TO WHAT EXTENT SHOULD PUBLIC CORPORATIONS BE CONSOLIDATED? CONSIDERING THE EFFECTS ON PUBLIC DEFICIT AND DEBT IN SPANISH MUNICIPALITIES*

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Abstract

The consolidation perimeter of the public
sector is the most important line between the
micro and macro systems of government ac-
counting. This paper focuses on the public sector
boundary and assesses the potential impact on
key reported figures – such as the 'Maastricht'
deficit and debt ratios – that would result from
moving public corporations inside the perimeter
of the consolidated general government sector,
public corporations that currently lie outside the
general government sector. After examining 90
Spanish local governments with populations of
over 50,000 during the 2010-2012 period, our
results show that including public corporations
within the general government sector perimeter
leads to substantial differences in deficit and
debt ratios, and that these differences signifi-
cantly increase the number of municipalities in
violation of fiscal limits imposed by the govern-
ment. We also find that municipalities' pre- and
post-consolidation debt ratios are significantly
different depending on the ruling party's political
ideology.

Keywords: national accounting, public ac-
counting, ESA 2010, consolidation perimeter,
debt, deficit.

1. Introduction

The scope of potential research on consolidation practices has been extended by ongoing debates regarding the convergence and harmonization among public accounting systems in EU Member States and the convergence of micro and macro systems of government accounting information. Achieving these convergences is understood as a prerequisite to improving the comparability of accounting and statistical information between states, and to enhancing governmental decision-making (Dabbicco, 2015; Heald and Georgiou, 2000). In this context, the consolidation perimeter of the public sector is one of the most important areas of divergence between the micro and macro systems of government accounting (Dasí *et al.*, 2016; Jorge *et al.*, 2014; Lequiller, 2014).

In the EU, public deficit and debt figures are assessed based on the national accounting system (the macro system), and both figures depend fundamentally on the criteria used to define the consolidation perimeter of the public sector. EU Member States prepare national accounts in accordance with the European System of National and Regional Accounts (ESA), which provides guidance on sector boundaries between the general government sector (GGS), the public financial corporations sector (FS) and the public non-financial corporations sector (NFS). A precise delineation of the GGS is critical in the EU, as it is the basis for determining government deficit and debt ratios that are key figures in monitoring Member States' compliance with the Maastricht convergence criteria.

Since 2014, the conceptual framework for elaborating national accounts has been the ESA 2010 (European Parliament and the Council, 2013), under which the GGS consolidates entities that are controlled by a government and are non-market oriented (i.e., the price at which they sell their products or services differs markedly from market-oriented entities). In several European countries, most public services at the local level have become involved in a series of externalization-oriented activities, and there has been a drive to create separate corporations to provide various municipal services (Grossi and Reichard, 2008). The market/non-market output analysis for classifying these public corporations in the GGS or in the NFS is operationalized by employing the concept of economically significant prices, which has been shown to be sensitive to interpretation (Dabbicco, 2015). Therefore, the boundary of the GGS and, in particular, the issue of which public corporations are inside or outside the GGS is an important issue that should be clearly explained and thoroughly researched because it directly affects government deficit and debt figures.

Spain is one of the most decentralized European countries and, in recent years, the number of public corporations owned by municipalities has increased significantly more than in other countries. This increase has been particularly important since the application in 2001 of the first Law of Budgetary Stability (Law no. 18/2001), which prohibits all levels of government (central, regional and local) from running non-financial deficits. Additionally, the Spanish government established local government

debt limits restricting total municipal debt in the Local Tax Authorities Act (Royal Decree-Law no. 2/2004). At the local level, a 2012 report by the Spanish General Intervention Board of the State Administration (IGAE, 2012) revealed that local governments hold shares in nearly 1,300 decentralized corporations. Indeed, there are nearly 1,100 corporations whose accounts are not consolidated with those of their parent municipality when computing non-financial deficits and debt levels.

Therefore, the Spanish context seems to be an ideal setting in which to simulate the effects on non-financial deficit/surplus and debt ratios that would result from including within the perimeter of GGS consolidation those public corporations that currently lie outside this perimeter. Second, this study analyzes whether including these companies within the perimeter of GGS consolidation leads to a significant increase in the number of municipalities in violation of deficit and debt requirements, which is particularly important because missing the deficit or the debt limits may have significant legal consequences for municipalities. The penalty for non-compliance with the targets is that the municipality will be under scrutiny and will have to prepare a 'rebalancing plan' to meet the target within one year. Moreover, if non-compliance persists, credit transactions may not be authorized, and the municipality may not have access to certain funding mechanisms. Ultimately, persistent breach that is considered harmful to the general interests can even lead to the dissolution of certain municipal bodies.

Finally, building upon the previous literature, municipalities' political ideology, political competition and population size may affect these measures. Thus, the different impact that these factors may have across municipalities should also be examined.

With these goals in mind, we examine a sample of 90 Spanish local governments with populations of over 50,000. We focus on larger municipalities to ensure consistency in the nature of the public services offered by the municipality, as they depend on the number of inhabitants of the municipality (Law no. 7/1985). The sample period runs from 2010 to 2012. This period is particularly interesting because during that time, the central government was concerned about local governments' debt levels and deficits, and tightened the restrictions on local governments.

We contribute to the prior literature in three ways. First, to the best of our knowledge, studies that analyze the delineation of the public sector are rare, and the few studies that do address this topic mainly use qualitative approaches to analyze the conceptual framework of national accounting (Dabicco, 2015). In our study, we employ a quantitative approach to address the issue, and we quantify the potential effects of enforcing different consolidation perimeters of the GGS on key local government ratios. Additionally, prior studies suggest that municipalities may create separate entities to elude legal restrictions on public deficit and debt. In this paper, we directly observe the potential impact of including these entities within the perimeter of GGS consolidation on the degree of compliance. Finally, we contribute to the ongoing debate about the accounting harmonization and the comparability of accounting and statistical information in EU Member States.

The remainder of the paper analyzes as follows: section two introduces the regulatory framework for classifying public corporations under the ESA concept of the GGS, section three reviews the previous literature and proposes hypotheses, section four describes the data and the methodology, and section five presents the results. Finally, section six offers final conclusions.

2. Regulatory framework

EU Member States are required to prepare their national accounts in accordance with the ESA, and government deficit and debt statistics are strictly based on the ESA concept of the GGS. Under the Maastricht Treaty, Member States must comply with specific fiscal discipline rules, particularly those that require states to maintain public account deficits below a threshold of 3% of the GDP benchmark, and public debt levels below 60% of GDP.

In Spain, the central government has imposed several restrictions on sub-national public administrations to control public deficit and debt levels. Law no. 18/2001 imposed an annual budget balance on all levels of government, which means that non-financial revenues must at least cover non-financial expenses. Furthermore, this law and Royal Decree-Law no. 2/2004 restrict total municipal debt. In particular, the central government prohibited local governments from accruing new long-term debt if their total debt exceeds 110% of their operating revenues. As the economic situation has evolved since those laws were originally enacted, the limit has undergone several changes (from 100% in 2009 to 75% in 2011 and 2012).

According to ESA 2010, an entity is classified in the GGS if it is an institutional unit, it is controlled by the government, and it is a non-market producer. The non-market nature of an entity means that its products or services are provided free of charge or sold at economically non-significant prices. However, the concept of economically significant price is difficult to define in practice, and the boundary between market and non-market production is far from distinct, such that a pragmatic rule is used in these cases. This test is referred to as the '50% market test', which primarily means that if sales cover a majority of the production costs over a sustained period (3 years or more), the entity is considered market (and hence included in the NFS); otherwise, it is considered non-market (and therefore included in the GGS). Moreover, compared to the previous ESA 95 (European Union Council, 1996), ESA 2010 emphasizes the qualitative aspects of the criteria for delimiting the GGS such that only public corporations driven by market competition are excluded from the GGS, and a significant increase in the number of corporations within this sector is expected.

3. Literature review and hypotheses development

Prior researches in Spanish municipalities have studied the determinants of debt levels (Benito and Bastida, 2004; García-Sanchez *et al.*, 2011; Benito *et al.*, 2011; Brusca Alijarde *et al.*, 2012; Cuadrado Ballesteros *et al.*, 2013b; Pérez López *et al.*, 2013; Pérez López *et al.*, 2014), the effectiveness of general fund balanced budgets and debt con-

straints at limiting debt levels (Cabasés *et al.*, 2007) and, more recently, the type of restrictions that are most often breached in this context (Benito *et al.*, 2015).

Some of these studies – which are generally closely related to our research – find a positive relationship between municipal decentralization and the level of debt and conclude that local governments may create new entities to assume transfers of municipal debt, which then show up on the financial statements of these corporations. However, although these studies do not consider whether these new entities are classified as GGS or NFS corporations, they intuitively suggest that local governments use such decentralization to avoid debt limits.

Regarding regional governments or autonomous communities, Fernández-Llera and García-Valiñas (2013) find a significant link between public debt outside the consolidation perimeter of the GGS and the number of public corporations, which suggests that regional governments decentralize to circumvent fiscal rules (the 'shift effect').

Drawing on this prior literature, as long as municipalities attempt to avoid debt limits by creating new entities to which they transfer their municipal debt (Cuadrado Ballesteros *et al.*, 2013b; Fernández-Llera and García-Valiñas, 2013; Pérez López *et al.*, 2014), we expect that including NFS and PC corporations within the perimeter of GGS consolidation will increase the debt ratio; in other words, the increase in outstanding debt is larger in proportion than the increase in total current revenues. Accordingly, we posit our first hypothesis as follows:

H1: Moving public corporations that are currently outside of GGS consolidation within the GGS perimeter will lead to a significant increase in the debt ratio of municipalities.

With respect to non-financial deficit/surplus, to the best of our knowledge, no empirical study has yet assessed the relationship between decentralization and public deficit. However, in a closely related and interesting study, Jorge *et al.* (2014) examine the relationship between non-financial deficit/surplus based on both micro and macro systems of government accounting and find material divergences between the two systems related to the definition and scope of the reporting entity (i.e., the GGS perimeter). Taken together with results from previous studies, this result suggests that local governments may use decentralization to elude legal limitations, and it would thus be reasonable to expect a significant deterioration in non-financial deficit/surplus ratios as a result of including public corporations within the GGS consolidation perimeter. Accordingly, we propose the following as our second hypothesis:

H2: Moving public corporations that are currently outside of GGS consolidation within the GGS perimeter will lead to deterioration in the non-financial deficit/surplus ratio of a municipality.

As a consequence, assuming that municipalities use public corporations whose deficit and debt are not consolidated as a means of circumventing fiscal rules, including these companies within the perimeter of GGS consolidation will lead to a

significant increase in the number of municipalities that violate deficit and debt requirements. Accordingly, we stipulate our third hypothesis as follows:

H3: Moving public corporations that are currently outside of GGS consolidation within the GGS perimeter will lead to an increase in the number of municipalities that violate deficit and debt limitations.

In line with previous studies that have examined the influence of political factors and population size on regional and local government decentralization and municipal debt levels, we also believe that the impact of consolidating these public corporations within the perimeter of the GGS will differ depending on political factors, such as the locality's political ideology, political competition, and on the size of the population.

Previous empirical research has yielded mixed results regarding political ideology. On the one hand, some studies find that right-wing parties favor low levels of public debt (Blais and Nadeau, 1992; Kiewiet and Szakaly, 1996; Dickson and Yu, 1997; Fernández-Llera and García-Valiñas, 2013) and favor decentralization processes (Dijkgraaf *et al.*, 2003; Walls *et al.*, 2005; Cuadrado Ballesteros *et al.*, 2013a). On the other hand, other studies do not find any significant relationships in this regard (Abizadeh and Gray, 1993; Benito and Bastida, 2004, González-Gómez and Guardiola, 2009; Bel and Fageda, 2010; Benito *et al.*, 2011; Pérez López *et al.*, 2014).

The second political factor is political competition. Some studies have reported higher levels of decentralization and debt with lower levels of political competition (Ni and Bretschneider, 2007; Smith and Fridkin, 2008; Cuadrado Ballesteros *et al.*, 2013a, 2013b; Pérez López *et al.*, 2014). However, other studies have found that municipalities characterized by weaker political competition report lower levels of public debt (Ashworth *et al.*, 2005; Benito *et al.*, 2011).

With regard to the influence of population size, several studies have found that population size positively influences the level of debt and decentralization because citizens in larger municipalities tend to make greater demands for public services (Vallés Giménez and Zárate Marco, 2001; Escudero and Prior, 2002; Mora Agudo and Montesinos Julve, 2007; Brusca Alijarde *et al.*, 2012), which is particularly significant in Spain because the law establishes a range of services to be rendered by the municipalities based on population size. However, other studies found no such significant relationship (Brusca Alijarde and Labrador Barrafón, 1998; Benito and Bastida, 2004).

Drawing upon previous studies, we believe that changes in municipalities' non-financial deficit and debt ratios before and after consolidation will depend on the municipality's size, political ideology and political competition. Thus, we posit our fourth hypothesis as follows:

H4: Moving public corporations that are currently outside of GGS consolidation within the GGS perimeter will have a differential impact on the change in non-financial deficit/surplus and debt ratios that depends on a given municipality's size, political ideology and political competition.

4. Methodology

4.1. Research design

The goal of this paper is to assess the potential impact on key local government ratios that would result from including NFS and PC corporations within the perimeter of GGS consolidation (i.e., as a result of the application of the new ESA 2010). In particular, we study the impact on the following two ratios:

1. The non-financial deficit/surplus ratio (*Deficit/Surplus*), defined as the net lending/net borrowing of the consolidated units divided by current revenues.

$$Deficit/Surplus = \frac{Net\ lending/Net\ borrowing}{Current\ revenues} \qquad [1]$$

2. The debt ratio (*Debt*), defined as the outstanding debt of the consolidated units divided by current revenues.

$$Debt = \frac{Outstanding\ debt}{Current\ revenues} \qquad [2]$$

The methodology used in our empirical study unfolds over several stages. First, we obtained the consolidated financial budget of the Spanish local governments in our sample, which consisted of the financial budget of a given municipality and the budgets of the autonomous bodies dependent on it. Second, all public corporations owned by those municipalities were identified in order to obtain their financial information and to classify them as included in the GGS or as NFS or as lacking classification under the ESA. This approach allowed us to identify the public corporations that were outside the GGS perimeter of consolidation (NFS and PC corporations). Third, we aggregated[1] the financial information of the municipality and its subsidiaries classified as GGS corporations under the ESA, and then we added to the latter the financial information of the NFS and PC corporations. As a result, this second database also consists of public corporations that are currently outside the scope of consolidation. Finally, we calculate the deficit/surplus and debt ratios before and after the inclusion of NFS and PC corporations within the scope of consolidation (designating these ratios as *Deficit/Surplus_before*, *Debt_before* and *Deficit/Surplus_after*, *Debt_after*).

Hypotheses 1 and 2 (H1 and H2) both predict a deterioration in the deficit/surplus and debt ratios as a result of including NFS and PC corporations in our GGS consolidation. To examine the differences in these key ratios, we first analyzed the descriptive statistics and the changes in the items used to calculate these ratios. The Shapiro-Wilk test was used to test for normality. We can confirm that in our sample, financial ratios do not follow a normal distribution; therefore, we run non-parametric Wilcoxon sign-rank tests to look for significant differences in the means of the ratios before and after the consolidation.

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1   One limitation in our data is that we cannot consolidate (as opposed to aggregate) financial information.

Second, to test Hypothesis 3 (H3) we analyzed the compliance with deficit and debt limits before and after consolidation to assess whether consolidating public corporations outside the GGS perimeter increased the number of municipalities that violated the deficit and debt limits. To examine the relationship between the level of compliance before and after consolidation, we used a comparison test of proportions.

Finally, based on the previous literature and in alignment with Hypothesis 4 (H4), we expected that the variation in municipalities' non-financial deficit and debt ratios before and after consolidation would differ based on the municipality's size, dominant political ideology and political competition. As discussed above, the same 90 municipalities comprise our sample over three years; therefore, panel data methodology was applied to test H4. The dependent variable was the comparability index (CI) for each of the ratios considered, and political ideology, political competition and size were the independent variables.

The comparability index for municipality i was calculated as follows to determine the percentage of variation in the ratios before and after consolidation:

$$CI_i = \left[\frac{Ratio\_after_i - Ratio\_before_i}{Ratio\_before_i} \right] \qquad [3]$$

The independent variables included in the model were as follows:
– Political ideology: we employed a dummy variable with the value of 1 if the dominant political party in the municipality was identified as 'left-wing', and 0 otherwise. The methodology followed in grouping the dominant party in the municipality is in line with the approach adopted by Pérez López *et al.* (2014).
– Political competition: we employed a dummy variable taking the value of 1 if the political party in the municipality leadership has won an absolute majority in the elections, and 0 otherwise.
– Population: we measured the size of the municipality in terms of the number of inhabitants.

The following databases were used in our analyses:
1. Information regarding consolidated financial budgets, outstanding debt and the population of municipalities were obtained from the Virtual Local Government Financial Coordination Office of the Ministry of Economy and Finance (OVEELL, 2010, 2011 and 2012).
2. To identify those public corporations owned by the municipality and to obtain their classification, we used reports regarding the composition and structure of state companies and foundations released annually by the IGAE (IGAE, 2010, 2011 and 2012).
3. Financial information regarding public corporations was obtained from the Sistema de Análisis de Balances Ibéricos (SABI) database (SABI, 2004).
4. Information regarding the political ideology and political competition in a given municipality was obtained from published electoral results (Spanish Ministry of Home Affairs, 2010-2012).

4.2. Data selection

We restricted our sample to those municipalities with populations of over 50,000 inhabitants (145 municipalities) for two main reasons. First, it has been argued that population size is an appropriate criterion in public municipality sample selection, as the slate of public services that larger municipalities provide is more homogenous. In addition, financial information is both more readily available and more reliable for larger municipalities than for smaller municipalities.

The sample period runs from 2010 to 2012 because it corresponds to the most recent available data. In addition, the central government tightened requirements for local governments during this period based on concerns regarding uncontrolled debt levels, and because of the non-fulfillment of budget balances by many sub-central governments.

Our initial sample consisted of 145 municipalities but not all had subsidiaries, leaving us with a sample of 123 municipalities that own a total of 516 public corporations. Financial information for 107 companies was unavailable mainly because they were being liquidated, which reduced the sample to 409 public corporations. This sample corresponds to 148 GGS corporations (36.2%), 206 NFS corporations (50.4%) and 55 PC corporations (13.4%). Furthermore, the subsidiaries of 33 municipalities in 2010 and 2011 and 38 municipalities in 2012 were all classified as GGS corporations, which means that they did not hold shares in any corporations outside the GGS perimeter, and they were thus excluded from the sample. As a result, our final sample consists of 90 municipalities in 2010 and 2011 and 85 in 2012 (265 observations), and 181, 187 and 176 public corporations in 2010, 2011 and 2012, respectively (544 observations).

5. Results

5.1. Descriptive statistics

Table 1 shows the descriptive statistics for the impact of including NFS and PC corporations within the perimeter of GGS consolidation. Regarding the items used to compute the ratios, the average increase in current revenues is 6.1%, which is less significant than the average increase in net lending/net borrowing (average 21.4%) and debt (average 23.4%). Consequently, the descriptive statistics for *Deficit/surplus_before*, *Deficit/surplus_after*, *Debt_before* and *Debt_after* ratios show that the level of debt (outstanding debt to current revenues) increased from 0.708 to 0.815, and that the deficit/surplus ratio dropped from -0.003 to -0.006 after including NFS and PC corporations within the perimeter of consolidation. The Shapiro-Wilk tests for the null hypothesis (that the ratios and the differences in the ratios are normally distributed) must be rejected for all the variables (p = 0.000), which means that non-parametric tests are used subsequently.

Table 1: Descriptive statistics of debt and deficit/surplus ratios

	Mean	Median	Min	Max	N	Shapiro-Wilk test (p-value)
Panel A: Impact of consolidation on current revenues, net lending/net borrowing and debt						
% Change in current revenues	6.1106%	2.9344%	-53.0950%	174.8175%	265	
% Change in net lending/net borrowing	21.4077%	0.1015%	-1,759.7240%	8,767.5090%	265	
% Change in debt	23.4232%	9.7724%	0.0000%	295.7076%	265	
Panel B: Descriptive statistics of debt and deficit/surplus ratios and test of normality						
Deficit_before	-0.0026	0.0021	-2.0988	0.6880	265	0.0000
Deficit_after	-0.0064	-0.0086	-1.2111	1.2092	265	0.0000
Difference	-0.0038	-0.0106	0.8877	0.5212	265	0.0000
Debt_before	0.7080	0.6397	0.0064	3.0480	265	0.0000
Debt_after	0.8152	0.7180	0.0081	3.3857	265	0.0000
Difference	0.1072	0.0783	0.0017	0.3377	265	0.0000

5.2. Differences in ratios

We applied the non-parametric sign test to examine Hypotheses H1 and H2. Notably, the sign test does not require assumptions regarding the form of the distribution of the measurements, and it is thus used for testing the null hypothesis that positive and negative changes in differences are equally likely (or, equivalently, difference in the median values is zero).

Table 2 shows the differences (and the statistical significances) between the median values of the deficit and debt ratios both before and after including NFS and PC corporations within the consolidated GGS perimeter. Both tests are significant at the level of $p < 0.1$ for both the deficit/surplus ratio and the debt ratio. We must therefore reject all the null hypotheses that the difference in the median values of the ratios before and after consolidation is different from zero. These results thus confirm H1 and H2, and we can conclude that moving public corporations that are currently outside of GGS consolidation within the GGS perimeter leads to a substantial deterioration of the deficit/surplus and debt ratios of the municipalities.

Table 2: Medians of ratios and Wilcoxon sign-test results

Ratio	Before (Median)	After (Median)	Difference	Change in %	Sign-test p-value	Result
Deficit	0.0021	-0.0086	-0.0065	-311.28%	0.0880	Accept H1
Debt	0.6397	0.7180	0.0783	12.25%	0.0000	Accept H2

5.3. The impact of consolidation on compliance with deficit and debt limits

This section will address Hypothesis 3 (H3). In addition to the significant changes in the value of the debt and deficit/surplus ratios, we are interested in testing whether they led to an increase in the number of municipalities that would now violate

the limits. As noted in section 2, all levels of government (central, regional and local governments) are prohibited from running non-financial deficits, and total municipal debt is also restricted. With regard to the debt limit, the ratio of total debt over current revenues was prohibited from exceeding 110% in 2009, but the central government increased this limit to 125% in 2010, and then reduced it to 75% in 2011 and 2012. In our tests, we used the 75% limit for every year to segregate the effects of the change in the consolidated GGS perimeter from the effects of the change in debt limits on the level of compliance.

A test of proportions is performed to test the null hypothesis that the proportion of municipalities that violate the limit is equal before and after consolidation against the alternative that it is more likely following consolidation (i.e., the difference between proportions is negative). Table 3 shows that there were 96 cases before consolidation (36.2%) and 125 cases (47.2%) following consolidation in which the municipalities were in violation of legal limits. The results in Table 3 also show that the difference between these two proportions is statistically significant (p-value = 0.010).

We run the same test with regard to the deficit limit (no deficit). Table 4 shows that there were 129 pre-consolidation cases (48.7%) in which the municipalities were in breach of the deficit limit, and that number increased to 143 (54.0%) following consolidation. However, there is no significant difference in the proportions, as Table 4 shows (p-value = 0.224).

Table 3: Test of the equality of proportions: debt limits

	Total cases	Number of non-compliance cases	Proportion
Before	265	96	0.362
After	265	125	0.472
p-value	0.010		

Table 4: Test of the equality of proportions: deficit limits

	Total cases	Number of non-compliance cases	Proportion
Before	265	129	0.487
After	265	143	0.540
p-value	0.224		

5.4. The influence of political factors and municipality size on the differences in ratios

As reported earlier in the literature review section, prior research regarding the influence of political factors on decentralization and on the level of debt was not conclusive. Several studies showed that the political ideology of the ruling party and local government fragmentation influence the level of debt carried by and the decentralization of a municipality. Concretely, these studies found that right-wing parties and local governments characterized by weaker competition were more likely to rely on

public corporations to deliver public services. Regarding debt levels, municipalities with right-wing parties and those that were characterized by a strong political majority in the leadership of the municipality tended to have higher levels of debt. Therefore, we believe – in line with our Hypothesis 4 (H4) – that the impact on the changes in the deficit/surplus and debt ratios as a result of consolidating public corporations within the GGS will vary depending on these political factors. Furthermore, based on the previous literature, we also believe that there will be a differential impact on changes in both the deficit/surplus and debt ratios based on the size of the population of a given municipality.

As noted in Section 4.1, a panel data methodology was applied to test H4. The dependent variable was the CI for each ratio considered, and political ideology, political competition and size were included as the independent variables. The Breusch-Pagan Lagrange multiplier test for random effects clearly recommends this alternative in lieu of ordinary least squares (OLS) estimation, in which the dependent variable is the CI based on the debt ratio. In addition, the Hausman test used in order to choose between fixed and random effects estimators finds different results depending on the model. However, the Breusch-Pagan Lagrange multiplier test recommends an OLS estimation in which the CI is based on the deficit/surplus ratio. We therefore run the OLS pooled estimation for the CI based on the deficit/surplus ratio and run the fixed effect specification for the CI based on the debt ratio.

Table 5 shows the results of the estimation for the OLS model, and the results using the fixed effect estimator for the CI based on the deficit/surplus and debt ratios, respectively. The population size of the municipality and political competition do not seem to be significant variables in this analysis. Regarding the political ideology variable, the variation in the debt ratio is higher when the dominant political party in the municipality is identified with a 'right-wing' ideology. This result is in line with those of Fernández-Llera and García-Valiñas (2013) and Cuadrado Ballesteros *et al.* (2013a). However, there is no significant relationship between the variation in the deficit/surplus ratio and the political ideology of the party in charge of the municipality.

Table 5: Fixed effects with 'Cluster' for the comparability index (CI) based on the deficit/surplus and debt ratios

	Dependent variable	
	CI_Deficit/Surplus	CI_Debt
	OLS	Fixed effects
POLITICAL IDEOLOGY	0.5455	**-0.3188 (**)**
POLITICAL COMPETITION	0.1368	0.0176
POPULATION	0.1612	-2.7006
Constant	-1.4892	3.2240
Number of observations	265	265
R^2	0.0042	0.1241
F Test	0.22	3.97 (***)
Hausman test χ^2	---	8.79 (**)

*, **, and *** denote statistical significances at the 10%, 5% and 1% levels, respectively.

6. Conclusions

The macro monitoring of fiscal policy in the European Union is performed using deficit and debt figures derived from GGS accounts that are based on the ESA concept of the GGS. Regarding public corporations controlled by governments at every level (central, regional or local governments), the GGS consolidates only those that are non-market.

Our results show the expected significant worsening of Spanish municipalities' deficit/surplus and debt ratios when public corporations are moved from outside to within the perimeter of the GGS. Thus, a number of municipalities that meet the deficit and debt targets before consolidation fail to meet them after consolidation. However, we find a significant difference in the proportion of municipalities that fail to comply with the targets only with regard to the debt limits. This result is in line with previous researches that suggest that public corporations may be used to hide debt and circumvent debt limits (Cuadrado Ballesteros *et al.*, 2013b; Fernández-Llera and García-Valiñas, 2013). Furthermore, our results show that the variation in the debt ratio is higher when the political party in the municipality is identified by a 'right-wing' ideology. However, no significant variation relationship is found for the size of the population or political competition.

Taken together, our results show that different interpretations of the elements that influence the classification of entities inside or outside the perimeter of the general government (e.g., a market/non-market analysis) might lead to major differences in these two key figures. Different classifications may also result in a greater number of municipalities violating the deficit and debt limits imposed on the governments, which is important because many countries, Spain among them, levy severe penalties on sub-central governments that fail to meet debt ceilings or that run non-financial deficits.

Policy makers in the EU require high-quality comparable accounting data from the GGS to produce the information on which many EU policies are based, and to reasonably monitor and control budget deficits and public debt. In this sense, our results have certain implications for policy makers, who must consider that the complete and exhaustive identification and correct classification of units is critical to accurately delineating the GGS, and to ensure that deficit and debt figures are comparable across countries. Consequently, EU policy-makers should ensure the homogeneous application of the criteria set forth in the ESA for classifying units in the GGS among EU Member States, particularly the application of the qualitative requirements that are more sensitive to interpretation. Furthermore, data reported for the convergence criteria under national accounts (macro system) are obtained from the public accounting systems of each country (micro system), and prior researches have revealed significant conceptual differences between the two systems, particularly regarding the GGS consolidation perimeter. Most EU members do not require the preparation of consolidated annual accounts at the local level. If standard-setting bodies were to impose consolidated financial reporting requirements under the public accounting

system, it would help to improve decision-making and reduce the gap between the two accounting systems, in addition to contributing to the transparency and quality of public information.

We believe that this paper contributes to the ongoing debate about the convergence between the micro and macro systems of government accounting information in the EU Member States, particularly regarding consolidating public entities' accounts within the GGS perimeter. Such consolidation is considered the largest conceptual difference between national accounting and public sector accounting. Furthermore, ESA 2010 is meant to expand the perimeter of GGS consolidation, and this paper simulates the impact on deficit and debt from considering a larger GGS consolidation perimeter. Therefore, public policy makers and politicians alike may find this information useful for both their decision making and for drafting future policies.

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