

Women CEOs and firm performance in the construction industry: evidence from Spain

Women CEOs
in the
construction
industry

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Abstract

Purpose – The construction industry has traditionally been a male-dominated economic sector. Barely 10% of managers are women. On the other hand, this sector is considered an engine of the economy. For these reasons, it is important to examine the influence of women CEOs on financial variables of firms in the construction industry.

Design/methodology/approach – The empirical study is carried out using a sample from the Iberian Balance Sheet Analysis System record (“Sistema de Análisis de Balances Ibérico”, SABI). The sample includes 8,492 Spanish companies from the construction sector. The methodology employed is a three-stage least squares (3SLS) analysis. This methodology controls for the endogeneity of explanatory variables. It is employed in accordance with the peculiar characteristics of the sample, which includes data for only one year.

Findings – The results show that firms with a woman CEO have a lower level of debt, whatever the terms of the maturity of the debt are. In contrast to most previous evidence, firms managed by women are found to be less profitable.

Originality/value – The paper gives evidence of the influence of the CEO’s gender on the performance (return and risk) of a firm. It provides original empirical evidence for the male-dominated construction sector. An extensive search identified no literature in which the researchers had focused on the construction industry.

Keywords Construction industry, Women CEO, Debt, Returns

Paper type Research paper

1. Introduction

There is political and academic interest in the role of women in society, supported by a high awareness of issues of equality and diversity. As women have continued to enter sectors traditionally dominated by men, attention has focused on the low representation of women in senior management positions. In Spain, the proportion of women managers in 2019 was 30% (Grant Thornton, 2019).

On September 25, 2015, 193 countries, including Spain, signed the 2030 Agenda for the Fulfillment of the 17 [Agenda 2030 for Sustainable Development Goals \(SDGs\)](#) of the United Nations. This agenda seeks equality between people, to protect the planet and to ensure prosperity. The fifth SDG is the commitment to achieve gender equality and the empowerment of all women.

Equality is recognized in the 1978 Spanish Constitution and other legislation such as the 2007 Equality Law ([Ley de Igualdad \[Gender Equality Act\], 2007](#)). This law focuses attention on the balance between women and men on boards of directors and in positions of responsibility. The Equality Law aims to ensure the full and effective participation of women and equal opportunities for leadership at all levels in political, economic and public life. Despite significant progress in recent years, inequality between women and men persists in all areas of life.

Some data that confirm that inequality exists are the following: 58.95% of unemployed workers in Spain are women ([Ministry of Labor, Migration and Social Security, Ministerio de](#)



Trabajo, Migraciones y Seguridad Social, 2019). The difference in annual salary (average difference in earnings between men and women) in Spain is € 5783.99 (INE, *Encuesta Estructural Salarial, Annual Salary Structure Survey, 2017*). Only 25.5% of engineering and architecture students are women (Ministry of Education, Culture and Sports, *Ministerio de Educación, Cultura y Deportes, 2016*). So, measures are still needed to achieve full economic parity (World Economic Forum, 2018). Only about 15% of the managers in the analyzed sample are women because this is a male-dominated sector. The low figure for women students in this sector helps to produce a glass ceiling that prevents women from reaching top management positions (Bureau of Labor Statistics, 2017). This can affect the returns and risk of the firms (Campbell and Mínguez-Vera, 2008; Faccio *et al.*, 2016).

Focusing on concrete economic sectors, the construction industry is one of the main contributors to economic development at a global level because of its links with all other sectors of the economy (Hillebrandt, 2000; Fulford, 2019). In most advanced economies, construction represents between 7 and 12% of the GDP (Cuadrado-Roura *et al.*, 2010). In Spain, during the period of growth from 1998 to 2007, its direct contribution to the growth of the economy exceeded 20% per year on average, and 23% of the employment created was in construction (Doménech, 2011). During that period, the total number of employees in the construction industry increased in Spain by more than one million (*Encuesta de población activa (EPA), 2012*).

The construction industry is a highly masculine sector and one of the economic sectors that employs fewest women. Only 9.3% of the people who work in construction are women (Construction Observatory, *Observatorio de la Construcción, 2019*). This may be due to segmentation of the labor market, historical and sociocultural barriers or gender stereotyping. Activities related to construction are usually considered less feminine.

There is a great deal of business/corporate governance literature examining gender related variables at the level of firm decision-making. However, most studies have focused on gender diversity on the board and not on the gender of the CEO. There is even less evidence of the influence of the CEO's gender on the performance (return and risk) of a firm. Khan and Vieito (2013), Faccio *et al.* (2016); and Martín-Ugedo *et al.* (2018) are some examples. A large search found no previous studies in which the researchers had focused on the construction industry.

There are many theories that try to explain different (or similar) behavior and firm performance considering gender variables. Two interesting surveys on this topic are Terjesen *et al.* (2009) and Kirsch (2018). Some of these theories, human capital, leadership, resource dependence and the gender self-schema theories, are mentioned in this manuscript. Theory and previous evidence usually show that women are more risk averse. This could drive companies managed by women to reduce debt. In relation to returns, both theory and previous evidence are inconclusive in their arguments and results but mainly point to a positive effect of involving women.

The gender of the CEO has important implications not only at the economic level but also for ethical considerations. If the fact of having women CEOs had no impact (or a positive one) on companies' outcomes, then the presence of women in this post would still be an ethical issue, as more women in these roles would lead to a more equitable society. Achieving a larger number of women CEOs could be considered an end in itself. In contrast, if having women CEOs had a negative influence (not compensated for by other economic benefits), then this issue would become a dilemma, given that ethical arguments would lead to the promotion of women, but economic arguments would suggest the opposite.

The aim of this paper is to examine whether women CEOs in the construction industry exert any significant influence on some variables related to the firm debt level and profitability. This paper contributes to the growing number of studies on gender by providing original empirical evidence for the construction sector. This and other papers may

help to build a framework of empirical evidence relating to the influence of women CEOs on firm performance and other financial variables that confirms or refutes theoretical arguments in different industries and contexts.

The results show that firms whose CEO is a woman have lower total, short-term and long-term debt but also lower returns. A possible explanation for this is the combination of women's risk aversion and the higher expected returns usually associated with greater risk (the portfolio selection theory). Women are a minority in the management of construction firms. The fact that minorities are often perceived as a token, and easily marginalized, could also help to explain lower returns.

The document is organized as follows. [Section 2](#) reviews the literature and presents the hypotheses. [Section 3](#) describes the sample, the variables and the methodology. [Section 4](#) is dedicated to the results. Finally, conclusions are presented.

2. Literature review

Globalization leads to a new conception of work and business organizations ([Legge, 1995](#)). However, the stereotypes related to gender are still present in most countries. Some activities are considered more feminine, such as service activities, while others are considered less feminine, such as construction and manufacture.

Women represent over 50% of the world population and this proportion should be present in all areas of society. For this reason, Organisation for Economic Co-operation and Development (OECD) and governmental institutions implement measures to promote equal opportunities for women and men ([ILO, 2004](#)). "In September 2015, the United Nations adopted the 2030 Agenda for Sustainable Development. Among the goals, the 2030 Agenda of United Nations establishes Goal 5.5: "Ensure the full and effective participation of women and equality of leadership opportunities at all decision-making levels in political, economic and public life".

In Spain there were 3.24 million active companies (INE, [DIRCE, Directorio Central de Empresas, 2016](#)). 88.8% were self-employed workers and small- and medium-sized enterprises with a high proportion of family businesses, especially in the sectors of construction, commerce, agriculture and industry. In 90% of cases, the CEO of the company belongs to the family that owns it. In the last ten years, the number of women managers has increased from 17% to 27% ([IEF, 2018](#)). It is estimated that effective parity of men and women in positions of responsibility will be achieved in 2037 ([Grant Thornton, 2017](#)).

The low representation of women in posts of corporate responsibility is generally thought to be due to the difficulty in breaking the so-called "glass ceiling", barriers faced by women to progress in companies ([Francoeur et al., 2008](#)). Women who break the glass ceiling are said to "make men feel comfortable" ([Catalyst, 1996](#)).

The construction industry is the sector where the predominance of men is strongest. Men represent 91% of the construction industry, compared to 9% of women. In the management of this sector, men occupy 92% of management positions, compared to 8% held by women ([Eurofound, 2018](#)). Women find it difficult to integrate into a world dominated by male culture ([Ibáñez and Narocki, 2011](#)).

The persistence of gender inequality in this industry is attributable to cultural and structural barriers ([Sang and Powell, 2012](#)), such as the image of the industry, professional knowledge, culture and work environment and family commitments ([Fielden et al., 2000](#)). On average, only 10% of workers on construction sites are women. This low figure is not due to a lack of interest or capacity but due to discrimination against women, sexual harassment and work safety ([Regis et al., 2019](#)). In addition, women focus on administrative positions in this industry, largely due to gender stereotypes ([Dainty et al., 2000](#)).

In the last few years there has been a growing number of publications on gender and corporate governance. [Terjesen et al. \(2009\)](#) made an interesting survey of women on boards of directors, including different areas of research. That research considered 20 theory-based

perspectives and different levels (individual, board, firm and industry/environment). Most empirical studies consider more than one theory simultaneously. Most academic literature is descriptive (Terjesen *et al.*, 2009).

CEO gender has also been studied in the business/corporate governance literature but much less than the gender composition of the board of directors. However, the CEO may be more important than the board in the running of a company because he or she has to deal with the day-to-day operations (Mínguez-Vera and Martín-Ugedo, 2010). Most literature focusing on the CEO is also descriptive.

Because the role of the CEO is performed by only one person, some of the theories that have traditionally been considered in the study of boards of directors, such as social identity and self-categorization theories, cannot be considered, as these theories focus on the composition of the group as well as on group-level processes. However, many other theories are applicable to both the study of the board and the analysis of the CEO.

The theories employed in the gender studies of the CEO usually link the attributes of individual managers to differences in effectiveness and leadership behavior between women and men. Arguments for gender-based differences are based, on the one hand, on assumptions about the values, traits and skills required for effective leadership (implicit theories) and, on the other hand, on assumptions about inherent differences between men and women (gender stereotypes) (Nielsen and Huse, 2010). In the following section, three of the most widely employed theories are briefly summarized: human capital, leadership and resource dependence theories.

The human capital theory (Becker, 1964) examines the role of a person's stock of education, skills and experience that can be employed in an organization. Years ago, it was commonly assumed that women lacked adequate human capital for executive positions. Nowadays things have changed radically and studies that consider the gender variable in different fields, including in management, argue that women are as well qualified as men (Carter *et al.*, 2010; Singh *et al.*, 2008).

The leadership theory suggests the importance of nurturing contacts, preparing for meetings and creating alliances. As Huse (2008) points out, women can make specific contributions if their backgrounds, personalities and behaviors are different from those of men. Following this reasoning, Loden (1985) argues women are more qualitatively oriented than men, so they are better at some tasks, such as strategic control and corporate social responsibility. In addition, women offer unique perspectives, experiences and styles of work (Hillman *et al.*, 2002; Daily and Dalton, 2003). They may also enhance discussions since their style of communication is more participatory and process oriented.

The resource dependency theory views firms as operating in an open system and needing to exchange resources in order to survive. This provokes a dependency between the firm and external units (Pfeffer and Salancik, 1978). Managers can act to reduce environmental uncertainty and dependence. Some authors, such as Zelechowski and Bilimoria (2004), argue that women relate less with managers in other companies. Thus, the resource dependence theory provides arguments that discourage the appointment of women as CEOs.

Even if women are as well qualified as men, and theory provides arguments both for and against the appointment of women CEOs, women are still underrepresented in top management. The underrepresentation of women may be in part due to a barrier which penalizes women in their job aspirations ("glass ceiling").

Discrimination and the possibility that women candidates are not correctly assessed are possible explanations for the underrepresentation of women. However, occupational segregation may mean that women are a reduced pool of candidates (Farrell and Hersch, 2005; Mateos de Cabo *et al.*, 2011). Family responsibilities may also interrupt women's professional development, especially in some countries. According to the Spanish Women's Institute, in 2006, 97% of people who were not seeking employment due to family reasons

were women (Mateos de Cabo *et al.*, 2011). The persistence of gender differences over the life cycle may also exert an influence on the number of women candidates (Anxo *et al.*, 2011).

Risk is a variable that has traditionally been considered in gender studies in management. Most studies analyze possible differences in the behavior between women and men but do not go deeply into the reasons for the results. The gender self-schema theory is the most commonly employed theory to explain such outcomes.

A self-schema is an individual's psychological construction of the self. This construction is based on a number of aspects that are developed from childhood and serve as mental models through which information is processed. Female (male) gender self-schemas are usually based on roles, norms, values and beliefs that are seen to be appropriate for women (men). As an example, although it has lost some of its force in recent decades, men tend to be considered as income provider and to have autonomy, dominance, etc., while women tend to be considered as a homemaker and to behave with deference and have an affiliation to others, etc. (Konrad *et al.*, 2000). Focusing on risk, self-schema arguments point to men as being risk takers and women as being more risk averse.

Most previous evidence suggests that women are more risk averse than men (Olson and Currie, 1992; Jianakoplos and Bernasek, 1998; Borghans *et al.*, 2009 and Khan and Vieito, 2013; among others). Therefore, their presence in management positions usually produces less risky decisions. Firms run by female CEOs tend to have a lower level of leverage (Hernández-Nicolás *et al.*, 2015; Faccio *et al.*, 2016).

Focusing on the effect of women CEOs on returns, the theory is inconclusive. As previously mentioned, human capital, leadership and resource dependence theories, and some others theories, provide arguments, both positive and negative, for the effects on firm returns. In addition, some authors, such as Adams and Ferreira (2004), claim that gender does not imply different behavior in business management. It is argued that female managers may reject feminine stereotypes and values and, as a result, behave like male managers. In the construction industry, Arditi *et al.* (2013) make the same point.

As previously suggested, to date studies have focused primarily on gender diversity on the board of directors and not on the gender of the CEO. The evidence relating to the boards of US firms is not conclusive although it tends to support a positive relationship between gender diversity and firm returns (Shrader *et al.*, 1997; and Erhardt *et al.*, 2003; among others). The evidence from Europe has also proved inconclusive, but also points, for the most part, to a positive relationship (Campbell and Mínguez-Vera, 2008; and Martín-Ugedo and Mínguez-Vera, 2014; among others). The small amount of evidence of the influence of women CEOs on returns also suggests a positive relationship (Jalbert *et al.*, 2013; Khan and Vieito, 2013; and Martín-Ugedo *et al.*, 2018).

3. Data and methodology

The empirical study is carried out using a sample from the SABI (*Sistema de Análisis de Balances Ibéricos*) records (Iberian Balance Sheet Analysis System created by Bureau Van Dijk). This database provides accounting information for Spanish and Portuguese companies, obtained from their annual accounts.

The study focuses on the year 2018 and firms from the building industry have been selected. In order to get a sample that was as reliable as possible, those firms whose data suggested the presence of accounting errors have been removed from the sample. For example, companies where the total assets were not equal to the sum of the financing resources, or where the total assets were zero, or less, were excluded. Finally, companies that did not provide data about the name of the CEO, and those that did not provide the accounting information needed to construct the variables employed in the analysis have also been removed from the final sample. The final sample included 8,492 companies.

The sample includes two large subsectors: the first subindustry is building (firms specialized in construction activities) and the second subindustry is technical (firms of architecture, engineering and some professional supervisors).

To measure indebtedness, three dependent variables are employed: the debt ratio, LEVtotal (total leverage), measured by the ratio of total debt to total assets (Scherr and Hulburt, 2001), the short-term debt ratio, LEVst (short term leverage), measured by the ratio of short-term debt to total assets and the long-term debt ratio, LEVlt (long term leverage), measured by the ratio of long-term debt to total assets.

For the gender of the CEO, a dummy variable, CEOwoman, is used which takes the value 1 when the CEO is a woman and 0 when the CEO is a man.

The following are included as control variables: the proportion of noncurrent assets, FIXED (fixed assets), measured as the ratio of total noncurrent assets to total assets (Masayuki, 2012), the return on assets, ROA, calculated as the ratio of earnings before interest and taxes to total assets (Alghifari *et al.*, 2013) and the firm size, SIZE, calculated as the natural logarithm of total assets (Fattouh *et al.*, 2008). The dummy variable, INDUSTRY, was also included, which takes the value 1 when the subindustry is building and 0 when the subindustry is technical.

The proposed models are as follows:

$$\text{LEVst}_{it} = \beta_0 + \beta_1 \text{CEOwoman}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{FIXED}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{INDUSTRY}_{it} + u_{it} \quad (1)$$

$$\text{LEVlt}_{it} = \beta_0 + \beta_1 \text{CEOwoman}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{FIXED}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{INDUSTRY}_{it} + u_{it} \quad (2)$$

$$\text{LEVtotal}_{it} = \beta_0 + \beta_1 \text{CEOwoman}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{FIXED}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{INDUSTRY}_{it} + u_{it} \quad (3)$$

where $i = 1, \dots, n$ denotes the company.

Following theory and most previous evidence about the influence of women managers on risk and debt, the following hypothesis is proposed:

H1. Women CEOs will have a negative influence on firm debt in the construction industry in Spain.

To analyze firm returns, following most previous studies examining nonlisted firms, return on assets (ROA) is used as the dependent variable (Lerman and Parliament, 1991) defined as above. Alternatively, return on equity (ROE) is included, calculated as the ratio of net profit to equity (Lucas-Pérez *et al.*, 2015).

The following are included as control variables: the debt ratio, LEVtotal, the firm size, SIZE and the firm age, AGE, calculated as the natural logarithm of the number of years since the company was established. These are control variables previously used in studies on the influence of women in decision-making positions (Farrell and Hersch, 2005; Martín-Ugedo and Mínguez-Vera, 2014). Finally, the variable INDUSTRY, defined above, is also included.

The proposed models are as follows:

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{CEOwoman}_{it} + \beta_2 \text{LEVtotal}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{INDUSTRY}_{it} + u_{it} \quad (4)$$

$$\text{ROE}_{it} = \beta_0 + \beta_1 \text{CEOwoman}_{it} + \beta_2 \text{LEVtotal}_{it} + \beta_3 \text{AGE}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{INDUSTRY}_{it} + u_{it} \quad (5)$$

where $i = 1, \dots, n$ denotes the company

In line with most previous evidence presented above, the following hypothesis is proposed:

H2. Women CEOs will have a positive influence on firm rates of return in the construction industry in Spain.

Table 1 shows the descriptive statistics for the variables used in this study. Of all the firms, 14.9% have a woman as CEO, which means that a large majority of the companies in the sample are managed by men. This figure is consistent with most previous evidence (Erhardt *et al.*, 2003) although the proportion of women is higher than expected. Only 10% of executive positions in large Spanish companies are occupied by women (Carrasco and Laffarga, 2007) and 8.4% for Spanish small- and medium-sized enterprises (Martín-Ugedo and Mínguez-Vera, 2014). Finally, 74.7% of the firms belong to the building subindustry.

The average ROA is 3.9% and the average ROE is 6%. For the indebtedness level, the average level of debt (LEVtotal) is 56.1%, the average level of short-term debt (LEVst) is 36.6% and the average level of long-term debt (LEVlt) is 19.5%.

A three-stage least squares (3SLS) methodology was employed in this study. This methodology controls for the endogeneity of explanatory variables by using a system of simultaneous equations (Chamberlain, 1982). It is used here because of the peculiar characteristics of the sample, which includes data for only one year, 2016. The fact that data can only be obtained for the identification of the CEO in the SABI database for one year makes it impossible to use a more powerful methodology such as panel data. An alternative method that could be used to control for endogeneity, the two-stage least squares (2SLS) methodology, produces consistent estimators but is not efficient. In particular, 2SLS methodology does not account for the interdependence of the equations and calculates an instrumental variables regression, equation by equation. The 3SLS methodology is based on the 2SLS methodology but improves the estimators and is more efficient (Dhrymes, 1969; Agunbiade, 2011).

4. Results

The results of the estimation of models are presented in Tables 2 and 3. Table 2 shows the results for the influence of CEO gender on the company's debt ratios, short-term, long-term and total debt. Firms with a woman CEO have a lower debt ratio in all cases and these results are statistically significant. Companies in the construction sector, managed by women, are less indebted in total (LEVtotal) and in both the short-term (LEVst) and the long-term (LEVlt), and that is consistent with most previous evidence. Based on this evidence, it seems that women are more risk averse than men in managing firms. It is possible that women, seeking

Variable	Mean	Standard deviation	Minimum	Maximum
CEOWoman	0.149	0.356	0	1
ROA	0.039	0.140	-3.78	3.52
ROE	0.060	0.427	-6.98	7.33
FIXED	0.352	0.267	0	0.90
LEVtotal	0.561	0.223	0.09	0.92
LEVst	0.366	0.203	0.09	0.90
LEVlt	0.195	0.187	0	0.82
SIZE	6.598	1.363	1.60	14.99
AGE	8.776	0.193	8.45	9.10
INDUSTRY	0.747	0.435	0	1

Note(s): Variables: CEOWoman (dummy variable that takes a value of 1 when the CEO is a woman and 0 when the CEO is a man); ROA (return on assets); ROE (return on equity); FIXED (fixed assets divided by total assets); LEVtotal (total debt divided by total assets); LEVst (short-term debt divided by total assets); LEVlt (long-term debt divided by total assets); SIZE (natural logarithm of total assets); AGE (natural logarithm of the years since establishment); INDUSTRY (dummy variable that takes a value of 1 when the subindustry is building and 0 when the subindustry is technical)

Table 1.
Descriptive statistics

Model	LEVtotal	LEVst	LEVlt
Constant	0.572 ^{***} (46.29)	0.450 ^{***} (40.24)	0.570 ^{***} (7.09)
CEOWoman	-0.023 ^{***} (-3.37)	-0.024 ^{***} (-3.90)	-0.077 ^{***} (-2.76)
ROA	-0.141 ^{***} (-8.82)	-0.055 ^{***} (-3.66)	-6.321 ^{***} (-8.28)
FIXED	-0.001 (-0.23)	-0.109 ^{***} (-6.79)	0.105 ^{***} (4.26)
SIZE	-0.008 ^{**} (-4.40)	-0.011 ^{***} (-6.79)	-0.003 (-0.48)
INDUSTRY	0.067 ^{***} (11.93)	0.036 ^{***} (7.14)	-0.175 ^{***} (-5.07)
X^2	932.32 ^{***}	382.57 ^{***}	1798.46 ^{***}
Obs	8,492	8,492	8,492

Note(s): **, *** Significant at the, 5% and 1% levels, respectively

Z-statistic in parentheses

X^2 : Test of explanatory variables

Variables: LEVtotal (total debt divided by total assets); LEVst (short-term debt divided by total assets); LEVlt (long-term debt divided by total assets); CEOWoman (dummy variable that takes a value of 1 when the CEO is a woman and 0 when the CEO is a man); ROA (return on assets); FIXED (fixed assets divided by total assets); SIZE (natural logarithm of total assets); INDUSTRY (dummy variable that takes a value of 1 when the subindustry is building and 0 when the subindustry is technical)

Table 2.

Estimation of the influence of gender on debt level (LEVtotal), short-term debt level (LEVst) and long-term debt level (LEVlt)

financing, think about risk and the possibility of loss more than men. They may also be more cautious than men and seek to secure only the funds that they need (World Bank, 2012). In this way, promoting women to top management positions of a firm not only is ethically desirable but also enhances financial stability. Therefore, it would be appropriate to extend the recommendations about equality to firms in this economic sector. In addition, Bessler *et al.* (2013) conclude that the choice of financial conservatism is linked to a company's attempt to maintain financial flexibility, which allows it to respond to unexpected changes in cash flow and investment opportunities quickly and optimally. That is, the fact that companies are conservative allows them to create more jobs and have a less negative variation in employment in the medium term (Sanchez-Vidal *et al.*, 2020).

These results confirm Hypothesis 1(H1): Women CEOs will have a negative influence on firm debt in the construction industry in Spain. Hernández-Nicolás *et al.* (2015), Faccio *et al.* (2016) and Martín-Ugedo *et al.* (2018) obtain similar conclusions but not focused on the construction sector.

Regarding the control variables, ROA has a significant and negative relationship with the debt ratio. Several studies find an inverse relationship between leverage and profitability (Antoniou *et al.*, 2008; Giroud *et al.*, 2012). Women are more cautious than men in their investment decisions (Lundeberg *et al.*, 1994). Women expect less profit, invest less money in their businesses and tend to have a lower level of debt (Romani *et al.*, 2012). According to Markowitz (1952, 1959), who first developed the portfolio selection theory, an investor assumes more risk if they expect to obtain a higher return and vice versa. Companies with less risky investments tend to have lower levels of profitability.

Firms with a higher proportion of noncurrent assets have a smaller short-term debt ratio. There are tax deductions such as depreciation of fixed assets (DeAngelo and Masulis, 1980) which could lead to this negative relationship between fixed assets (FIXED) and the short-term debt level (LEVst). In addition, the problem of asset substitution is more important in companies that have a high proportion of current assets in their economic structure, which entails higher surveillance costs associated with debt and moral hazard (Fama, 1985). These influences produce the positive relationship between fixed assets (FIXED) and the long-term debt level (LEVlt). Larger companies have a lower debt ratio. Large companies have a reputation for consolidation in the market with lower financing costs and little information asymmetry, so favor self-financing (Rajan and Zingales, 1995, p. 453). Finally, firms

belonging to the building subindustry have higher short-term and total debt ratios but a smaller long-term debt ratio.

Table 3 shows that women CEOs have a negative influence on ROA and ROE. This result does not support Hypothesis 2(H2): Women CEOs will have a positive influence on firm rates of return in the construction industry in Spain.

As mentioned before, the portfolio selection theory (Markowitz, 1952, 1959) is one of the best established theories explaining a positive relationship between risk and return. In the sample examined, the results show that women CEOs are associated with lower firm debt (and so, lower financial risk), so this theory could explain the lower returns found. Kolev (2012) also finds that female CEOs underperform their male counterparts in terms of shareholders' returns by roughly 0.35% per month, explaining this result in terms of female risk aversion. Similar conclusions are reached in studies focusing on gender diversity on the board, for example, Mínguez-Vera and Martín (2011) for a sample of Spanish Small and medium-sized enterprises (SMEs) in a six year period and some other international evidence (Bohren and Strom, 2010; Shehata et al., 2017).

As mentioned before, discrimination leads to a reduced number of women in managerial posts, but it could also provoke discrimination in the relationships that a firm with a female CEO has with other firms. Minorities, when their presence in a large group is modest, are perceived negatively and are not trusted. Minorities may be viewed as tokens, and thus are easily marginalized. This discrimination could interfere with performance (Powell, 2018). Wolfers (2006) finds that female CEOs generate less firm value and he conjectures that this is caused by discrimination. Men-run businesses can implement more aggressive strategies with better short-term results but with less future financial stability. Therefore, the more conservative financial behavior of women can waste the tax advantages of having debt.

In contrast to our results, and to some other evidence, most previous results show that women in managerial and decision-making bodies have a positive influence on various measures of returns (Carter et al., 2003; Smith et al., 2006; among others). In view of the fact that our analysis considers only one year, due to data limitation, caution has to be exercised not to overreach our conclusions.

Regarding the control variables, the debt ratio, LEVtotal, has a significant negative influence on ROA. Debt overhang impairs firm performance (Myers, 1977), and the

Model	ROA	ROE
Constant	0.144*** (3.24)	0.267 (1.54)
CEOWoman	-0.014*** (-3.29)	-0.030*** (-2.30)
LEVtotal	-0.066*** (-11.06)	-0.051*** (-3.45)
SIZE	-0.001 (-1.34)	0.002 (-0.06)
AGE	-0.004 (-0.85)	-0.018 (-0.94)
INDUSTRY	-0.028*** (-7.90)	-0.047*** (-4.31)
χ^2	1231.48***	34.90***
Obs	8,492	8,492

Note(s): **, *** Significant at the 5% and 1% levels, respectively

Z-statistic in parentheses

χ^2 : Test of explanatory variables

Variables: ROA (return on assets); ROE (return on equity); CEOWoman (dummy variable that takes a value of 1 when the CEO is a woman and 0 when the CEO is a man); LEVtotal (total debt divided by total assets); SIZE (natural logarithm of total assets); AGE (natural logarithm of the years since establishment); INDUSTRY (dummy variable that takes a value of 1 when the subindustry is building and 0 when the subindustry is technical)

Table 3.
Estimation of the
influence of gender on
profit (ROA) and (ROE)

relationship between leverage and profitability is generally found to be negative (Mínguez-Vera and Martín-Ugedo, 2005; Antoniou *et al.*, 2008; Giroud *et al.*, 2012). Finally, firms belonging to the building subindustry are less profitable in terms of both ROA and ROE.

5. Conclusions

Equal opportunities is a hot topic worldwide. As a consequence, many countries, including Spain, have approved measures related to gender equality. However, women are still underrepresented in most areas, including managerial positions in firms. This is especially true of male-dominated industries such as the construction industry.

“To correct this inequality, the 2030 Agenda for Sustainable Development adopted by the United Nations in September 2015 includes Goal 5.5”, to ensure equal leadership opportunities. Goal 5.5 states that the signatory will: “Ensure the full and effective participation of women and equality of leadership opportunities at all decision-making levels in political, economic and public life”.

The construction industry is generally dominated by men. In addition, it is considered an engine of the economy, both for its contribution to the GDP and the number of jobs it generates. For these reasons, it is important to examine the influence of women CEOs on companies in this sector.

This article focuses on women CEOs in the construction industry in Spain, of firms founded between 1994 and 2006, the golden period of this sector. In the sample examined, 14.9% of CEOs are women. This is nowhere near the goal of gender equality in positions of senior management. In family businesses, family ties may help increase this figure in the future, as family businesses help to balance work and family responsibilities (Fielden *et al.*, 2003). In addition, the glass ceiling seems to be not so relevant in family businesses. More women entering the sector as entrepreneurs could also help to raise this figure.

The results show that female managers in the construction industry in Spain lead to lower total, short-term and long-term indebtedness. This evidence is in line with previous studies that confirm greater risk aversion among women than men. This conservative behavior can generate more financial stability for women-run companies. In this way, these companies may be better prepared to face financial crises, such as the COVID-19 virus (Coronavirus Disease 2019). As a consequence, the loss of employment in these companies may be less.

Results also show that companies whose CEO is a woman have lower returns. The portfolio selection theory (Markowitz, 1952, 1959) explains a positive relationship between risk and return. So, given that, in the sample examined, the findings show that women CEOs are associated with lower firm debt (and so, lower financial risk), this theory could explain the lower returns found. Discrimination, and the fact that women are more resistant to change in the architecture, engineering and construction (AEC) industry, could also help explain lower returns of firms with female CEOs.

As mentioned throughout the manuscript, having more women in managerial posts has implications that are ethical as well as economic. If our results had shown that firms with women CEOs have lower returns combined with higher financial risk, measured by their debt level, then women, on average, would exert a negative influence on firm performance. In that case, promoting more women CEOs would become a dilemma, as ethical arguments would imply promoting women, but economic arguments would suggest the opposite. However, in this study, the lower returns may be explained by economic arguments, one of them the lower risk that firms with women CEOs are exposed to.

Finally, this study has one specific limitation as data related to the gender of the CEO are only available for one year in the database used. As a consequence, it has not been possible to configure a data panel. Another limitation is that it only focuses on one country, Spain, where the business network is formed mostly by microenterprises and SMEs. A future line of research would be to examine whether different countries and contexts produce the same results.

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