used. All these conditions are valid here.

Notice that, endogeneity issues could arise in random effects estimates. Considering that we do not possess valid instruments in the data set to deal with the potential endogeneity of our variables of interest, we prefer to apply a random effects approach since it is well known that the choice of less valid instruments can lead to any kind of results (Ferreira, 2010). The random effects results do not establish the direction of causality. However, in the present paper we cope with potential endogeneity issues performing alternative regressions in order to evidence the robustness of our results.

## 4. Results

### 4.1. Descriptive statistics

Before estimating the different models, we present in Table 2 some descriptive statistics and the correlation matrix of the variables. The sample's mean values for the different variables, differentiating between the two kinds of firms are presented, together with the results of a test for differences in mean values between the two sub-

samples. This test evidences significant differences between woman led and non-woman led firms, with the latter being smaller, younger, less export-oriented and displaying higher levels of indebtedness.

Table 2 – **Descriptive statistics and correlation matrix**

| | Woman led firms | Non-woman led firms | Mean differ. (t-test) | WL | WP | LEV | SIZ | AGE | EXP | NS | NM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| REBIT | 5,6% | 5,7% | 0,55 | -0,013 (***) | 0,015 | -0,279 (***) | 0,053 (***) | -0,130 (***) | 0,063 (***) | -0,098 (***) | -0,023 (***) |
| WL | … | … | … | 1 | -0,045 | -0,024 (***) | 0,209 (***) | 0,101 (***) | 0,058 (***) | 0,016 (***) | 0,275 (***) |
| WP | 10,4% | 13,7% | -1,30 (***) | | 1 | -0,078 (***) | -0,017 (***) | 0,055 (***) | 0,021 (**) | -0,034 (***) | -0,056 (***) |
| LEV | 50,5% | 51,5% | 1,53 (*) | | | 1 | -0,096 (***) | -0,221 (***) | 0,030 (***) | 0,044 (***) | -0,125 (***) |
| SIZ | 8,1 | 7,6 | -13,64 (***) | | | | 1 | 0,325 (***) | 0,055 (***) | 0,206 (***) | 0,333 (***) |
| AGE | 3,4 | 3,3 | -7,65 (***) | | | | | 1 | 0,285 (***) | 0,077 (***) | 0,557 (****) |
| EXP | 35,2% | 30,7% | -4,19 (***) | | | | | | 1 | 0,013 (***) | 0,162 (***) |
| NS | 2,6 | 2,6 | -1,13 | | | | | | | 1 | 0,276 (***) |
| NM | 4,9 | 3,4 | -18,19 (***) | | | | | | | | 1 |

Notes: First three columns computed with 2019 values. REBIT = EBIT/Total assets; WL = dummy variable assuming the value of 1 if the firm is led by a woman; WP = dummy variable assuming the value of 1 if the firm's president (if existent) is a woman; LEV = Total liabilities/Total assets; AGE = log of firm's age; SIZ = log of Total assets; EXP = Exports/Total sales; NS = Number of registered shareholders; NM = Number of directors. * p < 0,10; ** p < 0,05; *** p < 0,01.

Table 2 also presents the coefficients of correlation of the variables used in the model. Problems of correlations between variables that could affect the validity of the econometric results due to multicollinearity are negligible since only in one case it is above 50%. Since the variable NM is going to be used only occasionally, the problem of collinearity between explanatory variables will not be particularly relevant.

### 4.2. Econometric results

Table 3 presents the results for the REM with year-dummies, where it is analyzed the influence of gender, plus the set of control variables, on firm performance.

Table 3 – **Random Effects Model results**

| | I | II | III | IV | V | VI | VII | VIII |
|---|---|---|---|---|---|---|---|---|
| C | 0,135 (***) | 0,135 (***) | 0,124 (***) | 0,140 (***) | 0,060 (***) | 0,059 (***) | 0,020 (***) | 0,066 (***) |
| WL | | -0,003 (*) | | | -0,002 | | -0,001 | -0,004 (**) |
| WP | | | | | | -0,001 | | |
| LEV | -0,134 (***) | -0,134 (***) | -0,131 (***) | -0,136 (***) | -0,128 (***) | -0,128 (***) | -0,110 (***) | -0,127 (***) |
| SIZ | 0,014 (***) | 0,014 (***) | 0,013 (***) | 0,015 (***) | 0,018 (***) | 0,018 (***) | 0,013 (***) | 0,016 (***) |
| AGE | -0,030 (***) | -0,030 (***) | -0,027 (***) | -0,032 (***) | -0,020 (***) | -0,020 (***) | -0,022 (***) | -0,031 (***) |
| EXP | 0,010 (***) | 0,010 (***) | 0,010 (***) | 0,009 (***) | 0,005 | 0,005 | 0,008 (***) | 0,007 (***) |
| NS | -0,000 | -0,000 | -0,000 | -0,000 | -0,000 | -0,000 | 0,001 (**) | -0,002 (***) |
| NM | -0,003 (***) | -0,003 (***) | -0,003 (***) | -0,004 (***) | -0,002 (***) | -0,002 (***) | -0,003 (***) | -0,004 (***) |
| *Overall* $R^2$ | 13,7% | 13,7% | 13,1% | 14,1% | 14,1% | 14,1% | 15,6% | 14,0% |

Notes: Dependent variable: REBIT (except models VII and VIII, where it is, respectively, ROA and REBITDA). Standard-deviations presented in brackets. * p<0,10; ** p<0,05; *** p<0,01.

Models I and II use the complete sample; Models III and IV consider, respectively, the sub-samples with woman-led (n = 1.705) and non-woman led firms (n = 3.101); Models V and VI consider only the sub-sample of firms with a board of directors (n = 933) and Models VII and VII use as dependent variables, respectively, ROA and REBITDA.
The results evidence the absence of a relation between gender and profitability, with all control variables presenting significant results and the expected signs (with the exception of the variable NS). Models II and VIII even evidence a slightly significant negative relation between gender and profitability, thus giving a negative answer to our main research question. Nevertheless, in sum, it seems that gender has a neutral effect on financial performance, a result consistent with several previous papers (e.g., Randøy et al., 2006; Rose, 2007, among others). Given the intermediate position occupied by Portugal in terms of gender parity and its high women participation rate in the labour force, our results partially conform with the argument by Post and Byron (2015). According to these authors, the relationship between female board representation and performance is negative in countries with lower gender parity.
Regarding the control variables, leverage, size and age evidence always a significant impact in profitability, displaying the expected signs. Larger, younger and less leveraged firms tend to present higher levels of financial profitability, confirming previous results found in the literature (e.g,, López-Garcia and Aybar-Arias, 2000; Pacheco et al., 2020).
A final word for the significant negative impact of the number of managers/directors, evidencing the potential negative effects on performance of lower coordination and alignment of interests associated with larger management teams.

### 4.3. Results for different firms' size, age, economic period and possible moderating effects

In this section we discuss how sensitive our results are to some robustness checks. Firm size and age are usually confirmed as important determinants of financial performance. In order to study age differences, the original sample is divided in young vs. old firms, respectively, firms incorporated after 2000 or before that. Regarding size, larger firms, here associated with the "medium firm" criteria, are firms with total assets above 10M€ in 2019. Additionally, since the period under analysis is characterised by strong differences in terms of economic growth, we divide our sample in two distinct periods. The "recession years" span the period 2010-2014, with Portugal evidencing an average negative rate of growth in the period, whereas the "growth years" (2015-2019) are broadly characterised by a robust recovery of the economy. The estimation results are presented in the left-hand panel of Table 4. As can be seen, the negative impact of leverage on profitability is stronger in younger and larger firms, whereas the fact of the firm being led by a woman continues to be rather irrelevant. Distinguishing between time periods also evidences that the macroeconomic context surrounding firms is not relevant for the gender-performance relationship. It was also tested a dummy variable assuming the value of 1 for the period 2010-2014, being obtained a significant coefficient (results not presented).
The right-hand panel in Table 4 presents the results for the interaction variables in order to test whether the effects of debt, size, age or internationalization are additive or not to the gender-performance relationship. Apart from age, moderating effects seem to be absent. Regarding firm age, the variable WL is significantly negative but the interaction variable is significantly positive, evidencing that the age of the firm has an incremental role on the negative relationship between female leadership and profitability.

Table 4 **– Random Effects Model results: sub-samples of firms and moderating effects**

| | Young firms | Old firms | Medium firms | Small firms | Recession years | Growth years | Moderating effects | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| C | 0,167 (***) | 0,129 (***) | 0,155 (***) | 0,133 (***) | 0,156 (***) | 0,180 (***) | 0,136 (***) | 0,136 (***) | 0,141 (***) | 0,135 (***) |
| WL | -0,005 | -0,002 | 0,001 | -0,003 (*) | -0,002 | -0,001 | -0,005 | -0,004 | -0,019 (**) | -0,003 (*) |
| LEV | -0,170 (***) | -0,124 (***) | -0,154 (***) | -0,131 (***) | -0,130 (***) | -0,145 (***) | -0,136 (***) | -0,134 (***) | -0,134 (***) | -0,134 (***) |
| SIZ | 0,009 (***) | 0,016 (***) | 0,010 (***) | 0,015 (***) | 0,009 (***) | 0,011 (***) | 0,014 (***) | 0,014 (***) | 0,014 (***) | 0,014 (***) |
| AGE | -0,022 (***) | -0,034 (***) | -0,021 (***) | -0,032 (***) | -0,032 (***) | -0,038 (***) | -0,030 (***) | -0,030 (***) | -0,032 (***) | -0,030 (***) |
| EXP | 0,006 (*) | 0,010 (***) | 0,011 (**) | 0,009 (***) | 0,009 (***) | 0,011 (***) | 0,010 (***) | 0,010 (***) | 0,010 (***) | 0,009 (***) |
| NM | -0,004 (***) | -0,003 (***) | -0,003 (***) | -0,003 (***) | -0,002 (***) | -0,002 (***) | -0,003 (***) | -0,003 (***) | -0,003 (***) | -0,003 (***) |
| LEV x WL | | | | | | | 0,006 | | | |
| SIZ x WL | | | | | | | | 0,000 | | |
| AGE x WL | | | | | | | | | 0,005 (***) | |
| EXP x WL | | | | | | | | | | 0,002 |
| *Overall $R^2$* | 17,1% | 12,5% | 18,6% | 12,9% | 12,3% | 14,6% | 13,7% | 13,7% | 13,7% | 13,7% |

Notes: Dependent variable: REBIT. Young firms are firms incorporated after 2000 (n = 1.282); Old firms (n = 3.524); Medium firms are firms with total assets higher than 10M€ in 2019 (n = 585); Small firms (n = 4.221); "Recession years" are 2010-2014 and "Growth years" are 2015-2019. Standard-deviations presented in brackets. * p<0,10; ** p<0,05; *** p<0,01.

### 4.4. Results for the different sectors of activity

Some prior studies show industry to be a significant determinant of performance, so that we repeat the analysis distinguishing between sectors of activity. Table 5 presents the results estimated trough a Random Effects Model (REM) with year dummies.

As evidenced by Table 5, the coefficient of the variable WL is mostly negative but rarely significant (exceptions are sectors 13, 27 and 28). These three sectors are characterized by above-average percentages of woman-led firms and slightly older firms. Nevertheless, these results evidence the neutrality among sectors of the gender-performance relationship.

Table 5 – **Regression (Random Effects Model) for the different manufacturing sectors**

| | CAE 11/12 | 13 | 14 | 15 | 16 | 17 | 18 | 19/20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| **C** | 0,086 (***) | 0,162 (***) | 0,089 (***) | 0,117 (***) | 0,134 (***) | 0,133 (***) | 0,194 (***) | 0,085 (**) | 0,032 | 0,173 (***) |
| **WL** | -0,007 | -0,016 (***) | 0,000 | -0,004 | -0,006 | -0,002 | -0,009 | 0,009 | 0,000 | -0,008 |
| **LEV** | -0,072 (***) | -0,133 (***) | -0,164 (***) | -0,179 (***) | -0,118 (***) | -0,124 (***) | -0,091 (***) | -0,117 (***) | -0,089 (***) | -0,136 (***) |
| **SIZ** | 0,009 (**) | 0,007 (***) | 0,024 (***) | 0,018 (***) | 0,012 (***) | 0,011 (***) | 0,006 (**) | 0,013 (***) | 0,013 (***) | 0,009 (***) |
| **AGE** | -0,022 (***) | -0,030 (***) | -0,045 (***) | -0,035 (***) | -0,027 (***) | -0,026 (***) | -0,037 (***) | -0,019 (**) | -0,019 (**) | -0,027 (***) |
| **EXP** | -0,002 | 0,012 | 0,006 | 0,004 | 0,008 | -0,004 | 0,032 (**) | 0,051 (***) | 0,007 | 0,004 |
| *Overall $R^2$* | 14,2% | 13,3% | 15,2% | 18,3% | 13,1% | 17,2% | 18,0% | 13,9% | 13,8% | 18,6% |

| | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|
| **C** | 0,147 (***) | 0,186 (***) | 0,172 (***) | 0,134 (**) | 0,106 (***) | 0,155 (***) | 0,128 (***) | 0,177 (*) | 0,162 (***) | 0,251 (***) |
| **WL** | -0,002 | -0,014 | -0,003 | 0,022 | -0,026 (***) | -0,018 (***) | -0,016 | 0,030 | -0,003 | -0,000 |
| **LEV** | -0,094 (***) | -0,091 (***) | -0,134 (***) | -0,126 (***) | -0,131 (***) | -0,132 (***) | -0,142 (***) | -0,216 (**) | -0,135 (***) | -0,147 (***) |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **SIZ** | 0,009 (***) | 0,010 | 0,010 (***) | 0,010 | 0,019 (***) | 0,015 (***) | 0,010 (*) | 0,019 | 0,008 (***) | 0,005 |
| **AGE** | -0,028 (***) | -0,039 (***) | -0,035 (***) | -0,022 | -0,030 (***) | -0,037 (***) | -0,018 | -0,053 (***) | -0,032 (***) | -0,051 (***) |
| **EXP** | 0,016 (***) | 0,037 | -0,001 | -0,013 | -0,010 | 0,015 (*) | 0,007 | -0,037 | 0,012 (**) | -0,003 |
| *Overall* $R^2$ | 15,5% | 14,7% | 15,3% | 12,4% | 12,5% | 16,3% | 17,5% | 12,8% | 17,7% | 17,8% |

Notes: Standard-deviations presented in brackets. * p<0,10; ** p<0,05; *** p<0,01.

## 5. Conclusion

The present paper studied the link between women leadership and firm financial performance, departing from the assumption that gender is a significant variable for the success of the firm. Nevertheless, it is evidenced that women leadership does not influence Portuguese SMEs' performance, thus not accepting our main hypothesis. Possibly, some of the different results found in this paper can be explained by the fact that a large number of previous papers focused on large and listed firms and used different proxies for performance and gender. So, our results do not tend to justify current policies implemented in some countries, although directed to large and quoted firms, trying to promote the advancement of women in business. Additionally, these results give support to the agency theory perspective, that considers a neutral effect of gender on performance. Probably due to SMEs' lower visibility and sensitivity to community pressure, the stakeholder theory does not seem to be present here.

Our results should be considered with caution. The main reasons why gender does not seem to influence firm performance are certainly related to SMEs' particularities and the quantitative nature of the present study. An implication from our findings is therefore that more research is needed in order to further exploit that relationship. Case studies could reveal more insights into the nature of the decision process in small and medium firms' corporate boards. Quantitative studies may fail in capturing board members interpersonal relations, as well the complex nature of the decision process. As argued by Ferreira (2015), when discussing policies that promote women in business, it is better to focus on potential benefits to society that go far beyond narrow measures of firm profitability. Women presence could be irrelevant for profitability, since it does not provide significant economic benefits, albeit continues to be an ethical imperative.

Regarding future developments, and besides the development of case studies about the effects of gender related variables on firm profitability and other performance related variables, an interesting research could be to cross firm level data with the legislation on gender equality, in order to observe the magnitude of the response given by firms. Additionally, given the high percentage of SMEs that are family firms, it would be interesting to study the interaction of family related variables with the gender-performance relationship.

This paper represents one more step towards a deeper understanding of how women in top managerial positions effectively can affect firm performance. If future studies confirm the link between CEO gender and SMEs' profitability that could have relevant consequences in terms of policy recommendations for those firms, providing further support for governmental policies or recommendations aimed at favouring gender equality among firms' top management teams.


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