# DOES GENDER EXPLAIN THE INDEBTEDNESS LEVELS OF LOCAL GOVERNMENTS?

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## ABSTRACT

In recent decades, there has been a proliferation of research analysing the role of women in public management. This study contributes to this line of research by examining the influence women have on municipal public debt. To this aim, we use a sample of 141 Spanish municipalities with more than 50,000 inhabitants for the period 2008-2020. The empirical results suggest that municipalities that are leaded by a female mayor tend to show lower levels of public debt. In addition, empirical results reveal an inverted U-shaped relationship between the proportion of female councillors and the level of public debt. This means that the higher the proportion of female councillors, the lower the level of indebtedness, but this positive effect appears only if the number of female councillors is relatively high.

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**KEYWORDS:** gender, female mayor, female councillors, local governments, indebtedness, public debt.

**JEL CODES**: J16; H83; H63

**FUNDING:** This work was supported by the Ministerio de Ciencia e Innovación [Grant/Award No.PID2021-122419OB-I00-GELESMAT]

## 1. INTRODUCTION

Municipal indebtedness has attracted the attention of scholars, since Local Governments (LGs) must respond to citizens' requests for more and better public services (Brusca et al., 2015), while are challenged to present balanced budgets (Guerrini et al., 2017). The study of indebtedness is highly important in large-indebted contexts, like the Spanish one, where the debt of its public administrations reached the all-time maximum value in 2020 (120.4% of GDP).

There is a large amount of literature identifying the different determinants of public indebtedness of LGs (e.g., Guillamón et al., 2011; Dafflon, 2002; Ashworth et al., 2005; García-Sánchez et al., 2011; Cuadrado-Ballesteros et al., 2013; Veiga & Veiga, 2014; Prado-Lorenzo et al., 2014; Balaguer-Coll et al., 2016; Benito et al., 2015; 2016; Ehalaiye et al., 2017; Bastida et al., 2017; Balaguer-Coll & Ivanova-Toneva, 2019; among others). However, we have hardly found any studies focussing specifically on the role women play in public indebtedness. Indeed, gender differences in governments are still under-analysed (Holman, 2017), even though we can expect gender differences in public management (Park, 2021) that lead administrations to perform differently depending on the gender of the manager (Fox and Schuhmann, 1999).

As it will be described later (Section 2), the largest body of gender studies in public management has focussed on public expenditure and its composition (e.g., Bolzendahl and Brooks, 2007; Bolzendahl, 2009; 2011; Clots-Figueras, 2011; Holman, 2014a; 2014b; Hernández-Nicolás et al., 2018; Cabaleiro-Casal and Buch-Gómez, 2018; Funk and Philips, 2019; Slegten and Heyndels, 2020). However, it would be also interesting to know whether there are gender differences in the way of financing that expenditure, and concretely, through the use of public debt.

Some previous studies have considered a mayor's gender to be a determinant of municipal debt levels in Spanish LGs, but the results are inconclusive. For instance, on the one hand, Hernández Nicolás et al. (2018) found that LGs with women mayors have lower annual interest and debt repayment obligations in 2012. On the other hand, Balaguer-Coll and Ivanova-Toneva (2019) concluded that female mayors take on more debt than male ones in Valencian municipalities in 2015. Furthermore, Guillamón et al. (2011), Gras et al., (2014) and Brusca et al. (2015) concluded that there is no significant impact of gender on the level of municipal debt in Spanish LGs in 2008, 2011 and 2012, respectively.

This study aims extend these previous findings, by (i) using a larger sample that covers the most populated Spanish municipalities over four electoral cycles (2007, 2011, 2015, and 2019); (ii) considering the composition of municipal councils (i.e., the percentage of female members on the municipal council), not only the gender of the mayor (Cuadrado-Ballesteros et al., 2021); (iii) proposing a non-lineal relationship between the proportion of female members of LGs and the use of public debt (Holman, 2014; Araujo & Tejedo-Romero, 2018; Cuadrado-Ballesteros et al., 2021) between women's representation and public indebtedness; and (iv) considering the economic crisis of 2008, and another one considers the electoral cycle.

To conduct our study, we used a sample consisting of 140 of the 50,000 Spanish municipalities for the period 2008-2020. In Spain, Organic Law 3/2007 promoting the effective equality of women and men states that political party nominees should be at least 40% men and 40% women (except in municipalities with fewer than 3,000 inhabitants). Despite this, there is still a long way to go before the number of men and women governing Spanish municipalities is equal.

The results may have relevant implications for various stakeholders, regulators, policy makers, etc. Our findings show that those governments led by women have lower levels

of debt. Therefore, greater integration of women in political environments could improve public finances. In this sense, it is considered necessary to implement strategies and foster an inclusive and enabling environment that encourages and empowers more women to participate in governments, which will result in better representation and decision making for the benefit of society. Furthermore, this study contributes to the ongoing debate about gender differences in public management, especially at the under-analysed local level (Holman, 2017).

The rest of the paper is structured as follows. Section 2 shows the literature review on the role of women in public management and the hypothesis about how female participation in LGs affects public indebtedness. Section 3 addresses the methodology (sample, model, variables and analysis technique). Section 4 presents and discusses the empirical results. Finally, Section 5 summarises the main concluding remarks, limitations and future lines of research.

## 2. GENDER STUDIES IN PUBLIC SECTOR LITERATURE

According to the OECD (2014), female representation in politics is essential to improving the quality of governance. To this end, many governments worldwide have approved regulations to ensure gender equality and women's access to public leadership. However, despite these efforts, gender differences remain (Krøtel et al., 2019; Inter-Parliamentary Union, 2020; Park, 2021). For instance, the overall percentage of women in parliaments worldwide has more than doubled in the past 25 years, but it still falls below male representation (The Inter-Parliamentary Union, 2020).

This situation has attracted the attention of researchers, resulting in many studies focussed on the role of gender in the political arena and public administrations (Hessami and Lopes da Fonseca, 2020). One branch of this line of research has promoted the integration of

gender perspectives into all the phases of the budgeting process (e.g., Sharp, 2002; Budlender and Hewitt, 2003; Rubin and Bartle, 2005; Jung, 2022; among many others). It is usually called as women's budgets, gender-sensitive budgets or gender-responsive budgeting.

Another relevant branch of literature is focused on comparing male and female public expenditure patterns. The general conclusion is that a larger share of women in the legislature is positively correlated with social spending (Bolzendahl and Brooks, 2007; Bolzendahl, 2009; 2011; Holman, 2014a; 2014b; Hernández-Nicolás et al., 2018; Cabaleiro-Casal and Buch-Gómez, 2018; Slegten and Heyndels, 2020), including education (Álvarez and McCaffery, 2003; Svaleryd, 2009; Clots-Figueras, 2011; Funk and Philips, 2019), health and welfare policy (Funk and Gathmann, 2015; Clots-Figueras, 2011; Funk and Philips, 2019). Furthermore, from the revenue point of view, the main conclusion in literature is that women are more often in favour of redistribution than men (Lott and Kenny,1999; Alesina and Giuliano, 2009).

There are many studies that analyse how female representation affects the level of performance of public administrations (Park, 2021). In general, the presence of women in governments may help to reduce the risk of default (Navarro-Galera et al., 2017), increase the fiscal capacity and autonomy (Avellaneda et al., 2022), as well as increase the probability of compliance with regulations on budgetary stability, financial sustainability, and compliance with legal debt limits (Balaguer-Coll and Ivanova-Toneva, 2021). However, other studies conclude that the higher the proportion of female members the worsen the fiscal performance (Cabaleiro-Casal and Buch-Gómez, 2021; Rodríguez-Bolívar et al., 2018).

However, there is a public performance dimension that has been hardly analysed in gender studies, that is, public debt. There are very few studies that consider this issue and,

moreover, their findings are inconclusive. On the one hand, Guillamón et al. (2011) concluded that there is no significant impact of gender on the level of municipal debt. For that, they used a sample of Spanish municipalities with more than 1,000 inhabitants for 2008. Similarly, Gras et al. (2014) noted that the gender of the mayor is not significant in explaining municipal indebtedness of Spanish LGs in 2011. Brusca et al. (2015) analysed the financial condition of Italian and Spanish LGs in 2012. In order to represent financial condition, they used several variables related to debt. In their findings, the gender of the mayor did not come out significant.

On the other hand, Hernández Nicolás et al. (2018) and Balaguer-Coll and Ivanova-Toneva (2019) found evidence that support the existence of gender differences in using municipal debt in Spain. However, their findings are opposite: while Hernández Nicolás et al. (2018) found that Spanish LGs with women mayors have lower annual interest and debt repayment obligations in the period 2002-2010, Balaguer-Coll and Ivanova-Toneva (2019) concluded that gender of the mayors of Valencian LGs in 2015 was positively correlated with the level of public debt, suggesting that female mayors take on more debt than men.

As the conclusions extracted from previous literature are very different, further analysis may help to clarify if we can expect different levels of indebtedness according to the gender of members that make up the municipal political power. This is highly important, especially in highly indebted contexts, like the Spanish one, where the debt of its public administrations reached 120.4% of GDP in December 2020. To this aim, this study uses a larger sample than those used in previous literature (increasing the number of municipalities and increasing the period of analysis), as well as it considers, not only the gender of the mayor, but also the gender of the rest of the members of the municipal council.

## 3. THEORETICAL FRAMEWORK: HYPOTHESES

The upper echelons theory assumes bounded rationality in managerial decision-making (March and Simon, 1958) because these decisions are often complex and ambiguous (Mischel, 1977). Then, decisions are usually based on personalised interpretations of the decision-taker and, accordingly, they are affected by individual characteristics, like age, expertise, or gender, among others (Hambrick, 2007). So, the gender of top managers may affect how they cope with situations and will thus have an impact on organizational processes, decisions, and outcomes.

The upper echelons theory is usually used in the private sector context, but it may be extended to the public sector context (Anessi-Pessina and Sicilia, 2020). Concretely, in LGs, the mayor is the highest authority, just as top managers are those in companies. So, following this theoretical approach, we might expect that decisions made by the mayor are affected by their personal characteristics, such as their gender, resulting in gender differences.

Such gender differences may be explained by the social role theory, which is based on *stereotypes* (Eagly and Wood 2012). Gender stereotypes are learnt from parents and others (Eccles et al., 1990). Traditionally, women are raised to be caregivers, whereas men are taught to be wage-earners. These roles generate normative perceptions that are transmitted during the socialization process (Jennings, 2007), resulting in social rewards and punishments for conforming or not conforming to expected roles (Meyer-Levy and Loken 2015). Concretely, women are expected to have greater empathy with and concern for others (Eagly and Johannesen-Schmidt, 2001; Eagly and Johnson, 1990), greater sense of community and a longer-term outlook (Hamidullah et al., 2015). In addition, they are expected to be more democratic, participatory, collaborative, cooperative, interactional, flexible, multifaceted, less hierarchical than men (Bass and Avolio, 1993; Meier et al.,

2006; Merchant, 2012), as well as more risk-averse and competition-averse than men (Croson and Gneezy 2009; Suzuki and Avellaneda 2018).

Although many things have changed in recent decades in the search for gender equality, gender stereotypes persist (Knudsen and Waerness, 2008). In the public-sector context, gender differences may result in diverse approaches to how much and what to spend available funds on (Anessi-Pessina et al. 2016), which is directly related to the use of public debt. If we accept characteristics of female stereotype described by the social role theory (Eagly and Johannesen-Schmidt 2001; Eagly and Johnson 1990), we may think that women take decisions that positively affect the performance of public administrations (Park, 2020). So, we may propose the following hypothesis:

*H1. LGs governed by female mayors tend to show lower levels of public indebtedness.*

However, women may also participate in LGs as councillors. While there is only a mayor, the number of councillors depends on the number of inhabitants[1]. So, one might wonder how many female councillors should appear in a council in order to see a reduction in the level of indebtedness. This issue may be investigated under the lens of the critical mass theory, which suggests that any *minority* group can influence the rest of the group when there is a tilted (20-40% minority) or balanced ratio (40-60% minority). Applying this theory to the political context, Dahlerup (1988) concluded that women are likely to "make a difference" in an organisation once they constitute a "critical mass", i.e., women are unlikely to have an impact until they grow from a few token individuals into a considerable minority. Thus, gender differences might appear only if the number of female councillors is relatively large. Accordingly, we propose the following hypothesis:

[1] To know the number of councillors, see Article 179 of the Organic Law of the General Electoral Regime.

*H2. The higher the proportion of female councillors in LGs, the lower the level of public indebtedness.*

## 4. METHODOLOGY

### 4.1. Sample of analysis

The hypothesis of this study has been empirically tested by using a sample of Spanish municipalities for the period 2008-2020. We selected those with more than 50,000 inhabitants, ending up with a sample of 141 LGs. The populations of these municipalities ranged from 50,577 to 3,334,730 inhabitants in 2020 (the last year included in the study), so this sample represents nearly 53 percent of the Spanish population. Working with large municipalities provides some advantages. Firstly, these LGs are obliged to proportion a greater number of public services to citizens[2] than smaller municipalities. Secondly, in smaller municipalities, management is more informal and is carried out by a "non-professional" mayor, while the elected officials in large municipalities are professional politicians (Cuadrado-Ballesteros et al., 2013). Thirdly, the available information and reliability of the data are greater than in smaller areas, giving larger scope and impact to the analysis.

The Spanish context is highly appropriate because this country has struggled to climb out of the Great Recession beginning in 2008. Overall public debt fell from almost 70% of the GDP in 1996 to almost 40% of the GDP in 2007. However, from 2008, debt increased spectacularly, exceeding 100% of the GDP in 2014 (Alloza et al., 2019) and reaching a

[2] Article 26 of the Local Government Regulatory Law (*Ley Reguladora de Bases de Régimen Local*) establishes a list of minimum services to be provided by local authorities: all municipalities, regardless of the number of inhabitants, must provide public lighting, cemeteries, waste collection, street cleaning, drinking water, sewer systems and drains, paving and access to the municipality. Municipalities with more than 5,000 inhabitants must additionally provide parks and green areas, libraries and waste treatment. Municipalities with more than 20,000 inhabitants must additionally provide police and protection services, social services, firefighting services and sports facilities. Finally, municipalities with more than 50,000 inhabitants must additionally provide public transport and environmental protection services.

value of 120.4% of GDP by the end of 2020. This situation has led to the establishment of legal limitations on indebtedness. Royal Decree 20/2012 amended the fiscal system to ensure financial stability, and Organic Law 2/2012 on budgetary stability established principles to guarantee financial sustainability in all public administrations. The most relevant principles addressed in these laws are financial sustainability, budget stability and efficiency, which are supported by three fiscal rules: no public administrations (including LGs) may incur structural deficits; overall public debt is limited to 60% of the GDP (44% from the central government, 13% from regional governments and 3% from LGs); and public spending cannot exceed the GDP growth rate. These measures seemed to be effective, and levels of public indebtedness decreased until 2019. The positive effect of these measures was especially relevant at the local level, where the percentage of public debt went down quickly from 2013 (Alloza et al., 2019).

Our dataset also includes political, socioeconomic and financial factors. All the data were obtained from the Spanish Home Office, the Spanish National Statistics Institute and the Spanish Ministry of Finance.

### 4.2. Model of analysis and variables

To test the proposed hypothesis, we estimate the following model:

$$D_{it} = \alpha + \lambda \cdot D_{it-1} + \gamma \cdot W_{it} + \beta j \cdot C_{it} + \eta_i + \varepsilon_{it} \quad \textbf{(1)}$$

In Model 1, i and t refer to each municipality and year, respectively; D is the dependent variable, which represents the levels of LG public indebtedness; W is the vector of the independent variables, which represent the gender of politicians, including the mayor and councillors; C is the vector of the control variables, which refer to various socioeconomic characteristics and political. In addition, $\eta_i$ refers to unobservable heterogeneity (i.e., the

characteristics of each municipality that are different from others but invariant over time); and $\varepsilon_{it}$ is the classic disturbance term.

All variables are described in Table 1. The dependent variable is *Debtpc* that refers to public debt per capita. According to Council Regulation (EC) No. 479/2009 on excessive deficit procedures, public debt is the total nominal value of the gross outstanding payments at the end of the year, except for those of financial assets. More concretely, public debt includes cash and deposits, debt securities and loans, according to the ESA 2010 definition.

The independent variables in Model 1 representing the presence of women in LGs are expressed through two indicators: *F.Mayor* and *F.Councillors*. The former is a dummy variable that takes the value of 1 if the mayor is a woman and 0 otherwise. The latter is the percentage of female members on the municipal council, including the mayor. This is the most common way to represent female presence in LGs in the literature (Holman, 2014b; Smith, 2014; Araujo and Tejedo-Romero, 2016; 2018; Hernández-Nicolás et al., 2018; Suzuki and Avellaneda, 2018; Cabaleiro-Casal and Buch-Gómez, 2018; 2020; 2021; Funk and Philips, 2019; Balaguer-Coll and Ivanova-Toneva, 2021).

Additionally, one might wonder how many women should participate to note a change (in the use of debt, concretely, in this case). This issue has been traditionally studied by the *critical mass theory*, which suggests that any minority group can influence the rest of the group when there is a tilted (20-40% minority) or balanced (40-60% minority) ratio. Accordingly, women are unlikely to have an impact until they grow from a few token individuals into a considerable minority (Dahlerup. 1988). So, in order to check this issue, the model also includes the square of the variable *F.Councillors*. This variable let us to check the existence of a possible U-shaped relationship between women's representation and public indebtedness. This approach has been also used previously by Araujo and

Tejedo-Romero (2018), Cuadrado-Ballesteros et al. (2021), and Ríos et al. (2023), in order to analyse whether the gender of the members of the LG affects the level of transparency, budget deviations, and efficiency in the provision of public services, respectively.

The control variables in Model 1 represent the socioeconomic and political environment of each municipality through factors whose effect on public debt has been corroborated. Balaguer-Coll et al. (2016) analyze factors that directly influence levels of debt in Spanish LGs, using many variables that we are using here as well. For instance, budgetary balance, as the difference between revenues and expenses (*Balance*), divided by the number of inhabitants. Furthermore, Benito and Bastida (2004), Guillamón et al. (2011) and Balaguer-Coll et al. (2016) highlight the relevance of LGs to control their self-financing capacity, although the results of the studies are not conclusive. Thus, Model 1 also includes the variable *Autonomy*, which is the ratio of total taxes and public fees to total current revenue.

*Density* refers to the number of inhabitants per km2, and *Dependents* represents the percentage of the population over 65 and under 16 years old. Although a positive relationship between these variables and the use of public debt has been established based on the notion that larger populations (especially dependent populations) would logically demand more public services (Guillamón et al., 2011; Benito et al., 2015; Balaguer-Coll et al., 2016; Balaguer-Coll and Ivanova-Toneva, 2019), other studies have found a negative or non-significant link (Guillamón et al., 2011; Balaguer-Coll and Ivanova-Toneva, 2019; Cabaleiro-Casal and Buch-Gómez, 2020). Following Cabaleiro-Casal and Buch-Gómez (2021), the results are controlled by unemployment rates (*Unemployment*) as a way to represent the economic activity of each municipality. Although it could be

interesting to include the GDP per capita as well, these data are not available at the local level in Spain.

Finally, three political factors are included in the model. The first one is *Right*, that is a dummy variable that takes the value of 1 for a right-wing government and 0 otherwise. The second and third political factors refer to the electoral cycle. Concretely, *Election* is a dummy that takes the value of 1 for years when an election has happened; and *Pre_Election* is also a dummy variable that takes the value of 1 for years prior to an election has happened. Political ideology and electoral cycle seem to be relevant in explaining the use of public debt in Spanish LGs (Guillamón et al., 2011; Gras et al., 2014; Balaguer-Coll et al., 2016; Cabaleiro-Casal and Buch-Gómez, 2021).

Considering the described variables, the model may be represented by the following equation:

$$Debtpc_{it} = \alpha + \lambda Debtpc_{it-1} + \gamma_1 F.Mayor_{it} + \gamma_2 F.Councillors_{it} + \gamma_3 F.Councillors_{it}^2 + \beta_1 Balance_{it} + \beta_2 Autonomy_{it} + \beta_3 Density_{it} + \beta_4 Dependents_{it} + \beta_5 Unemployment_{it} + \beta_6 Right_{it} + \beta_7 Election_{it} + \beta_8 Pre.Election_{it} + \eta_i + \varepsilon_{it} \quad \textbf{(2)}$$

### 4.3. Technique of analysis

Model 1 is estimated using the two-step system estimator by Arellano and Bover (1995). This estimator allows us to control endogeneity, as well as heteroscedasticity and autocorrelation problems (Arellano and Bond, 1991). After several test analyses[3], these

[3] Heteroscedasticity and autocorrelation have been checked using the Breusch–Pagan and Wooldridge tests, whose p-values lead us to reject the null hypotheses of homoscedastic and no-serially correlated errors at a 95% confidence level. Endogeneity problems also arise in Model 1 because it is autoregressive of order 1. The results could be additionally controlled by other factors (e.g., population density, income, tourism and migration, etc.). These have been omitted because they are correlated with other control variables, and they would introduce multicollinearity (Wooldridge, 2010).

three problems appear in Model 1. Although other estimators may correct heteroscedasticity and serial correlation (e.g., panel-corrected standard errors or feasible generalised least squares), Arellano and Bover's (1995) estimator also overcomes endogeneity. It is an instrumental variable (IV) estimator that uses the lagged values of the right-hand-side variables of the model as instruments. These instruments are uncorrelated with the error terms (Arellano and Bond, 1991), and they contain information about the current value of the variable since there is frequently a delay between deciding and acting (Pindado and Requejo, 2015). In contrast, it is difficult to prove that the external instruments used by the traditional IV estimator (instrumental variables and two-stage least squares) are uncorrelated with errors and contain enough information to represent endogenous variables (Pindado and Requejo, 2015). Instrument validity is checked through two tests: (i) the Arellano-Bond test for AR(2) in first differences is the test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null hypothesis of no serial correlation between the error terms; and (ii) the Hansen test of over-identification restrictions is the test for the validity of the over-identifying restrictions for the GMM estimator, asymptotically distributed as chi2, under the null hypothesis that the over-identifying restrictions are valid.

## 5. RESULTS

### 5.1. Descriptive analysis

Table 1 shows some descriptive statistics of all the variables that have been previously described. Regarding public debt, *Debtpc* has a mean value of 610.39, which is the average amount of debt per capita. However, the standard deviation is quite large because there are significant differences among the municipalities in the sample. The most indebted municipality is Jaén that shows the maximum value (4.266,54€ per capita in

2020). The level of public debt increased a lot between 2011 and 2014, as we can see in Figure 1. Since 2014, the level of indebtedness has been constantly reduced and, in 2020, we can see a lower level of debt than there was in 2008.

<Insert Table 1 about here>

<Insert Figure 1 about here>

Regarding the two independent variables (*F.Mayor* and *F.Councillors*), the mean value of the former suggests that in about 25% of the observations in the sample, a woman is leading the government over the whole period (2008-2020). Nevertheless, analysing this percentage year by year (see Figure 2), we can see that women's participation has increased in recent years. In the last elections included in the period under study, 43% of LGs were governed by a woman. The number of female councillors (*F.Councillors*) has also increased, although to a lesser extent than female mayors (from 41.85% to 45.81%).

<Insert Figure 2 about here>

The descriptive statistics of the rest of the variables in Model 1 can also be seen in Table 1, while Table 2 shows the bivariate correlations among all the variables. In general, the correlation coefficients of the independent/control variables are relatively low, suggesting there are no multicollinearity problems in Model 1.

<Insert Table 2 about here>

### 5.2. Explanatory analysis

Tables 3 shows the empirical results of Model 1. At the bottom of the Table, we can find the Arellano-Bond test for AR(2) in first differences and the Hansen test of over-identification restrictions, which both check instrument validity. The p-values do not allow the rejection of the null hypotheses of (i) no serial correlation between the error

terms in the case of the first test and (ii) the over-identifying restrictions being valid in the case of the Hansen test. Thus, the instruments used are valid.

The variable *F.Mayor* negatively impacts on *Debtpc* in all equations, which is according to the expected effect that was initially proposed in the hypothesis H1, suggesting that the level of public debt is lower in municipalities governed by a female mayor. This is contrary to results obtained by Balaguer-Coll and Ivanova-Toneva (2019), who used a smaller sample that included only town councils from the Valencian Community for the year 2015. Our findings expand their results, considering a larger sample of the whole country and spanning the period of analysis between 2008 and 2020.

Regarding the second hypothesis, the effect of *F.Councillors* is positive, but $F.Councillors^2$ negatively impacts on *Debtpc*. This suggest that there is an inverted U-shaped relationship between the number of female councillors and the level of indebtedness of Spanish LGs. Figure 3 shows this relationship. This means that if the number of women in the council is relatively low, the level of public debt is relatively high. The expected effect of women in reducing public debt could be seen only when the proportion of female councillors is relatively high. Concretely, considering equation (2), the change in debt when the number of female councillors changes as well is represented as: $\partial Debtpc / \partial F.Councillors = \gamma_2 + 2 * \gamma_3 * F.Councillors$ (*ceteris paribus*). From Table 3, we know the mentioned coefficients, so: $\partial Debtpc / \partial F.Councillors = 0.0538 + 2 * (-0.0613) * F.Councillors$. The maximum value of this inverted parabola could be known as follows: $0.0538 - 0.1226 * F.Councillors = 0$. The result of this equation is $F.Councillors = 0.4388$. This means that the level of indebtedness begins reducing as the proportion of women in LGs is, at least, 43.88%.

This non-linear relationship may be explained by the critical mass theory (Dahlerup, 1988) which suggests that any minority group can influence the rest of the group when

there is a tilted (20-40% minority) or balanced (40-60% minority) ratio. Public administrations have been historically male dominated (Mastracci and Bowman 2015), so, women should ensure their power (at least in numbers) to make themselves heard, growing from a few token individuals into a considerable minority (Dahlerup 1988). In case the number of women is relatively low, voice, ideas and intentions of female members could be drowned out by their male counterparts, and accordingly, the expected effects (in reducing public debt, in this case) cannot be seen.

These results are according to the hypothesis H2, which suggests that the presence of women in the local council lead LGs to reduce the level of public debt; but that effect can be seen only if the number of women in relatively high. Then, the link between female participation and the use of public debt is non-linear, which may explain the ambiguity in the results previously obtained by other scholars. For instance, Balaguer-Coll and Ivanova-Toneva (2019) found that debt levels tend to be higher in LGs with a female mayor, but the results of Guillamón et al. (2011), Gras et al. (2014) and Brusca et al. (2015) were not statistically relevant. Thus, our findings highlight the relevance of considering a non-linear relationship in analysing the role of female participation in organisations, like Cuadrado-Ballesteros et al. (2021), and Ríos et al. (2022), who found a non-linear relationship between the presence of women in Spanish LGs and budget deviations and efficiency, respectively.

<Insert table 3 about here>

<Insert Figure 3 about here>

Regarding the control variables, *Balance* is negatively related to *Debtpc*, as we expected (Balaguer-Coll et al., 2016). *Autonomy* has also negative coefficients in all the equations, suggesting that higher taxes result in less indebtedness, as we expected (Guillamón et al.,

2011; Gras et al., 2014). In other words, if governments obtain enough resources through taxes, they use external financing resources, like public debt, less.

*Density* is not statistically relevant, but the variable *Dependents* is negatively related with *Debtpc*, which suggests that municipalities with larger dependent populations (below 15 and over 65 years old) show lower levels of indebtedness per capita. This result is contrary to what we expected, but it is consistent with the findings obtained by Balaguer-Coll and Ivanova-Toneva (2019) and Cabaleiro-Casal and Buch-Gómez (2021). Our results indicate that these groups of citizens do not pressure governments to provide a greater number of public services, at least at the local level. It is possible that the majority of the services these citizens require are provided by the central and regional governments in Spain, like education, social services, health services, etc. Therefore, LGs are less pressured by these groups. The effect of *Unemployment* is significant and positive, which suggests that municipalities with higher unemployment rates are more indebted (Cabaleiro-Casal and Buch-Gómez, 2021).

Political ideology shows positive coefficients in all the equations. This suggests that municipalities governed by right-wing parties have higher levels of indebtedness. These findings support the evidence presented by Gras et al. (2014), but it is contrary to that of other authors like Guillamón et al. (2011) and Prado-Lorenzo et al. (2014), who find that conservative governments tend to be indebted to a lesser extent than governments run by central or left-wing parties. The variable *Election* and *Pre.election* are also statistically relevant, and they are positively related with *Debtpc* in all the equations. These findings suggest that debt levels increase as elections approach, supporting previous findings on opportunistic political budget cycles in Spanish LGs (Prado-Lorenzo et al., 2014).

## 6. ROBUSTNESS CHECKING ANALYSES

To check the robustness of previous findings, this study carries out three additional analyses. The first one changes the dependent variable of Model 1. Although the level of public debt per capita (*Debtpc*) is the most common way to represent indebtedness, García-Sánchez et al. (2011) used another indicator for the cost of spending increases passed on to future generations of voters. This indicator is the ratio of total public debt to total current revenue; here called *Debt.Rev*. Navarro-Galera et al. (2017) and Balaguer-Coll and Ivanova-Toneva (2021) have also considered this ratio.

Then, equation (2) has been estimated again, considering a new dependent variable (*Debt.Rev*). The results in Table 4 are very similar for the other dependent variable and are according to the two proposed hypotheses. That is, *F.Mayor* negatively impacts on *Debt.Rev*, which means that LGs with a female mayor tend to be less indebted than LGs with a male mayor. Again, the percentage of female councillors is relevant in explaining levels of public indebtedness, and the impact is non-linear. *F.Councillors* positively impacts on *Debt.Rev*, while *F.Councillors2* has a negative coefficient. This suggests (once again) the existence of a U-shaped relationship between the number of female councillors and levels of indebtedness in Spanish LGs (see Figure 4).

<Insert table 4 about here>

The second and third analyses focused on the economic and political contexts that may moderate the results previously found. Firstly, we check if both proposed hypotheses may be moderated by the economic crisis that began in 2008 and hardly affected Spain until 2013. To do that, we use the difference-in-differences estimation method, which allows estimating the average treatment effect on a "treated" group. This method computes the difference of the mean outcome (level of indebtedness) for the treatment (female members of the council) and the control groups (male members of the council) before and after the treatment (economic crisis). This technique eliminates time-invariant

unobservable group characteristics that confound the average treatment effect, as well as the time-varying confounders that may affect the treatment group (Blundell and Dias, 2009; Donald and Lang, 2007; Lechner, 2011; Wing et al., 2018).

Table 5 shows the results of the model where the outcome of interest is *Debtpc* and treated observations are represented by variables *F.Mayor*Crisis* and *F.Councillors.Quota*Crisis*. The former is the interaction between the dummy variable *F.Mayor* that have been already previously used and *Crisis*, which takes the value of 1 in years between 2008-2012 (inclusive) and 0 otherwise. The latter is the interaction between that variable called *Crisis* and *F.Councillors.Quota*, which is 1 if the proportion of women in the LG is higher than 43.88%, which is the inflexion point derived from the initial analyses (Table 3).

<Insert table 5 about here>

The estimated coefficient is positive and statistically relevant in the first equation, suggesting that, during the crisis period, municipalities governed by women showed a higher level of debt than those governed by men. Similarly, the positive coefficient in second equation suggests that the level of indebtedness is greater in LGs that have a proportion of female councillors higher than 43.88% during the crisis period relative to LGs that have a percentage of women lower than 43.88%.

Connecting these findings with previous ones, we may conclude that the two proposed hypotheses, which represent the effect of women's participation in LGs, are moderated by the macroeconomic cycle. That is, the higher the proportion of women in LGs, the lower the level of indebtedness during a good macroeconomic cycle; but we found the opposite effect during a period of economic crisis. In crisis, LGs with a high proportion of women tend to use public debt to a greater extent. A possible conclusion that may be

extracted from this result is that, in times of crisis, women in LGs tend to use public debt to finance public services, instead of other fiscal policies, like increasing taxes or reducing expenditure (public services). Nevertheless, this conclusion needs further investigation.

The last robustness analysis considers the strategic debt cycles. The seminar study of Baber and Sen (1986) suggested that public debt is used as a mechanism for influencing electoral results, by increasing public spending without raising taxes. They showed that governments tend to increase the level of public debt in election years and one year prior to an election, while they found a reduction of public debt in the two years after an election. García-Sánchez et al. (2011) empirically evidenced that fact in Spanish LGs.

In the period of analysis three elections have been held, in 2011, 2015 and 2019. Then, we created the dummy *Electoral.Cycle* that takes the value of 1 in 2010-2011, 2014-2015, and 2018-2019, and 0 otherwise. It was additionally interacted with *F.Mayor* and *F.Councillors.Quota,* which have been previously described. Difference-in-differences method was used again, considering *Debtpc* as the outcome of interest, and treated observations are represented by variable *F.Mayor*Electional.Cycle* and *F.Councillors.Quota*Electional.Cycle*. Results are showed in Table 6. Both coefficients are not statistically relevant, so we may conclude that the electoral cycle does not moderate the two hypotheses that this study initially proposed.

<Insert table 6 about here>

## 7. CONCLUSIONS

In recent years, there has been a proliferation of research analysing the role of women in public management. The vast majority of studies are focussed on the role of women in spending decisions; but there are other decisions that may affect public finances, like the use of public debt, that have been hardly analysed before by taken a gender approach.

This is particularly relevant at the local level because municipalities have suffered the consequences of recent financial crises to a greater extent than other levels of government. LGs are the closest administration to citizens, and they must provide a large number of essential public services. However, the resources that can be used to provide these services are limited, and municipalities usually have to resort to public debt, which have led LGs to have high levels of indebtedness (Guillamón et al., 2011; Bastida et al., 2014; Benito et al., 2015).

Given the above, this paper aims to analyse debt levels in Spanish municipalities, by taking a gender approach. Several empirical analyses have been done by using a sample of Spanish LGs during the period 2008-2020. Findings suggest that municipalities that are leaded by a female mayor tend to show lower levels of public debt. In addition, empirical results reveal an inverted U-shaped relationship between the proportion of female councillors and the level of public debt. This means that the higher the proportion of female councillors, the lower the level of indebtedness, but this positive effect appears only if the number of female councillors is relatively high. According to the critical mass theory, the minority group (women in this case) can influence the rest of the council members only when they grow from a few token individuals into a considerable minority (Dahlerup 1988). If this is not the case, the interests and opinions of the few women could be overshadowed by their male counterparts, who have different opinions according to the social role theory.

Our findings suggest that the decisions taken by members of LGs depend on their personal characteristics, like their gender, which contributes to support the upper echelons theory (March and Simon, 1958). Anessi-Pessina et al. (2016) concluded that gender differences may result in diverse approaches to how much and what to spend public funds on; our results expand this evidence to the use of public debt as well. These gender differences

may be explained by the existence of gender stereotypes, as the social role theory proposes (Eagly and Wood, 2012). According to this theory, women are expected to have greater empathy and concern for others (Eagly and Johannesen-Schmidt, 2001), a greater sense of community, and a longer-term outlook (Hamidullah et al., 2015). So, the effect that we have found may be due to these personal characteristics that lead women to take decisions that reduce the use of public debt, taking care of future generations. It is according to the main conclusion of Park (2020), who noted that the presence of women positively influences the performance of public administrations.

We consider that the findings of this study could have implications for policy makers, regulators, and other public officials. Thus, gender should be viewed as an integral part of public management restructuring processes (Davies and Thomas, 2000). Encouraging women to participate in governance is an important step toward achieving gender equality and inclusive decision-making processes. Beyond moral obligations, actions and legislation should be implemented to further promote women's participation in public administrations because this could improve public finances. Thus, gender quotas are essential (Dahlerup, 2006). We are not talking about a specific number or proportion; something more is needed, like specifications of quota provisions that match the electoral system in question, rules about the order of candidates on electoral lists, and sanctions for not complying with quota provisions (Dahlerup & Freidenvall, 2005). Otherwise, gender quotas will be merely symbolic.

Women could also be encouraged to access political education and leadership training programs. These initiatives can improve their knowledge, skills and confidence to participate in politics and governance effectively. In addition, efforts should be made to remove cultural barriers to women's political participation. In particular, traditional gender roles and prejudices that limit women's access to political office and decision-

making processes should be challenged. In this sense, public awareness campaigns could be conducted that highlight the importance of women's participation in governance and the benefits it brings to society. These campaigns can challenge stereotypes, promote positive role models and inspire more women to participate in politics. In the same way, the creation of networks that allow women to build relationships, exchange knowledge and obtain the support of other women in government could be encouraged. Celebrate and recognize the achievements of women leaders in governance may also inspire other women to pursue similar paths. Finally, to encourage women's participation in political life, it is necessary to create an environment that allows women to reconcile their personal and professional responsibilities.

The main limitation of this study is the use of a sample of municipalities with specific characteristics, that is, only Spanish and only municipalities with more than 50,000 inhabitants. Thus, extrapolations to other contexts should be done cautiously. Accordingly, future studies could replicate this analysis in other countries, with different socioeconomic and institutional characteristics, as well as checking the role of women in smaller municipalities. Spain is one of the countries with the highest levels of women's participation, as it is Sweden, Finland, France, and Belgium (Margaras, 2019), so other contexts should be considered, where female representation in LGs is lower, like it is the case of Central European countries (Margaras, 2019).

Another idea for future studies is considering the interaction between the gender of the mayor and the gender of the councillors. Even when women break through the *glass ceiling* to attain top positions (like the office of "mayor"), the gender inequalities remain; just because women are in leadership positions does not mean they exercise their authority (Alkadry et al., 2019). They need the support of other members "at the table" (the

councillors in this case), so future studies may analyse if the two proposed hypothesis here are interconnected.

Finally, Mendelberg and Karpowitz (2016) and Karpowitz et al. (2015) suggest that the influence of the number of women and their authority can be affected by formal rules and informal norms. In fact, some rules can help women exercise voice and influence, which builds their authority and allows them to exercise leadership, beyond the number of female counterparts (Mendelberg and Karpowitz, 2016). So, future studies may consider moderating factors that characterise the institutional context of analysis.

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| Table 1. Description of Variables | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Definition** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| *Debtpc* | Total nominal value of the gross obligations pending payment at the end of the year, except for the obligations represented by financial assets (per capita terms). | 610.39 | 567.35 | 0.00 | 4266.54 |
| *F.Mayor* | Dummy that takes the value of 1 if the mayor is a woman and 0 otherwise. | 0.25 | 0.43 | 0.00 | 1.00 |
| *F.Councillors* | Percentage of female members on the municipal council. | 43.14 | 5.62 | 25.93 | 64.00 |
| *Balance* | Total revenue minus total expenses (per capita) | 62.84 | 135.93 | -472.36 | 1277.21 |
| *Autonomy* | Ratio of total taxes (direct and indirect) and public fees to total current revenue. | 0.66 | 0.09 | 0.32 | 0.89 |
| *Density* | Population density (inhabitants per km2) | 3194.43 | 6417.14 | 37.80 | 61636.37 |
| *Dependents* | Percentage of population over 65 and under 16 years old. | 32.33 | 3.03 | 20.54 | 40.11 |
| *Unemployment* | Unemployment rate. | 17.95 | 7.11 | 3.99 | 43.48 |
| *Right* | Dummy that takes the value of 1 for right-wing governments and 0 otherwise. | 0.51 | 0.50 | 0.00 | 1.00 |
| *Election* | Dummy that takes the value of 1 for years when an election has happened and 0 otherwise. | 0.23 | 0.42 | 0.00 | 1.00 |
| *Pre_election* | Dummy that takes the value of 1 for years before an election has happened and 0 otherwise. | 0.23 | 0.42 | 0.00 | 1.00 |

| **Table 2. Bivariate correlations** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Debtpc* | *F.Mayor* | *F.Councillors* | *Balance* | *Autonomy* | *Density* | *Dependents* | *Unemployment* | *Right* | *Election* | *Pre.election* |
| *Debtpc* | 1 | | | | | | | | | | |
| *F.Mayor* | -0.0462* | 1 | | | | | | | | | |
| *F.Councillors* | -0.0642** | 0.1245*** | 1 | | | | | | | | |
| *Balance* | -0.0136 | 0.0192 | 0.0845*** | 1 | | | | | | | |
| *Autonomy* | 0.0565* | 0.0413† | -0.0145 | 0.1101*** | 1 | | | | | | |
| *Density* | -0.0508* | 0.0016 | -0.0119 | -0.0491† | -0.079** | 1 | | | | | |
| *Dependents* | -0.0898*** | 0.0993*** | 0.1151*** | 0.0682** | 0.02 | 0.032 | 1 | | | | |
| *Unemployment* | 0.1536*** | -0.0117 | -0.0545* | 0.0295 | -0.0872*** | -0.0013 | -0.2675*** | 1 | | | |
| *Rigth* | 0.0904*** | -0.0223 | -0.0717** | -0.0002 | 0.1509*** | 0.0408† | -0.1167*** | 0.1682*** | 1 | | |
| *Election* | -0.0281 | 0.03 | 0.0749** | -0.0265 | 0.0213 | 0.0011 | 0.1128*** | -0.0549* | -0.0478* | 1 | |
| *Pre_election* | 0.0087 | -0.018 | -0.0538* | 0.0148 | 0.0426† | -0.0001 | -0.0088 | 0.0112 | 0.0480* | -0.3000*** | 1 |
| **Notes**: †, *, ** and *** refer to statistical relevance at 90%, 95%, 99% and 99.9%. | | | | | | | | | | | |

| **Table 3. Empirical results for Model 1** | | | | | | |
|---|---|---|---|---|---|---|
| | **Equation 1** | | **Equation 2** | | **Equation 3** | |
| | **Coef.** | **Std. Err.** | **Coef.** | **Std. Err.** | **Coef.** | **Std. Err.** |
| *Debtpc* $_{t-1}$ | 1.1444*** | 0.0023 | 1.1350*** | 0.0020 | 1.1449*** | 0.0026 |
| *F.Mayor* | -0.0276*** | 0.0057 | -0.0267*** | 0.0056 | -0.0257*** | 0.0063 |
| *F.Councillors* | | | 0.0006† | 0.0004 | 0.0538*** | 0.0084 |
| *F.Councillors2* | | | | | -0.0613*** | 0.0096 |
| *Balance* | -0.2905*** | 0.0073 | -0.2964*** | 0.0075 | -0.2890*** | 0.0079 |
| *Autonomy* | -1.2052*** | 0.0552 | -1.2728*** | 0.0547 | -1.1682*** | 0.0449 |
| *Density* | 0.0011 | 0.0029 | -0.0001 | 0.0027 | 0.0012 | 0.0030 |
| *Dependents* | -0.0204*** | 0.0011 | -0.0196*** | 0.0008 | -0.0198*** | 0.0011 |
| *Unemployment* | 0.0022*** | 0.0004 | 0.0023*** | 0.0003 | 0.0026*** | 0.0003 |
| *Right* | 0.0872*** | 0.0053 | 0.0832*** | 0.0034 | 0.0854*** | 0.0055 |
| *Election* | 0.0342*** | 0.0029 | 0.0318*** | 0.0012 | 0.0305*** | 0.0029 |
| *Pre_election* | 0.0718*** | 0.0037 | 0.0710*** | 0.0026 | 0.0728*** | 0.0039 |
| _cons | 0.4716*** | 0.0439 | 0.5259*** | 0.0471 | -0.7451*** | 0.1662 |
| Arellano-Bond test for AR(2) in first differences | Pr > z = 0.672 | | Pr > z = 0.672 | | Pr > z = 0.688 | |
| Hansen test of overid. restrictions | Pr > chi2 = 0.311 | | Pr > chi2 = 0.830 | | Pr > chi2 = 0.289 | |
| **Notes**:<br>†, *, ** and *** refer to statistical relevance at 90%, 95%, 99% and 99.9%<br>In all equations, dependent variable is *Debtpc* | | | | | | |

| **Table 4. Robustness checking I. Changing dependent variable** | | | | | | |
|---|---|---|---|---|---|---|
| | **Equation 1** | | **Equation 2** | | **Equation 3** | |
| | **Coef.** | **Std. Err.** | **Coef.** | **Std. Err.** | **Coef.** | **Std. Err.** |
| *Debt.Rev* $_{t-1}$ | 0.9938*** | 0.0028 | 0.9974*** | 0.0018 | 0.9930*** | 0.0028 |
| *F.Mayor* | -0.0094*** | 0.0022 | -0.0080* | 0.0025 | -0.0088*** | 0.0022 |
| *F.Councillors* | | | -0.0002 | 0.0002 | 0.0088** | 0.0026 |
| *F.Councillors2* | | | | | -0.1042** | 0.0295 |
| *Balance* | -0.0983*** | 0.0049 | -0.1051*** | 0.0026 | -0.0970*** | 0.0048 |
| *Autonomy* | -0.1058*** | 0.0276 | -0.1409*** | 0.0250 | -0.1091*** | 0.0273 |
| *Density* | 0.0028** | 0.0009 | 0.0038*** | 0.0008 | 0.0025** | 0.0009 |
| *Dependents* | -0.0084*** | 0.0003 | -0.0085*** | 0.0003 | -0.0084*** | 0.0003 |
| *Unemployment* | 0.0040*** | 0.0001 | 0.0041*** | 0.0001 | 0.0040*** | 0.0001 |
| *Right* | 0.0054** | 0.0018 | 0.0030† | 0.0017 | 0.0044** | 0.0017 |
| *Election* | 0.0401*** | 0.0013 | 0.0418*** | 0.0008 | 0.0394*** | 0.0014 |
| *Pre_election* | 0.0609*** | 0.0012 | 0.0631*** | 0.0011 | 0.0606*** | 0.0013 |
| _cons | 0.1411*** | 0.0260 | 0.1179*** | 0.0219 | -0.0446 | 0.0651 |
| Arellano-Bond test for AR(2) in first differences | Pr > z = 0.058 | | Pr > z = 0.056 | | Pr > z = 0.061 | |
| Hansen test of overid. restrictions | Pr > chi2 = 0.243 | | Pr > chi2 = 0.690 | | Pr > chi2 = 0.262 | |
| **Notes**:<br>†, *, ** and *** refer to statistical relevance at 90%, 95%, 99% and 99.9%<br>In all equations, dependent variable is *Debt.Rev* | | | | | | |

| **Table 5. Robustness checking II. Controlling for period of crisis** | | | | |
|---|---|---|---|---|
| | **Equation 1** | | **Equation 2** | |
| | **Coef.** | **Robust Std. Err.** | **Coef.** | **Robust Std. Err.** |
| ATET<br>*F.Mayor*Crisis*<br>(1 vs 0) | 0.1580* | 0.0708 | | |
| ATET<br>*F.Councillors.Point*Crisis*<br>(1 vs 0) | | | 0.0395† | 1.7700 |
| **Notes**:<br>†, *, ** and *** refer to statistical relevance at 90%, 95%, 99% and 99.9%<br>In all equations, dependent variable is *Debtpc*<br>In all equations, control variables are *Debtpc* $_{t-1,}$ *Balance, Autonomy, Density, Dependents, Unemployment, Right, Election, Pre_election*<br>ATET estimate adjusted for covariates, panel effects, and time effects. | | | | |

| **Table 6. Robustness checking III. Controlling for electoral cycle** | | | | |
|---|---|---|---|---|
| | **Equation 1** | | **Equation 2** | |
| | **Coef.** | **Robust Std. Err.** | **Coef.** | **Robust Std. Err.** |
| ATET<br>*F.Mayor*Crisis*<br>(1 vs 0) | 0.0313 | 0.0527 | | |
| ATET<br>*F.Councillors.Point*Crisis*<br>(1 vs 0) | | | -0.0603 | 0.0385 |
| **Notes**:<br>†, *, ** and *** refer to statistical relevance at 90%, 95%, 99% and 99.9%<br>In all equations, dependent variable is *Debtpc*<br>In all equations, control variables are *Debtpc* $_{t-1,}$ *Balance, Autonomy, Density, Dependents, Unemployment, Right, Election, Pre_election*<br>ATET estimate adjusted for covariates, panel effects, and time effects. | | | | |

**Figure 1. Evolution of public debt in Spanish LGs**

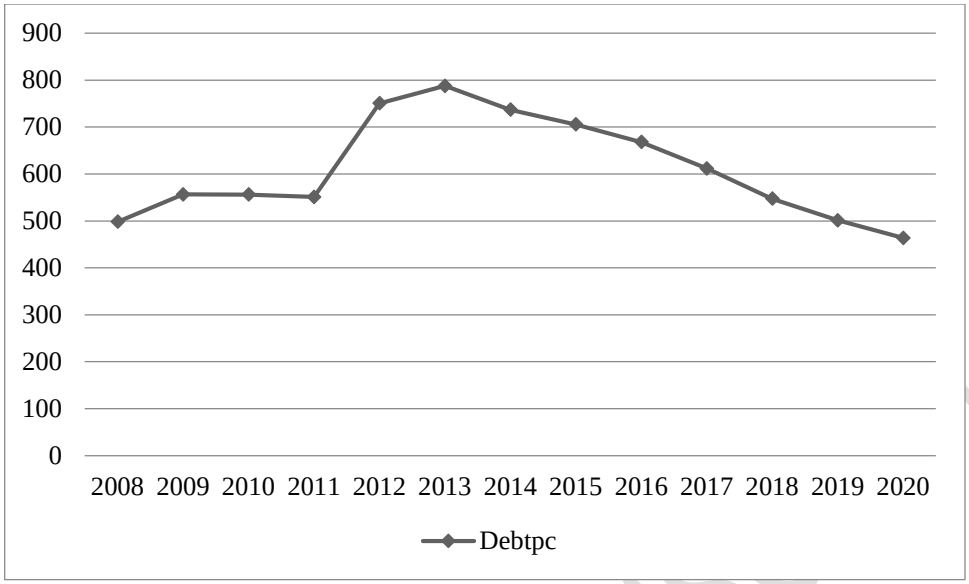

**Figure 2. Evolution of women's leadership in Spanish LGs**

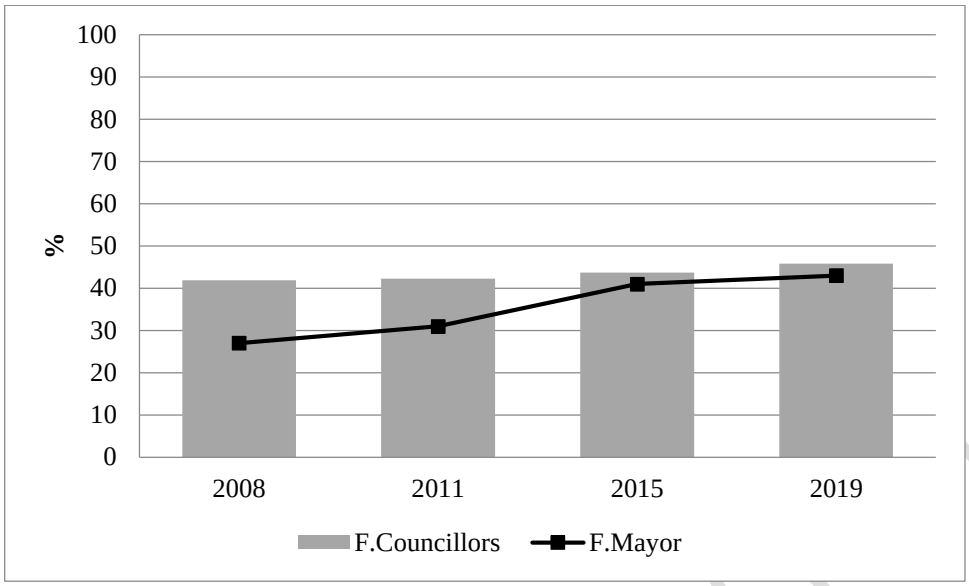

**Figure 3. Relationship between debt and women in LGs**