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IDENTIFYING RISK DETERMINANTS OF THE FINANCIAL SUSTAINABILITY OF REGIONAL GOVERNMENTS

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Summary

This paper seeks to identify explaining factors that can influence the financial sustainability (FS) of regional governments (RGs). We collected data on the variables for all the RGs of Spain, and our results show that the unemployment, immigrant population, dependent population, structure of revenues and expenditures, and source of debt influence SF. These findings can help policymakers and practitioners to improve the management of risk and opportunities, preventing or resolving sustainability problems.

Keywords: Financial sustainability; RG, socio-demographic and financial-economic variables; risk determinants.

1. Introduction

International organizations (European Commission [EC], 2011; European Union [EU], 2015; International Federation of Accountants [IFAC], 2016) have issued some recommendations and policies linked to performance on governmental sustainability through the implementation of solid accounting systems in drawing up budget forecasts, adding further pressure on governments. In this context, financial sustainability (FS) can be defined as the ability to manage expected financial risks and shocks over the long-term financial planning period without the need to introduce substantial or disruptive revenue (and expenditure) adjustments (EU, 2015; IFAC, 2013).

Similarly, international bodies such as the EU (2015, 2017), IFAC (2013), the National Audit Office (NAO) (2013) and previous studies (Cristina *et al.*, 2017; Navarro *et al.*, 2016; Rodríguez *et al.*, 2014a) have recognized the usefulness of government financial statements for reporting on the sustainability of public policies. In regional governments (RGs), the income statement is especially useful for planning short- and long-term public finances, and thus it is strongly linked to the intergenerational equity concept (EU, 2015, 2017; IFAC, 2016), which is crucial in assessing FS (IFAC, 2016; Rodríguez *et al.*, 2014a; Bisogno *et al.*, 2017), as these governments have the capacity to manage their income according to their spending priorities. Following the International Public Sector Accounting Standards (IFAC,

2016), the income statement is a financial statement that reflects the difference between revenues and expenses in governments, under accrual criteria.

Accordingly, previous research (García Sanchéz *et al.*, 2012; Rodríguez *et al.*, 2014a, 2016) has concluded that it is not only necessary to establish procedures for measuring the performance on FS (measured as difference between revenues and expenses accrued, adjusted for extraordinary activities), it is also essential to identify and to analyse the risk factors that could affect this sustainability. However, previous research has not devoted enough attention to discovering the causes of FS problems in regional governments (Guillamón *et al.*, 2011; Rodríguez *et al.*, 2016).

Socio-demographic and financial-economic variables have been considered relevant to achieving FS, and they could be of overriding importance, even more so at the regional level (EC, 2011; EU, 2015, 2017; IFAC, 2013). In fact, previous research has indicated that it is necessary to further the study of the influence of these variables on FS (Rodríguez *et al.*, 2014b; García Sánchez *et al.*, 2012).

Therefore, in light of the above, the analysis about the risk determinants of the FS in RGs is especially interesting and timely for countries such as Spain (Ruiz Huerta and García Diez, 2012; De la Fuente, 2014a, 2014b, 2014c, 2015), because they are not only responsible for many essential public services but are also funders of services provided by local governments. Moreover, despite having a high degree of autonomy, RGs systematically breach the deficit target stipulated in the *Stability and Growth Pact* of the EC (De la Fuente, 2014c; Díaz and Martín, 2015), and reach high levels of debt and deficit (368.9 million euros and 1.75% of regional GDP). This fact has led to regulatory reform to control FS, such as Act 2/2011, on sustainable economy, and Act 2/2012, on budgetary stability and financial sustainability.

The present paper seeks to determine the socio-demographic and financial-economic variables that influence FS in RGs. Our aim is identifying risk factors in the provision of public services over time by examining the influence of these variables on all Spanish RGs (17 in total) during the period 2006–2013.

2. Hypotheses to Empirical Test

Previous research (Rodríguez *et al.*, 2016; Navarro *et al.*, 2015) and international bodies (EC, 2009; EU, 2017) have indicated that socio-demographic and financial-economic variables could affect the financial health of governments.

2.1. Socio-demographic variables

Following the *stakeholder theory,* organizations should try to understand, respect, and meet the needs of all of those who have an interest in their goals (Freeman, 1984; Donaldson, 2001). However, organizations should not focus on meeting the interests of those who have extremely different interests, given that they might not survive economically. This theory posits that organizations have to make money and be managed sustainably, or else they will not be able to help meet anyone's needs. So the characteristics of the population could limit the evolution of FS of governments since the taxes paid, the needs of citizens (stakeholders) and the services received are very diverse (dependent population, immigrant population, unemployed). The characteristics of the population can have an effect on an RG's revenues received and financial needs (two dimensions of FS) since the most disadvantaged citizens will demand more public services and, at the same time, will have less capacity to contribute to the government's finances.

The *contingency theory* could explain the management of an organization, given that the main premise (Donaldson, 2001) is that there is no one best organizational structure; rather, the appropriate organizational structure depends on the (environmental) contingencies facing the organization. So the management of a governmental organization depends on the external constraints such as population structure. The change in stakeholder groups such as the dependent population, unemployed, and immigrant population could be addressed by different styles of management and could influence FS. This influence is because the structure of the population is a non-controllable factor for the RG, which can force its politicians and managers to modify their decision-making process to meet the needs of citizens with the resources available.

Accordingly, the pronouncements of some international organizations have highlighted that population structure is one of the most influential external factors that affects public finances and thus can influence the achievement of FS (EC, 2009; EU, 2015; IFAC, 2013).

Moreover, prior research has analysed the specific effect of the variables related to the population structure on different aspects of the public finances. Prior research has confirmed a positive relationship between population and debt (Guillamón *et al.*, 2011) and between public borrowing and spending (Choi *et al.*, 2010). The population pressure could lead to new needs in the provision of essential services provided to

citizens, such as health, education, employment, social affairs or roads, which can increase RGs' debt and expenses (Lago Peña and Fernández Leiceaga, 2013; Guillamón *et al.*, 2011; Choi *et al.*, 2010).

Therefore, taking into account these previous findings and the theoretical context (*stakeholder theory and contingency theory*), there is an influence of population size on debt, revenues and expenses (IFAC's dimensions), and hence, on the FS. The increase in population implies a greater expense that is not always accompanied by an increase in revenues and, in addition, the types of citizens can be vary greatly in their needs and financial capacity. So, analysing the following hypothesis, we will try to identify whether this variable could have a negative effect on the FS of RGs (risk factor). Thus, the increase in population should have a negative effect on FS (risk factor).

H.1: *Population size is an influencing factor on FS.*

Another factor that has been studied by previous research is the dependent population ratio (population under 16 and over 65). Several authors have specifically highlighted that the dependent population has an influence on the demand for public services and therefore on public expenditures and public finances (Ruiz and García, 2012). Other researchers have provided evidence of how this ratio affects financial capacity (Drew and Dollery, 2014) and balanced budget (Choi *et al.*, 2010) through its positive influence on per capita spending, taxation, and fiscal distress (Kloha *et al.*, 2005).

The findings of these previous studies linked to the theoretical context, especially the *stakeholder* and *contingency theories*, suggest that the dependent population could be a detrimental factor to the expenditures and debt (IFAC's dimensions), and hence, to the FS of RGs. In general, the dependent population has greater demands for public services due to their age and, at the same time, has lower financial capacity due to their reduced volume of revenue. It could be interesting to empirically study its influence, differentiating two variables (population under 16 and population over 65), as prior research on local government finances has proposed (Navarro *et al.*, 2015; Rodríguez *et al.*, 2014b, 2016). Therefore, we expect a negative influence, since the increase in the dependent population can reduce FS (risk factor).

H.2: *Dependent population under 16 can affect FS.*

H.3: *Dependent population over 65 can influence FS.*

Regarding the unemployment rate, this variable is very relevant in the findings of empirical research. In times of crisis, the unemployment rate is very high and provokes an increase in social expenditures (FS dimension) (Benito *et al.*, 2010). The *Fiscal Sustainability Report* (EU, 2015) indicates that a higher rate of unemployment has a negative influence on the country's productivity and on the revenues (FS dimension) of the social security system. The unemployed population has greater demands for public services (subsidies) and lower financial capacity due to their reduced volume of revenue. In the case of local governments, Rodríguez *et al.* (2016) found a negative influence of unemployment on FS.

Following the above and the theoretical context, we expect that an increase in the unemployment rate could reduce the FS of RGs, which leads us to check this variable as a risk factor under the following hypothesis:

H.4 *Unemployment rate is a limiting factor for FS.*

Regarding the immigrant population, other authors have highlighted that migration flows tend to raise the level of accumulated debt (Guillamón *et al.*, 2011) and negatively influences the financial performance of governments as a result of requiring increased social spending (Choi *et al.*, 2010; Lago Peña and Fernández Leiceaga, 2013; Ruiz and García, 2012). Rodríguez *et al.* (2016) found a negative influence of the immigrant population on the FS of local governments. Others have reported that the immigrant population is positively associated with the tax burden (Benito *et al.*, 2010).

These findings together with the theoretical context reveal that the immigrant population could be a risk factor to debt and expenditure, and hence to the FS of RGs. The immigrant population has greater demands for public services and lower financial capacity due to their reduced volume of revenue, affecting two dimensions of FS (expenses and revenues). Therefore, we expect a negative influence, since the increase in the immigrant population can reduce FS (risk factor).

H.5 *Immigrant population is a constraining factor for FS.*

2.2. Financial-economic variables

Our analysis of financial-economic variables is motivated by the pronouncements of the *agency theory* and the *goal-setting theory* (Grossman, 1990; Locke and Latham, 2002).

Following Baiman (1990), the *agency theory* each individual (e.g. politicians) is presumed to be motivated solely by self-interest, which does not always maximize the principal's (e.g. voters') welfare (Verbeeten, 2008). Therefore, from the standpoint of this theory, the citizenship will demand a greater volume of information to discover how well the government is meeting its duties (McMelland and Giroux, 2003) and how well it will maintain the delivery of public services in the future (Rodríguez *et al.*, 2016). Government managers are thus obliged to manage resources efficiently to demonstrate to citizens that they have used their resources adequately to meet the demands of public services. This behaviour may favor FS, since it may involve less consumption of resources to provide public services through an optimal use of financing, affecting three dimensions of FS: lower expenses, higher income, and lower indebtedness.

Considering the *goal-setting theory,* politicians and public managers in RGs could perform better having specific and challenging goals. The assessment of public revenues and expenditures could encourage them to reach FS since there is a direct relationship between the definition of specific and measurable goals and performance. If public managers know what they are aiming for, they are motivated to exert more effort, which increases performance (Locke and Latham, 2002). This in turn affects FS through measures to balance the consumption of resources with the revenues received from taxes on the citizens, which can influence government expenditures, revenues, and debt (dimensions of FS).

Considering the revenues, IFAC (2013) concludes that this dimension includes the ability to vary government revenues from taxes and create new ones, including income received from entities at other levels of government and from international organizations. So the "analysis of revenues" variable must include the total income in a period, taking into account current policies on the provision of services and revenues from taxation and other sources.

Its analysis is also supported by the *agency theory*. Citizens could demand more high-quality information about how public revenues are being used since they are required to pay several taxes. And the *contingency theory* (Donaldson, 2001) leads us to

believe that the source of income could condition FS because the RGs are partially financed by subsidies from the central government. Thus, politicians and managers should strive to get more external revenues (mainly subsidies from other governments) instead of demanding more taxes (internal revenue) from citizens and, in addition, they should try to ensure long-term financing through capital revenues, directed to finance investments.

Indeed, Alesina and Perotti (1995) concluded that there is an influence of transfers and taxes on governmental expenses, which are included in the dimension of FS. Based on these theories, we expect a positive influence for H.6 because the increase in external revenues in greater proportion to the increase in internal revenues can produce a favorable total effect on FS. By contrast, we expect a negative effect for H.7 since the politicians and managers will endeavor to obtain external financing and to ensure long-term revenues.

H.6 *The external/internal revenues indicator can influence FS.*

H.7 *The current/capital revenues indicator can affect FS.*

Regarding the services dimension, IFAC (2013) indicates that this dimension must express the ability to maintain the volume and quality of provided services. Considering the *goal-setting theory*, in RGs politicians and public managers could maintain better FS if they would establish some objectives about the deficit and public spending. The setting of objectives on expenditure limits and on their destination (current expenditure/capital expenditure) can motivate managers to control spending and to manage the proper balance between operating expenses and investments, since they are aware that deviations can be measured – and therefore the citizens can demand responsabilities. In this same line, Alesina and Perotti (1995) show the great influence of public investmente on government finances. Hence, we expect a negative sign in H.8, because the greater specific weight of current expenses implies a higher allocation of expenses in the current period, while capital expenses are charged during the years of useful life of the investments made.

H.8. *The current/capital expenditures indicator can influence FS.*

Turning to the debt dimension, IFAC (2013) considers that an increase in debt shows that a higher proportion of income is required to repay it, causing the diversion of the necessary resources. The assessment of the debt is essential to achieving FS.

Considering the *goal-setting theory*, politicians and public managers in RGs could better manage the debt dimension if they establish some aims about debt, such as those implemented by the recent reports about the achievement of the financial objectives in RGs (Ministry of Finance and Public Administration, 2014). Following the *agency theory*, citizens could have more interest in demanding information about public debt since its increase could negatively influence the resources available. These theories suggest a negative influence in H.9 because the increase in financial debt over the increase in commercial debt can imply the increase in interest expenses, as the banks always charge interest on loans. In addition, we expect a positive effect in H.10 since short-term debts generate less interest expenses than long-term debts, so that the increase in the ratio may favor FS. Thus, this paper analyses the hypotheses below:

H.9. *The origin of the debt (financial/commercial debt) can influence FS.*

H.10. *The maturity of the debt (short-/long-term debt) can affect FS.*

3. Research Design and Data Collection

3.1. Sample selection

All RGs from Spain have been selected for analysis (17 in total), as Spanish public administrations have some of the highest sustainability gap indicators in Europe (EU, 2017). In Spain, public sector revenues and expenditures have increased significantly in recent years as a result of the increased functions undertaken by and the expanding role of the public sector in economic activity (Bank of Spain, 2014), with special emphasis on RGs (Navarro *et al.*, 2016; De La Fuente, 2014a, 2014b, 2014c, 2015; Díaz and Martín, 2015; Ruiz and García, 2012). In 2014, the aggregate deficit of Spanish RGs was 1.75% of regional GDP and its accumulated debt was 368.9 million euros, which considerably reduces the ability to provide services to citizens because these governments handle 21.10% of public spending in Spain (Ministry of Finance and Public Administration, 2014; Bank of Spain, 2014).

Therefore, studies on FS are particularly timely and relevant to Spanish RGs, where the duplication in the delivery of services by local governments and RGs and the large size of the public sector preceded severe public spending cuts (Lago and

Fernández, 2013; Ruiz and García, 2012). The Spanish government's finance crisis has raised the concerns of citizens and politicians about the sustainability of public services, leading to regulatory reform (Law 2/2012 on budgetary stability and FS, which affect the size and volume of the services provided by RGs), with a particular emphasis on the principle of financial prudence in the functions of RGs. Most of the Spanish RGs have continuously exceeded the deficit target stipulated in the *Stability and Growth Pact* of the EC (De La Fuente, 2014c; Díaz and Martín, 2015). This had very severe effects on public finances, jeopardizing the sustainability of services provided to citizens (De La Fuente, 2014c; Lago and Fernández, 2013) because Spanish RGs have a very high degree of autonomy; are responsible for services such as health, education, roads, environmental issues, employment, and social affairs; and are funders of the public services provided by local governments. As a result, they manage very large budgets to provide such a variety of services (De la Fuente, 2014b, 2015a). Therefore, the systematic deficits by RGs and the financial link between regional and local governments could culminate in a failure to provide public services, which in turn would have a negative impact on citizens' quality of life.

3.2. Dependent variable

Our dependent variable is the FS of RGs, which is a key requirement of their capacity to provide public services over time. FS could be defined as the ability to manage expected financial risks and shocks over the long-term financial planning period without the need to introduce substantial or disruptive revenue (and expenditure) adjustments (EC, 2011; IFAC, 2013; EU, 2015), in line with Act 2/2012, of 27 April, on Budgetary Stability and FS. IFAC (2013) indicated that FS in governments is a broader concept linked to the concept of intergenerational equity (World Commission on Environmental and Development, 1987), or "inter-period equity".

Also, international bodies (EU, 2015, 2017; IFAC, 2013; NAO, 2013) are recognizing the usefulness of government financial statements for reporting on the sustainability of public services, in particular the income statement, which is closely linked to the "intergenerational equity" concept (Burritt and Schaltegger, 2010). Indeed, previous research (Bisogno *et al.*, 2017; Rodríguez *et al.*, 2014a, 2014b, 2016; Navarro *et al.*, 2015) and international organizations (EU, 2012; EC, 2012; IFAC 2013, 2016) have concluded that the income statement reflects a direct approach to two dimensions of FS (revenues and services) and, indirectly, to the debt dimension, due to its strong

link with the volume of expenditure. In fact, the income statement involves the effect of the debt, including the expenditure of loan interest, a magnitude very much associated with the volume of debt.

Hence, the analysis of an accrual-based income statement enables users to assess, on the one hand, the capacity of the entity to continue providing at least the same volume of goods and services and, on the other hand, the level of resources that will be needed in the future to continue to fulfil the government's obligation to deliver public services (Rodríguez *et al.*, 2016).

However, the income statement currently produced do not seem to be enough to assess the FS of public entities (Cristina *et al.*, 2017; Navarro *et al.*, 2016; Rodríguez *et al.*, 2014a, 2016) because this statement includes extraordinary activities which are not expected to be repeated in the future. The effect of extraordinary activities on revenues and expenses must be corrected in the income statement.

In this paper, the dependent variable is represented by the total amount of the adjusted income statement (standardized by the population). What must be corrected in the income statement is the effect of revenues and expenses derived from extraordinary activities, given that they lack any future scope, as previous studies concluded (Rodríguez *et al.*, 2014a, 2014b, 2016; Navarro *et al.*, 2015). This modification would make income a more reasonable measure of the size of intergenerational equity, and one more in accordance with the concept of FS. We have adjusted the annual income statement sampled in accordance with the purposes of this paper, in order to maximize its utility for assessing FS. The dependent variable is represented by the total amount of the adjusted income statement.

This accounting measurement of FS is defined based on the recommendations of the main international organizations (EU, 2015, 2017) and the declarations of international accounting bodies such as the IFAC (2013), as well as prior research (Burritt and Schaltegger, 2010; Cabaleiro *et al.*, 2013; Rodríguez al., 2014a, 2014b). Accordingly, our dependent variable is the measure of FS reflected in the adjusted income statement (adjusted for extraordinary results), which is an accounting measurement based on the accrual basis and calculated by subtracting expenses from revenues, proposed by International Public Sector Accounting Standards (IFAC, 2013). If this financial statement shows a positive result, this indicates a good financial and sustainability situation, and the opposite when the result is negative.

3.3. Independent variables

Based on section 2, and considering the factors that could influence FS and its three dimensions (demand, income, debt), we have selected ten variables as factors that may influence FS in the RGs, which have been linked with hypotheses defined in section 2 (see Table 1). The socio-demographic variables studied are population size (POP), dependent population (over 65 [DP65] and under 16 [DP16]), unemployment rate (UR), and immigrant population (IP). The financial-economic variables are external/internal revenues (REV_e/i), current/capital revenues (REV_c/k), current/capital expenditures (EXP_c/k), financial/commercial debt (DEBT_f/c), and short-/long-term debt (DEBT_s/l).

Furthermore, following the findings of previous research (Benito *et al.*, 2010; Guillamón *et al.*, 2011; Rodríguez, *et al.*, 2014a, 2014b), we have selected FS lagged one period as another possible independent variable. Its analysis could determine whether the level of FS of past years can influence the FS of the current fiscal year.

3.3.1. Socio-demographic variables

The first socio-demographic variable studied is the population size (POP) (H.1). It can be defined as the population residing in an RG and is measured using the neperian logarithm of the population (see Table 1).

The dependent population is considered to be those who do not work and rely on others for the goods and services they consume. We used two variables to measure it: the dependent population over 65 (DP65 [H.2]) (percentage of the population aged over 65 divided by the labour force) and the dependent population under 16 (DP16 [H.3]) (percentage of the population aged under 16 divided by the labour force) (see Table 1).

The unemployment rate (UR) considers the employed people in an RG (H.4), so it is measured by dividing the employed people by the labour force. Finally, the immigrant population refers to the immigrants residing in the RG, measured as a percentage of the total of the population (H.5) (see Table 1).

3.3.2. Financial-economic variables

Regarding the revenues dimension, we used two indicators. Firstly, the external/internal revenues (REV_e/i) (H.6) was measured using the budgetary external revenues divided by the internal revenues. On the other hand, we measured the current/capital revenues (REV_c/k) (H.7) using the budgetary operating revenues divided by the capital revenues (see Table 1).

Considering the services dimension, as mentioned above, we used public expenditures as a proxy for it. In this regard, we used the current/capital expenditures indicator (EXP_c/k) (H.8), which is measured using the budgetary operating expenditures divided by the capital expenditures.

They are all indicators to measure the structure of the revenues and expenditures. Regarding the former, external and internal revenues are considered to analyse the level of dependence or independence of RGs' finances: the higher the ratio, the more dependent RGs are on funds from abroad. On the other hand, capital revenues influence FS over time (long term), so the lower the ratio, the more resources RGs have to allocate to investment projects. Finally, capital expenditures influence FS over time (long term), so the lower the ratio, the RGs have to endure them over time.

To quantify the debt, IFAC (2013) states that the debt dimension must be measured by net debt, since this is a variable that provides information about a public administration's indebtedness in a year, taking into account current policies regarding the provision of goods and services. In this study, we calculated the net debt by total debt (total liability) minus financial assets (the receivables of the entity and the liquid assets).

Thus, we measured the origin of the debt using the indicator financial/commercial debt (DEBT_f/c) (H.9) and the maturity of the debt using the indicator short-/long-term debt (DEBT_s/l) (H.10) (see Table 1).

3.4. Statistical model and methodology

We collected data on the variables for all 17 RGs of Spain over an eight-year period (2006–2013) to analyse the influence of the independent variables on FS. The sample period in our study (2006–2013) is of particular interest, as it covers the period before, during, and after the boom and bust in the housing market, as several previous studies show (Rodríguez *et al.*, 2016; Navarro *et al.*, 2015). In this period, the interest of national and international organizations in public finances was increasing, so all levels of government should have paid more attention to public finances and FS, taking into consideration the national and international reports.

To test the variables, we used a panel data technique, which is the most used statistical technique in the latest research on public finances (Benito *et al.*, 2010; Navarro *et al.*, 2015; Rodríguez *et al.*, 2016). Therefore, we have a vector of variables

for N (17 RGs) over T periods of time (eight years, from 2006 to 2013). The equation model used in the study to analyse risk and drivers for FS is:

$$FS_{it} = \alpha\ FS_{it-1} + \beta_1 POP_{it} + \beta_2 IP_{it} + \beta_3 DP16_{it} + \beta_4 DP65_{it} + \beta_5 UR_{it} + + \beta_6 REV\_e/i_{it} + \beta_7 REV\_c/k_{it} + \beta_8 EXP\_c/k_{it} + \beta_9 DEBT\_f/c_{it} + \beta_{10} DEBT\_s/l_{it} + \varepsilon_i + u_{it}$$

where "i" is the i-th transversal unit (state government) and "t" is the time (year). ε_i is a regional government-specific constant term designed to measure the unobservable characteristics of the RGs that have a significant impact on FS, u_{it} is a stochastic residual capturing unexplained intra-regional government differences in FS, and α and β are coefficients to be estimated.

We estimate our model with the robust system-generalized method of moments (SGMM) (Arellano and Bover, 1995). This model is the most powerful tool to control the possible endogeneity between the variables and the error term (Prillaman and Meier, 2014) because it uses the lagged levels of the endogenous regressors as instrumental variables and combines the moment conditions for the equations in first-differences with additional moment conditions implied for equations in level. Furthermore, in order to overcome the bias due to the small sample, we applied the two-step estimation with the Windmeijer correction, which is asymptotically more efficient and robust to any patterns of heteroscedasticity and cross-correlation (Windmeijer, 2005; Roodman, 2009).

Thus, we have obtained robust results that allow us to properly support the findings related to the purpose of the paper, controlling for any type of endogeneity and multicollinearity that may exist between the variables. As Table 2 shows, we perform the Arellano–Bond test to check the existence of serial correlation, and the Hansen test to verify that the instruments used to control the endogeneity are adequate (Arellano and Bond, 1991). In our analysis, the Arellano–Bond test ($p = 0.482$) and Hansen test ($p = 0.174$) confirm the consistency of our model (Hansen, 1982).

4. Empirical Results and Discussion

Following Table 3, our results show some negative factors for FS, that is, the population ($\beta = -662.0$) (H.1 is accepted), the dependent population over 65 ($\beta = -626.8$) (H.2 is accepted), the unemployment rate ($\beta = -26.32$) (H.4 is accepted), the percentage

of the immigrant population (β = -402.87) (H.5 is accepted), the indicator current/capital revenues (β = -24.32) (H.7 is accepted), the indicator current/capital expenditures (β = 34.87) (H.7 is accepted), the indicator short-/long-term debt (β = -270.56) (H.10 is accepted). An increase in these variables could cause a worsening of RGs' FS. In addition, our results have identified other kinds of risk factors, identified as variables whose reduction can help reduce FS, that is, current/capital expenditures (β = +24.87) (H.8 is accepted) and financial/commercial debt (β = +94.65) (H.9 is accepted).

Our results demonstrate the specific influence of population size on the RGs' FS. This finding is according to the concern of international organizations that have pointed out the important effect of the population structure in public finances (EC, 2009; EU, 2015). Also, our findings are in line with prior research, as this variable significantly increases two dimensions of the FS, debt (Guillamón *et al.*, 2011; Choi *et al.*, 2010) and expenditures (Lago and Fernández, 2013; Guillamón *et al.*, 2011; Choi *et al.*, 2010), and thus can cause a negative effect in FS.

Regarding the dependent population, our empirical results have confirmed their adverse effect on FS, although the influence of the type of dependent population is different. In our case, we have found that, while the dependent population over 65 could cause a negative effect in FS (H.2 is accepted), the dependent population under 16 seems to have no influence (H.3 is rejected). So these results empirically contrast the postulates of the *stakeholder* and *contingency theories* and show that influential factors regarding debt (Guillamón *et al.*, 2011) or fiscal distress (Choi *et al.*, 2010) could affect FS.

We corroborate the negative impact of rising unemployment on FS, according to the *stakeholder* and *contingency theories*. Therefore, the level of unemployment (the unemployed being a group of stakeholders) is a risk factor to FS in RGs because an increase in the unemployment rate provokes a reduction in FS (this is an external factor/pressure which influences the management of FS [*contingency theory*], and governments tend to help these group of stakeholders [*stakeholder theory*]).

In the case of the immigrant population, our results empirically corroborate the postulates of the *stakeholder* and *contingency theories* because the influence of this group of stakeholders is supported as a pressure group that represents a restriction for the management of FS. However, our empirical results support the specific influence of the immigrant population on the evolution of the FS of the RGs, identifying it as a risk factor, which suggests that the positive correlation of this variable on the tax burden

(Benito *et al.*, 2010) does not outweigh its detrimental effect on two of the dimensions of sustainability: spending and debt.

Turning to the financial-economic variables, our results have identified three factors that can endanger the RGs' FS. Firstly, we have found that although the source of revenues does not have a strong influence on FS (β = -402.87) (H.6 is rejected), its structure has an important effect on FS (β = -24.32) (H.7 is accepted), as its upward trend has a detrimental effect on the behaviour of our dependent variable (it would show a dependence of RGs on resources from abroad). Therefore, according to the *agency theory*, its analysis is relevant to reach FS and useful for politicians, public managers, and citizens. Moreover, this result is consistent with the *contingency theory*, since it indicates that subsidies received from the central government may represent a constraint on the performance of FS.

In addition, we found that the nature of the structure of expenses (current/expenditure capital) and debt structure by origin (financial/commercial debt) and its maturity (short-/long-term debt) can be factors that jeopardize improvement to FS (β = +34.87, β = +94.65, and β = -270.56); if their values are reduced, FS is jeopardized (H.8, H.9, and H.10 are accepted). Hence, the finding about the expenditures is in concordance with the *goal-setting theory*, and the result regarding the debt dimension is supported by the *agency theory* and the *goal-setting theory*. That means, on the one hand, that the assessment of expenditures and debt is relevant to achieving FS (the *agency theory*) and, on the other hand, that establishing objectives for both dimensions (expenditures and debt) could help to improve the management of FS. This result seems to indicate that the continued receipt of grants and subsidies from the central government or the European Union in the RGs could endanger their FS, implying that the reception of these funds may limit the future viability of services.

Regarding the nature of the structure of expenses (current/expenditure capital), our results show that it is a variable whose reduction may jeopardize FS, implying that an increase in capital investments and subsidies could be a risk factor for FS. Whereas RGs are funders of services provided directly by other levels of government, it can be deduced from this finding that the amount of subsidies granted by RGs may adversely affect FS, especially if RGs increase subsidies for capital investments in buildings and roads.

In addition, we have empirically shown that the origin (financial/commercial debt) and the maturity of the debt (short-/long-term debt) can affect RGs' FS.

Considering together the three dimensions of FS proposed by the IFAC (2013) (debt, income, services), these findings suggest not only that the interest on commercial debt could have a greater negative effect on FS than interest debts to banks, but also that a higher amount of short-term debt could cause problems of solvency which could negatively affect FS. Thus, it is recommended that the composition of RG debt be analysed to reduce interest expenses and possible problems of solvency.

However, we have found no empirical evidence to support the influence of the current/capital revenues variable on the RGs' FS (H.7 is rejected). These results do not empirically corroborate the postulates of the *agency theory* and *goal-setting theory*.

Finally, our results indicate that "FS lagged one period" has a positive effect on FS, in line with Rodríguez *et al.*'s (2016) findings for local governments. Hence, if an RG has a positive FS, it is probable that it maintains it in the following year. However, if an RG has a negative FS, it could be more difficult to recover a positive FS the following year. This result, together with the uniform financial behaviour of RGs, suggests that the country's economic crisis and the financial austerity rules adopted by the central government had greater repercussions on the RGs' FS than the decisions taken by individual politicians to improve FS.

5. Conclusions

Our findings show that an increase in the unemployment rate and the immigrant population, as well as the specific weight of external subsidies can harm financial sustainability (FS). These findings represent empirical support for the consistency of two theories (*stakeholders* and *contingency theories*) in explaining the behaviour of the governments on FS.

Similarly, our results support the finding that the specific reduction of current expenditure and structure of debt can reduce RGs' FS, empirically constraining the utility of the *agency theory* and *goal-setting theory* to analyse the determinants of the governmental management of FS.

The findings are very important because, considering the theoretical context, they can help politicians and public managers to provide public services over time, and prevent and resolve performance regarding sustainability problems. Public managers could learn how to face external changes in the various interest groups (*stakeholder* and *contingency theories*). Likewise, they could establish realistic objectives (*goal-setting theory*) which help them improve the management of FS, providing citizens with useful

information about each of its dimensions (*agency theory*). These findings imply the empirical testing of the recommendations of international organizations and, likewise, reveal a considerable advance on previous research conclusions.

Our results allow us to conclude that the risk factors for performance of FS may have both a controllable and uncontrollable nature for politicians in the RGs. The evolution of the population structure, unemployment rate, and immigrant population are not variables that RGs' policies have a direct and immediate effect on. These causes of financial unsustainability are difficult to avoid, but their effects could be estimated in advance, allowing for the effectiveness of financial planning through annual budgets that incorporate these effects into the estimated revenues and expenditures. However, applying for grants, the purpose of the expenditure (current or capital), and the source of debts are risk factors that can influence RGs' politicians, as their evolution over time may depend on negotiations with the national government or with financial institutions, as well as the spending priorities of their policies.

With respect to socio-demographic risks, in accord with the conclusions of previous research, our results show that an increase in the population structure, the unemployment rate, and the immigrant population can cause problems for the FS of RGs. This finding is in line with previous research which concluded in the case of local governments that these factors cause more social spending and more debt. However, our results do not provide evidence to support the findings that the dependent population under 16 is a risk factor for FS. In comparison with the findings of previous research on local governments, these findings suggest that the high volume of subsidies granted by RGs for service delivery could influence the causes and origin of financial unsustainability.

On the other hand, the results on revenue structure reveal that growth in the volume of grants received, and their differential with respect to the growth of RGs' own revenues, can have a negative effect on the FS of RGs, as suggested by previous research findings.

Similarly, we found that the nature and structure of expenses can also lead to problems for the FS of RGs. Our results reveal that larger reductions in current expenditure than in capital expenditure can reduce FS. This finding could have two possible explanations. Firstly, it is possible that capital investments generate revenue from users of services that is sufficient to compensate for the evolution of current expenditure. On the other hand, it is also possible that the current subsidies granted to

local governments release the RGs from the need to fund services directly, reducing costs.

Likewise, our results indicate that the evolution of the debt structure and its maturity can have a negative effect on the FS of RGs. We found that a greater ratio of the reduction of financial debt to the reduction of commercial debt and an increase in short-term debt in comparison with long-term debt can lead to financial unsustainability. This finding suggests that the interest from bank loans has a less negative effect than the interest on debts to suppliers of goods and services, and it would be advisable to cancel trade debts by taking out bank loans.

Finally, these findings allow us to identify some useful guidelines for politicians and public managers to improve the management of RGs' FS; in particular, they should a) estimate the financial effect caused by the evolution over time of the population structure, the immigrant population, and the unemployed (as social benefits and subsidies); b) analyse the long-term financial impact on the perception of subsidies and adopt preventive actions; c) monitor and promote proportionality in the award grants, make capital investments, and current expenditures; d) carry out comparative analyses of financial expenses arising from financial liabilities and trade payables (explicit and implicit); and e) enhance the contribution of the RGs' own revenues (taxes and rates) to current subsidies and emphasize their nature and destination to promote employment among immigrants. In general terms, these findings could be useful to the public management of local governments, but it is necessary to conduct specific studies about their contexts, organizational issues, and bureaucratic obstacles.

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Table 1. Statatistic Descriptive

Variable (expected sign)	Acronym	Description	Calculation		Mean	Std. Dev.	Min	Max
Financial Sustainability	**FS**	Ajusted results per capita 2006-2013 (euros)[1]	Corrected income statement for the financial year per capita	overall		555.2218	-2621.2580	1075.7490
				between	-265.8983	284.9319	-1074.0500	65.8741
				within		480.9310	-1813.1060	1883.9000
LN Population (-)	**POP**	Population residing in the Region[2]	Neperian logarithm of the population	overall		0.8974	12.6205	15.9429
				between	14.4243	0.9213	12.6630	15.9188
				within		0.0234	14.3374	14.4721
% Immigrant Population (-)	**IP**	Immigrant population residing in the Region[2]	% Immigrant population	overall		4.9568	2.3366	20.9441
				between	10.1016	4.9936	3.1617	19.6674
				within		0.9626	6.9602	11.3783
Dependent Population < 16 years (-)	**DP16**	Population aged under 16 years residing in the Region[2]	% Population aged under 16 years	overall		4.9424	17.2123	36.3897
				between	26.5179	4.9862	18.5594	35.0750
				within		0.9244	24.7125	29.2753
Dependent Population >65 years (-)	**DP65**	Population aged over 65 years residing in the Region[2]	% Population aged over 65 years	overall		2.7190	16.0174	28.1492
				between	22.7250	2.7007	16.7695	27.5197
				within		0.6909	21.0869	24.6644
Unemployment Rate (-)	**UR**	Unemployment rate in the Region[3]	% Unemployed population	overall		7.8499	4.2800	36.2600
				between	16.8018	4.5526	10.8363	25.6413
				within		6.4784	3.3393	27.5593
Exernal/Internal Revenues (-)	**REV_e/i**	External revenues divided by internal revenues (budget)[4]	Budget external revenues (chapter 4 and 7) divided by internal revenues (chapter 1-3 and 5)	overall		7.0036	-0.2578	40.1145
				between	2.4361	6.9763	-0.0031	29.4365
				within		1.7042	-6.8705	13.1141
Current/capital Revenues	**REV_c/k**	Current revenues divided by capita revenues (budget) [4]	Budget operating revenues (chapter 1-5) divided by capital revenues (chapter 6 and 7)	overall		41.1061	6.3712	209.6286
				between	37.3878	33.8991	10.7814	137.6870
				within		24.4980	-25.5514	161.4906
Current/capital Expenditures	**EXP_c/k**	External revenues divided by internal expenditures (budget) [4]	Budget operating expnditures (chapter 1-4) divided by capital expenditures (chapter 6 and 7)	overall		2.9657	2.4017	19.3562
				between	6.3114	1.9710	4.3798	11.7910
				within		2.2610	1.7095	14.6470
Finalcial/ Comercial Debt	**DEBT_f/c**	Finalcial debt/comercial debt	Total short-term debt less the percentage of financial assets[5]/Total long-term debt less the percentage of financial assets[5]	overall		0.6702	0.1416	4.8615
				between	0.8169	0.4045	0.3466	1.8046
				within		0.5423	-0.6297	3.8738
Short/Long term Debt	**DEBT_s/l**	Short term debt/long term debt[1]	Total financial debt (example debenture and other securities)-the percentage of financial assets[1]/Total commercial debt (example creditors)-the percentage of financial assets[5]	overall		2.1156	0.4680	15.4271
				between	2.9382	1.4129	1.4635	6.9935
				within		1.6072	-2.5349	11.3718

Source: own elaboration; STATA 12

[1] Regional Government Financial Statement; [2] INE (Statistic Institute of Spain) www.ine.es; [3] Public Employment Service of Spain (www.sepe.es); [4] Ministry of Finance and Public Administration (www.minhap.gob.es)

Notes: N=136 observations (17 regional governments, 8 years); [5]Financial assets=receivables+liquid assets

Table 2. Hypothesis Testing

Test		Regional Governments
Arellano test (1)	**z**	-2.68
	Pr	0.007
Arellano test (2)	**z**	0.70
	Pr	0.482
Hansen test	**Chi²(73)**	84.21
	Pr	0.174

Table 3. Estimation result of the model GMM

FS	Acronym	Coefficients
Financial Sustainability lagged 1 period	FS_lag (1)	0.6637***
LN Population	POP	-8662.0480*
Dependent Population > 65 years	DP65	-626.7827*
Dependent Population < 16 years	DP16	578.6146
% Immigrant Population	IP	-402.8751**
Unemployment Rate	UR	-26.8703*
External/Internal Revenues	REV_e/i	-24.3245**
Current/Capital Revenues	REV_c/k	0.92600
Current/Capital Expenditures	EXP_c/k	34.8794**
Financial/Commercial Debt	DEBT_f/c	94.6505*
Short/Long term Debt	DEBT_s/l	-270.5618*
Constant	Conts	1297.393***

Source: Own elaboration based on the test performed in STATA12
Significant at 1%***;Significant at 5%**;Significant at 10% level*.