



**LOCAL GOVERNMENT DEBT IN SPAIN: SPATIAL EFFECTS AND  
BUDGETARY STABILITY**

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*A mi marido Jorge*



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## **TABLE OF CONTENTS**

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|  |           |
|--|-----------|
| <b>TABLE OF CONTENTS</b>   | <b>9</b>  |
| <b>LIST OF TABLES</b>  | <b>13</b> |
| <b>LIST OF FIGURES</b>   | <b>13</b> |
| <b>ABSTRACT</b>  | <b>15</b> |
| <b>RESUMEN</b>   | <b>19</b> |
| <b>INTRODUCTION</b>  | <b>23</b> |
| <br>   |           |
| <b>CHAPTER 1: Debt in Spanish Public Administrations</b>                     | <b>29</b> |
| 1. Introduction  | 31        |
| 2. Research based on analysis of the level of debt in public administrations | 32        |
| 3. Adaptation of Spanish legislation to European requirements                | 37        |
| 4. Analysis of the public debt according to the excessive deficit protocol   | 38        |
| 5. Conclusions   | 43        |
| <br>   |           |
| <b>CHAPTER 2: The importance of spatial effects in municipal debt</b>        | <b>45</b> |
| 1. Introduction  | 47        |
| 2. Previous literature and hypotheses  | 48        |
| 2.1 A review of the literature on local debt                                 | 48        |
| 2.2. Spatial effects in the financial situation of territorial authorities   | 49        |
| 2.3. Spatial effects in Spanish municipal debt                               | 50        |
| 2.3.1 Budget variables   | 51        |
| 2.3.2. Socio-economic variables  | 54        |
| 2.3.3. Political variables   | 56        |
| 3. Data and specification of the model                                       | 58        |

|  |            |
|--|------------|
| 3.1. Sample and definition of variables  | 58         |
| 3.2. Model specification   | 61         |
| 4. Results   | 65         |
| 5. Conclusion and discussion   | 69         |
| <br>   |            |
| <b>CHAPTER 3: Budgetary stability and financial sustainability from a gender perspective</b> | <b>73</b>  |
| 1. Introduction  | 75         |
| 2. Literature review   | 76         |
| 3. Determinants of compliance with the Law limiting local debt in Spain                      | 77         |
| 3.1. Political variables   | 77         |
| 3.2. Socio-economic/control variables  | 83         |
| 4. Data and specification of the model   | 85         |
| 4.1. Sample and definition of variable   | 85         |
| 4.2. Model specification   | 88         |
| 5. Results   | 91         |
| 6. Conclusion  | 96         |
| <br>   |            |
| <b>CONCLUSIONS</b>   | <b>99</b>  |
| <b>CONCLUSIONES</b>  | <b>105</b> |
| <b>REFERENCES</b>  | <b>111</b> |



## **LIST OF TABLES**

### **CHAPTER 1**

|   |    |
|---|----|
| Table 1.1. Studies of local and national public debt in various countries       | 33 |
| Table 1.2. Breakdown of public debt according to the Excessive Deficit Protocol | 40 |

### **CHAPTER 2**

|  |    |
|--|----|
| Table 2.1. Definition of the variables   | 52 |
| Table 2.2. Distribution of municipalities and local debt (year 2015)                 | 59 |
| Table 2.3. Descriptive statistics (2015)   | 60 |
| Table 2.4. Frequency of variables APP, GEN and SIGN in relation to local debt (2015) | 61 |
| Table 2.5. Spatial interactions of municipality debts                                | 63 |

### **CHAPTER 3**

|  |    |
|--|----|
| Table 3.1. Description of variables  | 87 |
| Table 3.2. Descriptive statistics  | 90 |
| Table 3.3. Frequency of variables GEN, EGEN and SIGN in relation to global limit | 91 |
| Table 3.4. Models and marginal effects   | 92 |
| Table 3.5. Interaction effects in models   | 95 |

## **LIST OF FIGURES**

|   |    |
|---|----|
| Figure 1. Evolution of public debt as a percentage of GDP in the different Spanish Public Administrations according to the Excessive Deficit Protocol | 42 |
|---|----|



## **ABSTRACT**

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This doctoral thesis analyses a number of issues within the domain of local administration; issues such as local indebtedness, spatial effect on local debt and the law of financial sustainability and budgetary stability. The thesis is presented in three sections. After a brief introduction, the first section examines the indebtedness of Spanish town councils during the period 1997-2017, and the main legislative modifications introduced at both European and national level. A review of the main contributions made by the relevant literature on public debt, taken from different approaches and perspectives, is also included. The overall conclusion reached is that during the period prior to the onset of the economic crisis the level of indebtedness remained stable at different levels of Public Administration, with a clear downward trend. However, from 2008 onwards, the level of debt showed a sharp increase in growth until the Budget Stability Law of 2012 was imposed. This managed to slow down the growth of state and regional debt, thus achieving a downward trend in local debt.

The second section of the thesis studies the local government debt, taking into account the presence of spatial interactions between neighbouring municipalities. For this, a sample of 527 municipalities of the Valencian Community is used and the spatial models S2SLS and Spatial lag are applied. The main results obtained show the existence of spatial autocorrelation in the outstanding debt among municipalities. The gender of the presiding mayor, subsidy index and transfers received and the average payment period are all variables which show a direct effect on outstanding debt. Furthermore, the variables index of net savings, the non-working population, local income and political strength have a direct effect on the municipality's debt and an indirect spatial effect on the debt of neighbouring municipalities.

The third section aims to analyse whether the gender of the mayor and the rest of the members of the municipal council can affect compliance with the principles of budgetary stability and financial sustainability, as outlined in Organic Law 2/2012. The main results indicate that in local Spanish governments the greater presence of female mayors in local governance contributes to a better financial situation. In particular, it can be seen that a higher proportion of women working as councillors increases the probability of complying with budget stability, financial sustainability and the legal limit of indebtedness. Therefore, the Law on Effective Equality of Women and Men, which requires a minimum percentage of female participation in municipal electoral lists, favours compliance with the Budget Stability and Financial Sustainability Law.



## **RESUMEN**

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La presente tesis doctoral analiza diferentes temas de relevancia en el ámbito de las administraciones locales, tales como el endeudamiento local, los efectos espaciales en la deuda local y la ley de sostenibilidad financiera y la estabilidad presupuestaria. La tesis está compuesta por tres capítulos. Tras una breve instrucción, en el primero se examina el endeudamiento en los ayuntamientos españoles durante el periodo de 1997–2017, así como las principales modificaciones legislativas producidas a nivel europeo y nacional. También se estudian las principales aportaciones de la literatura que analizan la deuda pública, observados desde diversos enfoques y perspectivas. Como conclusión principal se obtiene que durante el periodo previo de la crisis económica el nivel de endeudamiento se mantiene estable con una clara tendencia a la baja, en los diferentes niveles de las Administraciones Públicas. Es a partir del año 2008 cuando el nivel de deuda presenta un crecimiento elevado, hasta la entrada en vigor de la Ley de Estabilidad Presupuestaria del año 2012 que consigue suavizar el crecimiento de la deuda estatal y autonómica, logrando así una tendencia a la baja para la deuda local.

El segundo capítulo de la tesis estudia la deuda de los gobiernos locales teniendo en cuenta la presencia de interacciones espaciales entre los municipios vecinos. Para ello se utiliza una muestra de 527 municipios de la Comunidad Valenciana y se aplican los modelos espaciales S2SLS y Spatial lag. Los principales resultados obtenidos muestran la existencia de autocorrelación espacial en la deuda viva entre los municipios. Las variables género del alcalde, índice de subvenciones y transferencias recibidas y el periodo medio de pago presentan efectos directos sobre la deuda viva. Mientras que, el índice de ahorro neto, la población no activa, la renta local y la fortaleza política tienen efectos directos en la deuda del municipio y efectos espaciales indirectos en la deuda de los municipios vecinos.

El tercer capítulo tiene como objetivo analizar si el género del alcalde y el resto de miembros del consejo municipal pueden afectar el cumplimiento de los principios de estabilidad presupuestaria y sostenibilidad financiera, contenidos en la Ley Orgánica 2/2012. Los principales resultados apuntan que en los gobiernos locales españoles la mayor presencia de alcaldesas en la gobernabilidad local contribuye a mejorar la situación financiera de la entidad local. En particular, se observa que el trabajo de las mujeres con una alta proporción de concejalas mejora la probabilidad de cumplir con la estabilidad presupuestaria, la sostenibilidad financiera y el límite legal del endeudamiento. Por lo tanto, la Ley sobre la igualdad efectiva de mujeres y hombres, que exige un porcentaje mínimo de participación femenina en las listas

electorales municipales, favorece el cumplimiento de la Ley de estabilidad presupuestaria y sostenibilidad financiera.

## **INTRODUCTION**

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Public debt and its constant growth has been a serious issue on a global, European and national level. In Spain, a country with a decentralized administrative structure, the level of local public debt has been of great concern to government leaders and legislators due to its growth following the onset of the economic recession in 2008. To deal with this, legislators and managers have taken a series of measures aimed at limiting the debt incurred as well as measures to stabilize financial sustainability and budget stability. Thus, the *first section* of this doctoral thesis focuses on the study of indebtedness in Spanish public administrations during the period 1995-2017. In addition, the adaptation of Spanish legislation to the requirements of the legislation set out by the European Union is analysed to demonstrate Spain's commitment to upholding EU policy and, at the same time, restoring the confidence of investors. One of the most important events at legislative level has been the reform of article 135 of the Spanish Constitution of 1978 which aims to establish the concept of budget stability and prioritize the payment of public debt and interest before any expenditure. This constitutional amendment has put in motion the elaboration of legislation focused on establishing clear and mandatory fiscal rules to achieve financial sustainability and budget stability at all administrative levels.

To achieve these objectives, the Organic Law 2/2012, of April 27, on Budgetary Stability and Financial Sustainability (LOEPSF 2012) was approved. Its main task is to achieve budgetary stability of public debt, establishing the rule of computable spending and the average period of payment to suppliers. The law also establishes clear mechanisms in the case of non-compliance by the administrations. Together with the aforementioned legislation, the Organic Law 9/2013, of December 20, was approved to control commercial debt in the public sector, developing the concept of an average payment period in order to control commercial debt at state, region and local level. This legislation is designed to direct the monetary flow from the administration to private companies with the purpose of curbing the insolvencies that occur as a consequence of defaults. The Royal Decree 635/2014 was also approved, which develops the methodology for calculating the average payment period of Public Administrations to their suppliers.

Furthermore, this section makes a comparison, from the perspective of the excessive deficit protocol (EDP), of Spanish debt with the indebtedness of the other countries of the European Union, given that this measurement is defined according to standard compulsory norms set for all member countries of the European Union.

The analysis indicates that, following Spain's entry into the European Union in 1986 until the period prior to the economic slowdown, the Spanish economy experienced significant growth which led the public sector to increase its supply of public services and, as a consequence, its capital investment. The onset of the economic and financial crisis further complicated the situation of public finances, both nationally and internationally and, as a consequence of the cost of maintaining public services and the reduction of budgetary revenues, the level of public debt increased. Given the complicated financial situation of the member states, the European Union adopted a series of mandatory guidelines in order to reverse the situation. With the approval of the LOEPSF 2012, Spain reached a turning point in the growing level of indebtedness.

In the *second section* of this doctoral thesis we analyse the existence of possible imitative behaviour in local indebtedness. The main contribution is that this study aims to go beyond the classic approach of the study of indebtedness and its determinants by analysing the inter-neighbourhood interdependencies in debt decisions. In other words, it aims to study and quantify whether an increase in the level of debt in one municipality affects the debt of its neighbouring municipalities. Another contribution that our analysis offers is the study of the effect of the average period of payment to suppliers on local indebtedness. Given its recent implementation, there are no previous studies that take this variable into account.

In the relevant literature, a number of authors highlight that local governments do not make decisions in isolation. In fact, when deciding on the management of local resources, they take into account the decisions made by their neighbouring municipalities. Research by Bastida et al. (2013b), Ermini and Santolini (2010), Foucault et al. (2008) and López et al. (2017) show the existence of similar spatial behaviours in local administration, in terms of spending, where spending levels in a municipality are influenced by spending decisions adopted by neighbouring municipalities.

To study the determinants of local debt, we focus on the spatial effect of the debt between local governments in the Valencian region for the year 2015. The results show the presence of spatial autocorrelation in the local public debt. This leads us to conclude that, in general, the gender of the mayor, the subsidies and transfers received and the average period of payment to suppliers show direct spatial effects on the debt contracted in the municipalities analysed. The net saving, the non-working population, the level of income of local residents and the political strength of

the ruling party have a direct spatial effect on the municipal debt and an indirect effect on the debt of the neighbouring municipalities.

Following on from the second section of the thesis which shows that the gender of the presiding mayor influences local debt, the *third section* looks at whether it also influences compliance with the principles of financial sustainability and budget stability implemented by the Organic Law LOEPSF (2012). As mentioned earlier, due to the economic recession that began in 2008, public administrations had to adapt their budgetary policies in terms of expenses, taxes, deficits and debt, in line with the LOEPSF (2012). Together with the major legislative changes in public finances, legislators have had to deal with the preparation of legislation on gender equality in the area of local management. As a result of the growing social need to achieve greater gender equality in all social areas, the representation of women in local government is now firmly on the national and international agenda. In Spain, legislative changes in the area of gender equality have clearly had an impact on female representation in local corporations.

In light of the approval of these laws, the third section of the thesis also analyses whether the change in the gender profile of local governments has an effect on the decision-making in local management and on the degree of compliance or the risk of breach of the principles of budgetary stability and financial sustainability outlined in the LOEPSF (2012). For this purpose, a sample is used of 1,272 Spanish municipalities that have a population of at least 3,000 inhabitants, for the period of 2013-2016. Our results show that female mayors are more likely to comply with the principles of budgetary stability and financial sustainability and with the established legal limits on debt. Another contribution of the study is based on the evidence of the effects of the Organic Law 3/2007, of March 22, for the effective equality of men and women (LOI), in the fulfilment of the three principles studied. Our main contributions indicate that female mayors show differences in the way they manage local government, compared to male mayors, since they increase the probability of compliance with the principles of budgetary stability, financial sustainability and the legal limit on indebtedness. We can also highlight that when a female mayor works with a government that complies with the percentage of gender equality established in the LOI, the probability of compliance with the aforementioned principles increases. In summary, we conclude that the Organic Law 3/2007, of March 22, for the effective equality of men and women, has positively influenced compliance with the Law of Budgetary Stability and Financial Sustainability (LOEPSF 2012).

Regarding political variables, we observed the existence of different pre-electoral strategies between male and female mayors for complying with the legal limits established in the LOEPSF. Finally, it should be noted that the presence of a conservative political ideology tends towards non-compliance of the LOEPSF. However, it is evident that the political strength of the ruling party positively affects compliance with legal limits, given that weak governments have a tendency to incur greater debt.



## **CHAPTER 1**

### **Debt in Spanish Public Administrations**

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## **1. Introduction**

In recent years, the continuing rise in Spanish public debt, aggravated by the global economic recession, has been a cause for concern for economic authorities. Repercussions of the crisis were felt at both a social level, through the loss of jobs and budget cuts, and at an economic level, with the slowdown of the economy and the increase in public debt. The complicated economic outlook and the demands for compliance with the national deficit by the EU forced the legislators to take restrictive measures on public spending and financing with debt securities with the aim of guaranteeing budgetary stability and financial sustainability of the national accounts.

Recent data published by the International Monetary Fund (IMF) revealed that 2016 had the lowest world economy growth rate since the beginning of the crisis. During the eight-year period from 2008 to 2016, developed economies suffered a general slowdown due to the complicated international financial and economic situation, while emerging economies maintained their line of gradual growth. At a European level, these circumstances translated into a decrease in revenues and an increase in public spending by member countries, and financing the resulting deficit led to an increase in public debt. However, during the first semester of 2017, world trade showed promising growth that made the IMF review its growth forecasts. In Spain, this change in trend was reflected in the reports presented by the European Central Bank with upward revisions on the GDP growth of the Spanish economy, maintaining the forecasts of a positive growth differential compared to other member countries. The forecasts of international organizations and the recent economic and legislative changes seem to indicate that Spanish public debt in the coming years will maintain a downward trend.

The main objective of this paper is to analyse Spanish public debt during the period 1995-2017. The chapter is presented in five sections. Following the introduction, the second section summarises some of the main contributions from the literature on public debt, collated from different approaches and perspectives. Next, in the third section, the main legislative changes introduced at European and national levels are reviewed. In the fourth section, Spanish public debt and its components are analysed according to the Excessive Deficit Protocol (EDP). Finally, the main conclusions of the analysis are presented.

## **2. Research based on analysis of the level of debt in public administrations**

Research covering public debt can be classified into a number of categories. Some studies analyse the determinants of debt (Balaguer et al., 2016; Benito et al., 2004; 2015, Benito and Bastida, 2004; Guillamón et al., 2011; Pérez et al., 2013; Zafra et al., 2011), while others focus on the success or failure of the legal limits of debt (Allers, 2015; Benito et al., 2015; Cabases et al., 2005; 2007 and Vila i Vila, 2011). Some analyse the relationship between electoral cycles and the use of debt (Bastida et al., 2013; Cabaleiro et al., 2014 and Nande, 2016) and others cover the relationship which may exist between the level of debt and fiscal consolidation (Andrews, 2015) or budget transparency (Ríos et al., 2016). Another category includes those that analyse the possible spatial relationships of municipalities and their consequences on debt (Borck et al., 2015 and Kopczewsk et al., 2016). Finally, studies are found on the relationship between the decentralization of services and the level of debt (Brusca et al., 2012).

With the onset of the economic slowdown that began in 2008, Spanish public finances were overstretched due to the growing demand for public benefits at a time when there were lower public revenues and limits on debt (Benito et al., 2010). One of the main consequences of this situation was an increase in public spending and a decrease in the revenues available for financing (Balaguer et al., 2016 and Pérez et al., 2013). Historically, during the period of economic boom, local debt was offset by income from urban development. But the arrival of the economic slowdown curtailed the growth of the Spanish real estate sector and this resulted in public revenues from this source of financing being reduced considerably such that, as discussed in the paper by Benito et al. (2015), municipalities were forced to contract more debt to finance capital investments.

**TABLE 1.1. Studies of local and national public debt in various countries**

|                                       | <b>Country</b> | <b>Authors</b>                                 | <b>Sample</b>                         | <b>Study period</b> | <b>Main results</b>  |
|---------------------------------------|----------------|--|---------------------------------------|---------------------|--|
| Determinants of debt                  | Spain          | Balaguer-Coll, Prior and Tortosa-Ausina (2016) | 1381 Spanish municipalities           | 2008                | Certain financial, socioeconomic and political variables influence the level of debt, although their effects differ depending on the level of debt.                                      |
|                                       |                | Benito, Vicente and Bastida (2015)             | 302 Spanish municipalities            | 2003-2011           | Urban development revenues decreased debt during the real estate boom.   |
|                                       |                | Benito, Brusca and Montesinos (2004)           | Autonomous Communities                | 1994-1999           | The Autonomous Communities that have greater powers have higher levels of debt.  |
|                                       |                | Benito and Bastida (2004)                      | 130 Spanish municipalities            | 1994-1998           | The surplus/deficit financial/non-financial factors, financial independence, expenses and capital income are significant for explaining local debt.                                      |
|                                       |                | Guillamón, Benito and Bastida (2011)           | 3253 Spanish municipalities           | 2008                | Socioeconomic variables affect the level of debt and political variables indicate that minority governments contract lower levels of debt.   |
|                                       |                | Pérez, Plata, Zafra and López (2013)           | 1238 Spanish municipalities           | 2008-2011           | The level of debt is affected by the subsidy index, the coalition of the ruling parties, decentralization and greater cooperation between municipalities.                                |
|                                       |                | Zafra, Plata, Rodríguez and López (2012)       | 4395 Spanish municipalities           | 2005-2009           | During the economic crisis, net saving is replaced by an increase in debt. As a consequence of the recession, the tendency to resort to local debt increases.                            |
| Limits and legal restrictions on debt | Holland        | Allers (2015)                                  | 403 municipalities of the Netherlands | 1994-2012           | Effectiveness of the limiting regulations on Dutch debt.   |
|                                       | Spain          | Benito, Guillamón and Bastida (2015)           | 3090 Spanish municipalities           | 2001-2008           | The most infringed limits are the non-financial surplus and net savings. The population has a positive impact on non-compliance with the limit of net savings and non-financial surplus. |
|                                       |                | Cabasés, Pascual and Vallés (2007)             | 8102 Spanish municipalities           | 1988-2000           | Effectiveness of the design of the legal restrictions of municipal debt established in the Law Regulating the Local Revenue offices.   |
|                                       |                | Cabases, Pascual and Vallés (2005)             | 1001 Spanish municipalities           | 1995-1999           | The normative controlling local debt is not fulfilled and there is a trend towards increased debt.   |

|  | <b>Country</b> | <b>Authors</b>  | <b>Sample</b>                               | <b>Study period</b> | <b>Main results</b>  |
|--|----------------|---|---|---------------------|--|
|  |                | Vila i Vila (2011)                                      | 140 municipalities                          | 1993-2009           | This paper highlights the lack of operability and the high degree of non-compliance with the limits of local debt in the Valencian municipalities. |
| Electoral cycles, political factors and municipal debt | Spain          | Bastida, Beyaert and Benito (2013)                      | 238 Spanish municipalities                  | 1992-2005           | Electoral cycles influence local debt.   |
|  |                | Cabaleiro, Buch and Vaamonde (2014)                     | 387 Spanish municipalities                  | 2009                | Political factors affect local debt  |
|  | Mexico         | Nande (2016)  | 31 states and 127 Mexican local governments | 1996-2010           | Political cycles have a positive influence on local debt in Mexico.  |
| Budget transparency and debt                           | International  | Ríos, Bastida and Benito (2016)                         | 93 countries                                | 2010                | The level of public debt does not influence the transparency of governments.   |
| Fiscal consolidation and debt                          | England        | Andrews (2015)  | 386 local governments                       | 2003-2012           | Debt levels increase both in the consolidated municipalities, that is, those that merged with each other, as well as in the non-consolidated ones. |
| Spatiality and debt                                    | Germany        | Borck, Fossen, Freier and Martin (2015)                 | Babaria Region and NRW                      | 1999-2005           | There are intermunicipal spatial relationships in public debt.   |
|  | EU             | Kopczewska, Kudła, Walczyk, Kruszewski and Kocia (2016) | 34 European countries                       | 2002-2011           | Taxes on consumption and capital significantly affect debt level.  |
| Decentralization of municipal services and debt        | Spain          | Brusca, Montesinos and Mora (2012)                      | 122 municipalities                          | 2003-2005           | Positive relationship between municipal debt and decentralization of services.   |

Guillamón et al. (2011) performed an evaluation of the Spanish municipal public debt, revealing that certain socioeconomic variables (population, transfers and taxes) positively affect the level of municipal debt. They also observed that the weakest governments are those with the lowest level of debt. Zafra et al. (2011) observed that during the economic recession the net saving, considered to be a way of financing investments, was replaced by a rising level of local debt. In research by Pérez et al. (2013), the outstanding municipal debt is analysed during the economic crisis through the use of determinants of an economic, social and political nature. Their main conclusions reveal that the political strength, immigration and the financial variables included in the model influence the level of municipal debt. In turn, the authors point out that the local authorities with greater cooperation between them, and the more decentralized ones, present higher levels of debt. Benito and Bastida (2004) conclude that the variables that best explain the level of debt of the municipalities are: the non-financial surplus or deficit, financial independence and expenditure and capital income. Benito et al. (2004) analyse the debt factors in the 17 Spanish Autonomous Communities (CCAA). Results suggest that the factors with the greatest incidence in the debt of the Autonomous Communities are: a higher level of abilities, the GDP generated and the expenses destined to transfers, among others. They also note that the Autonomous Regions with the greatest financial charges allocate less economic resources to current expenses and investment because they need greater amounts for the amortization of the debt contracted.

The economic slowdown meant that compliance with the legislation that establishes legal limits of debt went from recommendable to mandatory and Spanish Public Administrations not complying with the established legal limitations are penalized and forced to present plans for the restructuring of their accounts. In light of this, some studies have set about scrutinising the effectiveness of Spanish legislation. Benito et al. (2015) studied the determinants of the breach of the legal limits of debt for the period 2001-2008, observing that the limits for the non-financial surplus and the net saving were not adhered to. In turn, they demonstrated a positive relationship between the level of municipal revenues and compliance with debt limits. Also, Cabasés et al. (2005) presented evidence of non-compliance with the financial solvency-limiting regulations in Spanish institutions for the period 1995-1999. And Vila i Vila (2011) showed that setting of legal limits did not reduce the local debt in the Valencian city councils. By contrast, Cabasés et al. (2007) note that the legal limits of debt, established in Spanish regulations, fulfil their restrictive functions for the period 1988-2000. In the same vein, Allers

(2015) supports the opinion that fiscal rules prevent local governments from accumulating unsustainable levels of debt.

Numerous studies show that the behaviour of public debt is influenced by local elections. Bastida et al. (2013) stress that political cycles have a significant influence on the volume of local debt and the degree of solvency of institutions. The authors analyse the Spanish legislation of 2001 derived from the European Stability Pact and find that Spanish legislation diminishes the electoral effect on municipal debt. Cabaleiro et al. (2014) find that the territoriality of political parties influences the level of transfers received and the expenditures destined for municipal investment, while the political ideology (conservative or liberal) does not influence the financial health of the entity. However, the opposite is true of political parties that do not clearly detail their ideology, since they present better debt management. The Nande doctoral thesis (2016) analyses the possible effects of elections on budget management and the possibility of re-election in Mexican local governments. The author states the existence of growth in total expenditure, public works and infrastructure expenses and the decrease in normal operating expenses. Capital expenditures are the expenses that have the greatest influence on debt, since they are used as a tool to influence the behaviour of the voter.

Furthermore, some studies analyse public debt and its effects on budgetary transparency. One of the most recent studies on this subject is that of Rios et al. (2016), which concludes that the level of public debt does not affect the level of budget transparency.

It is interesting to note that, although Spanish Public Administrations do not present fiscal consolidations, that is, the absorption of one municipality by another, many European countries have already taken the first step towards this in an attempt to reduce their costs, achieving savings of scale in municipal administrative management. Andrews (2015) analyses the case of consolidated governments in England noting that, in the short term, consolidated municipalities present similar expenditures to unconsolidated municipalities. The author concludes that there is the possibility of obtaining long-term administrative improvements but without losing sight of the unavoidable high costs required for the restructuring of the administration.

Another field of study focuses on spatial econometrics applied to debt, studying whether the decisions taken by one Public administration are independent of decisions taken by the neighbouring administration. In this vein, Kopczewska et al. (2016) note the existence of global spatial effects among the member countries that influence the fiscal policy of the Euro Zone.



Borck et al. (2015) find that the municipal debt of the German municipalities is related to each other, that is, if one municipality increases its level of debt, its neighbouring municipality also increases its level of debt.

Finally, Brusca et al. (2012) study the relationship between the level of municipal debt and the decentralization of the running of municipal services, based on a sample of Valencian and Catalan municipalities. The authors find that the local entities that have the largest number of dependent entities present higher levels of debt. In other words, the greater the decentralization of municipal services, the greater the repercussions are on increased debt levels.

### **3. Adaptation of Spanish legislation to European requirements**

Due to the continuous growth of the level of Spanish public debt both the need to decrease the cost of national financing and, at the same time, foster the confidence of foreign investors to bolster the bonds market was crucial. So, in 2011, article 135 of the Spanish Constitution was modified, establishing the concept of budgetary stability and that the payment of public debt took priority over any other State expenditure in the general budgets.

This constitutional reform initiated the legislative amendment in the national fiscal framework reinforcing, in turn, the European commitment of Spain with the EU, guaranteed by the commitment of the principles of budgetary stability and financial sustainability of Spanish Public Administrations. In order to implement the aforementioned principles at the different levels of the administration, Organic Law 2/2012, of April 27, on Budgetary Stability and Financial Sustainability (LEP 2012) was approved. This law defines the concept of financial sustainability as "*the guiding principle of the economic-financial performance of all Public Administrations, both of the State and of the Autonomous Communities, Local Corporations and Social Security.*" Its main intention is the fulfilment of the objective of budgetary stability of public debt together with the rule of computable expenditure where, failing this, Administrations would be forced to take steps in the formulation of economic - financial plans to achieve these objectives.

Another purpose of the LEP 2012 is to reduce the term established in defaults to suppliers. Likewise, with the approval of the Organic Law 9/2013 of December 20, concerning control of

the commercial debt in the public sector, the concept of the average payment period is developed in order to be able to keep control over the commercial debt at state, autonomous and local levels. According to the principle of transparency and good governance, the average payment period must be made known and, in the case of non-compliance, a detailed procedure of measures specified by the law should be applied. To make its calculation effective, Royal Decree 635/2014 develops the methodology to determine the average period of payment to suppliers of Public Administrations and the conditions and procedure of retention of payments from the administration concerned, as set out in the Organic Law 2/2012 of April 27 of Budgetary Stability and Financial Sustainability. These regulations require Public Administrations, from 1 January 2013, to pay their commercial debt within a maximum period of thirty days after receipt of the acquired goods, provision of services or certification of the works.

In order to analyse the effectiveness of measures to combat late payment in commercial transactions, Pons (2017) monitors the average payment period to suppliers of Spanish Local Administrations and highlights the existence of entities with significant delay in making commercial payments. As a consequence of the delay in payments, late-payment interest is generated which, along with the original debt, starts a default chain reaction initiated by the public sector and transmitted to the private sector, with a knock-on effect on economic growth and credibility of Spain and a further increase in interest rates and debt.

#### **4. Analysis of the public debt according to the excessive deficit protocol (edp)**

The Bank of Spain defines the capacity or need for financing, taking into account the structure of budgets of Public Administrations, as costs that cannot be financed with current income and capital and which are necessarily financed by the contraction of financial liabilities from other public or private entities, called liabilities or debt<sup>1</sup>. Based on the above definition, Table 1.1.

<sup>1</sup> In terms of National Accounts, it is defined as “the capacity or need for financing of the State, such as the resulting difference between resources and jobs, current and capital of the State. It can also be defined as the difference between the net variation of financial assets and the net variation of financial liabilities of the State. This concept is not the same as the one of surplus (+) or deficit (-) of cash, in which the differences between the income and non-financial expenses of the State are collected, in terms of budget settlement”.

shows the classification of public debt, taken as a global reference of the financial activity of Spanish Public Administrations. The valuation of the liabilities contracted and contained in the present analysis has been carried out by the Bank of Spain through the use of methodology established by the European System of Integrated Economic Accounts for the year 2010 (ESA 2010).

This methodology allows the valuation of the stocks and flows of debt securities taking into account market prices<sup>2</sup>. In the present analysis we use the most restrictive concept of debt as defined by the EDP<sup>3</sup>. A comparison of this size of debt can be made at a European level, since its definition was established in accordance with the homogeneous norms of obligatory fulfilment for all the member countries of the EU.

To clarify the technical procedure for debt calculation, it should be noted that the total liabilities contained in the first column of table 2.1 represent the total debt at national level. This figure is composed of the following elements of debt: cash and deposits; representative debt securities held by both Public Administrations and other short, medium and long-term securities; long-term non-commercial credits held by Public Administrations; other non-commercial credits in the short and long term; commercial credits and other liabilities held by Public Administrations and, finally, commercial credits and other liabilities not previously included. The debt according to the EDP, which is presented in the last four columns of the table, is obtained by excluding the adjustments and consolidations between the different scales of the Public Administrations from the total liabilities<sup>4</sup>.

<sup>2</sup> In its statistical bulletin, the Bank of Spain differentiates between the liabilities contracted in time called investment flows, and stocks or outstanding obligations of the static public administrations at a certain point in time, called debt.

<sup>3</sup> Article 126 of the Treaty on the Functioning of the EU regulates the excessive deficit procedure. This procedure is consolidated in the fiscal policy agreement of the member countries called the EU Stability Pact.

<sup>4</sup> The Bank of Spain uses the scale of GDP to calculate national debt in relative terms of GDP at market prices. For regional and local debt, it takes into account the regional GDP, taken from the publications of the National Accounts of Spain.

**TABLE 1.2. Breakdown of public debt according to the Excessive Deficit Protocol**

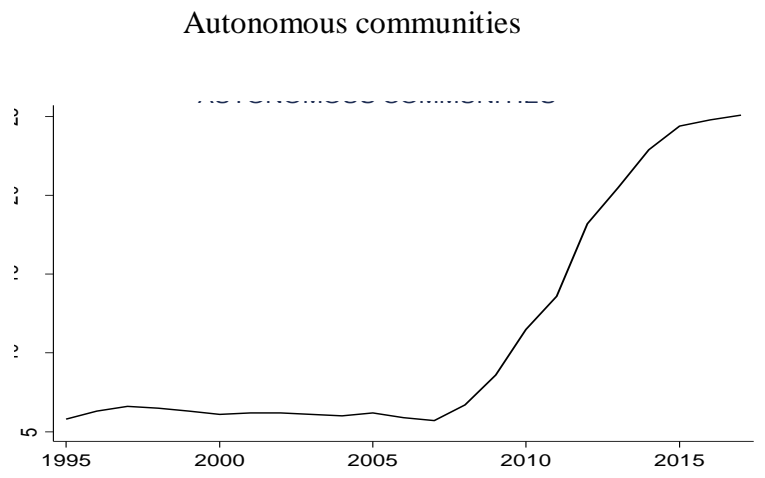
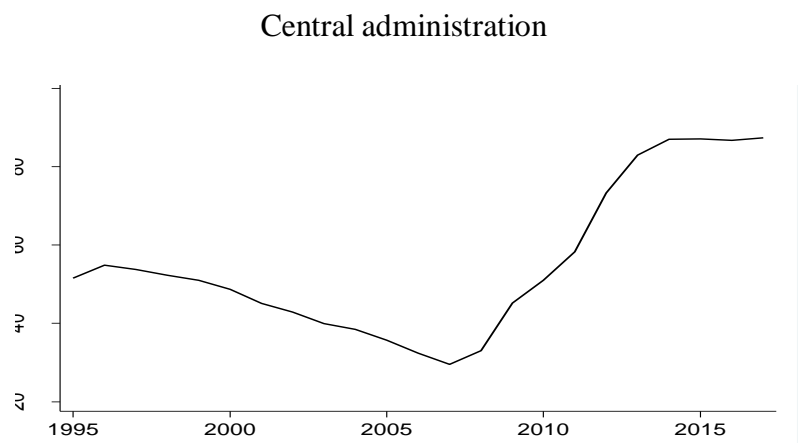
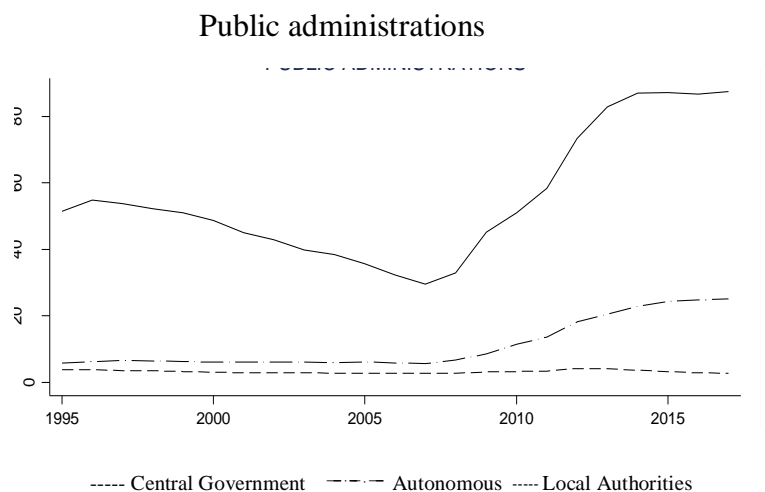
| LIABILITIES IN CIRCULATION IN % OF GDP |       |                    |                        |                   | DEBT ACCORDING TO PDE IN % OF GDP (*) |                    |                        |                   |  |
|--|-------|--------------------|------------------------|-------------------|---------------------------------------|--------------------|------------------------|-------------------|--|
| PERIOD                                 | TOTAL | CENTRAL GOVERNMENT | AUTONOMOUS COMMUNITIES | LOCAL AUTHORITIES | TOTAL                                 | CENTRAL GOVERNMENT | AUTONOMOUS COMMUNITIES | LOCAL AUTHORITIES |  |
| dic-95                                 | 70.6  | 54.5               | 7.0                    | 5.5               | 61.8                                  | 51.5               | 5.8                    | 3.9               |  |
| dic-96                                 | 77.6  | 60.2               | 7.5                    | 5.4               | 65.6                                  | 54.9               | 6.3                    | 3.9               |  |
| dic-97                                 | 82.8  | 65.3               | 7.5                    | 5.0               | 64.4                                  | 53.8               | 6.6                    | 3.5               |  |
| dic-98                                 | 85.1  | 67.1               | 7.7                    | 5.0               | 62.5                                  | 52.3               | 6.5                    | 3.5               |  |
| dic-99                                 | 72.8  | 55.3               | 7.6                    | 4.6               | 60.9                                  | 51.0               | 6.3                    | 3.3               |  |
| dic-00                                 | 69.6  | 52.9               | 7.4                    | 4.4               | 58.0                                  | 48.7               | 6.1                    | 3.1               |  |
| dic-01                                 | 64.8  | 48.9               | 7.3                    | 4.2               | 54.2                                  | 45.1               | 6.2                    | 2.9               |  |
| dic-02                                 | 63.9  | 47.9               | 7.6                    | 4.2               | 51.3                                  | 42.9               | 6.2                    | 2.9               |  |
| dic-03                                 | 59.5  | 44.0               | 7.7                    | 4.1               | 47.6                                  | 39.9               | 6.1                    | 2.9               |  |
| dic-04                                 | 58.3  | 43.2               | 7.7                    | 4.1               | 45.3                                  | 38.5               | 6.0                    | 2.8               |  |
| dic-05                                 | 55.9  | 40.5               | 8.1                    | 4.2               | 42.3                                  | 35.7               | 6.2                    | 2.7               |  |
| dic-06                                 | 51.0  | 35.9               | 8.0                    | 4.2               | 38.9                                  | 32.4               | 5.9                    | 2.7               |  |
| dic-07                                 | 47.1  | 32.1               | 8.1                    | 4.3               | 35.6                                  | 29.5               | 5.7                    | 2.7               |  |
| dic-08                                 | 53.4  | 37.2               | 9.1                    | 4.5               | 39.5                                  | 33.0               | 6.7                    | 2.8               |  |
| dic-09                                 | 69.5  | 50.5               | 11.3                   | 5.1               | 52.8                                  | 45.2               | 8.6                    | 3.2               |  |
| dic-10                                 | 76.1  | 53.4               | 14.5                   | 5.5               | 60.1                                  | 51.0               | 11.5                   | 3.3               |  |
| dic-11                                 | 89.5  | 61.7               | 19.0                   | 6.1               | 69.5                                  | 58.3               | 13.6                   | 3.4               |  |
| dic-12                                 | 114.3 | 83.9               | 21.6                   | 6.0               | 85.7                                  | 73.3               | 18.2                   | 4.2               |  |
| dic-13                                 | 132.2 | 99.4               | 24.3                   | 5.8               | 95.5                                  | 82.9               | 20.5                   | 4.1               |  |
| dic-14                                 | 146.1 | 111.6              | 26.4                   | 5.4               | 100.4                                 | 87.0               | 22.9                   | 3.7               |  |
| dic-15                                 | 139.6 | 104.5              | 27.3                   | 4.9               | 99.4                                  | 87.1               | 24.4                   | 3.3               |  |
| dic-16                                 | 138.7 | 104.1              | 27.3                   | 4.5               | 99.0                                  | 86.7               | 24.8                   | 2.9               |  |
| jun-17                                 | 138.8 | 103.3              | 27.4                   | 4.5               | 99.8                                  | 87.4               | 25.1                   | 2.8               |  |

From Spain's entry into the EU in 1986 until the period prior to the financial and economic crisis, the Spanish economy showed significant growth which was reflected in the public sector with an increase in public services provided and the growth of capital investments. Subsequently, the complicated economic situation at European level led the member states to increase the public deficit to levels that questioned the sustainability of public finances. At the beginning of 2007, the Spanish public debt was at a relatively low level in relation to the Spanish GDP compared to other EU countries. This fact gave Spanish Public Administrations time to react when faced with a complicated international situation. However, the loss of jobs, the increase in social aid, the growth of the public deficit and the aid granted to the financial sector so increased the levels of debt that by 2012 it stood at 86% of GDP (see Figure 1). The rapid growth of the public debt of European countries called for the revision of European regulations. One of the eight regulations implemented after the economic slowdown is the Stability, Coordination and Governance Treaty of 2012<sup>5</sup>, approved by the EU, with the clear objective of limiting debt. These legislative changes at a European level were quickly translated into Spanish legislation through the constitutional reform in 2011 and subsequently with the development of the LEP 2012. The national regulations set the mandatory limit of debt at 60% on GDP noting as its deadline, year 2020.

Figure 1 shows the evolution of public debt at the different levels of Public Administration according to the EDP during the period of 1995-2017. It shows that, during the period prior to the economic crisis, from 1995 to 2008, the level of debt remained stable with a clear downward trend. From 2008, the level of debt showed a significant increase at all levels of Public Administration until the 2012 LEP came into force, which managed to soften growth of the state and regional debt, thus achieving a downward trend for local debt (figure 1).

<sup>5</sup> According to EUR-Lex, this budgetary pact incorporates stricter fiscal provisions than the Stability and Growth Pact of 1997.

**FIGURE 1. Evolution of public debt as a percentage of GDP in the different Spanish Public Administrations according to the Excessive Deficit Protocol**



## **5. Conclusions**

In this chapter an analysis is made of the evolution of the debt of Spanish Public Administrations during the period before and after the economic crisis. The literature shows that, during the period of economic and real estate boom, income obtained from urban development served to reduce the level of municipal debt but with the arrival of the crisis this income was reduced and, consequently, the debt increased considerably. However, the literature review shows that not only budgetary factors can influence the level of debt but also certain socio-economic and political aspects. In addition, the level of decentralization of public services can affect the volume of debt.

Finally, it should be noted that, although the Spanish economy now seems to be on the path to economic recovery, there is still a long way to go, with progress being limited by restrictions from the commitments made regarding the public deficit included in the Stability Plan 2017-2020. As a consequence of this plan, Spanish Public Administrations are faced with the difficult task of having to comply with the established objectives while still seeking to meet social needs. In a general context, and taking into account the fiscal policies adopted at national and European level, Spain has no choice but to reduce its public debt to the obligatory limits set.





## **CHAPTER 2**

### **The importance of spatial effects in municipal debt**



## 1. Introduction

Public debt is an indicator for measuring a country's financial health. In Spain, the volume of debt has steadily increased, notably since the start of the global economic crisis. Given its volume and importance, European and national legislation has had to adapt to the situation, imposing strict limits to be met at central, regional and local levels. The importance of the topic has led to numerous studies in the literature analysing local debt in its different aspects, such as the success or failure of the debt limits, or the determinants of debt, among others. However, few studies analyse the existence of neighbourhood interdependencies on debt decisions. The only contributions we are aware of are Borck et al. (2015), Kopczewska et al. (2016), whose studies analyse the spatial effect in the German municipalities and EU countries, respectively.

This chapter therefore aims to go beyond the classic approach of indebtedness, by analysing whether neighbouring interdependencies exist in municipal debt decisions, that is, whether an increase in the debt level of one municipality might affect that of the neighbouring municipality. In today's globalised world, the effect of interconnectivity and technological development seems to be that nothing happens randomly. This has motivated some authors to hypothesise that local governments do not make decisions in isolation, but take into account the decisions adopted by their neighbours. Spatial interactions among municipalities and their influence on fiscal policy are increasingly attracting research attention. Authors such as Bastida et al. (2013b), Ermini and Santolini (2010); Foucault et al. (2008) and López et al. (2017) highlight the existence of similar spatial behaviours in localities in spending, that is, spending levels in one municipality are influenced by the spending decisions adopted by neighbouring municipalities.

In this chapter, we focus on the determinants of local debt, specifically on the spatial effects of debt among Valencian (Spain) local governments for the year 2015. In this case, the literature is much scarcer. In fact, our study is the first to examine this question for Spanish municipalities. A further contribution of the study is the inclusion of the variable average payment period to suppliers, which has not been analysed in previous research, in order to examine its possible effects on the level of municipal debt.

Our results show the presence of spatial autocorrelation in public debt. Overall, the gender of the mayor, grants and transfers received and average payment period to suppliers show direct spatial effects on current debt. Net savings, inactive population, inhabitants' income

level and the political strength of the governing party have direct spatial effects on municipal debt and indirect effects on the debt of neighbouring municipalities.

This chapter is structured in five sections. Following this introduction, the next section reviews some relevant literature on debt and spatial patterns, and defines the hypotheses to be tested. The third section outlines and justifies the sample and specifies the model. Section four presents the main results, and the conclusions of the analysis are presented in section five.

## **2. Previous literature and hypotheses**

### **2.1. A review of the literature on local debt**

Government debt has been analysed from various different perspectives in recent years. Research interest in public debt has grown since the onset of the recent economic crisis, which at the same time ushered in far-reaching legislative changes. The extensive literature can be classified into several groups according to the analytical focus taken.

The first group includes studies analysing the determining factors of debt (Balaguer-Coll, Prior & Tortosa-Ausina, 2016; Bastida & Benito, 2005; Benito & Bastida, 2004; Benito et al., 2015a; Cabasés et al., 2007; Guillamón et al., 2011; Pérez-López et al., 2013; Ribeiro & Jorge, 2014).

A second group explores legal debt limits and their success or failure (Allers, 2015; Benito et al., 2015a; Cabasés et al., 2007; Vallés et al., 2003; Vila, 2012). In a recent article, Olmo (2018) analyses the explanatory factors and the limitations of Spanish debt. His main conclusions suggest that the budget stability regulation, provided for in Law 2/2012, of April 27, on Budgetary Stability and Financial Sustainability, has not had a significant effect on the reduction of accumulated municipal debt. However, the author notes that this regulation has contributed to changing the trend of indebtedness in Spanish municipalities.

Another line of research includes studies on the relationship between electoral cycles and debt as a financial resource (Bastida et al., 2013a; Cabaleiro-Casal et al., 2014; García-Sánchez et al., 2011; Vicente et al., 2013). In this line, Clinger et al. (2008) examine local debt in U.S. cities by considering turnover among local government officials and its

influence on debt. They conclude that debt is not only affected by the economic situation facing local governments, but also by the decisions taken in uncertain political contexts driven by political incentives.

A further area of analysis explores the possible relationship between debt level and fiscal consolidation (Andrews, 2015) or budget transparency and debt (Ríos et al., 2016).

Other studies analyse the relationship between decentralisation of municipal services and debt levels (Brusca et al., 2012; Zafra-Gómez et al., 2014) and the creation of special districts and the increase of debt in the United States (Faulk & Killian, 2017). The literature on debt includes the work of Pérez-López et al. (2014), who analyse the setting up of instrumental bodies that allow local governments to exclude part of the debt from their budgets. These authors show how municipalities that outsource more of their services and have a higher number of consortiums also have lower debt levels.

The final field of study, which has attracted less analytical attention at both national and international levels, applies spatial econometrics instruments to examine the existence of similar debt patterns among public administrations (Borck et al., 2015; Kopczewska et al., 2016).

## **2.2. Spatial effects in the financial situation of territorial authorities**

The literature on spatial patterns in local taxes provides evidence of tax mimicking among municipalities (Allers & Elhorst, 2005; Cassette et al., 2012; Delgado & Mayor, 2011). The work of Álvarez and Barbero (2016) highlights the importance of spatial effects of tax income on growth in Spanish regional economies, analysing at the same time competition among regions for public resources.

Recent studies have sought spatial relationships between neighbouring units with reference to specific expenditure items. In Spain, authors such as Bastida et al. (2013b) and López et al. (2017) provide empirical evidence of spatial effects in municipal expenditure. Ermini and Santolini (2010) and Foucault et al. (2008) find similar spatial patterns in Italian and French municipalities, respectively.

In line with the previous research, Kopczewska et al. (2016) carried out a broad study on the existence and magnitude of the spatial effects of debt in EU countries. These authors

observe that taxes have a considerable spatial repercussion on debt at the European level, confirming the existence of global effects that influence the fiscal policy of the Eurozone. Pan et al. (2017) find a pattern of constant debt accumulation in Chinese municipalities due to their increased income from taxes, which represents greater capacity to return the debt they owe. Their main conclusions identify spatial patterns in municipal debt, that is, the issue of bonds as a local financing instrument in one city is related to the amount of bonds issued by neighbouring cities. Borck et al. (2015) study spatial patterns in German municipal debt and uncover a robust spatial correlation. These authors confirm that if one local authority increases its debt level, this has repercussions for its closest neighbour, which in turn increases its own debt.

Finally, Zhang and Gibson (2017) observe spatial dependency in the outsourcing of local services, indicating that decisions to subcontract services to third parties are influenced by the outsourcing decisions taken by their nearest neighbouring local authorities.

### **2.3. Spatial effects in Spanish municipal debt**

Economic management in local councils has worsened as a result of the recent economic and financial crisis. Municipalities with high debt levels and budgetary deficit or those receiving insufficient transfers are now opting to outsource their services or are entering into inter-municipal collaboration agreements (Zafra-Gómez et al., 2014). These developments led us to consider that municipal debt level may be influenced by the level of debt in neighbouring municipalities. It is therefore of interest to analyse the variables used in this study from the perspective of municipalities' financial condition. The present study takes this perspective to analyse four budgetary indicators: grants and transfers received (GRANTS), net saving rate (NSR), capital expenditure (CE) and average payment period (APP).

Grants and transfers received (GRANTS) may be defined as an indicator that measures a municipality's financial vulnerability, that is, how sensitive it is to external sources of funding from other levels of government. In turn, the net saving rate (NSR) is the local authority's capacity to generate additional resources once it has fulfilled its obligations, and may be an indicator of its budgetary sustainability. Zafra-Gómez et al. (2009) consider net savings as an indicator of flexibility, which they refer to as the capacity of

local authorities to service borrowing with their available resources. For its part, solvency at the services level can be represented by the variable capital expenditure (CE), defined as the capacity of local authorities to provide facilities in order to offer adequate services. Finally, the average period of payment to suppliers (APP) is defined as an indicator of cash solvency, that is, the authority's ability to generate liquidity to meet its short-term payment obligations.

Next, we will analyse the effects of these budgetary variables and others of a socio-economic and political nature (Table 2.1).

### **2.3.1. Budget variables**

#### ***Grants and transfers received (GRANTS)***

Lago-Peñas (2008) finds that local authorities with higher grants increase their expenditure level, and refers to this effect as "fiscal replacement form of asymmetry." The author notes that, depending on the ruling political ideology, grants are either used to reduce the debt or not. Specifically, grants are used by conservative governments to reduce their deficit because their income from taxes is lower. Pérez-López et al. (2014) state that increase in subsidies correlates negatively with local corporation indebtedness, because their need for financing is reduced. Balaguer (2002), Bastida and Benito (2005), and Pérez-López et al. (2013) report that higher volumes of grants received coincide with debt reduction. However, Guillamón et al. (2011) and Levaggi and Zanola (2003) find a positive relationship between grants received and debt level. Bastida et al. (2009) find that transfers received increase local expenditure and there are few incentives to use grants to reduce the local tax burden. In light of the above, we propose the following hypothesis:

H1: The volume of grants received has positive/negative effects on local debt.

**Table 2.1. Definition of the variables**

|                                 | Definition of the variables            |   | Expected sign | Sources  |
|---------------------------------|--|---|---------------|--|
| <i>Dependent variable</i>       | Log Current Debt (log <i>CD</i> )      | Total nominal value of gross liabilities of the public administration sector pending at the end of the year   |               | Ministry of Finance  |
| <i>Budget variables</i>         | Grants and transfers ( <i>GRANTS</i> ) | Grants and transfers received / total population  | +/-           |  |
|                                 | Net Savings Rate ( <i>NSR</i> )        | Gross savings-amortization expenses/ current revenues (net recognized revenue)  | -             | Ministry of Finance  |
|                                 | Capital Expenditure ( <i>CE</i> )      | Capital expenditure / total population  | +             |  |
|                                 | Average Payment Period ( <i>APP</i> )  | Dummy variable (0: payment within 30 days; 1: payment in excess of 30 days)   | +             |  |
| <i>Socio-economic variables</i> | Population density ( <i>DENS</i> )     | Number of inhabitants/total extension (in squared kilometres)   | -             | National Statistics Institute                                      |
|                                 | Income ( <i>INCOME</i> )               | Disposable income per capita  | +             | Klein Institute  |
|                                 | Retired people ( <i>RET</i> )          | Population aged over 65/total population  | +/-           | National Statistics Institute                                      |
| <i>Political variables</i>      | Gender of mayor ( <i>GEN</i> )         | Dummy variable (0: male mayors; 1: female mayors)   | +/-           | Spanish Government's Transparency Portal                           |
|                                 | Herfindalh Index ( <i>HI</i> )         | Values between 0 and 1 depending on the number of councillors for each party in the council. High values denote a lower level of political fragmentation or higher political strength | +/-           | Ministry of the Presidency and for the Territorial Administrations |
|                                 | Political Sign ( <i>SIGN</i> )         | Dummy variable (0: municipalities governed by left-wing parties; 1: municipalities governed by right-wing parties)  | +/-           | Ministry of the Presidency and for the Territorial Administrations |



### ***Net savings rate (NSR)***

According to Cabasés et al. (2003), local authorities that implement austerity policies in their current expenditure and have an appropriate plan for debt reduction have greater financing capacity; in other words they do not need excessive debt to finance their capital investments. However, in their analysis of nonfulfilment of debt limits, Benito et al. (2015a) conclude that net saving is the most frequently breached limit. Similarly, Vila (2012) analyses the evolution of net savings as a determinant of compliance with legal debt limits, finding a negative evolution. Balaguer (2002), Bastida and Benito (2005), Brusca and Labrador (1998), Cabasés et al. (2003) and Pérez-López et al. (2013) find a negative relation between net savings and municipal debt. Given the significance of net saving to debt, we formulate our second hypothesis:

H2: When net saving is higher, local debt is more likely to decrease.

### ***Capital expenditure (CE)***

Capital expenditure is financed by capital transfers received, current savings, income from urban development taxes, or long-term loans, which increase municipal debt. In this line, Benito et al. (2015b) find a significant and positive relationship between capital spending and local debt. The studies by Balaguer-Coll et al. (2016), Bastida and Benito (2005), Benito and Bastida (2004), Cabasés et al. (2003, 2007), and Pérez-López et al. (2013) conclude that capital investment positively influences local debt, and that local debt is one of its determinants. Zehms (1991) highlights the need to update capital assets and their financing through opportune budgetary allocations in the budgets. According to this study, investment spending, contained in budget reports, informs users about the proportion of expenditure allocated to financing municipal investment. This leads us to the following hypothesis:

H3: When capital expenditure is higher, local debt is more likely to increase.

### ***Average payment period (APP)***

Organic Law 2/2012 on Budget Stability and Financial Sustainability establishes a set of fiscal regulations that affect local administrations through the principles of financial

stability and sustainability, the expenditure rule, and the use of budget surplus to pay off debt. To control commercial late payments, the regulation stipulates the average period of payment to local suppliers, setting a final payment date at 30 days of receiving the invoice. If the local administration does not make the payment, it incurs interest on arrears that increases the total debt. In this line, Pons (2017) runs an analysis of variance on the average payment period, as an indicator of debt, of different types of local organisations, finding that a large proportion of the municipalities analysed do not comply with the regulation. Given the innovative nature of the variable APP, we test its possible influence on municipal debt with the following hypothesis:

H4: Compliance with the legal limit of period of payment to suppliers reduces current debt.

### **2.3.2. Socio-economic variables**

#### ***Income level (INCOME)***

This variable has been used by Bastida et al. (2013a), Benito et al. (2015b), Cabasés et al. (2007) and McEachern (1978), among others, in their studies on debt. In his study analysing how the electoral cycle influences municipal debt per capita, Bastida (2013a) noted that an increase in the level of income has a positive long-run effect on debt. Cabasés et al. (2007) and McEachern (1978) found that the level of debt is positively associated with a higher economic level. In another study on the housing bubble and its consequences at local government level, Benito et al. (2015b) found that economic level does not affect public debt growth. Most studies find a positive relationship of this variable with debt, indicating that wealthy states can handle new debt; that is, higher per capita income levels lead to higher accumulated public debt due to higher demand from citizens for goods and services (Bastida & Benito, 2005; Clingermayer & Wood, 1995; Cabasés et al., 2007; Guillamón et al., 2011; Kiewiet & Szakaty, 1996; Vallés et al., 2003). This leads us to formulate the following hypothesis:

H5: Income level affects local debt positively.

### ***Population density (DENS)***

In the literature on debt, the relationship between population density and local debt growth is unclear, and has led to many diverse conclusions. Bastida et al. (2009) report that economies of scale are more likely to be present in local authority expenditure, the higher the population density. Benito et al. (2015b) state that population density is negatively correlated with debt growth; that is, the need for financing declines as population density increases. Bastida et al. (2013b) conclude that the impact of population density on different types of functional expenditure is negative. This conclusion is explained by the fact that expenditure on street cleaning and lighting in the town or city centre, among other factors, does not vary according to number of inhabitants. These authors find that municipalities with higher population densities have lower current debt levels. However, Andrews (2015) analyses vertical consolidation and financial sustainability in English local authorities, finding that population density is not a factor that determines an authority's "fiscal health". In light of the above, we propose the following hypothesis:

H6: The higher the population density, the greater the possibility that the local debt level will be lower.

### ***Retired people (RET)***

Social services, resulting from local policies, lead to increased public spending, which in turn affects debt level. Social policies are associated with population segments, in that the existence of vulnerable groups motivates social policies with resulting increased service costs. In this vein, Hagen and Vabo (2005) find evidence that older people have negative effects on public finance surplus; similarly, Rodríguez et al. (2016) found evidence that citizens over the age of 65 have a negative effect on the financial sustainability of local authorities. Hence, the needs of the retired population lead to an increase in the public services provided and consequently the level of debt. However, in contrast to these results, Ellis and Schansberg (1999) concluded that population older than 65 was negatively related to the level of state long-term debt. Taking these results into account, we consider the effect of inactive population on the amount of municipal debt an interesting question to examine, and formulate the following hypothesis:

H7: The inactive population has positive/negative effects on local debt.

### **2.3.3. Political variables**

Election data from 2011 were used to define the political variables (political strength, political inclination and gender of the mayor), since current debt is an accumulated amount and its volume is a result of past decisions.

#### ***Gender of the mayor (GEN)***

Massolo (1996) highlights the importance of analysing the gender variable in municipal studies. According to Hernández-Nicolás et al. (2018) councils with women mayors have fewer annual interest and debt repayment obligations and have higher expenditure on security, protection, and social promotion. However, Brusca et al. (2015) found that mayor's gender was not significant in Spanish and Italian local authorities' per capita debt. Guillamón et al (2011) and Gras et al. (2014) found that the gender of the mayor is not an explanatory factor of Spanish local debt.

Hamidullah et al. (2015) point out that not only do men and women have different values of equity, long-term perspective, sense of community and representation, but also differ in their values of efficiency, effectiveness and experience. For their part, Carozzi and Gago (2017) analyse gender and social policies related to support for families, preschool education and work, finding no empirical evidence that women mayors are more likely to introduce such policies. Clots-Figueras (2011) observes that when women are responsible for political management, a positive impact is seen in educational performance in urban areas of India.

Ferraz and Tejedó-Romero (2016) find that women's role in local Spanish politics was greater in the 2011 elections than in the previous 2007 local elections. Ilcan et al. (2007) studied the restructuring of the Canadian public sector and women's new political and economic role. Green and Homroy (2018) evidence the positive and economically significant effects of women directors' involvement on company boards and committees. Bagues and Campa (2017) identify increased gender quotas in local authorities, but find no statistically significant evidence of change in the composition of public finance. The above arguments lead us to formulate the following hypothesis:

H8: The mayor's gender can affect local debt.

### ***Herfindahl Index (HI)***

Research analysing political strength and its consequences for local debt has reached varying conclusions. Ashworth, Geys and Heyndels (2005) find that more politically fragmented local governments have higher public deficits and debt, due to the strategic use of debt by political coalitions. Roubini and Sachs (1989) find that governments with a larger number political parties in coalition have higher levels of public deficit; that is, the weaker the government, the higher the deficit will be. Their analysis of strategic debt shows that local governments probably prefer to take on higher debt as a legacy for future governments, concluding that the effects of political fragmentation have a long-term influence on municipal debt. Guillamón et al. (2011) show that the concentration of local government power influences debt level. Tovmo (2007) and Rattsø and Tovmo (2002) conclude that political fragmentation does not affect public deficit, and therefore debt. Borge (1996) finds robust effects of political fragmentation on municipal debt, although politically strong governments are not confirmed to have lower debt levels. Hagen and Vabo (2005) conclude that stronger political leadership leads to higher fiscal performance and, therefore, improved – that is, higher – budget balance. This lack of consensus motivates our objective to test the effects of political strength on local debt.

To measure the degree of political competition in the municipalities analysed, we use the Herfindahl index, which takes values between 0 and 1, depending on the number of councillors from each party represented in the council, with higher values indicating a lower degree of political fragmentation and, therefore, a lower degree of competition or higher degree of political strength. Following Guillamón et al. (2011), we define the Herfindahl index by means of the following expression:

$$\sum_{i=1}^n S_i^2 / S^2 \quad (1)$$

where  $S_i$  is the number of councillors of party  $i$  in the local government; and  $S$  is the total number of councillors. Taking into account the above arguments, we formulate our next hypothesis:

H9: Greater political fragmentation in local governments can increase/decrease local debt.

### *Political sign (SIGN)*

The study by Rattsø and Tovmo (2002) shows that left-wing parties are more likely to increase spending, without raising income through taxes, as a result of their social policies; this positively contributes to the public deficit, which increases local debt. García-Sánchez et al. (2011) find evidence for partisan budgetary cycles, noting that parties with a left-wing ideology incur greater debt than conservative parties due to their political ideology. These authors show that left-wing incumbents increase debt significantly more than conservative governments during election periods in order to improve their re-election chances. Kiewiet and Szakaty (1996) find that conservative-run councils have lower levels of debt.

In contrast, authors such as Cabaleiro-Casal et al. (2014) note that ideology has a significant influence on debt level, confirming that councils governed by political parties with no clear ideological identity have lower debt levels. However, these authors are unable to confirm significant differences between conservative and left-wing parties in terms of debt levels. For their part, Bastida and Benito (2005), Benito and Bastida (2004), Guillamón et al. (2011) and Pérez-López et al. (2013) conclude that political inclination does not have a significant influence on municipal debt level. Finally, Bastida et al. (2009) demonstrate that parties' political ideology has no clear influence on municipal expenditure, deducing from this that ideology does not affect indebtedness. The above arguments lead us to our final hypothesis:

H10: The political sign may or may not influence municipal debt.

## **3. Data and specification of the model**

### **3.1 Sample and definition of variables**

This study was carried out using a sample of town councils from the Valencian Community (Spain) for which information was available for the year 2015. The sample comprised 527 municipalities, representing 97% of all the municipalities in the region.

Table 2.2 displays the distribution of per capita debt in the municipalities of the Valencian Community, showing that small municipalities have higher debt levels per capita than medium-sized or large municipalities.

**Table 2.2. Distribution of municipalities and local debt (year 2015)**

| Population size       | Municipalities        |                  | Local debt      |                   |
|-----------------------|-----------------------|------------------|-----------------|-------------------|
|                       | Number municipalities | % municipalities | Debt per capita | % Debt per capita |
| <b>Below 1,000</b>    | 208                   | 39.47%           | 73043.37        | 35.56%            |
| <b>1,001–3,000</b>    | 123                   | 23.34%           | 40842.54        | 19.88%            |
| <b>3,001–5,000</b>    | 41                    | 7.78%            | 19767.08        | 9.62%             |
| <b>5,001–10,000</b>   | 57                    | 10.82%           | 26682.17        | 12.99%            |
| <b>10,001–20,000</b>  | 33                    | 6.26%            | 11352.83        | 5.53%             |
| <b>20,001–50,000</b>  | 50                    | 9.49%            | 23134.39        | 11.26%            |
| <b>50,001–100,000</b> | 11                    | 2.08%            | 8282.71         | 4.03%             |
| <b>Over 100,000</b>   | 4                     | 0.76%            | 2315.95         | 1.13%             |
| <b>Total</b>          | 527                   | 100%             | 205421.05       | 100%              |

The dependent variable that we analyse in this paper is current debt (*CD*), which can be defined as the stock of government liabilities at the end of the period, measured at nominal value. Currency and deposits, loans and debt securities are the instruments that are included in the definition of general government gross debt in Council Regulation (EC) No 479/2009 as amended by Commission Regulation No 220/2014 (Maastricht debt). They are defined in terms of the ESA 2010 classifications<sup>6</sup>.

Data for ‘current debt’ and ‘budget variables’ were taken from the Ministry of Finance. Data for the variable ‘per capita income’ are from the Klein Institute database. Information on people over the age of 65, number of inhabitants, and square kilometres for each locality came from the Spanish National Statistics Institute. Data for the variable

<sup>6</sup> The definition of current debt can be found on the website of the Ministry of Finance (*Ministerio de Hacienda*, in Spanish): <http://www.hacienda.gob.es/es-ES/CDI/Paginas/SistemasFinanciacionDeuda/InformacionEELLS/DeudaViva.aspx>

‘gender of the mayor’ was provided on request by the central government’s Transparency Portal. Finally, data on the political variables came from the Spanish Ministry of the Interior and the Ministry of the Presidency and for the Territorial Administrations. Descriptive statistics of these variables are provided in Table 2.3.

**Table 2.3. Descriptive statistics (2015)**

| <b>Variable</b> | <b>Mean</b> | <b>Std. Dev.</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|------------------|------------|------------|
| <b>Log (CD)</b> | 4.199       | 2.825            | 0.000      | 8.852      |
| <b>GRANTS</b>   | 0.406       | 0.149            | 0.062      | 0.938      |
| <b>NSR</b>      | 0.091       | 0.166            | -0.832     | 0.498      |
| <b>CE</b>       | 300.853     | 455.373          | 2.880      | 5007.601   |
| <b>APP</b>      | 0.474       | 0.500            | 0.000      | 1          |
| <b>DENS</b>     | 541.984     | 1965.978         | 0.520      | 26644.430  |
| <b>INCOME</b>   | 13666.380   | 20965.160        | 7578.296   | 471403.100 |
| <b>RET</b>      | 0.241       | 0.083            | 0.091      | 0.577      |
| <b>GEN</b>      | 0.194       | 0.396            | 0.000      | 1          |
| <b>HI</b>       | 0.450       | 0.133            | 0.174      | 1          |
| <b>SIGN</b>     | 0.676       | 0.469            | 0.000      | 1          |

Table 2.4 reports the frequencies of the dummy variables (*APP*, *GEN* and *SIGN*), together with their percentage of the variable ‘local debt’. The table shows that the majority of local governments do not meet the stipulated average payment period for local suppliers (*APP*). Local governments that pay their suppliers on time are also those with the lowest levels of per capita debt. Most Valencian municipalities are led by men (mayor’s gender *GEN*), and those with women mayors have higher per capita debt levels. The political ideology variable (*SIGN*) reveals that conservative parties outnumber left-wing parties, and their debt levels are higher.



**Table 2.4. Frequency of variables APP, GEN and SIGN in relation to local debt (2015)**

| Variable | Dummy | Mean    | Std. Dev. | Percentage | Freq. |
|----------|-------|---------|-----------|------------|-------|
| APP      | 0     | 202.263 | 285.039   | 47.440     | 250   |
|          | 1     | 559.045 | 780.881   | 52.560     | 277   |
| GEN      | 0     | 384.496 | 650.832   | 80.650     | 425   |
|          | 1     | 411.868 | 503.404   | 19.350     | 102   |
| SIGN     | 0     | 360.961 | 501.226   | 32.450     | 171   |
|          | 1     | 403.642 | 676.229   | 67.550     | 356   |

### 3.2. Model specification

Following the basic modelling strategy in the work of Elhorst (2010), we apply the ordinary least squares (OLS) model to test for spatial dependence. Standard econometric estimation methods are not suitable when spatial autocorrelation is present, due to bias and inconsistency in the estimates (Chasco, 2003; Hall, Karadas & Schlosky, 2016). This is because of the endogeneity that characterises spatial models, which can be defined as linear models that represent spatial effects of dependency or spatial autocorrelation. When tests are applied to detect autocorrelation, namely Moran's I, Lagrange multiplier lag, Lagrange multiplier error and Lagrange multiplier SARMA, they are shown to be significant: that is, substantive and residual autocorrelation is observed. Table 2.5 reports the results of these tests. Both the LM (lag) test and the robust LM (lag) test show that spatial dependence is substantive and is adapted to the SAR model, as specified by Anselin (2005). The test performed on the residual model shows spatial dependence, but its robust version rejects this hypothesis. These results were confirmed by the robust SARMA test.

The non-normal distribution of the residuals precludes the application of the strategy to estimate the model with the maximum likelihood (ML) method, presented in the spatial literature by Elhorst (2010), and LeSage and Pase (2009, 2010, 2014). We therefore use spatial lag and two-stage least squares (2SLS) models as proposed in Bastida et al. (2013b). To estimate the spatial lag model, we include the spatially lagged dependent

variable  $W_y$  as a further explanatory variable, in line with Chasco (2013). The spatial lag is included in the analysis in order to achieve the consistency that is not yielded by the OLS model and, at the same time, incorporate in the model the influence of the variables omitted in the OLS model. We take into account the presence of endogeneity in the model by constructing the spatial lag, since this functions in the same way as including the endogenous variable in the simultaneous equations framework, according to Chasco (2013). In accordance with the above, in the spatial literature this model is referred to as the simultaneous autoregressive spatial model.

We use the Anselin-Kelejian test to check the existence of spatial autocorrelation in the residuals. The results show no spatial autocorrelation in the error term. Therefore, the most suitable model, once again, is the mixed autoregressive model of spatial regression, known as the lag model, which is expressed as follows:

$$y = \rho W_y + X\beta + u \quad (2)$$

where:

$y$ : vector of observations of the dependent variable.

$\rho$ : spatial autoregressive coefficient corresponding to the spatially lagged variable.

$W_y$ : vector of spatial lags of the dependent variable (spatial lag of the variable  $y$ ).

$W$ : matrix of spatial weights.

$X$ : matrix of observations of the independent variables.

$\beta$ : vector of the independent variable parameters.

$u$ : vector of random disturbances.

For our case we define the following model:

$$\begin{aligned} \log(CD_i) = & \rho W_{\log(CD)} + \beta_1 GRANTS_i + \beta_2 NSR_i + \beta_3 CE_i + \beta_4 AAP_i + \\ & + \beta_5 INCOME_i + \beta_6 DENS_i + \beta_7 RET_i + \beta_8 GEN_i + \beta_9 HI_i + \beta_{10} SIGN_i + u_i \end{aligned} \quad (3)$$

**Table 2.5. Spatial interactions of municipality debts**

| Variables                  | Models     |          |             |          | Spatial effects |                  |                |
|----------------------------|------------|----------|-------------|----------|-----------------|------------------|----------------|
|                            | 2SLS       |          | Spatial lag |          | Direct effects  | Indirect effects | Total effect   |
| $\rho$ W log ( <i>CD</i> ) | 0.3028***  | (0.1201) | 0.3215***   | (0.1207) |                 |                  |                |
| GRANTS                     | -1.5647*   | (0.9468) | -1.5694*    | (0.8354) | -1.6014e+00*    | -7.1154e-01      | -2.3130e+00*   |
| NSR                        | -3.0823*** | (0.6249) | -3.0889***  | (0.5791) | -3.1521e+00***  | -1.4005e+00*     | -4.5525e+00*** |
| CE                         | -0.0003    | (0.0002) | -0.0003     | (0.0003) | -3.1425e-04     | -1.3963e-04      | -4.5388e-04    |
| APP                        | 1.6068***  | (0.2572) | 1.6101***   | (0.2436) | 1.6430e+00***   | 7.3001e-01       | 2.3730e+00***  |
| INCOME                     | 0.0000     | (0.0000) | 0.0000***   | (0.0000) | 6.1071e-06***   | 2.7185e-06**     | 8.8255e-06***  |
| DENS                       | -0.0000    | (0.0001) | -0.0000     | (0.0001) | -3.3600e-05     | -1.4929e-05      | -4.8529e-05    |
| RET                        | -5.0533*** | (1.6823) | -4.9078***  | (1.7132) | -5.0053e+00***  | -2.2280e+00*     | -7.2333e+00*** |
| GEN                        | 0.4083     | (0.2609) | 0.4005*     | (0.2346) | 4.0841e-01*     | 1.8180e-01       | 5.9021e-01     |
| HI                         | -4.1699*** | (1.0236) | -4.1175***  | (1.0504) | -4.2016e+00***  | -1.8668e+00*     | -6.0684e+00*** |
| SIGN                       | 0.2178     | (0.2214) | 0.2229      | (0.2144) | 2.2731e-01      | 1.0118e-01       | 3.2849e-01     |
| CONSTANT                   | 7.8154***  | (0.9468) | 7.6971***   | (0.9501) |                 |                  |                |
| Anselin-Kelejian Test      | 0.1577     |          | 0.1618      |          |                 |                  |                |
| $R^2$                      | 0.3093     |          | 0.3122      |          |                 |                  |                |
| Moran's I (error)          | 2.6170***  |          |             |          |                 |                  |                |
| LM (lag)                   | 8.9340***  |          |             |          |                 |                  |                |
| Robust LM (lag)            | 3.6460**   |          |             |          |                 |                  |                |
| LM (error)                 | 5.6020***  |          |             |          |                 |                  |                |
| Robust LM (error)          | 0.3150     |          |             |          |                 |                  |                |
| LM (SARMA)                 | 9.248***   |          |             |          |                 |                  |                |

\*  $p < 0.1$  \*\*;  $p < 0.05$ ; \*\*\* $p < 0.01$

Standard error in parenthesis.

As there is no theoretical model that specifies the most suitable matrix for each case, in the spatial autocorrelation test we used four types of weight functions for spatial contiguity matrix: queen contiguity (w1sdv), minimum distance (dminsdv)  $k$ -nearest-neighbour (knn5sdv), and inverse distance (dinvsdv). The results of the log likelihood ratio (LR) test<sup>7</sup> led us to select the 5 nearest-neighbour matrix, which best adapted to the spatial model, in line with Elhorst (2010). The  $k$ - nearest-neighbour criterion considers the geometric distance between regions taking into account the  $k$  nearest neighbours of each observation. To construct the matrix selected, we used information on the centroids and identified the nearest centroid as the neighbour until the established number of neighbours is obtained, following Herrera (2015). This criterion ensures that all the municipalities have the same number of neighbours and also avoids the problem of isolation of neighbours or municipalities with too many neighbours. Having chosen the nearest neighbour criterion, the municipalities were represented with the binary technique that assigns values of  $W_{ij} = 1$  when  $i$  and  $j$  are neighbours and  $W_{ij} = 0$  otherwise. Econometric treatment of the data requires matrix standardisation by rows. The distances based on the spatial weight matrix are used to interpret the interactions of the neighbours, calculated with UTM coordinates (latitude and longitude). Euclidean distance was used to construct the matrix; that is, distance based on a straight line and not kilometres.

Arraiz et al. (2010), Drukker et al. (2013) and Kelejian and Prucha (1998, 1999, 2010) the most prominent scholars in the spatial literature, have developed the two-stage least squares estimation technique with instrumental variables and the spatial lag model. In their work, Anselin (1988) and Bastida et al. (2013b) propose using spatial two-stage least squares (2SLS) by constructing an instrument fitted to the variable  $W_j$ . Chasco (2003) and Kelejian and Robinson (1993) argue that the spatially lagged exogenous variables are the appropriate instrumental variables for spatial analysis, which requires the use of first-order contiguous matrices. For these reasons, we use the logarithm of the current debt as the instrumented variable, and the lagged independent variables are the instruments.

To calculate the spatial effects, we take into account the multiplier of the matrix:

$$(I - \rho W)^{-1} \beta_k \tag{4}$$

<sup>7</sup> Log likelihood for each matrix is: w1sdv (-1197.2560); dminsdv (-1199.4940); dinvsdv (-1197.5780); knn5sdv (-1196.8860).

where:

$I$  represents the identity matrix of the order, in this case order 1.

$\rho$  represents the spatial parameter<sup>8</sup> that lies between -1 and 1.

$W$  represents the matrix.

$\beta_k$  is the vector of the independent variable parameters.

#### 4. Results

Table 2.5 presents the results of the LM tests, Moran's I and the SARMA test that initially identified the existence of spatial autocorrelation. The LM tests, developed by Anselin (1988), show that a priori the spatial lag model is the most suitable, as it is confirmed by the robust LM test (Anselin et al., 1996). Although in our case the LM test for the residuals is significant, the robust LM test rejects the spatial error model as the most suitable model. These results were confirmed by the Anselin-Kelejian test, the results of which show no spatial autocorrelation in the residuals. We therefore adopt the spatial lag model as the most suitable option for this study.

We also take into account the possible problem of endogeneity by following the instrumental variables (IV) or spatially lagged variables approach. Table 2.5 displays the main results. The effects of the spatial iteration of current municipal debt, represented by  $\rho = 0.32$ , are significant and positive. We can therefore confirm that if current debt rises in one municipality, its five nearest neighbours will also experience an increase in their debt levels. Our results are in line with the findings of Borck et al. (2015).

In addition, the interpretation of the results of the spatial models does not directly depend on the matrix units, since their interpretation is not based on the  $\beta$  coefficients, due to the feedback effects from the  $\rho$  coefficients, according to Hall et al. (2016). That is, if an explanatory variable in one municipality undergoes changes, these changes will affect the dependent variables in the other municipalities. We therefore obtained the direct (on the diagonal of each matrix) and indirect (off the diagonal of each matrix) total effects

<sup>8</sup> Kelejian and Prucha (1998, 1999) and Elhorst (2014a, b).

according to Elhorst (2014a, b) and LeSage and Pace (2009). The direct effect reflects how a change in a variable in municipality  $i$  affects its current debt, and vice versa. The indirect effect represents the effect of the change in an independent variable in municipality  $i$  on the current debt of its neighbours  $j$  and vice versa (Elhorst, 2014a; López et al., 2017).

Similarly, spatial feedback effects occur due to their expansion; in other words, the spatial effects not only affect immediate neighbours, but also their neighbours' neighbours. For this reason we limited the expansion effect to the five nearest neighbours<sup>9</sup> through the first-order identity matrix. Having detected the existence of spatial autocorrelation we cannot interpret the spatial effects in the same way as the  $\beta$  coefficients in the OLS model due to the presence of the spatial multiplier in the matrix.<sup>10</sup>

It is also important to note that the direct and indirect effects are different for each municipality and direct interpretation would be difficult since the sample in the present case comprises 527 municipalities. This problem is addressed by LeSage and Pace (2009), who provide the average indicators for each of the effects.

Continuing with the analysis of Table 2.5, the variable *grants and transfers received* (*GRANTS*) presents a direct spatial effect; that is, an increase in the *GRANTS* in one municipality has a negative effect on its current debt. Balaguer (2002), Bastida and Benito (2005), Benito et al. (2015a) and Pérez-López et al. (2013) found the same results. However, this increase does not affect the current debt of neighbouring municipalities. Local governments' involvement in local taxation systems (personal income tax, VAT, property tax, etc.) and grants received from other government bodies to finance services, investment in assets and public works are alternative sources of funding to taking on debt. Our results reveal that the coefficient of the *net savings rate* (*NSR*) is significant and negative. Thus, H2 is supported, in the same line as Cabasés et al. (2003). That is, if a municipality's net savings rate increases, its current debt will fall, and to a lesser extent, its neighbours' current debt will also decrease. Net savings represents local government sustainability in that if a municipality can meet its current expenses with its current income, it will not need to get into debt. Our results are in line with Balaguer (2002),

<sup>9</sup> The results proved to be robust with the rest of the matrices.

<sup>10</sup> Calculated as the partial derivative of the dependent variable with respect to changes in the explanatory variables (Elhorst, 2014a).

Bastida and Benito (2005), Brusca and Labrador (1998), Cabasés et al. (2003) and Pérez-López et al. (2013). These studies analyse this variable as a determinant of municipal debt, but without considering its potential spatial effects.

In a context of economic crisis, local investment may not be significant due to the stricter controls to which it is subjected.<sup>11</sup> We deduce that local governments with high levels of debt postpone major investments in order to stabilise their growth and avoid excessive deficits. For this reason, we find no significant results of spatial autocorrelation for per capita *capital expenditure (CE)*. Neither does *population density (DENS)* present evidence of spatial autocorrelation in debt. However, when we analyse the linear model with OLS budget variables, these are statistically significant, in line with the literature on local debt (Bastida et al., 2009 & Benito et al., 2015b).

One of the main contributions of this study is the introduction of the *average payment period to suppliers (APP)* into the analysis. The results show that this variable is highly representative and significant, showing that compliance with the legal limit of APP to suppliers (payment within 30 days) reduces current debt, thus supporting H4, although it does not affect the debt of neighbouring municipalities. To date, given that the payment period for local government suppliers has been introduced very recently, the only other contribution we are aware of is the article by Pons (2017). This author studied APP as an indicator of commercial debt, and his findings point to significant variations of APP among the different local government groups analysed, highlighting the high levels of non-compliance with the payment limits established in current legislation, and municipalities' failure to report their information.

The variable *per capita income (INCOME)* is significant and has positive direct and indirect effects on accumulated debt, supporting H5. Municipalities with higher per capita income have higher levels of current debt, coinciding with studies by Cabasés et al. (2003), Guillamón et al. (2011), Kiewiet and Szakaty (1996) and Vallés et al. (2003). The results of the present study are in the same line and extend the findings of these authors. In addition, higher income levels in one municipality positively affect its neighbours' debt levels, as the variable with indirect effects is more significant ( $p < 0.05$ ), although

<sup>11</sup> The limitations on municipal investments are regulated the Organic Law 2/2012, of April 27, on Budgetary Stability and Financial Sustainability (*Ley Orgánica 2/2012, de 27 de abril, de Estabilidad Presupuestaria y Sostenibilidad Financiera*) in the "expenditure rule".

with little economic effect. This is due to the demand from citizens for more public services in relation to the higher taxes they pay.

*Retired people (RET)*, comprising people over the age of 65, has negative effects on local and neighbouring debt due to the indirect and direct effects of spatial spillover. This variable has greater economic importance since it has the highest indirect effect, but with a low level of significance ( $p < 0.1$ ). Our results are in line with Borck et al. (2015), who include older citizens as a measure of the labour force. This stakeholder group can be analysed from the perspective that they do not pressurise municipalities to provide a greater number of services.

The variable *gender of the mayor (GEN)* presents positive spatial autocorrelation and direct effects, confirming that gender (woman) has positive effects on debt level. Hypothesis 8 is therefore confirmed. However, its coefficient shows a lower positive effect on debt because it is not reflected in the total effect. These results could be related to spending policies. In the literature, authors such as Funk and Philips (2018) found that in municipalities where women are mayors the composition of local government expenditures is different. Consequently, we believe that this aspect could affect local debt.

*Political strength (HI)* shows negative spatial effects, both direct and indirect, on local debt. Our results coincide with those of Bastida et al. (2013a), Hagen and Vabo (2005) and Roubini and Sachs (1989). According to the literature, party political majorities enable local governments to resist pressure on debt from different stakeholder groups. This is because political decisions taken by majority governments on expenditure and investment budgets are not dependent on coalitions with other political parties.

Finally, the political ideology of the party, whether conservative or liberal, does not influence the evolution of local debt, since this variable (*SIGN*) has no significant effects at either local or neighbourhood level. Our results coincide with those of Bastida and Benito (2005), Benito and Bastida (2004) and Pérez-López et al. (2013) in that political ideology does not influence local debt level.



## 5. Conclusion and discussion

The aim of the present study was to analyse the spatial relationships in public debt among municipalities in the Valencian Community (Spain). Using spatial techniques, we observe the existence of spatial dependency of neighbouring councils for current debt. Thus, our findings indicate that debt should not be ignored when considering interactions between municipalities. The influence of the spatial effects observed in the debt could contribute to future decisions on inter-municipal cooperation between small authorities. Such cooperation reduces unnecessary costs in the provision of public services as a result of economies of scale (Ferraresi et al., 2018; Zafra-Gómez et al., 2013) and consequently could help to reduce the debt.

When analysing the determinants of local debt, on the one hand there are variables that have direct and significant effects on the debt of your municipality, such as the volume of grants and transfers received, the average payment period and the gender of the mayor. The volume of *grants and transfers received* has direct negative effects at a local level; in other words, it contributes to reducing local debt. However, the *average payment period* has a direct positive effect on the municipality's debt. This variable may be analysed as a financial indicator of cash solvency, demonstrating that local governments which do not pay their suppliers within the stipulated period are also those with higher debt levels. In other words, if a local government fulfils its short-term payment obligations it avoids interest on default payments, which in turn would cause an increase in its debt levels. Likewise, we find a similar pattern for the *gender of the mayor*, which has a direct positive effect on the level of current debt; that is, women mayors call for greater recourse to debt, although this influence is not highly significant.

On the other hand, there are other variables that not only have direct effects on municipal debt, but also have indirect effects on the debt of neighbouring municipalities. This is the case of variables such as net saving and political strength, which have a negative direct and indirect effect on debt. A higher *net savings rate* has a negative influence on a municipality's accumulated debt and in turn, reduces the debt of its neighbours. Thus, if a local government has greater capacity to generate additional resources (savings) once it has fulfilled its obligations, its budgetary sustainability will be greater. Likewise, the analysis of *political strength*, reveals stronger governments can take decisions on public

finances without having to depend on the support of minority parties, and therefore incur fewer costs and as a result, have lower debts. In the same line, in their study of Norwegian local municipalities Kalseth and Rattsø (1998) observed that the more concentrated the political leadership, the lower the administration costs. This pattern could have imitative effects among the citizens of neighbouring municipalities, as shown in the results of our study.

In turn, debt is affected by the socio-economic variables of neighbouring municipalities, such as number of pensioners and income level. The *number of pensioners* has negative effects on local and neighbouring debt. These results may suggest that spatial dependence of debt could be defined by the characteristics, needs and preferences of the municipality's inhabitants. Because the higher welfare benefits this population group receives are paid directly by the central government (pensions and health), they do not require some of the social benefits directly provided through local expenditure, therefore reducing the need to resort to borrowing. However, the *capita income* has a positive direct and indirect effect; that is, it affects current municipal debt and at the same time, affects debt levels in neighbouring municipalities due to higher demands for the provision of public services. From an economic perspective, our findings demonstrate that the economic level of a region influences the municipal debt of its neighbours. This result could be explained as imitative behaviour (López et al., 2017). That is, if the inhabitants of a locality have a higher economic level, they will demand better local services and benefits that, in turn, will be demanded by their municipal neighbours.

Finally, it is also important to note that *capital expenditure* is not significant. This result may be because municipalities have not had to borrow to finance the low investment in infrastructure, due to the economic crisis and its consequent restrictions on debt. An interesting future line of research would be to analyse the spatial effects of this variable over a longer time horizon, and to break down the total investment to take into account the type of investment and its possible spatial effects on debt.

Another future research line could be to evaluate the long-term evolution of spatial relationships in local debt and extend the study to cover all Spanish municipalities. However, in our study we focus only on the Valencian municipalities due to the lack of some data for municipalities in the rest of Spain. It would also be interesting to break down current municipal debt into short-term and long-term payment obligations, which

would allow us to analyse the spatial effects taking into account the term of the payment of the debt.



**CHAPTER 3**  
**Budgetary stability and financial sustainability from a gender  
perspective**

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## **1. Introduction**

During the recent economic crisis, which began in 2008, European public administrations had to adapt their budgetary policies on expenditure, taxes, deficits and debt. The consequences of these changes have been noted across all European Union countries, but especially in Spain, Portugal, Greece, Italy and Ireland (Bastida et al., 2014; Moody's, 2013; Navarro-Galera et al., 2015, 2017). In Spain, reduced public revenues and rising public expenditure resulted in the serious deterioration of public finances. In order to stabilise this situation and comply with European fiscal policies, Article 135 of the Spanish Constitution was amended to introduce new fiscal rules on structural deficit, allocation of budget surplus and public debt limits, in accordance with the values established in the Treaty on the Functioning of the European Union.

In an attempt to recover stability, and in response to restrictive EU fiscal policies, on 27 April 2012 the Spanish parliament approved Organic Law 2/2012, the Law on Budgetary Stability and Financial Sustainability (LOEPSF). This law implemented a set of governing principles that would guarantee budgetary stability and financial sustainability at all levels of public administration, thereby strengthening the trust, security and stability of the Spanish economy within the EU framework. Three interrelated dimensions are involved in local government financial sustainability: public expenditure, debt and deficit (Navarro-Galera et al., 2017). One of our aims in this chapter is therefore to analyse the behaviour of these three dimensions in order to examine how they might affect the risk of local governments' non-compliance with the principles of local government budgetary stability and financial sustainability as defined in the LOEPSF.

In addition, increasing women's representation in local government is also firmly on the agenda, nationally and internationally, as a consequence of legislative responses to the growing social need to achieve gender equality. Women have become more visible in a broad range of social contexts in the wake of major international events such as the United Nations world conferences on women in Nairobi (1985) and Beijing (1995). Current changing trends resulting from the modernisation of administrative structures are driving the need for research on differences in political leadership of women and men as part of wider changes in local government management (Broussine & Fox, 2002; Ryan et al.,

2005). In this line, Navarro-Galera et al. (2017) find that the composition of local governments can affect the risk of their non-compliance with legal limits. Slegten et al. (2018) demonstrate that female and male politicians have different preferences at the local government level in Belgium.

Changes in legislation on gender equality in Spain have led to a rise in women's representation in local government. As a consequence of the legal measures adopted to this end, we wonder whether this shift in local government composition has also had an effect on decisions taken at the municipal level. The present study therefore attempts to analyse whether differences in the gender of local government mayors and councillors affect the degree of compliance or the risk of non-compliance with the principles of budgetary stability and financial sustainability contained in the LOEPSF.<sup>12</sup> The main results show that women mayors are more likely to comply with the principles of budgetary stability and financial sustainability, and to adhere to the established legal debt limits.

The chapter is structured in six sections. Following this introduction, section 2 reviews the most relevant literature on legislative changes and gender. Section 3 describes the variables, the sample and the specification of the models. Section 5 presents the study's main results, and conclusions are drawn in the final section.

## **2. Literature review**

Some research in the gender studies literature confirms that the composition of government and expenditure allocation vary according to the leader's gender; that is male and female leaders of public institutions have different preferences when allocating public resources (Ennsner-Jedenastik, 2017; Funk & Philips, 2018; Svaleryd, 2009). Other studies, however, conclude that the gender of the mayor has no effect on local government management (Guillamón et al., 2011; Carozzi & Gago, 2017; Ferreira & Gyourko, 2014).

In the business environment, research has also examined the differences in management by men and women in political or business positions. Green and Homroy (2018) find that female company directors have positive effects on performance. These authors observe

<sup>12</sup> In this study we refer to the level of compliance with the principles established in the LOEPSF as the "global limit" (see Table 3. 1.).



positive and economically significant effects on performance in large European businesses with a female presence on their board of directors, corroborating the claim that female management differs significantly.

Hamidullah et al. (2015) studied gender and the magnitude of managerial values in local governments in the U.S., finding that women differed from men in values of equity, long-term perspective, sense of community and representation, as well as in values of efficiency, effectiveness and expertise.

In Spain, Araujo and Tejedó-Romero (2016) analysed the rising role of women in Spanish local governments during the period 2008–2012. They conclude that female political representation has a positive influence on the level of transparency in local councils, reflected by increased information transparency and less information asymmetry. Hernández-Nicolás et al. (2018) show that councils led by a woman mayor have lower debt interest repayment obligations.

Ferreira and Gyourko's (2014) study on the consequences of electing a woman leader in U.S. cities showed that women mayors have higher unobserved political skills than their male counterparts. Slegten et al. (2018) found that female and male politicians use different strategies to reduce public deficit. In a context of budgetary restraints, these authors observed gender-based differences in budget preferences among the council members of Flemish municipalities. Specifically, the female politicians preferred to tackle budget deficit by raising public revenues, whereas their male counterparts preferred to reduce expenditure.

Women's political leadership style, characterised by practices and behaviours that positively influence the quality of public institutions (Epstein et al., 2005), might therefore have an impact on local government policies which affect non-compliance with the established debt limits.

### **3. Determinants of compliance with the Law limiting local debt in Spain**

#### **3.1. Political variables**

*Gender of the mayor (GEN)*

In Spain, promotion of gender equality policies is influenced by the social beliefs about the role of women in senior political positions, which, together with the dictatorship that ended in 1975, delayed women's entry into the public sector, as Hernández-Nicolás et al. (2018) confirm in their study. These circumstances prevented Spain's inclusion in the list of countries with pioneering gender equality policies. However, legal measures are now being implemented to promote women's participation in the public space, designed to eliminate the barriers to access known as the "glass ceiling". Since the approval of Organic Law 3/2007 for the Effective Equality of Women and Men in March 2007, a growing number of municipalities now satisfy the minimum quota of female participation in municipal electoral lists.

The management of public finances is becoming an important latent issue due to the restrictive budgetary policies adopted to tackle the problems of rising deficit and public debt in EU member states. For this reason, as a result of European legislation on this question, Spanish legislators had to adapt quickly to the economic reality to maintain their commitment to the EU. Recent legal events have placed local budget management in the firing line, since if the fiscal requirements set out in the LOEPSF are not met, obligatory measures are brought to bear. In this line, Slegten et al. (2018) found that to alleviate budget deficit, women politicians preferred to increase public revenues, whereas the preference of male politicians was to reduce expenditure. In turn, authors like Amanatullah et al. (2010) found evidence of different management styles between men and women and as a consequence, different outcomes and performances.

Navarro-Galera et al. (2017), however, found that the mayor's gender was not a statistically significant factor in the risk of local government default. In light of the differences in management behaviour between men and women, in this study we analyse whether there are differences in local government management that may be attributed to the gender of the governing leader. Specifically, we explore whether behaviours in complying with the principles of budgetary stability and financial sustainability differ according to the gender of the mayor and the composition of the local government.

### ***Percentage of women councillors (COUNC)***

Organic Law 3/2007 for the Effective Equality of Women and Men, approved in March 2007 (LOI), introduced a new article into Organic Law 5/1985 on the

General Electoral Regime, Article 44 bis, according to which political party electoral lists must include a minimum of 40% female and 40% male candidates, both in the complete list and in every five posts. This quota is obligatory only in municipalities with more than 3,000 inhabitants.

It is therefore of interest to analyse how this change in the legislation might have affected compliance with the restrictions established in the LOEPSF. In this vein, Navarro-Galera et al. (2017) found that having a higher proportion of women councillors helps to reduce the risk of local governments failing to meet their financial obligations. Geys and Revelli (2011) observed a positive relationship between the number of women councillors and the combination of tax revenues in municipalities. In a similar line, Navarro-Galera et al. (2017) state that if tax revenues rise, local governments will have more resources with which to meet their financial obligations, and in consequence, would be less likely to violate their financial obligations. The evidence therefore seems to suggest that the number of women councillors in a local government has an impact on whether or not a municipality complies with the principles of budgetary stability and financial sustainability provided for in the LOEPSF.

### *Gender quotas (EGEN)*

Baltrunaite et al. (2014) studied the effects of incorporating gender quotas in Italian electoral lists in relation to the quality of the politicians elected, finding a relationship between gender quotas and an increase in the quality of elected politicians. Chen (2010) analysed the correlation between gender quotas and women's representation in politics, resulting from the response to equality policies, and different government expenditures. The author concludes that a rise in the number of female legislators increases the government's expenditure on health and social welfare.

In turn, Campa and Bagues (2017) observed that while quotas raise the proportion of women council members in Spanish municipalities, they are not effective enough to stimulate women's empowerment in the composition of governments because of underlying beliefs about women's role in society.

Finally, in their study of Indian municipalities Chattopadhyay and Duflo (2004) analysed the effects of reserving 30% of local council seats for women, and the consequences of this policy in terms of expenditure. These authors' main conclusion was that the political

leader's gender does lead to differences in public spending. They found that women leaders increase spending on public goods associated with the main concerns they have about their region, and invest less in goods more closely associated with men's concerns.

In light of these studies, and taking into account the gender quota system for Spanish electoral lists introduced in the LOI, we attempt to verify whether the quota of women councillors influences the probability of compliance with the principles of budgetary stability and financial sustainability.

The variable (*EGEN*) represents the gender quota in electoral lists. In accordance with the LOI, this variable takes a value of 1 in municipalities where women councillors represent at least 40% of the total number of councillors (compliance with the LOI), and 0 otherwise (non-compliance with the LOI).

### ***Electoral period (ELECT)***

Analysis of political budget cycles in government management has attracted much academic interest (Akhmedov & Zhuravskaya, 2004; Drazen & Eslava, 2010; Rogoff, 1990). The literature contains various research streams on the convergence of political decisions and voter preferences. Governing parties often increase public spending as an electoral strategy to raise their re-election chances. Male mayors may use their experience in local government as a way of launching their political careers in higher levels of public administration (Ryan et al., 2005). For these reasons we consider that electoral periods could affect political behaviour in terms of the differences in the electoral strategies male and female politicians employ.

In Spain, Balaguer-Coll et al. (2015) analysed the effects of public spending on the re-election possibilities of local governments, finding that increased spending, particularly investment, in pre-election periods positively affects their probability of re-election.

Repetto (2016) examined whether having more informed voters affects the political budget cycle in Italian municipalities. The study shows that a change in the law requiring municipalities to publish their balance sheets in the pre-election period affects budget cycles by reducing investment expenditure, which in the year before elections was higher than in election years.

In turn, authors such as Ågren et al. (2006) confirm that voters can elect politicians with different preferences from their own. Jottier et al. (2012) found that public policies may not be oriented towards the electorate because politicians are unaware of voters' preferences due to the existence of asymmetrical information. Vila (2012) found no evidence of debt cycles in electoral periods. Finally, Allers (2015) was unable to demonstrate that voters punish bad financial management.

In light of the above, we test whether local governments differ in their compliance with debt limits as a consequence of the political strategies they take at different points in the political budget cycle. In the present study we consider this as a dichotomous variable,<sup>13</sup> where pre-electoral and electoral period (2014 and 2015) take a value of 1 and post-electoral period (2013 and 2016), a value of 0.

### ***Political Ideology (SIGN)***

Budget allocation preferences of municipal governments may be determined by their political party affiliation (Slegten et al., 2018). In this line, Balaguer-Coll and Brun-Martos (2013) concluded that conservative local governments are more likely to be re-elected than progressive governments, affirming that increased public spending positively affects re-election. Public spending on capital investments is mainly financed through long-term debt, and therefore may affect the global limit of the study.

However, Blais and Nadeau (1992), Kiewiet and Szalaky (1996) and Dickson and Yu (1997) found that conservative parties present lower debt levels. Balaguer-Coll et al. (2015), Brender (2003) and Cassette and Farvaque (2014) showed that high debt levels negatively affect governments' re-election probabilities.

Various authors have explored political party behaviour in terms of expenditure and revenue. Hibbs (1987), Seitz (2000), Tellier (2006) and León Ledesma et al. (2010), among others, support the view that progressive parties are more likely to implement policies financed through higher public spending that, in turn, affects their debt level. However, these authors also note that conservative political parties support austerity measures in their budget policies and therefore have lower levels of public debt.

<sup>13</sup> Municipal elections were held in Spain in 2011 and 2015; 2014 is therefore pre-electoral and 2015 electoral, whereas is post-electoral following the elections of 2011, and 2016, those of 2015.

Slegten et al. (2018) found that politicians' political preferences are influenced by their ideology; they observed that incumbent political parties are more willing to make quantitative adjustments, and that conservative parties are more likely to reduce government activities than progressive parties. Svaleryd (2009) confirmed that political ideology is correlated with budget preferences. Navarro-Galera et al. (2017) showed that progressive parties incur higher expenditure, debt and deficit than conservative parties, concluding that local governments controlled by progressive parties may have a higher risk of non-compliance with restrictions. Vila (2012) observed that conservative governments are more likely to fail to meet legal debt limits than progressive governments.

In contrast, other authors such as Guillamón et al. (2011), Benito and Bastida (2004), Abizadeh and Gray (1993) confirmed that political ideology does not affect municipal debt levels. Benito and Bastida (2008) concluded that financial management at the municipal level does not depend on the governing party's political affiliation.

### ***Political strength (HI)***

Political and managerial decision-making is more straightforward in majority-led governments. In this line, Guillamón et al. (2011) confirmed that political strength influences debt level, showing that municipalities with weak governments have lower levels of debt per capita. Pérez et al. (2013) found that political fragmentation affects local debt. Vila (2012) concluded that minority or coalition governments are more likely to incur debt than single-party governments. Ashworth et al. (2005) demonstrated that more highly fragmented governments have higher levels of debt and public deficit, and suggest that disagreement may be more prevalent among members of coalition governments, or they may use debt strategically. In turn, Roubini and Sachs (1989) showed that parties in a coalition are more likely to present public deficits. Hagen and Vabo (2005) found that less politically fragmented governments have higher levels of public surplus than more fragmented governments.

On the other hand, Benito and Bastida (2008) concluded that municipalities' financial situation does not depend on the strength of the local government. Navarro-Galera et al. (2017) found no evidence that political strength influences the risk of violating legal debt restrictions in municipalities.

Based on the above, we test whether the political strength of the government can affect compliance with the global limit as a result of its decisions on expenditure and debt levels. To quantify the political strength of the governing party we define the Herfindahl index, in the same way as in Guillamón et al.'s (2011) study, by means of the following expression:

$$\sum_{i=1}^n S_i^2 / S^2 \quad (1)$$

where  $S_i$  is the number of councillors of party  $i$  in the local government; and  $S$  is the total number of councillors.

### **3.2. Socio-economic/control variables**

#### ***Population (LogPOB)***

The number of inhabitants in a municipality is an important factor when analysing expenditure, debt and deficit, since different population groups can lobby for increased spending on social policies that have a greater effect on their interests. Guillamón et al. (2011) and Pogue (1970) showed that municipalities with larger populations also have greater debt; that is, the number of inhabitants affects debt levels. For their part, Benito and Bastida (2008) found evidence to show that municipal population positively influences municipal spending and taxes. In this line, Benito et al. (2015a) demonstrated that population has a positive impact on non-compliance with debt limits. However, other studies have shown that population does not affect debt level (Benito and Bastida, 2004).

#### ***Local Income (INCOME)***

According to Benito and Bastida (2004), many studies, such as Hulten and Peterson (1984), Dickson and Yu (1997), McEachern (1978), Kiewiet and Szalaky (1996) and Farnham (1985), confirm that families with higher income levels demand better infrastructures and services, which are reflected in increased public spending and, in turn,

higher municipal debt. Increases in public spending and debt could also increase the risk of non-compliance with the legal debt limits analysed in this study.

In a similar vein, Cabasés et al. (2007) showed that municipal debt arises as a consequence of spending pressure motivated by the demand for public goods at the local level. These are normal goods and their income elasticity of demand is positive. Non-financial public revenue systems are too rigid to satisfy this demand, and municipalities resort to debt as a result. In sum, per capita GDP has a positive impact on demand for services, which indirectly affects expenditure and local debt. Similar conclusions were drawn by Guillamón et al. (2011): municipalities' economic level positively affects per capita municipal debt. Benito and Bastida (2008) also confirmed that local economic level positively influences local spending.

In contrast, Benito et al. (2015a) found a positive relationship between income level and compliance with the global debt limit. Benito et al. (2015b) concluded that municipal income level does not affect the increase in public debt. Finally, Benito and Bastida (2004) showed that the economic level in municipalities does not explain the indebtedness of Spanish local governments.

Given the wide discrepancies in findings on how municipal income level influences public finances, we study its effect on our dependent variable.

### ***Immigration (INMIG)***

Some studies in the literature demonstrate how ethnic fragmentation affects public finances in U.S. cities. The needs of ethnic groups are shown to have a direct impact on spending and debt; in consequence, public spending is inversely related to the level of ethnic fragmentation in the city (Alesina et al., 1999).

In the other hand, Pérez et al (2013) found that the immigration rate influences the level of municipal debt. Studies by Oates (1972), Schultz and Sjöström (2001), Guillamón et al. (2011) concluded that the percentage of immigrants positively affects local debt. Finally, Benito et al. (2015b) demonstrated a negative relationship between immigration and the increase of municipal debt.



### ***Retired people (RET)***

Social policies designed to meet the specific needs of certain population groups affect local public spending and the financing of services to meet these needs through increased debt. In this vein, Rodríguez et al. (2016) demonstrated that the population aged over 65 has a negative impact on local financial sustainability. Hagen and Vabo (2005) confirmed that older people have a negative effect on public finance surpluses.

In addition, Crespo and Mira (2014) analysed the relationship between the employment status of European women and caring for older family members. The main contributions of this study suggest that women's loss of employment due to caring for older relatives is more significant in southern European countries than in central and northern Europe. This conclusion leads us to consider that women who are elected to political posts may be more sympathetic to spending on social policies designed to help older people. With regard to spending preferences, in his study on the degree of heterogeneity in public spending preferences in Spanish autonomous communities, Calvo (2019) showed that the rate of dependency of the population, represented by people over the age of 64, has opposing and significant effects; in other words, preferences were not seen to converge.

In turn, Ellis and Schansberg (1999) found that this group has a negative influence on long-term debt levels. Balaguer-Coll and Ivanova-Toneva (2019) evidenced a negative relationship between people over the age of 65 and current debt.

## **4. Data and specification of the model**

### **4.1. Sample and definition of variables**

The sample comprises 1,272 Spanish municipalities with populations of 3,000 or more for the period 2013–2016. These municipalities were selected for the study because under the LOI, they are obliged to meet the established gender quotas for local government composition.

Table 3.1. presents the sources from which information on the variables was taken: Sielocal (*Sistema de Información Económico Local*, local economic information system), Ministry of Finance (*Ministerio de Hacienda*), Spanish Government's Transparency Portal (*Portal de Transparencia de la Administración del Estado*), Ministry of Interior.

Directorate General of Domestic Policy (*Ministerio del Interior. Dirección General de Política Interior*), Ministry of the Presidency and Territorial Administrations (*Ministerio de la Presidencia y Administraciones Territoriales*), Spanish Statistical Institute (*Instituto Nacional de Estadística*) and State Tax Agency (*Agencia Estatal Tributaria*).

**Table 3.1. Description of variables**

|   | <b>Definition of the variables</b>   |  | <b>Expected sign</b> | <b>Sources</b>   |
|---|--|--|----------------------|--|
| <i>Dependent variable</i>                 | <p><i>Limit 1</i> (L1): Average Payment Period <math>\leq 30</math> days;<br/> <i>Limit 2</i> (L2): Debt <math>&lt; 110\%</math> current revenues;<br/> <i>Limit 3</i> (L3): compliance with the principle of Budgetary Stability (LOEPSF)</p> | $Global\ limit = \sum_{i=1}^3 Li/3$  |                      | Sielocal and Ministry of Finance                                   |
| <i>Political variables</i>                | Gender of the mayor ( <i>GEN</i> )   | Dummy variable (0: male mayors; 1: female mayors)  | +/-                  | Spanish Government's Transparency Portal                           |
|   | Women councillors ( <i>COUNC</i> )   | % women councillors in the municipality  | +                    | Ministry of Interior. Directorate General of Domestic Policy       |
|   | Gender quotas ( <i>EGEN</i> )  | Dummy variable (1: municipality complies with LOI; 0: otherwise)   | +                    | Ministry of Interior. Directorate General of Domestic Policy       |
|   | Electoral period ( <i>ELEC</i> )   | Dummy variable (1: pre-electoral period and electoral year; 0 post-electoral year)   | +/-                  | Ministry of the Presidency and for the Territorial Administrations |
|   | Political Sign ( <i>SIGN</i> )   | Dummy variable (0: municipalities governed by progressive parties; 1: municipalities governed by conservative parties)   | +/-                  | Ministry of the Presidency and for the Territorial Administrations |
|   | Herfindalh Index ( <i>HI</i> )   | Values between 0 and 1 depending on the number of councillors for each party in the council. High values denote a lower level of political fragmentation or higher political strength. | +/-                  | Ministry of the Presidency and for the Territorial Administrations |
| <i>Socio-economic (control variables)</i> | Logpob ( <i>LogPOB</i> )   | Log of number of inhabitants   | +/-                  | Spanish Statistical Institute                                      |
|   | Income ( <i>INCOME</i> )   | Disposable income per capita   | +/-                  | State Tax Agency   |
|   | Immigration ( <i>INMIG</i> )   | % immigrants /total population   | +/-                  | Spanish Statistical Institute                                      |
|   | Retired people ( <i>RET</i> )  | % Population aged over 65/total population   | +/-                  | Spanish Statistical Institute                                      |

## 4.2. Model specification

In this study we examine the degree to which the principles of budgetary stability and financial sustainability are satisfied in accordance with the mayor's gender and the gender quota in the local government, taking into account a set of political (electoral period, political ideology of governing party) and socio-economic variables (logarithm of the population, income per capita, percentage of immigration, and percentage of population over the age of 65).

The dependent variable, termed the global limit (*GLOBAL LIMIT*) comprises the average of the three limits analysed individually:<sup>14</sup>

*Limit 1 (L1)*: compliance with the average payment period to local suppliers;

*Limit 2 (L2)*: compliance with the percentage established for public debt;

*Limit 3 (L3)*: compliance with the principle of budgetary stability.

In what follows we define the three individual limits.

The LOEPSF understands financial sustainability from a dual perspective: sustainability of commercial debt and sustainability of financial debt. In consequence, *limit 1 (L1)* is based on compliance with the principle of financial sustainability of the commercial debt, known as the average payment period to suppliers. This law establishes that the period must not exceed the maximum term provided for in late payment regulations.<sup>15</sup> Following Olmo et al. (2018), we calculate the variable average payment period to suppliers (APP) as: (outstanding payment obligations/recognised net liabilities) \*365 days.<sup>16</sup>

*Limit 2 (L2)* verifies the compliance with debt limits set for local governments and is established as follows: debt pending payment for the year under study  $\leq$  110% of current revenues for the previous year.

Finally, *limit 3 (L3)* concerns compliance with the principle of budgetary stability in local governments defined by the LOEPSF as the situation of balance or structural surplus

<sup>14</sup> See Table 1.

<sup>15</sup> The fifth additional provision of the LOEPSF states that “*references in this law to the maximum period set by regulations on late settlement of payments to suppliers will be understood to refer to the period established at each moment in the aforementioned current regulations, which at the time this law comes into force, is thirty days*” (authors’ translation)

<sup>16</sup> Data obtained from <http://www.sielocal.com/>.

(authors' translation). For this purpose we use data on compliance in each municipality published by the Ministry of Finance.<sup>17</sup>

The variable *GLOBAL LIMIT* can therefore take four values (0; 0.33; 0.66 and 1), that is, it is censored between values 0 and 1. According to Wooldridge (2010), censored regression models are applied when the dependent variable is continuous, but has a positive probability mass at one or several points. We cannot consider using ordinary least squares to model the data in these cases due to their inconsistency of the estimator (Wooldridge, 2010). Given this circumstance, our model is fitted to Tobit's model, developed by Tobin in 1958, of random effects<sup>18</sup> for panel data with the dependent variable restricted to a range between 0 and 1 (see Baum & Christopher, 2006). Our model is therefore defined as follows:

$$Y_{it} = \alpha_i x_{it}\beta + v_i + \epsilon_{it} \quad (2)$$

$$Y = \begin{cases} y_i^* & \text{if } 1 \geq y_i^* > 0 \\ 0 & \text{if } 1 < y_i^* < 0 \end{cases}$$

where  $Y_{it}$  is the probability of complying with the legal limit (*GLOBAL LIMIT*);  $\alpha_i$  is the model constant;  $i = 1, \dots, n$  panels;  $t = 1, \dots, n_i$ ;  $x_{it}$  represents the vector of the independent variables that affect the probability of compliance or not with the global limit;  $\beta$  represents the coefficient matrix; the random effects termed  $v_i$  are distributed as  $N(0; \sigma_v^2)$ ;  $\epsilon_{it}$  represents the residuals that are distributed as  $N(0; \sigma_\epsilon^2)$ , independently of  $v_i$ ; and  $\gamma^*$  is the latent variable.

The model requires a normal distribution  $N(0; \sigma_v^2)$  for the random effects  $v_i$ , which yields the combined density of the data observed for the panel. In the present case, for each year the models have 78 censored observations on the left, 2,483 non-censored observations and 2,527 censored observations on the right. The  $\beta$  coefficients in both models measure the marginal effects of the independent variables (*GEN, CONS, EGEN, ELECT, SIGN, HI, LogPOB, INCOME, INMIG* and *RET*) on the latent variable  $\gamma^*$ , which is expressed with the following formula:

<sup>17</sup> See [http://www.hacienda.gob.es/es-](http://www.hacienda.gob.es/es-ES/CDI/Paginas/EstabilidadPresupuestaria/InformacionCCLLs/Cumplimiento_objetivoestabilidad_EELL.aspx)

ES/CDI/Paginas/EstabilidadPresupuestaria/InformacionCCLLs/Cumplimiento\_objetivoestabilidad\_EELL.aspx

<sup>18</sup> As seen in the literature, there is no Tobit model of fixed effects of panel data.

$$\beta = \frac{\partial E(y_i^*)}{\partial x_i} \quad (3)$$

However, we are interested in finding out the marginal effects of the aforementioned independent variables on  $Y: (E(Y|0 \leq Y \leq 1))$ , assuming  $v_i = 0$ ). That is, we calculate the marginal effects of the independent variables for the probability that a local government will comply with the principles of budgetary stability and financial sustainability using the following formula:

$$\beta^* = \frac{\partial E(y_i, x_i)}{\partial x_i} \quad (4)$$

Table 3.2 reports some descriptive statistics of the variables used in this study. Table 3.3 shows the frequency of the dichotomous variables in relation to the dependent variable analysed. The data reveal 79.87% of male mayors compared to 20.13% of female mayors, reflecting the higher participation of men in local politics. The number of municipalities that comply with the gender quota in their electoral lists exceeds those that do not. Progressive political parties represent the most frequent political ideology.

**Table 3.2. Descriptive statistics**

| <b>Variable</b> | <b>Mean</b> | <b>Std. Dev</b> | <b>Min.</b> | <b>Max.</b> |
|-----------------|-------------|-----------------|-------------|-------------|
| GLOBAL LIMIT    | 0.7881      | 0.2420          | 0           | 1           |
| GEN             | 0.2013      | 0.4010          | 0           | 1           |
| COUNC           | 0.4080      | 0.0829          | 0.1400      | 0.6920      |
| EGEN            | 0.5267      | 0.4993          | 0           | 1           |
| ELECT           | 0.5000      | 0.5000          | 0           | 1           |
| SIGN            | 0.4438      | 0.4969          | 0           | 1           |
| HI              | 0.3623      | 0.0900          | 0.1257      | 0.7693      |
| LogPOB          | 4.0233      | 0.4530          | 3.4518      | 6.5061      |
| INCOME          | 21397.61    | 5740.51         | 12023       | 72993       |
| INMIG           | 0.0941      | 0.0918          | 0.0006      | 0.6915      |
| RET             | 0.1897      | 0.0685          | 0.0460      | 0.7694      |

**Table 3.3. Frequency of variables GEN, EGEN and SIGN in relation to global limit**

| Variable | Dummy | Mean   | Std. Dev. | Percentage | Freq. |
|----------|-------|--------|-----------|------------|-------|
| GEN      | 0     | 0.7883 | 0.2393    | 79.87      | 4064  |
|          | 1     | 0.7871 | 0.2528    | 20.13      | 1024  |
| EGEN     | 0     | 0.7987 | 0.2344    | 47.33      | 2408  |
|          | 1     | 0.7785 | 0.2484    | 52.67      | 2680  |
| SIGN     | 0     | 0.8027 | 0.2340    | 55.62      | 2830  |
|          | 1     | 0.7697 | 0.2507    | 44.38      | 2258  |

## 5. Results

Two models were estimated because the variables COUNC and EGEN were highly correlated. Table 3.4 reports the results for models I and II, in which the coefficient  $\rho$  is different from zero in both models; therefore the variance component at the panel data level is significant as the panel estimator is different from the pooled estimator. For our data, therefore, the data panel offers a better fit than the pool of data. The log likelihood test is statistically significant, as it compares the pooled estimator with the panel estimator, following Baum and Christopher (2006).

From the  $\beta$  coefficients of both models, we expect that each of the variables with significant and positive effects will increase the probability of a municipality complying with the global limit established, and vice versa. That is, each one of the variables with significant and negative effects will reduce the probability of a municipality complying with the established global limit. However, to accurately interpret the results we calculate the marginal effects of each explanatory variable on the dependent variable ( $E(Y|0<Y<1)$ ), which is the probability of obtaining that a local government will comply with the principles of budgetary stability and financial sustainability.

**Table 3.4. Models and marginal effects**

| Variables      | Models                    |                           | Marginal effects          |                           |
|----------------|---------------------------|---------------------------|---------------------------|---------------------------|
|                | I                         | II                        | I                         | II                        |
| GEN            | 0.0343*<br>(0.0197)       | 0.0351*<br>(0.0197)       | 0.0104*<br>(0.0059)       | 0.0106*<br>(0.0059)       |
| COUNC          | -                         | -0.0184<br>(0.0835)       | -                         | -0.0056<br>(0.0253)       |
| EGEN           | 0.0050<br>(0.0138)        | -                         | 0.0015<br>(0.0042)        | -                         |
| ELEC           | 0.0282***<br>(0.0092)     | 0.0282***<br>(0.0092)     | 0.0085***<br>(0.0028)     | 0.0085***<br>(0.0028)     |
| SIGN           | -0.0806***<br>(0.0139)    | -0.0812***<br>(0.0139)    | -0.0243***<br>(0.0042)    | -0.0246***<br>(0.0042)    |
| HI             | 0.3294***<br>(0.0973)     | 0.3351***<br>(0.0974)     | 0.0996***<br>(0.0293)     | 0.1013***<br>(0.0294)     |
| LogPOB         | -0.1448***<br>(0.0256)    | -0.1433***<br>(0.0254)    | -0.0438***<br>(0.0077)    | -0.0188***<br>(0.0033)    |
| INCOME         | 9.32e-06***<br>(1.99e-06) | 9.33e-06***<br>(1.99e-06) | 2.82e-06***<br>(6.00e-07) | 2.82e-06***<br>(6.00e-07) |
| INMIG          | -0.2723**<br>(0.1226)     | -0.2737**<br>(0.1226)     | -0.0823**<br>(0.0370)     | -0.0828**<br>(0.0370)     |
| RET            | 0.7547***<br>(0.1730)     | 0.7538***<br>(0.1730)     | 0.2281***<br>(0.0521)     | 0.2279***<br>(0.0522)     |
| $\rho$         | 0.5908<br>(0.0161)        | 0.5905<br>(0.0161)        |                           |                           |
| Log likelihood | -2693.4600                | -2693.5019                |                           |                           |

\*  $p < 0.1$  \*\*;  $p < 0.05$ ; \*\*\* $p < 0.01$   
Standard error in parenthesis.

Table 3.4 reports the estimations of the Tobit models. Here we can observe that in both models the independent variables *GEN*, *ELECT*, *HI*, *INCOME* and *RET* show positive and significant effects on the variable global limit, whereas the variables *SIGN*, *LogPOB* and *INMIG* present significant and negative effects.

The variable *gender of the mayor (GEN)* has a positive effect on the probability of complying with the global limit; that is, the presence of a woman mayor in the local government contributes to improving the financial situation, due to her commitment to complying with the global limit. Our results are similar to those of Hernández-Nicolás et



al. (2018), who found that local governments with women mayors have lower annual interest and debt repayment obligations.

The variables *gender quotas (EGEN)* and *councillors (COUNC)* have no statistically significant effects when included in the model separately. One possible explanation for this could be that our study covered two electoral cycles; this suggests that the possible effects of gender quotas on participation are not seen in the short term. In this vein, the study by Bagues and Campa (2017) concluded that quotas fail to achieve, at least within three electoral cycles, several other goals with which they are commonly associated.

Table 3.5 reports the results of the interactions between the above variables, based on the original models, in order to identify possible effects. Specifically, two interactions and their marginal effects are presented (GEN and EGEN; GEN and ELECT).

**Table 3.5. Interaction effects in models**

| Interactions   |    | Coefficients          | Marginal effect       |
|--|----|-----------------------|-----------------------|
| <b>GEN # EGEN</b>  |    |                       |                       |
| Mayor is a woman and municipality does not comply with LOI | 10 | 0.0290<br>(0.0291)    | -<br>-                |
| Female mayors and municipality complies with LOI           | 11 | 0.0406*<br>(0.0239)   | 0.0100*<br>(0.0060)   |
| Male mayors and municipality complies with LOI             | 01 | 0.0036<br>(0.0150)    | -<br>-                |
| <b>GEN#ELECT</b>   |    |                       |                       |
| Female mayors in post-electoral period                     | 10 | 0.0316<br>(0.0217)    | -<br>-                |
| Female mayors in pre-electoral period                      | 11 | 0.0656***<br>(0.0244) | 0.0085***<br>(0.0028) |
| Male mayors in pre-electoral period                        | 01 | 0.0268***<br>(0.0103) | 0.0105***<br>(0.0059) |

\* p < 0.1; \*\* p < 0.05; \*\*\*p < 0.01  
Standard error in parenthesis.

The interaction between *gender of the mayor (GEN)* and *gender quota* of councillors in the local government (*EGEN*) yielded the following results: if the local government is led by a woman mayor and this government has a percentage of female councils equal to or

above 40% of its members, the combination of the two factors has a positive influence on compliance with the global limit, that is, with the LOEPSF.

The results show that when local governments are led by women mayors in a working context comprised of a majority of women councillors, the effect on compliance with the global limit is positive and significant (the marginal effect is 0.010). However, local governments led by women mayors in which the majority of the councillors are men, that is, councils that do not comply with the gender equality legislation, show no statistically significant effects on compliance with the global limit. Neither do we find statistically significant evidence to show that councils with a male mayor and with at least 40% of women councillors in the government, that is, where decisions are taken by male mayors together with a municipal government team that complies with the gender quotas, has no influence on compliance with the global limit.

Our results coincide with those of Navarro-Galera et al. (2017), who confirmed that the increase in the proportion of women councillors in the local government can help to reduce the risk of non-compliance. Similarly, Geys and Revelli (2011) demonstrate that the increase in the proportion of women councillors is positively related to tax revenues; in other words, these councils have more liquidity to meet their payments. We therefore deduce that these local governments will also be more likely to comply with the global limit.

In the second interaction we examined the behaviour of local governments according to *gender* (*GEN*) in the pre- and post-electoral periods (*ELECT*), to identify any possible behaviour strategies. The results show that in pre-electoral periods, male mayors are more likely to comply with the global limit than women mayors, since the marginal effect for men is higher (0.0105) than that for women (0.0085). This suggests that men follow a strategic management behaviour pattern, possibly for electoral purposes. This finding demonstrates that male local mayors could use their position as a way of promoting their political career (Ryan et al., 2005), and from which we deduce that they use different political strategies than women in their dealings with voters. In this vein, González et al. (2019) found that male politicians change parties as a result of their political ambition and the pursuit of better professional opportunities. These authors show that men are more likely to switch political party than women. This circumstance may be due to the presence of electoral strategies.

Table 3.4. shows that *electoral period (ELECT)* influences the level of compliance with the legal limit; that is, compliance with the global limit is higher in pre-electoral periods. This finding confirms the existence of electoral cycles since incumbent governments make a greater effort to meet the legal limits during this pre-electoral period. This circumstance could also be explained from the point of view of the electorate; as Repetto (2016) showed, today's voters have access to more information about public finances which they might use to punish candidates. This could explain why politicians tend to comply with the legal limits in pre-electoral periods in order to improve their re-election chances.

The variable *political ideology (SIGN)* has a negative effect on compliance with the global limit established in the two models. We can therefore confirm that conservative political ideology influences non-compliance with the limits set out in the LOEPSF. Our results are similar to the conclusions drawn by Benito et al. (2015b), who point out that conservative governments significantly influence the likelihood of increased local debt. In the same line, Balaguer-Coll et al. (2015) demonstrated that conservative parties are more likely to be re-elected. In their paper these authors observe how policies that increase public spending –particularly investment spending– in pre-electoral years, positively affect the local government's probabilities of being re-elected. For this reason, and given that investment spending is mainly financed through long-term debt, we consider that councils driven by a conservative political ideology are more likely not to comply with the global limit.

In turn, the variable *political strength of the governing party (HI)* positively affects compliance with the global limit. According to Hagen and Vabo (2005), increased political strength positively influences budget balance. Our results are in line with the study by Guillamón et al. (2011), which showed that weak governments have higher levels of contracted debt.

*Population size (LogPOB)* has a negative effect on the probability that a municipality will comply with the legal limits studied. This finding can be explained by the higher volume of public spending, which leads to increased debt (Farnham, 1985; Guillamón et al., 2011; Pogue, 1970). Our results coincide with those of Ashworth et al. (2005) and Benito et al. (2015b), who found that the larger the population, the higher debt growth will be. Higher spending translates into higher debt; in consequence we consider that these two budget factors may be key in non-compliance with established legal limits.

Our results for the variable *local per capita GDP (INCOME)* show that it has a positive relationship with global limit compliance. These findings align with Benito et al. (2015b), who revealed a positive relationship between income level and compliance with the global limit. One possible explanation for this finding is that municipalities with higher incomes also have higher revenue collection capacity. Following the studies of Benito and Bastida (2008) and Adams (1977), income level affects the need to finance expenditure through debt; that is, the higher the population's income, the greater the tax revenue and, therefore, the lower the debt.

Regarding the *percentage of immigrants (INMIG)*, we find that this variable has a significant and negative effect on compliance with the global limit. These results align with the work of Guillamón et al. (2011) and Pérez et al. (2013), who found a positive relationship between percentage of immigrants and volume of debt. This might be explained by the fact that municipalities with higher numbers of immigrants incur higher social welfare expenditure due to the needs of these citizens (Alesina, et al., 1999).

Finally, the variable *people over the age of 65 (RET)* increases the probability of compliance with the global limit. Our results concur with studies by Ellis and Schansberg (1999) and Balaguer-Coll and Ivanova-Toneva (2019), who found a negative relationship between people over the age of sixty-five and debt. This result may be explained by older people's reluctance to leave a negative legacy, which leads them to limit their electoral support for politicians that increase debt levels (Ellis & Schansberg, 1999). According to these authors, younger people prefer financing through debt rather than taxes, in direct contrast to the preferences of older citizens.

## **6. Conclusions**

The aim of this study was to analyse whether the gender of local government mayors and councillors influences the risk of non-compliance with the principles of budgetary stability and financial sustainability provided for in the law (LOEPSF) in Spanish municipalities with over 3,000 inhabitants during the period 2013–2016. We also analysed the effect of a series of political and socio-economic variables on the compliance with this law.

Although the law on gender quotas in local politics (LOI) was introduced only recently, our results do demonstrate its effects. We find that women mayors have an effect on local financial management in that their presence increases the probability that the municipality will comply with the principles of budgetary stability, financial sustainability and legal debt restrictions. In turn, when women mayors lead a local government comprising at least 40% of women councillors, probability of compliance with the LOEPSF increases. Thus, the *Law of Effective Equality of Women and Men* (LOI), which requires a minimum percentage of female participation in the municipal electoral lists, favours compliance with the *Law on Budgetary Stability and Financial Sustainability* (LOEPSF).

Similarly, we identified the use of pre-electoral strategies in complying with the law. However, when the mayor's gender was analysed, we found that in pre-electoral periods male mayors comply with the legal restrictions to a greater extent than their female counterparts. In other words, male mayors make a greater effort to comply through more strategic behaviours in order to increase their chances of re-election.

As regards the other political variables, a conservative political ideology was seen to influence non-compliance with the legal debt limits established in the law. These results coincide with findings by Benito et al. (2015b), who showed that conservative governments have a significant influence on the increase of local debt. Similarly, political strength of the governing party positively affects compliance with the law, as weak governments are more likely to have higher contracted debt.

Finally, in relation to the socio-economic variables, we found that the number of immigrants and population size have negative effects on the probability of compliance with the law. This may be due to the greater needs implied by these two factors, which translate into higher spending and debt. However, people over the age of sixty-five and municipal income have positive effects on compliance. These results suggest that older people aim to avoid leaving a negative legacy to future generations, and that municipalities whose citizens have more disposable income are more likely to comply with the law due to their greater capacity for revenue collection.



## **CONCLUSIONS**

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The main objective of this doctoral thesis is the study of different aspects related to the local management of Spanish municipalities. The first section analyses the evolution of Spanish local debt in the period before and after the economic crisis. In the second section, the existence of imitative spatial behaviours in the approach to indebtedness is studied. And in the third section, the profile of the local mayor is analysed from a gender perspective and according to their influence on local management.

The main conclusions obtained in the *first section* show that during the economic boom period, driven mainly by the services and construction sectors, there was an increase in funds which led to a reduction in local indebtedness. However, with the onset of the economic recession in 2008, these revenues were reduced, resulting in an increase in the level of indebtedness caused by the financing of public services. There are also other socioeconomic and political factors that play a part in the level of local debt. Nowadays, the local public debt is in a situation of normalization thanks to the legal measures adopted and to the economic recovery of the country. However, local corporations have a long way to go in order to adjust to the national deficit objectives included in the 2017-2020 Stability Plan.

In the *second section* of the thesis, the existence of spatial patterns of indebtedness in Valencian local municipalities is analysed for the year 2015. By means of the use of spatial econometric techniques, the existence of spatial dependence in the indebtedness of the municipalities is identified. The influence of the observed spatial effect on debt could contribute to future decisions on inter-municipal cooperation among smaller local authorities. Cooperation between municipalities reduces unnecessary costs in the provision of public services as a result of economies of scale.

When analysing the determinants of local debt, variables are identified that have a direct and significant effect on the debt of the municipality, such as the volume of subsidies and transfers received, the average payment period and the gender of the mayor. The volume of subsidies and transfers received has a direct negative effect at a local level. However, the average payment period has a direct positive effect on the municipality's debt, that is, municipalities that fail to comply with the average payment period established for local suppliers are also those with the highest levels of debt. On the other hand, there are other variables that not only have a direct effect on municipal debt but also have an indirect effect on the debt of neighbouring municipalities. This is the case for variables such as net saving and political strength, which have a direct and indirect negative effect on debt.

In turn, the debt is affected by the socioeconomic variables of neighbouring municipalities, such as the number of pensioners and the level of income.

The objective of the *third section* of the thesis is to analyse whether the gender of the local mayor, and that of the councillors, influences the risk of noncompliance with the principles of budgetary stability and financial sustainability contained in the LOEPSF (2012). We also analyse the effect of a series of socioeconomic and political variables and their impact on compliance with these limits. Taking into account the Organic Law 3/2007, of March 22, for the effective equality of men and women, we find empirical evidence that shows the effect of this law. The results indicate that female mayors have a different impact, compared to their male counterparts, on local financial management since they increase the probability of compliance with the principles of budgetary stability, financial sustainability and the legal limit on indebtedness. We also observe that, when female mayors work with a government group in which at least 40% are women, the probability of compliance with the aforementioned principles increases. Therefore, we can conclude that the Organic Law 3/2007, of March 22, for the effective equality of men and women, which establishes a minimum percentage of female participation in the municipal electoral lists, has positively influenced the fulfilment of the Law of Budgetary Stability and Financial Sustainability (LOEPSF 2012).

Furthermore, the existence of pre-electoral strategies is visible for compliance with the legal limits established in the LOEPSF. However, if we analyse this existence taking into account the gender of the local mayor, it can be seen that male mayors comply more with the legal restrictions in pre-electoral periods, in comparison to their female counterparts. This would suggest a greater, albeit strategic, effort of male mayors to comply with the three principles studied to improve their chances of being re-elected.

In addition, a conservative political ideology appears to influence the breach of the three legal limits studied. These results are in line with the results obtained by Benito et al. (2015b), which indicate that conservative governments have a significant influence on the increase in local debt. However, it is also evident that the political strength of the ruling party positively affects compliance with the law, given that weak governments have a tendency to incur greater debt.

To conclude, we recognise that the number of immigrants and the population have a negative effect on the probability of compliance with legal limits, most likely due to

greater social needs leading to greater spending and debt. However, retired people and municipal revenue have positive effects on compliance with the law. These results indicate that people who are outside the labour market probably try not to leave a negative legacy to future generations. Finally, municipalities with greater purchasing power are more likely to comply with the principles studied, due to their greater tax revenues.



## **CONCLUSIONES**

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El principal objetivo de esta tesis doctoral ha sido el estudio de diferentes aspectos relacionados con la gestión local de los municipios españoles. En el primer capítulo se analiza la evolución de la deuda local española en un periodo previo y posterior a la crisis económica. En el segundo capítulo, se estudia la existencia de comportamientos espaciales imitativos en el recurso al endeudamiento. Y en el tercero se analiza el perfil del gobernante local, desde la perspectiva de género y su influencia en la gestión local.

Las principales conclusiones obtenidas en el **primer capítulo** de esta tesis doctoral muestran que durante la época de bonanza económica, propulsada principalmente por el sector de servicios y construcción, ha provocado la entrada de fondos que permitieron la disminución del endeudamiento local. Sin embargo, con la llegada de la recesión económica iniciada en 2008, estos ingresos se vieron mermados, lo que ha provocado un aumento en el nivel de endeudamiento para poder financiar los servicios públicos. Asimismo, se observa que existen otros factores socioeconómicos y políticos que también indiquen en el comportamiento de la deuda local. Actualmente, observamos que la deuda pública local se encuentra en una situación de normalización provocada por las medidas legales adoptadas y por la recuperación económica del país. No obstante, las corporaciones locales tienen un largo camino por recorrer, para ajustarse a los objetivos de déficit nacional recogidos en el Plan de Estabilidad 2017-2020.

En el **segundo capítulo** de la tesis se analiza la existencia de patrones espaciales de endeudamiento en las corporaciones locales valencianas para el año 2015. Mediante la utilización de técnicas de econometría espacial, se observa la existencia de dependencia espacial en el endeudamiento de los municipios. La influencia de los efectos espaciales observados en la deuda podría contribuir a futuras decisiones sobre la cooperación intermunicipal entre pequeñas autoridades. La cooperación entre municipios reduce los costos innecesarios en la prestación de servicios públicos como resultado de las economías de escala.

Al analizar los determinantes de la deuda local, se observa que hay variables que tienen efectos directos y significativos en la deuda de su municipio, como el volumen de subvenciones y transferencias recibidas, el período de pago promedio y el género del alcalde. El volumen de subvenciones y transferencias recibidas tiene efectos negativos directos a nivel local. Sin embargo, el período de pago promedio tiene un efecto directo positivo sobre la deuda del municipio, es decir los municipios que incumplen con el periodo medio de pago establecido a los proveedores locales, son también los que

mayores niveles de deuda presentan. Por otro lado, hay otras variables que no solo tienen efectos directos sobre la deuda municipal, sino que también tienen efectos indirectos sobre la deuda de los municipios vecinos. Este es el caso de variables como el ahorro neto y la fortaleza política, que tienen un efecto negativo directo e indirecto sobre la deuda. A su vez, la deuda se ve afectada por las variables socioeconómicas de los municipios vecinos, como el número de pensionados y el nivel de ingresos.

El objetivo del **tercer capítulo** de la tesis se analiza si el género del gobernante local, y el de los concejales, influye en el riesgo de incumplimiento de los principios de estabilidad presupuestaria y sostenibilidad financiera, contenidos en la LOEPSF (2012). A su vez, analizamos el efecto de una serie de variables socioeconómicas y políticas y su incidencia en el cumplimiento de dichos límites. Teniendo en cuenta la Ley Orgánica 3/2007, de 22 de marzo, para la igualdad efectiva de mujeres y hombres, encontramos evidencias empíricas que muestran los efectos de dicha ley. Los resultados señalan que las alcaldesas presentan una incidencia diferenciadora, en comparación con sus compañeros masculinos, en la gestión financiera local, debido a que éstas aumentan la probabilidad de cumplimiento con los principios de estabilidad presupuestaria, sostenibilidad financiera y el límite legal al endeudamiento. Observamos también que, cuando las gobernantes trabajan con un grupo de gobierno en el cual, al menos el 40% son mujeres, aumenta la probabilidad del cumplimiento con los dichos principios anteriormente nombrados. Por todo ello, podemos concluir que, la Ley Orgánica 3/2007, de 22 de marzo, para la igualdad efectiva de mujeres y hombres, que establece un porcentaje mínimo de participación femenina en las listas electorales municipales, ha influido positivamente en el cumplimiento de la Ley de Estabilidad Presupuestaria y Sostenibilidad Financiera (LOEPSF 2012).

Por otro lado, se observa la existencia de estrategias pre-electorales en el cumplimiento de los límites legales, establecidos en la LOEPSF. Sin embargo, si analizamos esta existencia teniendo en cuenta el género del gobernante local, se obtiene que los alcaldes cumplen en mayor medida con las restricciones legales en periodos pre-electorales, en comparación con sus compañeras femeninas, es decir, apreciamos un mayor esfuerzo de los alcaldes en cumplir con los tres principios estudiados, con el posible fin de ser reelegidos, actuando así de forma estratégica.

Asimismo, también se obtiene que la ideología política conservadora influye en el incumplimiento de los tres límites legales estudiados. Estos resultados se encuentran en



línea con los resultados obtenidos por Benito et al. (2015b), que señalan que los gobiernos conservadores influyen significativamente en el aumento de la deuda local. Asimismo, también se evidencia que la fortaleza política del partido gobernante afecta positivamente en el cumplimiento de la ley, dado que los gobiernos débiles presentan una tendencia a tener mayor deuda contraída.

Para terminar, apreciamos que el número de personas inmigrantes y la población, presentan efectos negativos en la probabilidad para el cumplimiento de los límites legales, probablemente por las mayores necesidades, traducidas en mayor gasto y deuda. Sin embargo, las personas retiradas y la renta municipal tienen efectos positivos en el cumplimiento de la ley. Estos resultados indican que las personas que se encuentran fuera del mercado laboral probablemente intentan no dejar un legado negativo a las generaciones futuras. Por último, los municipios con mayor poder adquisitivo presentan mayores probabilidades en el cumplimiento de los principios estudiados, debido a su mayor capacidad impositiva.



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