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Determinants of budget forecast errors in federal economies: 1995-2014

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Determinants of budget forecast errors in federal economies: 1995-2014.

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Abstract

In this paper we intended to test the relevance of political and institutional variables in explaining revenue and expenditure budget forecast errors. Results suggest that estimates are driven by the causality of expenditure forecast errors on revenue forecast errors and viceversa, which makes impossible to disentangle the direction of the causality and which makes the role of the other variables irrelevant.

Results indicate also that public sector debt plays a role in explaining forecast errors. This variable is significant when estimates refer both, to aggregate value or to budget items. However, the sign of this relationship is different if we refer to expenditure or revenues forecast errors.

To what concerns the role played by institutional and political variables, results indicate that they play no role when estimating the aggregate expenditure and revenues forecast errors. Nevertheless, tax autonomy, electoral coincidence, political orientation of ruling parties and per capita revenue from financing agreement have some explanatory powers (with different signs) when running the estimates based on budget items.

JEL Classification Numbers: H71, H74, E61

Keywords: fiscal federalism, forecast errors, tax autonomy

1 Introduction

The economic downturn that started in 2007 activated mechanisms to control budget deviations in some countries in the Eurozone. These mechanisms, arising from the implementation of the Stability and Growth Pact, introduced, among other restrictions, deficit targets to be achieved by the aggregate of all public authorities in a country within a specific timeframe.

It must be remarked that deficit targets are settled for the aggregate of all tiers of government. This is rather relevant in those countries with a federal structure because

there exist different levels of government whose fiscal budgets do affect the aggregate fiscal deficit. The coexistence of different tiers of government, and their heterogeneity both from an ideological as well as from a fiscal perspective, introduces several difficulties that must be addressed by all public administrations.

In Spain Central Government (CG) led the strengthening of fiscal rules aimed at reducing the fiscal gap at regional and local administrations, as well as their own fiscal gap. The new procedures were focused at forcing Regional Parliaments and Local Administrations to pass fiscal budgets that satisfied deficit targets and to control the “execution/realisation” of public budget (at period t). It must be taken into account that new fiscal rules did not deal with budget forecasts (at period $t-1$). It seems that such procedures did not succeed in their goal because most Regional Governments (RG) have not achieved their fiscal targets during the period 2008-2014.

Our argument is that fiscal rules implemented in the last years are not sufficient to tighten fiscal deficits because they do not consider the process according to which budget are elaborated. We argue that the current design of fiscal rules allow, and foster, strategic behaviours by RG aimed at circumventing fiscal rules. In addition to that, we argue that the current financing agreements among the CG and RG reinforce the previous strategic behaviours.

To what concerns financing agreements that regulate RG’s tax autonomy and public transfers from the CG to RG’s, although Spain’s devolution process is said to generate one of the most decentralized regimes among western countries, this is not true to what concerns tax autonomy. In Spain there are important restrictions preventing RG’s on altering shared taxes (VAT and Excise Taxes). In addition to that, there are some taxes, considered as RG taxes, that have relevant restrictions on them. The crucial aspect to be analysed is who estimates tax revenues and transfers at period $t-1$ to be collected/delivered at period t , and what is the mechanism to correct possible deviations (see section 4.2 for further discussion). In Spain the CG forecasts revenues from shared taxes and RG’s do so with regards to RG’s taxes, which has an obvious impact on RG’s budget forecasts and behaviours.

Another relevant aspect of budget forecast to be considered is that in Spain the distribution of deficit targets is not the result of a bargaining process but, instead, is a unilateral decision by the CG (see section 3.2 for a more detailed description of this process). Given that the deficit target for each country refers to the aggregate of all levels of government, the larger the deficit assigned to subnational governments, the lower the remaining deficit target for the CG. This means that the CG effectively decides which level of government is going to bear the burden of budget cuts. In addition to that, the CG linearly distributed the deficit target across regions, at least since 2012. This meant that all regions, regardless of their

economic position in their own economic cycle, were expected to achieve the same deficit target in the same year.

In this paper we focus our analysis on budget forecasts rather than on budget “execution/realisation”. More precisely, although there is an extensive literature that analyzes different techniques of budget forecasts we focus our analysis on the factors that explain forecast errors (see section 2). In addition to that, since the Stability and Growth Path many efforts have been devoted to analyze the relationship between fiscal rules and budget forecast, but most of these empirical contributions estimate forecast errors comparing 15 European countries based on a macroeconomic perspective (considering budget balances and public debt) and they do not consider the role played by subnational tiers of government.

On the contrary, we run our estimates considering the interactions among the CG and the RG and among the RG’s themselves, based on the Spanish economy for the period XXX-YYY. In addition to that, we run our estimates based on budget items rather than on budget aggregates.

All in all, results suggest that estimates are driven by the causality of expenditure forecast errors on revenue forecast errors and viceversa, which makes impossible to disentangle the direction of the causality and which makes the role of the other variables almost irrelevant.

Results indicate also that public sector debt plays a role in explaining forecast errors. This variable is significant when estimates refer to the aggregate budget or to budget items. However, the sign of this relationship is different if we refer to expenditure or revenues forecast errors.

To what concerns the role played by institutional and political variables, results indicate that they play no role when estimating the aggregate expenditure and revenues forecast errors. Nevertheless, tax autonomy, electoral coincidence, political orientation of ruling parties and per capita revenue from financing agreement have some explanatory powers (with different signs) when running the estimates based on budget items.

In section 2 we refer to the literature related to our research. In section 3 we refer to the determinants of the Autonomous Communities budget forecast. In section 4 we describe briefly the Spanish process of decentralization and the mechanism used by the CG to distribute fiscal resources to subnational levels of government. In section 5 we develop the methodology and the variables used in our estimates. Finally, section 6 and 7 contain the results and our conclusions.

2 Related literature.

There are extensive contributions analysing the relationship between fiscal deficits and fiscal federalism issues, such as the existence of mechanisms of coordination-cooperation between federal and RGs, the role of RGs in the law-making process, the default-bailout game, the role of soft budget constraints, etc. (see Von Hagen and Eichengreen 1996, Wildasin 1997, Goodspeed 2002, Rodden et al 2003, Von Hagen 2005, Bordignon 2006, von Hagen 2006, and Hallerber et al 2007, among others). However, none of them has analyzed the role of fiscal budgets as the instruments through which public authorities implement their policies in a framework where there are fiscal rules that condition aggregate fiscal deficits.

The issue of budget forecast techniques has been analyzed extensively (see Plesko 1988, Gentry 1989, Holden and Peel 1990, Baguestani and McNown 1992, Mocan and Azad 1995, Auerbach 1996, Auerbach 1999, Leal et al. 2008, and Jinping and Lynch 2008, among others), but most of the contributions do not analyze institutional determinants of budget forecast errors.

In the recent years, since the Stability and Growth Path was passed, there has been an increasing number of contributions analyzing the the role of fiscal rules, budget forecasts and their determinants in the EU zone (see Strauch et al 2004, Jonung and Larch 2006, Brück and Stephan 2008, Beetsma et al. 2009, Christoloulakis and Mamatzakis 2009, Pina 2009, Pina and Venes 2011, Beetsma et al 2012, Merola and Pérez 2012, Martins and Correia, 2013, among others). The main shortcoming of these contributions, from a fiscal federalism perspective, is that their analysis is based on macroeconomic national aggregates neglecting the role played by subnational governments and their interactions (dhared tazxes, intergovernmental transfers, expenditure on shared responsibilities etc.) with national authorities, where in some countries their responsibilities account for more than 50% of total expenditure. In this paper we try to fill in this gap.

We cannot avoid mentioning some contributions that, based on Spanish data, analyze the relationship between fiscal balances, public debt, fiscal rules and financing agreements (see García-Milà and McGuire 1990, Monasterio and Suarez Pandiello 1993, Lago-Peñas 2005, Sorribas-Navarro 2011, Argimon et al. 2012, Hernández de Cos et al. 2013, Pérez-Cucarella 2013, and Mussons 2013.). However, none of the previous articles deals with budget forecast issues.

Finally, there are other contributions (see Pons and Solé 2001, Argimón and Martí 2006 Leal and Pérez 2009, and Ferández-Caballero et al 2012) that analyze public budgets in Spain, in particular their deviations. However, they do so from a descriptive and time-series perspective, avoiding the analysis of causality.

Our empirical analysis is based on Brück and Stephan (2008), who analyse the political, electoral and institutional determinants of the quality of the budget deficit forecasts across

Eurozone countries. They review the literature that analyses political cycles (including political business cycles, electoral cycles, partisan cycles and institutional cycles) and they study their impact on budget forecast errors. We adapt their approach to a framework in which subnational governments and their interactions with the central government are considered.

We argue, following Roden (2002), Roden (2006), Foremny (2014) and Molina-Parra et al (2015), who find that vertical fiscal imbalances do have a positive effect on subnational governments' deficits, that ACs' subnational fiscal deficits in Spain are influenced by the decisions of the Spanish CG. The Spanish CG affects subnational fiscal deficits through different mechanisms: i) the CG decides the distribution of deficit targets between the CG and RGs and, therefore, it decides who is going to bear the burden of budget adjustments, ii) the CG unilaterally decides subnational government's deficit targets which traditionally have been fixed linearly (2002-2012) or discretionary for 2013 (apparently depending on the real deficit in 2012) and, iii) the CG unilaterally estimates the amount of resources that RGs are going to receive. Therefore, as suggested in the data, the CG can underestimate these resources, which will be adjusted in period $t+2$. This would allow the CG to transfer part of its fiscal deficit to RGs.

Finally, we run our estimates based on budget items rather than on budget aggregates

3. The determinants of the Autonomous Communities budget forecast.

3.1 Fiscal Rules

ACs and Local Governments (LGs) in Spain are empowered to take on debt, as long as they respect certain limits. The basic rule is that debt repayment and interest cannot exceed 25% of the ACs' and LGs' current revenues. In addition to this, authorisation from the CG is required to arrange credit operations abroad and for debt issuance. Nevertheless, credit operations with national banks and short term credit operations (less than one year) do not require such authorisation.

These general rules have been implemented since the very beginning of the Spanish decentralisation process and still remain. However, it is important to notice that the implementation of these rules has been tightened since 2008, because until that year authorisations were conceded almost automatically.

With regard to the rules governing ACs' budget balances, these have evolved over different periods. In the first period, from 1992 to 2001, the CG-assigned budget deficits and debt to each AC were based on bilateral negotiation for a two-year period (these agreements were known as the Budgetary Consolidation Scenarios).

In the second period, from 2001 to 2005, under the Budget Stability Law (BSL) the CG assigned a single limit, in terms of budget deficit, for all ACs although the general rule was

that they had to achieve the budget stability scenario. No individual targets were settled for each region, therefore they faced the same deficit target regardless of their cyclical position.

Finally, in 2006 the BSL was reformed. According to this reform CG and ACs would be able to adapt their deficits and surplus targets to their economy's cyclical positions. As a consequence budget surpluses were to be achieved if the growth rate of the economy exceeded 2% and deficits were allowed if the economy's growth rate was below 0%. The allocation of deficit targets between the CG and the ACs – and LGs- was decided unilaterally by the CG. Again, it is important to remember that the same deficit target was assigned to all ACs regardless of the region's economic position, meaning that effective deficit targets were significantly different across ACs because the mechanism that allocates fiscal revenues across ACs introduces significant asymmetries across regions (see Lopez-Casasnovas et al 2014), regardless of the evolution of the AC's fiscal basis.

We should point out that since the implementation of the BSL, ACs have demanded a different distribution of deficit targets between CG, ACs and LGs based on a real bargaining process at different levels of government. In addition to this, they demanded an asymmetric allocation of deficit targets among ACs. CG rejected all these proposals arguing that it would be impossible to implement a distribution of deficit targets that satisfied all ACs and LGs.

Exceptionally, in 2013 the CG accepted the possibility of assigning individual short term budget deficit targets. However, no regulation exists that explains the allocation of deficit targets across ACs. Apparently, it seems that they were decided unilaterally by the CG based on AC budget deficit at $t-1$. Nevertheless, this was not the situation during the period 2014-2016 and in addition to that long term budget deficit targets remain uniform - all ACs A must present balanced budgets by 2020.

3.2 Deficit targets in Spain, 2008-2012

Table 1 provides the distribution of deficit targets across all levels of Administration in Spain during 2008-2012. As we have already mentioned, this decision was taken unilaterally by the CG¹.

The first column indicates the deficit target for each administration for each year. The second column shows the proportion of the deficit target assigned to each administration. The third column provides the final deficit achieved by each administration. For 2012 we

Regarding deficit targets for ACs, the CG raises a proposal to the Consejo de Política Fiscal y Financiera. Although this proposal is discussed in the Council, it is not subject to negotiation. It must be approved and although 17 regions and two autonomous cities are represented the CG holds the majority. As a consequence, this suggests that there is no real multilateral bargaining process, as the Council is designed as an instrument for validating CG initiatives. At the most, the political bargaining process might be bilateral, with some regions, and in most cases it would simply be validated multilaterally ex-post by majority voting.

have introduced an additional column that represents the proportion of total public expenditure managed by each level of administration.

Data in table 1 suggests that deficit targets were evenly distributed across different levels of administration in favour of the central administration and social security. Based on the 2012 financial year, data shows that although CG is responsible for 56% of total expenditure, it self-assigns 71% of total deficit. Data also shows that CG has demanded larger cuts in deficit targets from local and regional administrations with respect to budget cuts fixed for itself. From 2010 to 2012 local and regional administrations were required to reduce their deficit targets by 50% and 38%, respectively, while the effort demanded to the CG was 24%.

	2008			2009			2010			2011			2012			
	Target	%	Result	Target	%	Result	Target	%	Result	Target	%	Result	Target	%	% Expen	Result
Central	0,3		-2,8	0,02		-9,5	-5,9	66%	-5,72	-4,8	75%	-5,13	-4,5	71%	56%	-3,83
Regional	-0,75	100%	-1,49	-0,75	100%	-2	-2,4	27%	-2,94	-1,3	20%	-3,31	-1,5	24%	32%	-1,73
Local	0		-0,48	0		-0,5	-0,6	7%	-0,48	-0,3	5%	-0,45	-0,3	5%	12%	-0,2
Social Security	0,6		0,78	0,8		0,8	0,2		-0,2	0,4		-0,07	0			-0,96
Total	0,15		-3,99	0,07		-11,2	-8,7		-9,34	-6		-8,96	-6,3			-6,72

(1) Deficit targets (expressed as the ratio deficit/GDP) correspond to the last figure approved by the CG. Some years deficit targets have been changed at least three times in a year.

From the perspective of budget forecast, we must remind that some years budget deficit targets have changed several times in the same fiscal year, which has an obvious impact on budget forecast errors. In addition to that, very often the CG has taken some unilateral decisions that do have an impact on ACs' expenditure, which clearly distort ACs' budget forecast.

3.3 Norms affecting budget execution

Budget is the instrument through which a Government presents to the Legislative an estimation of the public policies that is going to implement and the resources that are going to be collected. However, it is the legislative that finally accepts or rejects the distribution of expenditures and that authorises taxes that are going to be paid by tax payers (this also means that they accept or not governments' budget forecasts).

Given that the budget is an estimation of income and expenditures, it is expected that there is some flexibility in managing it. All countries have their own regulation that determines the balance of powers between the legislative and the executive. In particular, these norms determine the degree of autonomy according to which the executive can manage its budget.

In those countries in which there is a clear distinction between the legislative and executive power, the legislative has a tight control on any modification that represents changes in budget items or that derive into increasing public expenditure (i.e USA). On the contrary,

this tight control is relaxed in those countries in which the executive is elected based on a majority in the legislative. In those countries, the norm that affects budget control apparently is as tight as that in the US, but in real terms is so flexible that it allows increases in public expenditure and important changes in budget items without the ex-ante authorization of the Legislative (e.g in the UK and Spain).

All in all, this flexibility allows the Executive to alter initial budget estimates that make the initial budget forecast irrelevant (i.e the evolution of expenditure is not link to the evolution of tax revenues, public expenditure could be augmented without guaranteeing resources available to finance, some budget items could be approved without considering the real evolution of these items in the past meaning that they are clearly underestimated, etc.).

3.4 Financing agreements

In this section we want to provide some insights concerning those characteristics of the financing agreement that may have an impact on AC's budget forecasts.

3.4.1 Increasing tax autonomy.

The first characteristic of the Spanish process of decentralisation is that there is a relevant asymmetry concerning the origin of ACs' fiscal revenues, which has a clear impact on budget forecast. There are two different groups of regions. On the one hand, there are two regions (named Foral Regions) that collect the most tax revenues (even if they are shared with the CG) and transfer resources to the CG in order to cover the services that the Spanish government is providing in these regions. On the other hand, there are the rest of ACs, which receive transfers (direct transfers or derived from shared taxes) aimed at financing the provision of public goods and services that have been devolved from CG during the last 30 years. RGs in this group of regions also have some revenues that are obtained from own taxes (which are often managed by the CG).

These financing agreements have been changed several times since the first mechanism settled in 1987. Several facts characterise the evolution of such agreements.

First, apparently there has been a significant increase in fiscal co-responsibility, for two reasons: i) because the mechanism has moved from a transfer based to a shared tax process, ii) because ACs have been increasing regulatory power on income tax, which is a shared tax, and on some of the taxes that were transferred to them but that were considered as own taxes. Therefore, it seems that tax autonomy has gradually been increasing.

However, some characteristics of the mechanism distort effective tax autonomy. The CG has traditionally opposed the creation of new taxes by ACs, even when these new taxes did not overlap with CG taxes and even though ACs had the regulatory capacity to create and regulate them. In addition to this, ACs cannot manage or regulate shared taxes. For instance, the 2009 agreement stated that ACs shared CG's Income Tax (50%), VAT (50%)

and Excise Duties (58%) but the possibility of regulating or managing VAT and Excise duties is non-existent.

Second, resources are distributed across regions based apparently on an objective estimation of necessities. However, there is also a bunch of equalization transfers that provokes that the final allocation of resources has no systemic relationship either in terms of any sort of needs assessment of the regions or regarding their fiscal capacity or income levels (see Lopez-Casasnovas et al, 2014). In particular, one of the compensation funds is very sensitive to the relative position of AC's in terms of revenues, which means that it is very unlikely that revenues from the fund can be estimated accurately.

3.4.2 Estimation of tax revenues on shared taxes by the Central Government

Up to now, we have described the main characteristics of financing agreements very succinctly. Nevertheless, the agreements contain some technicalities that have a significant effect on ACs' revenues, in particular since 2009.

This technicality refers to how the CG calculates the resources that are going to be transferred to ACs with respect to shared taxes and transfers. On the one hand, the CG estimates revenues for shared taxes and transfers at $t-1$ and notifies these estimates to ACs by October $t-1$. On the other hand, ACs must approve their public budgets in year t by December at year $t-1$, which means that they must know tax revenues from own and shared taxes and CG transfers by October ($t-1$). It is important to remark that the CG will transfer all estimated resources regardless of whether their calculations were achieved, or not, during period t . Then, at period $t+2$, once real revenues are known, the CG compensates ACs for the difference (results might also be in favour of the CG).

This mechanism has a clear impact on AC's budget forecast: apparently there should not be any forecast error concerning transfers and revenues from shared taxes. Budget forecast errors from revenue sources could only be associated to estimates on own taxes. However, as we mentioned before, the norm does not prevent that a regional parliament approves a budget with revenues that have not been accepted previously by the CG.

In addition to that, ACs have no access to how revenues are forecasted by the CG. Data in table 3 suggest that a significant portion of the reduction of CG's fiscal deficit in 2010, 2011 and 2012 might have been accomplished by underestimating the resources that should be transferred to ACs (equivalent approximately to 0.40% of GDP each year). One could argue that these deviations are due to unpredictable errors but as a curiosity we should remark that the forecast error also favours the CG, except fiscal years 2008 and 2009.

Table 3. Balance between estimated resources (t)- validated resources (t+2) 2007-2013														
	Balance 2007	% GDP 2007	Balance 2008	% GDP 2008	Balance 2009	% GDP 2009	Balance 2010	% GDP 2010	Balance 2011	% GDP 2011	Balance 2012	% GDP 2012	Balance 2013	% GDP 2013
CC.AA														
Catalonia	816.575	0,40%	-690.717	-0,33%	-2.478.108	-1,23%	916.507	0,45%	847.000	0,42%	646.224	0,33%	269.317	0,14%
Galicia	393.029	0,70%	-573.758	-0,98%	-1.600.592	-2,82%	361.682	0,63%	301.000	0,54%	233.288	0,43%	91.819	0,17%
Andalusia	1.426.172	0,96%	-1.475.978	-0,97%	-4.637.439	-3,17%	289.592	0,20%	442.000	0,31%	427.187	0,31%	-265.272	-0,19%
Asturias	117.325	0,50%	-171.162	-0,71%	-588.064	-2,59%	143.751	0,63%	116.000	0,52%	93.540	0,44%	49.564	0,24%
Cantabria	114.656	0,89%	-125.021	-0,94%	-364.226	-2,84%	105.210	0,82%	35.600	0,28%	28.417	0,23%	388	0,00%
Rioja	55.022	0,69%	-46.314	-0,56%	-202.974	-2,55%	61.698	0,77%	14.000	0,18%	12.325	0,16%	232	0,00%
Murcia	197.101	0,70%	-160.515	-0,55%	-581.974	-2,09%	104.398	0,37%	133000	0,49%	125.938	0,47%	55.213	0,21%
Valencia	515.569	0,49%	-635.685	-0,59%	-1.707.219	-1,66%	727.551	0,71%	923000	0,92%	955.900	0,99%	684.424	0,71%
Aragon	201.589	0,59%	-171.838	-0,48%	-721.646	-2,11%	156.201	0,45%	119000	0,35%	109.790	0,34%	-20.790	-0,06%
Castilla-la-Mar	366.870	0,95%	-265.153	-0,66%	-1.033.694	-2,64%	170.543	0,43%	120000	0,31%	66.239	0,18%	49.176	0,13%
Canary Islands	471.193	1,13%	-340.039	-0,80%	-1.102.358	-2,71%	-46.609	-0,11%	75.000	0,18%	145.348	0,36%	9.121	0,02%
Extremadura	184.287	1,05%	-252.350	-1,39%	-764.378	-4,30%	92.742	0,51%	35.800	0,20%	94.141	0,56%	25.908	0,15%
Balearic Island	34.643	0,13%	-162.051	-0,60%	-178.377	-0,68%	429.057	1,64%	520.000	2,00%	489.645	1,90%	553.857	2,14%
Madrid	819.831	0,42%	15.069	0,01%	-1.336.223	-0,67%	1.272.225	0,64%	330.000	0,17%	163.469	0,08%	238.052	0,12%
Castilla-Leon	362.226	0,65%	-443.607	-0,78%	-1.439.181	-2,60%	317.551	0,57%	266000	0,48%	163.319	0,31%	28.486	0,05%
Total	6.076.088	0,61%	-5.499.120	-0,54%	-18.736.453	-1,89%	5.102.099	0,51%	4.277.400	0,44%	3.754.770	0,39%	1.769.495	0,19%
(*) A positive value represents that at period t the CG underestimated revenues to be transferred to regional governments.														
These resources are transferred at t+2.														

The data in table 3 allows us to reach another conclusion: the error in the estimation of fiscal transfers to ACs is not uniform across regions. The effects of over, or under, estimation are evenly distributed. This has to do with two different facts: i) tax autonomy is rather heterogeneous across regions, and, ii) the mechanism according to which the CG transfers resources to regions is biased against those ACs with an above average tax capacity and a below average initial distribution of resources because these regions receive additional resources aimed at providing them average revenues pc. Since 2011 the CG decided that these regions would not receive any advance payment of these resources, but in 2013 and successive years. Notice that for the Balearic Islands, the difference accounts for more than 2% of their GDP. This clearly affects the capacity of some AC's when making accurate predictions on their revenues, especially those mentioned in group ii) in this paragraph.

There is another technicality that must be considered. In 2010 the CG introduced some reforms regarding consumption taxes (VAT and Excise Duties) which increased tax revenues associated with them. However, the CG did not transfer any additional resources to ACs, although these are shared taxes. The procedure used by the CG to estimate tax revenue is not available to ACs'; given that tax revenues may vary due to changes in the economic position of each region or due to tax rates increases, this lack of transparency introduces the possibility that tax revenue estimates are biased in favour of the CG. This is also very relevant with regards to forecasting ACs' tax revenues on own taxes, because ACs may try to compensate underestimation on shared taxes by the CG by overestimating tax revenues on own taxes.

Altogether, this data suggests that the CG might transfer part of its deficit to ACs by underestimating the resources that regions should receive for period t and transfer the difference to $t+2$ and introduces significant difficulties concerning ACs' budget forecasts.

Finally, we cannot avoid mentioning that attention should be paid to the effective responsibility assumed by ACs. In Spain, the CG fixes minimum public goods and services that ACs must provide for their citizens, therefore ACs do not have total autonomy in managing such responsibilities. This means that the CG has the possibility to force ACs to provide additional public services at their expense at current fiscal year t , which are very likely not to be budgeted.

4 Methodology

We estimate the following structural model:

$$EFE_{it} = \beta_0 RFE_{it} + X'_{1,it} \beta_1 + u_{it} \quad [1]$$

$$RFE_{it} = \gamma_0 EFE_{it} + X'_{2,it} \gamma_1 + \varepsilon_{it} \quad [2]$$

Where EFE is the Expenditure forecast error and the RFE stands for the Revenue forecast error. X'_1 and X'_2 are exogenous explanatory variables that include: political variables, institutional variables and a constant.

We must be aware that, by definition, initial budget is passed in a balanced position. This opens the door to different situations that derive into an endogeneity problem that is solved via three-stage least squares (3SLS) as introduced by Zellner and Theil (1962). Balanced budget, for instance, can be achieved overestimating revenues to finance “real” expenditure” or underestimating expenditures adjusted to “real” revenues, or both. The endogenous explanatory variable is the dependent variables from the other equation in the system. This is equivalent to estimate an instrumental variable regression for equation 1 and 2 if disturbances u_{it} and ε_{it} are independent. However, we allow for correlation between the disturbances aimed at gaining in efficiency, therefore estimating a seemingly unrelated regression model (SURE).

In addition to endogeneity we should also care for the persistence in forecast errors. We consider the introduction of the endogenous variable with one period lag.

Alternatively, we estimate the structural models specified in equations [3] and [4] to find out which budget item explains better the error forecast.

$EFE_{it} = \sum_{j=1}^9 \alpha_j weight RevItem_{.j,it} + X'_{1,it} \beta_1 + u_{it}$ $RevItem_j = \gamma_{j,0} EFE_{it} + X'_{2,it} \gamma_{j,1} + \varepsilon_{j,it}, \text{ for } j=1,2,3, 4, 5, 6, 7, 8 \text{ and } 9$	[3]
$RFE_{it} = \sum_{j=1}^9 \alpha_j weight ExpItem_{.j,it} + X'_{1,it} \beta_1 + \varepsilon_{it}$ $ExpItem_j = \gamma_{j,0} RFE_{it} + X'_{2,it} \gamma_{j,1} + \varepsilon_{j,it}, \text{ for } j=1,2,3, 4, 6, 7, 8 \text{ and } 9$	[4]

The Expenditure (Revenue) forecast error is computed as the deviation of the budgeted expenditure (revenue) from the expenditure (revenue) cleared in relative terms. Positive values reflect that the forecast is over the cleared value. Negative values imply the opposite.

4.1 Explanatory variables.

Explanatory variables can be grouped into two categories. On the one hand, we find political and institutional factors such as the composition of majorities (unitary governments as opposed to fractioned ones), the existence of budgetary institutions, the role of political business cycles, partisanship, etc. On the other, we find macroeconomic factors such as interest rates, asset prices, inflation, economic cycles, etc.

In the first group, economic factors are considered. Estimates on variables related to the economic cycle (GDP, interest rates, inflation, asset prices, etc) may have an impact on budget forecast. It is expected that GDP forecasts errors do have an impact on budget forecast on items such as social expenditure, tax revenues, etc. Unfortunately, these data are not available for each CA because some of them do not present GDP growth estimates. In addition to that, it should be remarked that real GDP forecast errors are known at period $t+2$. Alternatively, we introduce the variation in interest rates interest rate (obtained from the ratio interest payments/total debt at period t) because it captures the cost of the total debt issued by a government at moment t .

The second group of variables is made up of those referring to political factors. Political instability, ideology and electoral-cycles are expected to impact budget forecast errors. As an explanatory variable, we introduced Political Coincidence, which refers to the coincidence (or not) in the ideology of ruling parties at ACs and the CG (it takes the value 1 if there is coincidence and 0 otherwise). We expected that if there is political coincidence the CG will favour related ACs by transferring more resources to them or by financing their capital expenditure, while unrelated ACs may have to finance capital expenditure with their own resources, overestimating them. Another political variable is the ACs political

orientation. It is commonly expected, at least in Spain, that nationalist and left-wing oriented ruling parties tend to take less care on achieving budget targets than right-wing oriented parties.

Finally, there is a third group of variables that refer to institutional factors, as in Rosselló and Sansó (2016) and Lago et al 2016. We argue that the existence of institutions responsible of budget surveillance does not guarantee that fiscal rules are implemented or that there is coordination among different levels of governments. As we explained in footnote¹ in Spain a budgetary institution exists, but instead of fostering institutional coordination it is fostering institutional disloyalty (Lopez-Casasnovas et al 2014). Two different groups of variables are introduced concerning institutional factors. We try to go beyond traditional variables computed based on general definitions concerning the level of decentralization, tax autonomy, etc. and we compute new variables that consider some of the technicalities that characterize fiscal relationships between CG and RGs that we detailed in section 4.

On the one hand, we introduce two variables that are associated with potential strategic behaviours of CG and ACs. First, we introduced the ratio of ACs' Public Debt in relation to their Public entities over GDP. Our argument is that fiscal rules on RGs can be circumvented by deviating AC's fiscal deficit to ACs' public entities. This explains, in Spain, the fact that there has been an enormous increase of such public entities, and their debt. It is often the case that when the CG introduces additional restrictions on such entities, ACs (and also the CG itself) create new entities with different legal status. Therefore, a negative sign is expected for this variable. Second, we introduced CG's Budget Deficit. We argue that CG can be tempted to correct its deficit by transferring it to ACs. We introduced two lags in this variable due to the process with which the budget is drawn up. A positive sign is expected in this variable, which means that the larger the CG budget deficit, the more tempted the CG will be to transfer it to ACs (through financing arrangements or by changing the allocation of deficit targets during fiscal year t). We introduced one lag in this variable. Alternatively, one may argue that this is an endogenous variable, because the CG may fail in its deficit target because it might be forced to increase the amount of resources aimed at relieving ACs' budget deficits. However, the financing agreements between the CG and ACs prevent this occurring because the CG unilaterally controls the process through which ACs receive their resources and also the allocation of deficit targets between and within different levels of government. In addition to that, the CG controls the evolution of expenditure since 2012 and can fix restrictions of ACs' evolution of public expenditure.

On the other hand, we introduce some variables relating to the financing agreements between the CG and AC, which determine the total resources that ACs are going to receive. We argue that financing agreements do have an impact on ACs' tax autonomy levels and that this has an impact on ACs budget forecasts. In this group of variables we include the

Total Resources per capita available to each AC. This variable is measured considering estimated revenues on shared taxes and transfers to ACs from the CG at period t plus the compensation received by ACs due to the difference of estimated revenues and effective revenues at $t-2$. We also introduce a dummy variable with the intention of capturing the specificity of each financing agreement (FA1, FA2, FA3 and FA4). From a formal point of view, renovation of financing agreements has tended to increase the degree of tax autonomy, which indicates that this variable might be interpreted as a proxy for tax autonomy. In addition, we introduced two different direct measures of tax autonomy. The first one is the Total Transfers (including those from the EU) over Total non Financial Revenues ratio. The second one was measured based on Total Revenues from Own Taxes (plus Income tax, which is a shared tax and which can be slightly regulated by ACs) over Non Financial Revenues. No expectations were made in relation to the sign of such variables because, while some authors suggest that more tax autonomy is expected to make ACs more responsible (a positive sign would be expected for FA1, FA2 and FA3 in comparison to FA4), some others argue that with more tax autonomy ACs' revenues largely depend on the tax basis evolution, while ACs expenditure are rather structural².

A dummy variable was introduced for each region, which is particularly interesting for those regions with special status (Navarra, the Basque Country and the Canary Islands) and a variable that measures the different degrees of devolved responsibilities (as provided for in articles 143 and 150 of the Spanish Constitution). However, given that we were estimating the model on first differences these individual effects are not presented in our results.

5 Results

In table 1 we present the summary statistics. Figure 1 also shows the forecast error in each AC.

In table 2, first two columns, we provide the OLS estimation of Expenditure and Revenue forecast errors considering that each variable is exogenous in the other equation. Columns 3 and 4 present 3SLS estimation, considering endogeneity in both dependent variables. Columns 5-6 consider the role of the endogenous variable lagged one period. A first result to be remarked is that even that OLS estimates are inconsistent in case of endogeneity, the results of estimating each equation individually without using instruments are similar to the structural estimation. In particular, results suggest that there is a strong relationship between revenue and expenditure forecast errors, although we cannot provide any results concerning the direction of the causality. In addition to that, results indicate that the size of public sector debt has a negative effect on expenditure forecast errors, meaning that the larger the amount of debt of public firms the lower expenditure forecast errors. Our

interpretation is that expenditure forecast errors are lower because regional governments tend to translate part of the expenditure not considered in the budget to their public sector, which softer rules considering the execution of their budgets. On the contrary, revenue forecast errors are positively affected by the size of public sector debt (however, we cannot test whether revenues are over or underestimated). Finally, it seems that institutional and political variables do not influence forecast errors except when we consider the estimates with the endogenous variables lagged one period, when electoral coincidence becomes significant (and with opposite signs with regards to revenue and expenditure forecast errors).

In table 3 and 4 we estimate revenue and expenditure forecast errors using as endogenous variables all forecast errors by budget item. In particular, we use the weight of the error in each expenditure item as an explanatory variable in the revenue forecast error equation. The weighted sum of the errors in each expenditure item is the total expenditure forecast error, by definition. The same is true for the total revenue forecast error.

Estimates in the first column in Table 3 indicate that all forecast errors in all expenditure budget items have a positive effect on revenue forecast errors. In addition to that, governments ruled by left wing parties, compared to those ruled by right wing parties, tend to have larger revenue forecast errors, and these forecast errors are larger in electoral years. Finally, results suggest that revenue forecast errors were lower in the financing agreement that was implemented during 1994-1996 compared to the financing agreement implemented in 2009 characterized by larger levels of tax autonomy.

To what concerns the estimates for each expenditure budget items (columns 2-8) in Table 3, results are different for each item. First, we observe that forecast errors in public employees (cap1) supplies (cap2) transfers (cap4), and investment (cap6) are larger, the larger revenue forecast errors. Second forecast errors in two expenditure budget items seem to be influenced by political variables. On the one hand, we observe that electoral coincidence among ruling parties in the central administration and regional governments positively effect forecast errors in public employees and interest payments forecast errors. On the other hand, forecast errors in these two items are also larger in those regional governments ruled by nationalist parties, although results are opposite when considering left-wing oriented ruling parties, in comparison to right-wing oriented regional governments. Finally, per capita revenues from financing agreements do have a positive effect on forecast errors in interest payments (cap3) and public investment (cap6), while the opposite is true concerning forecast errors in transfers to other administrations or private agents (cap4).

Finally, estimates in the first column in Table 4 indicate that forecast errors in all revenue budget items do have a positive effect in expenditure forecast errors. As going, the size of

public sector debt has a negative effect on expenditure forecast errors. None of the other explanatory variables present significant coefficients.

To what concerns estimates for each revenue forecast error items results provide: First, forecast errors in direct taxation (mainly income and property taxes) are not explained by none of the variables considered; second, expenditure forecast errors seem to have a significant and positive impact on forecast errors in indirect taxation (mainly, VAT and excise taxes). This result is a little bit unexpected given that these revenues are computed and decided by the Central Government, not by RG's. Third, public sector debt causes different effects on budget revenue items: larger public sector debt levels cause larger forecast errors in revenues from indirect taxes (III), fees and public prices (Tax) and Debt, while the contrary is true for forecast errors in revenues from transfers from the other administrations (TTCA). Fourth, tax autonomy measured as Transfers/non-financial-revenues motivate larger forecast errors in revenues from fees (Tax) and transfers (TTCA); the opposite applies concerning revenues from indirect taxation (III).

Political variables also play a role in explain revenue forecast errors because regional governments ruled by nationalist parties present lower forecast errors in revenues associated to fees (Tax) and transfers (TTCA), while the opposite is true for forecast errors in revenues from indirect taxation (III).

Finally, and unexpectedly, the deficit of the central government lagged on period plays a negative impact on revenues forecast from fees (Tax).

6 Conclusions

In this paper we intended to test the relevance of political and institutional variables in explaining revenue and expenditure budget forecast errors.

All in all, results suggest that estimates are driven by the causality of expenditure forecast errors on revenue forecast errors and viceversa, which makes impossible to disentangle the direction of the causality and which makes the role of the other variables almost irrelevant.

Results indicate also that public sector debt plays a role in explaining forecast errors. This variable is significant when estimates refer both to the aggregates or to budget items. However, the sign of this relationship is different if we refer to expenditure or revenues forecast errors.

To what concerns the role played by institutional and political variables, results indicate that they play no role when estimating the aggregate expenditure and revenues forecast errors. Nevertheless, tax autonomy, electoral coincidence, political orientation of ruling parties and per capita revenue from financing agreement have some explanatory powers (with different signs) when running the estimates based on budget items.

Further research would bring us to consider the role of GDP forecast errors and GDP variations, aimed at capturing the impact of the cycle. This would allow us to test the hypotheses that forecast errors may have a different sign, or a different size in expansionary vs contracting position in the cycle. In addition to that, we should test whether explanatory variables cause under estimation or over estimation of revenues and expenditures, because in this paper we did not deal with the sign of the forecast error.

Estimar si les variables que hem trobat que tenen significació provoquen over or underestimation.

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TABLES

Tables

Table 1: Summary statics

	Mean	Standard Deviation	Min.	Max.	N. Obs.
Expenditure forecast error	-0.0145	0.103	-0.465	0.442	340
Revenue forecast error	-0.0248	0.109	-0.481	0.433	340
Public sector debt/GDP	0.447	0.557	0	2.8	357
Tax Autonomy	0.359	0.221	0.0694	0.974	289
Transfers / non-financial revenue	0.455	0.26	-0.336	0.969	340
Electoral coincidence	0.442	0.497	0	1	391
Left wing party	0.366	0.482	0	1	391
Nationalist party	0.205	0.404	0	1	391
Electoral year	0.269	0.444	0	1	391
Per capita revenue (financial agreements)	3.17	5.04	0.0178	36.5	340
Central Government deficit / GDP	-0.0181	0.0204	-0.0578	0.0106	340

Table 2: OLS vs. 3SLS (Three-stage estimation for systems of simultaneous equations)

Table 2 (new): OLS vs. 3SLS (Three-stage estimation for systems of simultaneous equations)

Estimation method Expla. var. / Dep. var.	OLS	OLS	3SLS	3SLS	3SLS	3SLS
	Expenditure forecast error	Revenue forecast error	Expenditure forecast error	Revenue forecast error	Expenditure forecast error	Revenue forecast error
Revenue forecast error	0.7903*** (0.0268)		0.7129*** (0.1192)		0.8916*** (0.1049)	
Revenue forecast error (-1)						0.0084 (0.0223)
Expenditure forecast error		0.9424*** (0.0313)		1.4052*** (0.2394)		1.1117*** (0.0995)
Expenditure forecast error (-1)					-0.0058 (0.0281)	
Public sector debt/GDP	-0.0175*** (0.0049)	0.0156** (0.0055)	-0.0174*** (0.0049)	0.0245** (0.0087)	-0.0171*** (0.0048)	0.0188*** (0.0056)
Dummy (if Tax Autonomy)	0.0057 (0.0125)	0.0036 (0.0145)	0.0068 (0.0126)	-0.0099 (0.0193)	0.0066 (0.0124)	-0.0058 (0.0139)
Tax Autonomy	0.0112 (0.0151)	-0.0213 (0.0160)	0.0098 (0.0151)	-0.0137 (0.0208)	0.0136 (0.0149)	-0.0152 (0.0161)
Transfers / non-financial revenue	0.0093 (0.0125)	0.0057 (0.0136)	0.0126 (0.0133)	-0.0177 (0.0212)	0.0041 (0.0126)	-0.0043 (0.0142)
Electoral coincidence	0.0119 (0.0062)	-0.0134* (0.0065)	0.0114 (0.0062)	-0.016 (0.0086)	0.0127* (0.0061)	-0.0142* (0.0066)
Left wing party	-0.0112 (0.0066)	0.0111 (0.0070)	-0.0101 (0.0067)	0.0142 (0.0091)	-0.0119 (0.0067)	0.0132 (0.0070)
Nationalist party	0.0002 (0.0086)	-0.0004 (0.0091)	-0.0005 (0.0086)	0.0008 (0.0120)	0.0014 (0.0085)	-0.0016 (0.0092)
Electoral year	-0.007 (0.0065)	0.0133* (0.0068)	-0.0049 (0.0072)	0.0069 (0.0097)	-0.0101 (0.0073)	0.0116 (0.0071)
Per capita revenue (financial agreements)	-0.0002 (0.0006)	0 (0.0006)	-0.0003 (0.0006)	0.0004 (0.0008)	-0.0001 (0.0005)	0.0001 (0.0006)
Central Government deficit / GDP	-0.3336 (0.2071)	0.3063 (0.2939)	-0.3961 (0.2259)	0.5535 (0.3461)	-0.1976 (0.1953)	0.2386 (0.2417)
Central Government deficit / GDP (-1)	0.0467 (0.2387)		0.0042 (0.2453)		-0.0156 (0.2069)	
Financing agreement 1994-1996		-0.0147 (0.0142)		0.0002 (0.0180)		-0.0018 (0.0130)
Financing agreement 1997-2001		-0.0123 (0.0133)		0.0003 (0.0161)		-0.0011 (0.0110)
Financing agreement 2002-2008		-0.0213 (0.0147)		0.0002 (0.0137)		-0.0018 (0.0103)
Constant	-0.0055 (0.0135)	0.0009 (0.0148)	-0.0115 (0.0162)	0.0163 (0.0196)	-0.0156 (0.2069)	0.0008 (0.0140)
N. Obs.	306	323	306	306	306	306

* p<0.05, ** p<0.01, *** p<0.001

Table 3: Revenue forecast error. 3SLS (Three-stage estimation for systems of simultaneous equations)

Estimation method	3SLS	3SLS	3SLS	3SLS	3SLS	3SLS	3SLS	3SLS
Expla. Var. / Dep. Var.	Revenue forecast error	Forecast Error Cap1	Forecast Error Cap2	Forecast Error Cap3	Forecast Error Cap4	Forecast Error Cap6	Forecast Error Cap8	Forecast Error Cap9
Revenue forecast error		1.4867*** (0.1475)	1.7611*** (0.1766)	0.1103 (0.1560)	1.3038*** (0.1029)	0.5975*** (0.0931)	0.8949 (1.9524)	148.8051 (206.8687)
Forecast Error Cap1	0.9203*** (0.0553)							
Forecast Error Cap2	1.0715*** (0.0810)							
Forecast Error Cap3	-1.0091* (0.4247)							
Forecast Error Cap4	1.0700*** (0.0553)							
Forecast Error Cap6	0.9175*** (0.1190)							
Forecast Error Cap7	0.8777*** (0.1383)							
Forecast Error Cap8	0.8362*** (0.1842)							
Forecast Error Cap9	0.6318*** (0.0868)							
Public sector debt/GDP	0.0058 (0.0050)	0.0166 (0.0227)	0.0332 (0.0272)	0.0107 (0.0240)	0.0138 (0.0158)	0.0135 (0.0143)	-0.1121 (0.3006)	61.0368 (31.8457)
Dummy (if Tax Autonomy)	0.0095 (0.0187)							
Tax Autonomy	0.0066 (0.0126)							
Transfers / non-financial revenue	0.0206 (0.0107)							
Electoral coincidence	-0.0077 (0.0061)	0.0719* (0.0296)	0.0302 (0.0354)	0.0870** (0.0313)	-0.0252 (0.0207)	-0.0009 (0.0187)	-0.2225 (0.3919)	59.4241 (41.5219)
Left wing party	0.0088 (0.0062)	-0.0736* (0.0289)	-0.0409 (0.0345)	0.1060*** (0.0305)	0.0034 (0.0201)	0.0066 (0.0182)	0.8515* (0.3819)	24.1226 (40.4652)
Nationalist party	-0.0105 (0.0083)	0.1012** (0.0388)	0.0226 (0.0465)	0.1436*** (0.0411)	0.0294 (0.0271)	0.0149 (0.0245)	-0.6717 (0.5141)	-6.2126 (54.4756)
Electoral year	0.009 (0.0063)	-0.0434 (0.0311)	0.0014 (0.0372)	0.0069 (0.0329)	-0.0052 (0.0217)	0.0019 (0.0196)	0.4034 (0.4111)	-94.3388* (43.5602)
Financing agreement 1994-1996	-0.0490* (0.0199)							
Financing agreement 1997-2001	-0.0329* (0.0153)							
Financing agreement 2002-2008	-0.0212 (0.0129)							
Per capita revenue (financial agreements)	0.0002 (0.0005)	0.0024 (0.0025)	0.0053 (0.0030)	0.0140*** (0.0027)	-0.0072*** (0.0018)	0.0038* (0.0016)	0.0051 (0.0337)	-0.2947 (3.5691)
Central Government deficit / GDP	0.3863 (0.2866)							
Central Government deficit / GDP (-1)	-0.4405 (0.3455)							
Constant	-0.0037 (0.0147)	-0.0358 (0.0323)	-0.0870* (0.0386)	-0.0222 (0.0341)	-0.0142 (0.0225)	0.1490*** (0.0204)	-1.0480* (0.4270)	-72.9776 (45.2380)
N. Obs.	283							

* p<0.05, ** p<0.01, *** p<0.001. Note: Balearic Islands are dropped from the estimation due to abnormally large errors in Cap 8.

Table 4: Expenditure forecast error. 3SLS (Three-stage estimation for systems of simultaneous equations)

Estimation method	3SLS	3SLS	3SLS	3SLS	3SLS	3SLS
Expla. Var. / Dep. Var.	Expenditure forecast error	Forecast Error IID	Forecast Error III	Forecast Error Tax	Forecast Error TTCA	Forecast Error Debt
Expenditure forecast error		0.0336 (0.3119)	5.1127*** (0.4308)	0.0817 (0.1529)	0.5269 (0.4542)	-0.0779 (2.6048)
Forecast Error IID	0.3504** (0.1205)					
Forecast Error III	0.9653*** (0.0370)					
Forecast Error Tax	0.7097*** (0.1468)					
Forecast Error TTco	0.7657*** (0.0371)					
Forecast Error TTCA	0.6771*** (0.1111)					
Forecast Error Debt	0.5102*** (0.0558)					
Public sector debt/GDP	-0.0211*** (0.0051)	0.0274 (0.0470)	0.1590* (0.0649)	0.0761*** (0.0230)	-0.4700*** (0.0685)	-0.8337* (0.3926)
Dummy (if Tax Autonomy)	0.0165 (0.0271)					
Tax Autonomy	0.0142 (0.0302)					
Transfers / non-financial revenue	0.0142 (0.0253)	-0.0447 (0.1370)	-0.4717* (0.1893)	0.2681*** (0.0672)	0.8483*** (0.1996)	-0.1816 (1.1446)
Electoral coincidence	0.0066 (0.0061)	0.0767 (0.0567)	0.1205 (0.0783)	0.0066 (0.0278)	-0.0173 (0.0826)	0.1263 (0.4735)
Left wing party	-0.008 (0.0065)	-0.0647 (0.0604)	-0.0313 (0.0835)	0.0306 (0.0296)	-0.1202 (0.0880)	0.194 (0.5046)
Nationalist party	-0.0083 (0.0087)	0.122 (0.0805)	0.2544* (0.1112)	-0.1022** (0.0394)	-0.2300* (0.1172)	-0.7549 (0.6722)
Electoral year	-0.0042 (0.0067)	0.0512 (0.0618)	0.1136 (0.0854)	0.0024 (0.0303)	0.0146 (0.0900)	0.3535 (0.5164)
Financing agreement 1994-1996	0.0076 (0.0245)	0.0431 (0.1447)	0.224 (0.1999)	-0.1007 (0.0709)	-0.5197* (0.2107)	-0.1101 (1.2087)
Financing agreement 1997-2001	0.0142 (0.0179)	-0.0303 (0.1036)	-0.1122 (0.1432)	0.0329 (0.0508)	-0.3667* (0.1509)	-0.6353 (0.8656)
Financing agreement 2002-2008	0.0178 (0.0158)	-0.1942 (0.1144)	-0.4376** (0.1580)	0.1056 (0.0561)	-0.0015 (0.1666)	0.62 (0.9554)
Per capita revenue (financial agreements)	-0.0001 (0.0006)	0.0056 (0.0052)	0.0109 (0.0072)	0.0035 (0.0025)	-0.0045 (0.0076)	0.0407 (0.0433)
Central Government deficit / GDP	-0.6053 (0.3497)	0.9091 (2.8433)	6.7768 (3.9281)	-0.7154 (1.3937)	2.5027 (4.1407)	-30.3699 (23.7486)
Central Government deficit / GDP (-1)	-0.0747 (0.4200)	0.6008 (2.1197)	1.768 (2.9284)	-3.4668*** (1.0390)	-5.4668 (3.0869)	-8.4057 (17.7048)
Constant	-0.0347 (0.0184)	-0.0533 (0.1256)	0.2536 (0.1735)	-0.3150*** (0.0616)	-0.0049 (0.1829)	-1.3129 (1.0492)
N. Obs.	284					

* p<0.05, ** p<0.01, *** p<0.001

Figure 1 Expenditure Budget (Desptot) vs Real expenditure (Destotl)

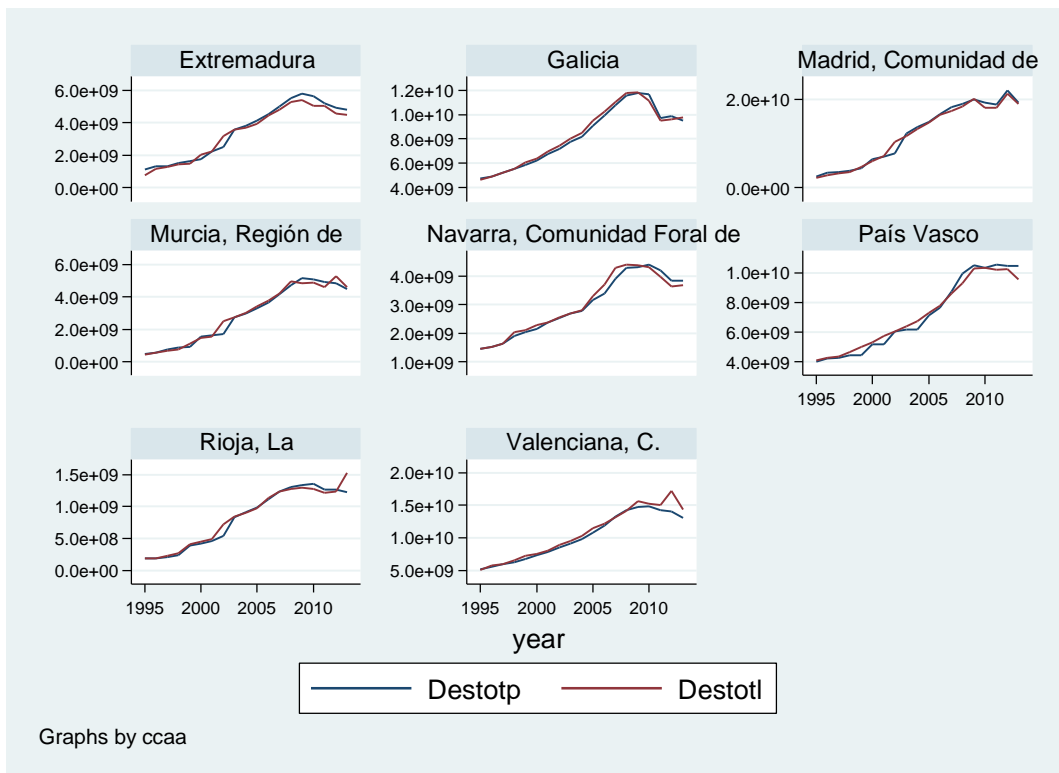
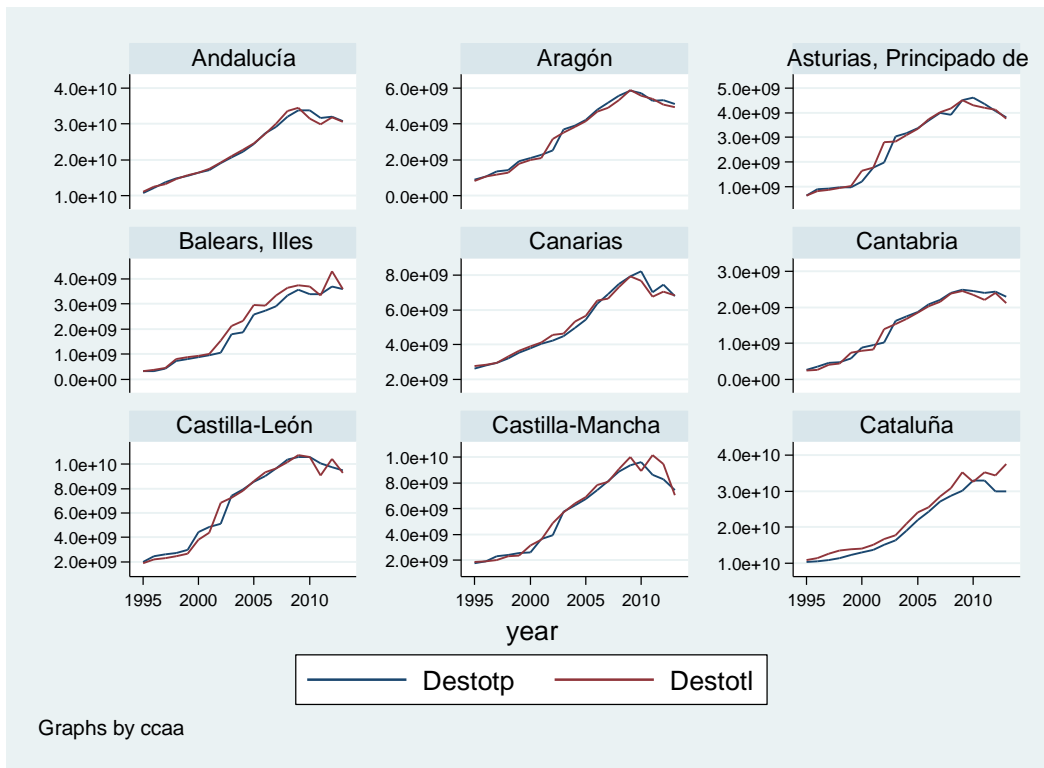


Figure 2 Revenue Budget (Ingrtotp) vs Real revenues (Ingrtotl)

