# Too Small to Fail? Subnational Spending Pressures in Europe

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**Abstract**

The purpose of this paper is to assess whether expenditure decentralization has contributed to weakening fiscal performance in Europe. Using a panel of EU15 countries for the period 1995-2011, we estimate three econometric models and ask the following questions: (1) does the form of spending decentralization affect the general government fiscal balance?; (2) is there evidence of spending duplication?; and (3) are soft budget constraints prevalent at the subnational level in Europe? Our results indicate that current decentralization models may have some shortcomings and efforts to achieve fiscal consolidation would require improvements in three areas: better matching subnational spending and revenues; reshaping expenditure assignments to reduce overlap; and improving the effectiveness of institutional arrangements at the subnational level.

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## I. INTRODUCTION

The Great Recession has put a heavy burden on public finances across Europe, with the general government debt having, on average, increased by 25 percent of GDP in the EU15 since the onset of the crisis.[2] This phenomenon is generally attributed to three main factors: the government support to the financial sector; the fiscal stimulus implemented at the early stages of the crisis; and the severe economic downturn. However, as tempting as it might be to put all the blame on "acts of nature", there is growing consensus that the lack of fiscal discipline also played an important role. In particular, fiscal policy was markedly pro-cyclical during the last decade (European Commission, 2008; IMF, 2011); and budgetary positions could have been substantially more resilient, had governments adopted sound expenditure policies in the years preceding the crisis.

A key question is then whether subnational governments had any part in that play. At first glance, it would appear that subnational governments were just innocent bystanders as their fiscal position—measured by the subnational balance in percent of GDP—was and remains relatively small in most countries. In that world, subnational governments would be too small to significantly impair the general government fiscal position. However, the overall fiscal balance may not be the right metric to assess subnational imbalances. Indeed, an analysis of subnational spending paints a somewhat different picture.

The purpose of this paper is to determine to what extent subnational governments have contributed to fiscal vulnerabilities in the EU15, with an emphasis on expenditure. We present empirical evidence suggesting that spending pressures at the subnational level built up over the last decade and have intensified during the crisis. Using a sample for the period 1995-2011, we estimate three econometric models and ask the following questions: (1) does the form of spending decentralization affect fiscal performance?; (2) is there some overlap between the responsibilities of different government levels?; and (3) are soft budget constraints prevalent at the subnational level? To the best of our knowledge, our paper is the first to present a comprehensive view of the role of spending decentralization in the European fiscal crisis.

Our results show that, while expenditure decentralization is not necessarily bad, decentralizing some specific spending functions may bring zero benefit or even create overlap and waste resources. In addition, we find that expenditure decentralization financed through transfers and/or borrowing is associated with weaker fiscal outcomes. This is somewhat troubling, as that was the preferred form of financing in the EU15 over the last decade. Finally, we provide evidence that subnational governments do not fully adjust expenditure to negative revenue shocks, implying that they may not face a hard budget

[2]The focus of the paper is on the EU15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. Two considerations motivated our decision to restrict the analysis to this sample. First, data availability for New Member States is limited. Second, there are important differences in the decentralization models of advanced and emerging countries (in particular post-communist economies). For a a description of the data and definitions, see Appendix I.

constraint, at least in the most recent period. These results have important policy implications as they suggest that efforts to improve the fiscal position in Europe could not advance without revisiting expenditure decentralization models.

The rest of the paper is organized as follows. Section II gives a brief overview of the literature on expenditure decentralization focusing on the size of government. Section III presents some stylized facts about the role of spending decentralization in the run-up to and during the crisis. Section IV presents econometric evidence, while Section V concludes and discusses policy recommendations.

## II. Fiscal Decentralization and The Size Of The Public Sector

### Theoretical Considerations

According to the traditional theory of public finance, fiscal decentralization should reduce public sector growth. "Total government intrusions into the economy should be smaller, ceteris paribus, the greater the extent to which taxes and expenditures are decentralized" (Brennan and Buchanan, 1980). Indeed, fiscal decentralization is expected to generate "productive efficiency" gains for two main reasons:[3]

- The *competition* between jurisdictions limits the local tax burden and, encourages cost-efficient public good delivery (Brennan and Buchanan, 1980). If the taxpayers are not satisfied with the tax-benefit mix proposed by the local authorities, they can "vote with their feet" and move to another jurisdiction or use the electoral system to pressure local officials. This competition effect is likely to be stronger if the number of jurisdictions is larger, "fragmentation" reducing the likelihood of collusive agreements between subnational entities. The competition effect also depends on the degree of transfer dependency: local governments should have sufficient tax resources to be able to engage in tax competition.

- Fiscal decentralization also enhances the *information* available to taxpayers about government activities, and increases the transparency of public good provision and financing. In decentralized frameworks, taxpayers are in a better position to identify decision makers, and sanction their performance. This information effect is likely to be stronger if spending is financed through local taxation, as a tighter tax-benefit link enhances the local authorities' accountability.

[3]Decentralization also produces "allocative efficiency" gains, subcentral governments having the possibility to better match policies with the preferences of the citizens (Oates, 1972). However, such gains are not necessarily associated with lower spending. In addition, decentralization may allow for experimentation of public responsibilities, as subnational governments can introduce innovative measures to enhance public spending efficiency (Oates, 1999).

However, the more recent literature challenges these predictions, highlighting "the dark side of fiscal decentralization" instead (Oates, 2006) In particular, fiscal decentralization may heighten spending pressures and inflate the size of the public sector (Box 1). An important finding is that, while moral hazard and governance failures certainly play a role, fiscal underperformance at the subnational level could also result from the institutional framework itself, for instance from weak public financial management systems or ill-designed transfers.

**Box 1: Why Fiscal Decentralization May Inflate the Size of the Government**

Fiscal decentralization may increase the size of the public sector mainly due to four reasons:

First, decentralization does not generate unlimited efficiency gains. If decentralization is too large, these gains may be offset by diseconomies of scale, negative inter-jurisdictional spillovers, and coordination issues. Because of this, it is often argued that macroeconomic stability and redistribution responsibilities should be left at the center. Regarding resource allocation functions, the central government should provide public goods that are national in scope, while subnational governments should be in charge of delivering services with local benefits, such as waste disposal, street maintenance, or primary education (IMF, 2009).

Second, normative considerations seldom guide actual expenditure assignments across levels of government. Fiscal decentralization is largely driven by political motives, and historical and cultural legacies. Accordingly, the degree of decentralization and the distribution of responsibilities may not be optimal from an efficiency standpoint. For instance, constitutional boundaries at the local level and the existing "political map" limit the scope for adjusting the local entities' size according to efficiency criteria (Dafflon, 2006).

Third, fiscal discipline is more difficult to enforce at the subnational level:

- *Soft budget constraint*. Subnational governments tend to overspend if they do not face a fixed envelope of resources. This may happen because local authorities receive bailout transfers from the center; get subsidized loans from public banks or state-owned enterprises; run arrears to their suppliers or creditors; or underfund public sector pensions.

- *Common pool problem*. Local policymakers fail to fully internalize the cost of spending when they can finance expenditure with intergovernmental transfers or shared revenue that are funded by other jurisdictions' taxpayers (that is, the marginal benefit of additional spending exceed the perceived marginal cost).

- *Moral hazard and weak governance*. When important tax bases and spending responsibilities are devolved to subnational governments, the central government may be unable to monitor how efficiently revenues are used. In addition, local bureaucracies are often of lower quality, and clientelism and corruption may be more prevalent.

Fourth, expenditure control failures may also reflect structural difficulties to manage local budgets:

- *Procyclicality of resources.* Subnational own revenue sources are narrow and volatile, while transfers received from the center are often procyclical. Given that subnational governments have limited access to credit markets and/or are subject to budget balance rules, they are left alone to deal with business cycle volatility, resulting in procyclical local spending (Rodden and Wibbels, 2010).

- *Unclear spending assignments*. It is not uncommon that different levels of governments are responsible for the same spending functions. For instance, the center can retain some control in the definition of health or education standards, and provide the financing, while lower levels of government are

involved in service provision. Lack of clarity in these concurrent assignments weakens accountability, as local officials can play a blame game and avoid taking responsibility and corrective action (IMF 2009).

- *Weak public financial management (PFM) systems*. Effective fiscal decentralization requires a sound PFM framework. At the subnational level, the lack of proper audit and control mechanisms, looser accounting standards (in particular for arrears recording), the absence of multi-year fiscal frameworks, and ill-designed fiscal rules complicate the local budgeting process and create incentives for riskier behaviors.

- *Flaws in the transfer system design*. Some grant characteristics encourage overspending. Many transfers, for instance, have a matching dimension, with grant allocation increasing when subnational governments spend more on the matched service. Also, the heterogeneity of subnational jurisdictions is not always adequately addressed in the design of transfers, resulting in unfunded mandates in some jurisdictions, and excess resources in others. Finally, the allocation of transfers is often based on actual spending costs (rather than "expenditure needs") and independent of the quality of service provided, discouraging the adoption of cost-saving measures at the local level.

## Findings from the Empirical Literature

The empirical literature has identified three key determinants of **subnational spending**:

- *Bailout expectations*. An abundant descriptive literature, based on case studies, emphasizes the role of bailout expectations in the profligacy of subnational governments (Hagen et al. 2000; Rodden et al., 2003). Bailout expectations are caused by a series of factors, including: the negative spillovers that local bankruptcy could have on other jurisdictions (in particular if local governments are "too big to fail"); a political system that over-represents local interests in the central legislature; the lack of effective market signals such as well-functioning capital and land markets which would sanction local governments by capitalizing their weak performance in land prices or interest rates; the history of bailouts; unclear spending and revenue assignments; the high reliance on transfers, which leaves local governments limited room to raise additional revenue in response to adverse shocks; and the assignment of some key sensitive expenditure responsibilities to lower levels of government, especially in the presence of mandates and standards.

- *The tax-transfer mix*.[4] Particular attention has been paid to the effect of intergovernmental transfers on local spending. Quantitative studies show that the propensity of local governments to spend "external revenues" (intergovernmental transfers) is significantly larger than their propensity to spend "own revenues" (that is, the tax base of their

[4]In this paper, the word "transfer" always refers to intergovernmental (not interpersonal) transfers and it is used interchangeably with "grant". "Own revenues"—which are measured as the difference between total revenues and intergovernmental transfers received by a given level of government—include both tax and nontax revenues (but exclude borrowing).

jurisdiction). In the United States, an extra dollar of personal income is found to increase government spending by $0.2 to $0.5, but an equivalent dollar of grants increases spending by $0.3 to $1 (Gramlich 1977, Inman 1979, 2008; Hines and Thaler, 1995). This puzzle is referred to as the "flypaper effect," as income to citizen stays with the citizen (is barely taxed and spent), while grant money tends to stick where it first lands, leaving a small fraction available for tax relief.

- *Government fragmentation*.[5] There is also an abundant country-specific literature on the impact of fragmentation on public spending, in particular in the United States. This literature provides some (limited) support to the hypothesis that fragmented governments are smaller and spend less (Boyne 1992). More recent studies (Hendrick et al., 2011) argue that the fragmentation effect is more significant for "general" than for "special-purpose" subnational governments: competition among local governments that provide substitute services tend to reduce the government size, while overlapping governments that provide complementary services have the opposite effect.

The empirical literature has also examined the effect of fiscal decentralization on **general government expenditure** from a cross-country perspective. Two main results have emerged:

- *Decentralization*. There is no strong evidence that fiscal decentralization in itself increases the size of the public sector. Earlier literature (Oates 1972, 1985; Heil, 1991) find no relation, while more recent papers tend to show opposite effects of spending and revenue decentralizations (Jin and Zou, 2002; European Commission, 2012a).

- *Vertical fiscal imbalance*. A consensus seems to emerge on the "conditional" effect of decentralization: spending decentralization only raises general government spending when it is financed from transfers or borrowing, meaning when it is associated with large vertical fiscal imbalances (VFI).[6] One possible reason is that expenditure decentralization without corresponding local tax powers will not generate the tax competition that underpins the Leviathan model, nor will it increase local government accountability. The negative effect of the VFI on general government spending and its interaction with spending decentralization are found in Jin and Zou (2002), Rodden (2003), and Eyraud and Lusinyan (2011). Fornasari et al. (2000) also show that subnational spending not funded by local taxes is additional to central government spending.

[5]The term "government fragmentation" refers to the number of subcentral jurisdictions, in some cases standardized by population or other factors.

[6]A VFI exists when there is a gap between subnational spending and subnational "own" revenues (i.e., excluding transfers received).

## III. Stylized Facts on Expenditure Decentralization in Europe

Many European countries have embarked on fiscal decentralization programs over the last decades, reassigning spending responsibilities from the center to subnational (local and regional/state) governments. This section examines this phenomenon, with an emphasis on the most recent period.

**Fact 1: European countries have progressively decentralized public expenditure over the last 20 years, but this process was interrupted by the crisis.**

Today, about 30 percent of public expenditure programs are carried out at the subnational level in the EU15 (Figure 1, upper left chart)—a share broadly similar to the OECD average (32 percent in 2010), and slightly higher than in the EU27 (27 percent in 2011).[7] Expenditure decentralization is more advanced in federal states (Austria, Belgium, Germany, and Spain), reflecting the larger size of intermediate government levels in those countries.

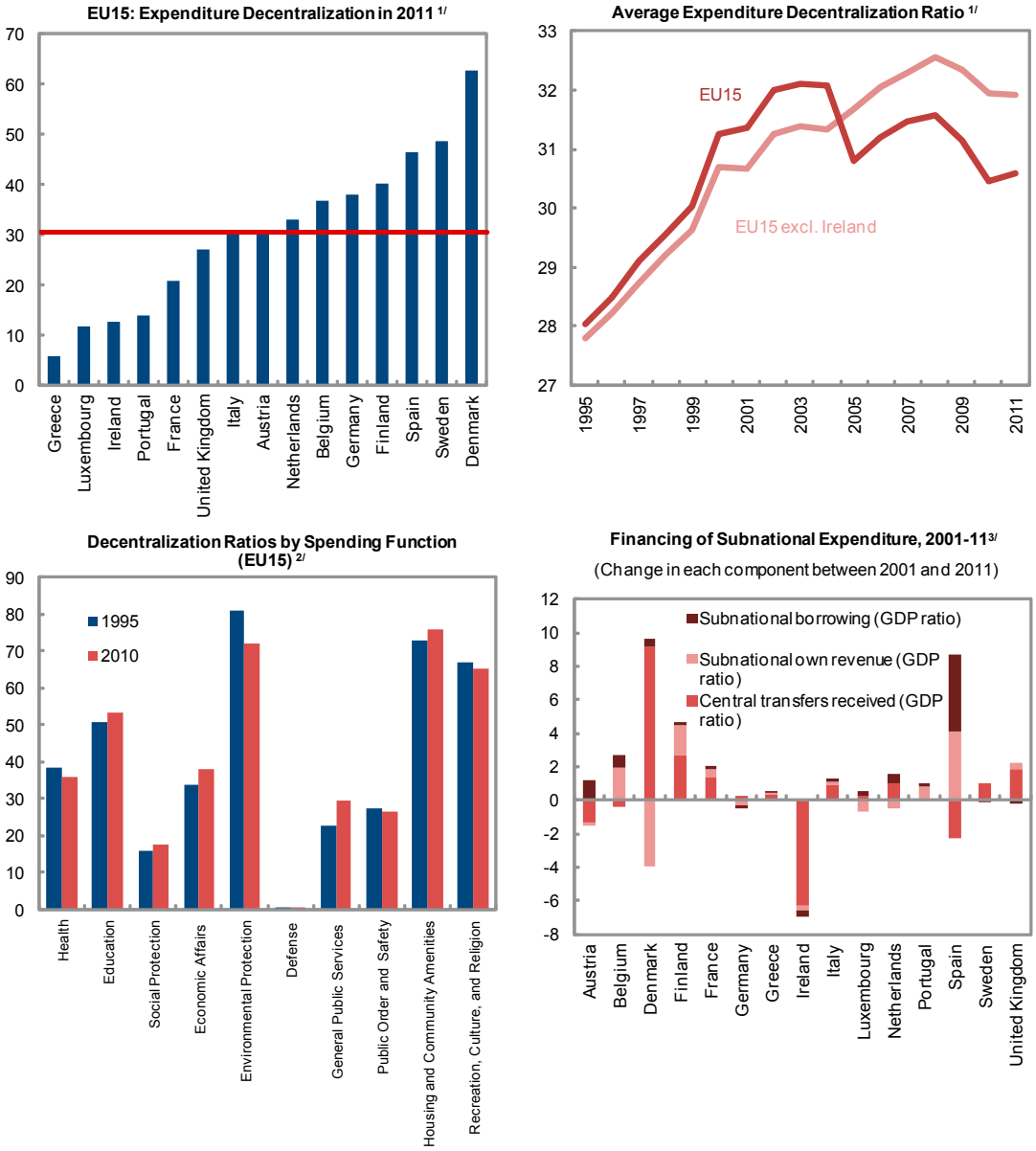
Most European countries have undertaken fiscal decentralization reforms since the mid-1990s, assigning more expenditure functions to lower levels of governments (Figure 1, upper right chart). Ireland has followed an opposite path, with the ratio of subnational to general government expenditure falling sharply from about 40 percent in 2004 to 10 percent in 2010. This decline resulted from a recentralization of health functions in the mid-2000s (McDaid et al., 2009), and a surge in central expenditure during the crisis as part of the banking sector recapitalization. Excluding Ireland, about 4 percent of total expenditure has been redirected from the central to subnational governments since 1995. This suggests that the reassignment of spending responsibilities is a continuous but relatively slow process.

Disaggregated data on expenditure functions show that decentralization has been across-the-board (Figure 1, lower left chart), except in health and environmental protection. The decline in the health decentralization ratio, particularly marked in Ireland, is also noticeable in advanced economies outside our sample, such as Norway. As explained by Saltman (2008), the recentralization of health is a recent phenomenon, motivated by several considerations, including rising health costs due to population ageing and technological advances, the need to reduce regional disparities in access to services, and the insufficient own revenue sources of local authorities to fund future care needs.

In the last decade, the increase in subnational spending has mostly been financed by central transfers and subnational borrowing (Figure 1, lower right chart). Only one fifth of the change in subnational spending was funded from own revenues; the rest came from transfers and borrowing roughly in equal parts. As a result, the VFI has, on average, increased over the period.

[7]The term "subnational" refers to both the state and local levels of government. "National" refers to both the central government and the social security administration.

## Figure 1: Expenditure Decentralization in EU15 Countries




Sources: Eurostat; and authors' estimates.
1/ Share of subnational own spending in general government spending.
2/ Same ratio as 1/ but for specific expenditure functions.
3/ All variables are shares of GDP. The change in the own revenue, transfer and borrowing ratios is computed between the average 2000-01 and the average 2010–11 (instead of 2001 and 2011), to ensure that our results are not sensitive to the choice of the initial and final data points.

Since the onset of the Great Recession, the decentralization trend has been reversed in most European countries (Figure 1, upper right chart). Three hypotheses may account for this phenomenon. A first interpretation is that an optimal level of decentralization was achieved in the pre-crisis period, and the long-term movement of devolution has now come to an end.

Although this may be true for specific components like health expenditure, it is doubtful that all the benefits from decentralization have been exhausted.[8] A more plausible explanation is that the decline in the decentralization ratio partly reflects the large increase in counter-cyclical expenditure carried out at the center. In most countries, national expenditure has indeed increased sharply in 2008-09. The fact that the expenditure decentralization ratio has leveled off when the fiscal stimulus was withdrawn in 2010-11 also supports this hypothesis. A third explanation could be that subnational governments are bearing a heavy burden in the ongoing consolidation efforts. In fact, the decline in the subnational and national expenditure-to-GDP ratios in 2010-11 are of the same order of magnitude, while the national government had, on average, expanded far more in the preceding years.

**Fact 2: Highly-decentralized countries have larger public sectors**.

From a theoretical perspective, the effect of expenditure decentralization on the size of the government is ambiguous. If subnational governments take over functions previously carried out by the center, the substitution effect should not affect general government expenditure. On the other hand, decentralization may be associated with smaller governments if inter-jurisdictional competition encourages a more cost-efficient provision of public goods. A third possibility is that decentralization inflates the government size, if fiscal discipline is undermined by common pool problems and bailout expectations.

In the data, we observe a positive correlation between expenditure decentralization and the government size in the EU15 (Figure 2). This relation holds for all years from 1995 onwards, as well as for the whole EU sample. One explanation could be that there are expenditure overlaps, some responsibilities devolved to subnational governments being still performed (and duplicated) by the center (Joumard, and Kongsrud, 2003).

The negative correlation may also reflect that subnational governments carry out less prudent fiscal policies than the center, and have a tendency to overspend. More decentralization would exacerbate this problem, and may also increase central spending through the cost of bailouts, or the higher interest rate risk premium on sovereign issuances.

A more benign interpretation could be that voters prefer a mix of high taxes and high public services in the EU15. By better tailoring goods and services to local needs, decentralization would reveal these preferences, and raise total spending. However, this interpretation is difficult to reconcile with the deterioration in fiscal positions.

In any case, the correlation between decentralization and government size should be interpreted with caution due to the possible reverse causality, large countries having probably more incentives to decentralize. Omitted variables (for instance transfer dependency) could also drive this correlation.

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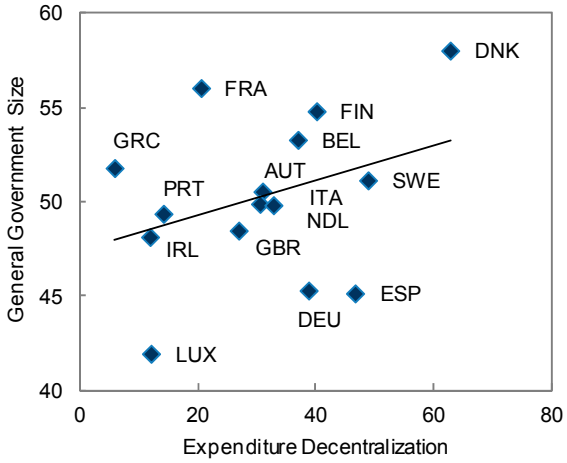
[8]There is still scope to develop innovative approaches to decentralization, with a view to exploiting economies of scale and internalizing spillovers. These new approaches include cooperative agreements between subnational governments, and asymmetric forms of decentralizations (Joumard and Kongsrud, 2003).

**Figure 2: Expenditure Decentralization and Government Size in 2011 1/**




Sources: Eurostat; and authors' estimates.
1/ Expenditure decentralization is the share of subnational own spending in general government spending. General government size is the ratio of general government expenditure to GDP.

**Fact 3: A significant part of the deterioration in fiscal positions during the crisis occurred at the subnational level**.

Based on the analysis of *overall balances*, there is little evidence that subnational governments have been fiscally irresponsible since 2008 (Figure 3, upper left chart). On average, their balances have only deteriorated by half percentage point of GDP between 2004-07 and 2008-11. By contrast, deficits at the national government level have increased by almost 4 percent of GDP over the same period. In addition, in most countries, the deficit of subnational governments has remained below 1 percent of GDP during the crisis.

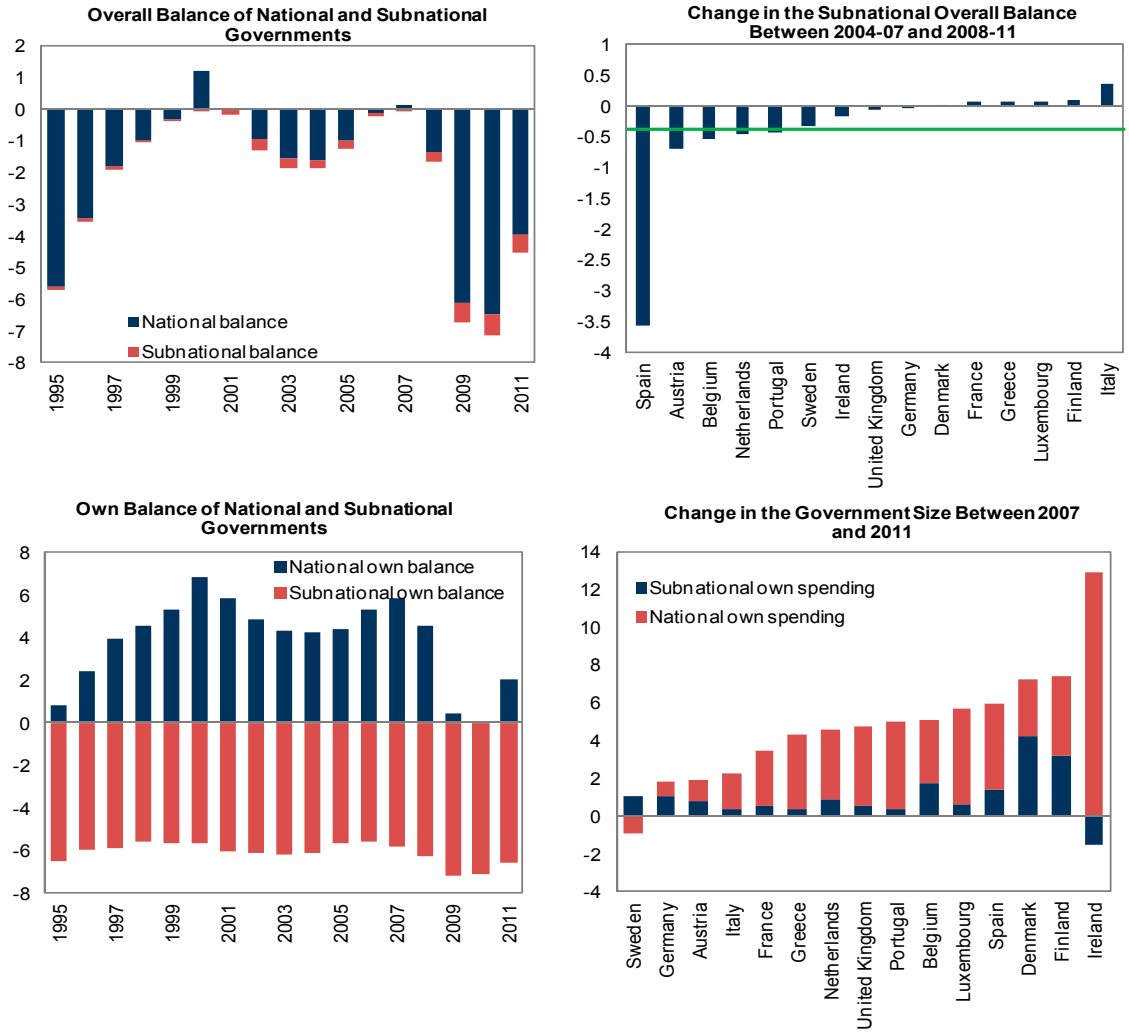
There are, nonetheless, large disparities across countries (Figure 3, upper right chart). In particular, Spain had to struggle with large fiscal pressures at the regional level in recent years, with two-thirds of its general government deficit originating at the subnational level in 2011.

In addition, the overall balance indicator does not reflect properly the subnational governments' fiscal performance, as any balance target can be achieved through higher gap-filling transfers from the center. We use two alternative indicators to get round this issue. The *own balances*[9] of the national and subnational governments better depict underlying fiscal positions (Figure 3, lower left chart). While the national own surplus declined by about 3

[9]The "own" balance of a given level of government is defined as its revenues excluding transfers received from other levels of government minus its expenditure excluding transfers paid to other levels of government. Importantly, this indicator is more meaningful if it is interpreted in first difference, as its level primarily reflects the idiosyncrasy of the intergovernmental fiscal framework.

percent of GDP between 2004-07 and 2008-11, the subnational deficit increased by 1 percent over the same period. Based on this metric, subnational governments have, thus, accounted for one-fourth of the increase in the general government deficit during the crisis.[10] Another indicator—the *own-spending-to-GDP ratio*[11]—confirms this finding. Indeed, 22 percent of the increase in general government spending between 2007 and 2011 occurred at the subnational level (Figure 3, lower right chart).

**Figure 3: Fiscal Balances and Expenditure of Subnational and National Governments 1/**




Sources: Eurostat; and authors' estimates.
1/All variables are shares of GDP. Overall balance is total revenue minus total expenditure. Own balance is own revenue (revenue excluding transfers received) minus own spending (expenditure minus transfers paid).

[10]Excluding Spain, this share comes down to one-fifth.

[11]"Own" expenditure of a given level of government is defined as its total expenditure excluding transfers paid to other levels of government.

**Fact 4: Subnational expenditure pressures have been exacerbated but not generated by the crisis.**

Table 1 analyzes the changes in subnational expenditure and its financing over the last decade, based on an accounting decomposition. The table splits the whole period into 5 sub-periods, and reports, for each of them, the changes in expenditure and resources.[12] All variables are expressed as ratios of potential GDP to ensure that the cyclical movements in GDP do not distort the comparison between consecutive periods.

**Table 1: EU15: Change in Subnational Spending and Resources over 2001-11 1/**

| | | | | Resources | | |
|---|---|---|---|---|---|---|
| | | | Spending | Transfers received | Own Revenue | Deficit |
| Crisis | **2010-11** | EU15 | -0.05 | 0.00 | -0.19 | 0.14 |
| | (relative to 08-09) | Excluding Ireland | 0.06 | 0.06 | -0.16 | 0.16 |
| | **2008-09** | EU15 | 0.57 | 0.44 | -0.24 | 0.37 |
| | (relative to 06-07) | Excluding Ireland | 0.60 | 0.46 | -0.24 | 0.38 |
| Pre-crisis | **2006-07** | EU15 | 0.04 | 0.09 | 0.12 | -0.16 |
| | (relative to 04-05) | Excluding Ireland | 0.25 | 0.32 | 0.12 | -0.19 |
| | **2004-05** | EU15 | -0.04 | -0.20 | 0.18 | -0.01 |
| | (relative to 01-03) | Excluding Ireland | 0.24 | 0.04 | 0.19 | 0.01 |
| | **2001-03** | EU15 | 0.45 | -0.01 | 0.24 | 0.22 |
| | (relative to 95-00) | Excluding Ireland | 0.37 | -0.14 | 0.28 | 0.23 |

Sources: Eurostat; and authors' calculations.
1/ All variables are shares of potential GDP. The table reports changes relative to previous periods on average in the EU15. For instance, the average ratio of spending-to-potential GDP in the EU15 declined by 0.05 percentage points between 2008-09 and 2010-11.

Although subnational expenditure increased rapidly in 2008 and 2009, spending also expanded quite significantly in the early 2000s. Excluding Ireland, about half of the subnational government increase during the last decade occurred prior to the crisis.[13]

Table 1 also provides useful information about the resources used by subnational governments to fund expenditure. On average, the subnational deficit stayed relatively stable before the crisis, as the increase in the early 2000s was later offset by a reduction in 2006 and 2007. Higher spending was primarily financed from own revenues in the first half of the 2000s, while transfers played a more important role in 2006-07. In the first two years of the crisis (2008-09), the subnational spending increase was financed from central transfers (as

[12]The accounting decomposition is: $\Delta(subnational\ spending/PGDP) = \Delta(transfers\ received/PGDP) + \Delta(own\ revenue/PGDP) + \Delta(subnational\ deficit/PGDP)$, with *PDGP* denoting potential GDP.

[13]The same analysis with nominal GDP ratios would distort the comparison between the pre-crisis and crisis periods. Indeed, the share of subnational expenditure in nominal GDP soared during the fiscal stimulus period, partly because the GDP suffered a cyclical decline.

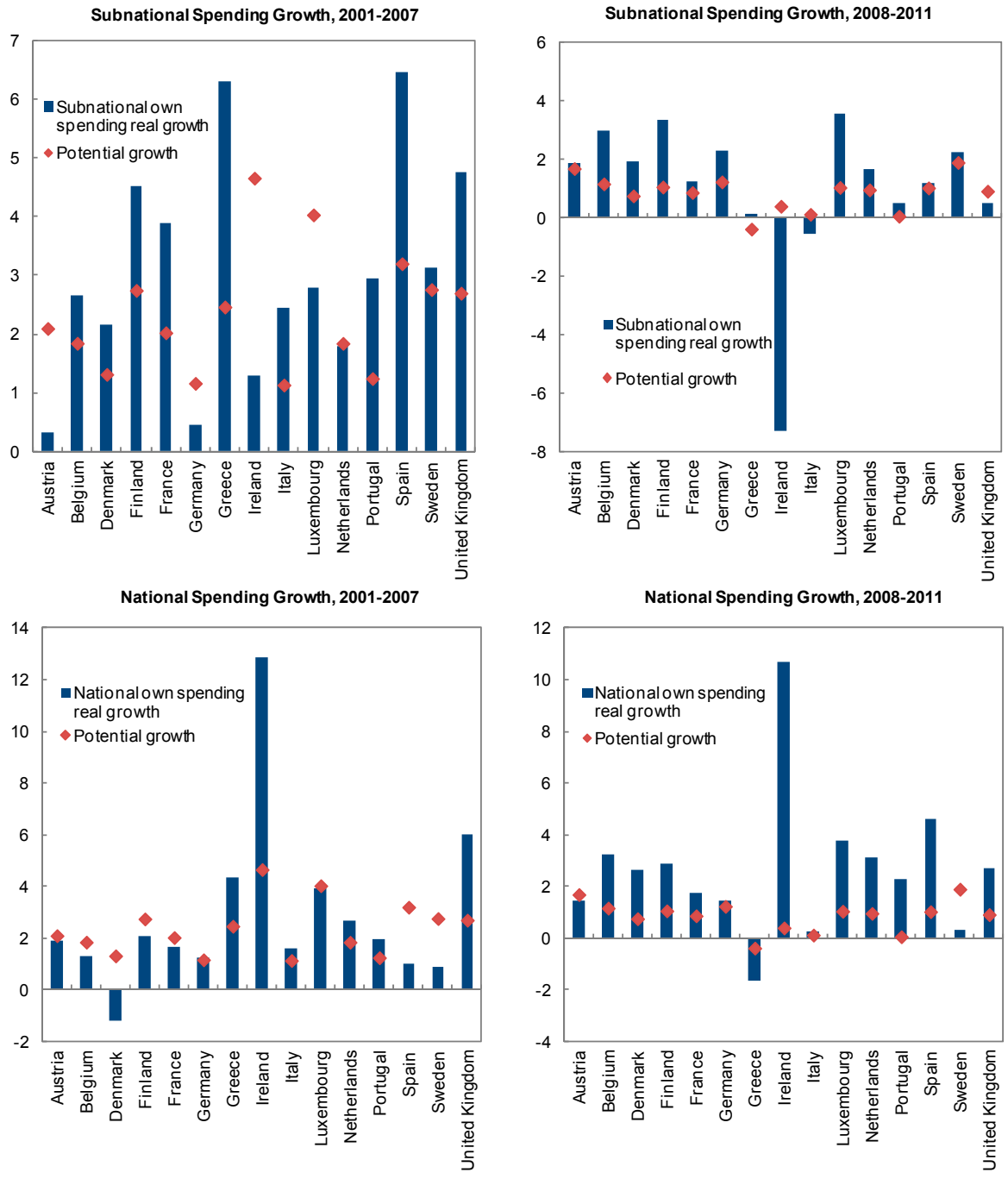
part of the fiscal stimulus), and higher deficit roughly in equal parts. However, during 2010-11 (a consolidation period), subnational governments did not receive additional transfers; but their deficit still increased moderately, offsetting the contraction in own revenues.

These results may suggest that expenditure pressures built up in the years prior to the crisis, when subnational budgets benefited from buoyant own revenue sources. During the crisis, local governments experienced a steep decline in own revenues, reflecting the combined effects of the economic cycle (automatic stabilizers), and the asset cycle (housing market collapse in Spain, for instance). In order to offset this revenue shortfall, local authorities increased fiscal deficits, probably because reversing past expenditure increases was not feasible or politically acceptable.

Figure 4 provides further evidence of pre-crisis expenditure pressures, as real growth in subnational spending exceeded potential growth between 2001 and 2007 in most countries. Excluding Ireland, the gap amounted to 1 percentage point per year. By contrast, real growth in national spending was on par with potential growth over the same period. Since 2008, the difference between national and subnational spending growth has faded away.[14]

[14]These conclusions are necessarily tentative, as the increase in subnational spending can potentially be explained by the devolution of new responsibilities as well.

## Figure 4: Real Expenditure Growth of Subnational and National Governments




Source: Eurostat, and IMF Staff Estimates.
1/ The figures report average annual real growth rates per country over 2001-07 and 2008-11. Own spending is spending minus transfers paid by a given level of government. Series are deflated with the GDP deflator.

## IV. ECONOMETRIC EVIDENCE

The previous section has provided illustrative evidence suggesting that expenditure decentralization may have created incentives to overspend in the EU15. As appealing as this story may be, there are few empirical papers analyzing whether decentralization have indeed impaired fiscal performance in Europe. In this section, we explore econometrically three questions that go to the core distortions created by spending decentralization:

- *Are all forms of decentralization unequivocally good or bad?* We are more specifically interested in two issues: (1) Is it better to decentralize some spending functions than others?; and (2) Does the financing of expenditure decentralization matter for fiscal performance?

- *Has decentralization resulted in expenditure overlap?* The argument is that decentralization may entail unnecesary duplication (and possible waste), particularly if there are shared competences over the same functions across different levels of government and without clear division of responsibilities.

- *How prevalent are soft budget constraints at the subnational level?* And more concretely, do subnational governments expect that they can strategically shift the burden of adjustment to the central government? The answer to this question gives us some insights on whether the system of intergovernmental fiscal relations might have created moral hazard and bailout expectations in the EU15.

### A. Are All Forms of Decentralization Unequivocally Good or Bad?

As a first step, we test whether spending decentralization is generally good or bad for fiscal performance (measured at the general government level) irrespective of what forms it takes. We estimate a dynamic fiscal reaction function over the period 1995-2011, following the specifications adopted by Bohn (1998), Debrun et al. (2008), and Escolano et al. (2012). The estimated equation is:

$$PB_{it} = \alpha_0 + \beta\, PB_{it-1} + \delta Dec_{it} + X_{it-1}\mu + \eta_i + d_t + \varepsilon_{it}, \qquad (1)$$

where the indices *i*, *t* denote countries, and years, respectively; *PB* is the general government primary balance to GDP; *Dec* is overall spending decentralization (own subnational spending as a ratio of general government spending); *X* denotes a vector of control variables, $\eta_i$ represents country-specific fixed effects; $d_t$ are time dummies; and $\varepsilon_{it}$ is a time- and country-specific error term. The impact of fiscal decentralization is a priori ambiguous (as discussed in Section II). A positive (negative) value for the estimated coefficient $\delta$ would indicate that decentralization improves (hampers) fiscal performance. Our preferred specification includes two control variables: the general government debt to GDP ratio (*debt)*, and the output gap

*(gap)*.[15] The model is estimated using the bias-corrected Least Square Dummy Variable estimator proposed by Bruno (2005).[16]

In the baseline model, spending decentralization generally improves fiscal ouctomes (Table 2, column 1) but the effect is not large.[17] In particular, increasing spending decentralization by 10 percentage points is associated with a 1¼ percent of GDP improvement in the general government primary balance. To put this into perspective, spending decentralization in the EU15 has increased on average by only 4 percentage points since 1995 (Section III). Thus, it is not reasonable to expect a major improvement in the fiscal accounts through decentralization given past trends. In addition, the positive effect of decentralization is not robust to alternative specifications. It disappears if the dependent variable is the general government structural primary balance (Table 2, column 2), or if the sample excludes Ireland (Table 2, column 3).[18] Finally, our results also show that there is a significant degree of persistence in the primary balance and that debt stabilization plays a role in fiscal policy. However, there is no evidence of procyclicality as the coefficient of the output gap is not significant in the specification with the structural primary balance.

These results, however, do not tell us whether some forms of decentralization are better than others. In particular, given economies of scale and externalities, it may not be optimal to decentralize the provision of certain public services. Also, a higher weight of subnational spending on items that are highly dependent on demographics or political pressures—such as health or social protection—may have an adverse effect on the fiscal position, as subnational government have less capacity or incentives to resist those pressures (European Commission, 2012a). To assess whether there are differences across functions, we reestimate equation (1) but this time we split spending decentralization into 8 functions: health (*h*); education (*educ*); social protection (*socp*); economic affairs (*ea*); environmental protection (*envip*); defence (*def*); general public services (*gps*); public order and safety (*poas*); housing and community assistance (*haca*); and recreation, culture and religion (*rcar*). For each function, we test whether increasing decentralization by rising spending on this particular function improves fiscal performance *ceteris paribus* (i.e. assuming decentralization in other functions remains

[15]T he output gap is defined as actual GDP less potential GDP as a percent of the latter.

[16]With standard estimation methodologies, the inclusion of fixed-effects in dynamic panels creates a bias. The bias (which affects all variables) is a function of T, and only as T tends to infinity will the within estimators be consistent. The estimator proposed by Bruno (2005) approximates the bias to construct a consistent estimator in unbalanced panels.

[17]This result still holds if the model is estimated over the pre-crisis period 1995-2007.

[18]Over the sample period, Ireland shows a strong positive correlation between expenditure decentralization and fiscal performance, mostly driven by third factors. While decentralization was associated with positive fiscal outcomes until the mid-2000s, recentralization took place at the same time as the financial crisis and the surge in fiscal deficits.

constant).[19] Overall, we find that only decentralization of social protection and economic affairs have a positive effect on fiscal performance, other functions having no statistically significant effect (Table 2, columns 4-13).

A key question is whether the effect of decentralization is conditional on the degree of government fragmentation. The idea is that higher fragmentation strenghtens the competition effect that underpinns the Leviathan model, increasing the benefits of expenditure decentralization (Section II). Also, decentralization may prevent the exploitation of economies of scale and this problem may be agravated by the degree of fragmentation. To test this hypothesis, we modify equation (1) and introduce an interaction term between expenditure decentralization and fragmentation. As a proxy for the degree of fragmentation in each country, we use the number of municipalities per million inhabitants.[20] We expect the coefficient of the interaction term to be negative if fragmentation aggravates the effect of decentralization on the general government balance. However, the results show that fragmentation does not alter the impact of spending decentralization (Table 2, column 14). One possible explanation may be that our proxy does not fully capture the degree of fragmentation (both vertical and horizontal). In an alternative specification (not reported), we also interacted fragmentation with the VFI, and the interaction term was also insignificant.

So far, we have tested the effect of spending decentralization irrespective of how it is financed. However, there are reasons to believe that some forms of financing may create distortions. The argument is that if subnational governments rely heavily on borrowing and, particularly, transfers from the center, they will have less incentives to maintain discipline by balancing expenditures with revenues. In order to test this hypothesis, we follow Eyraud and Lusinyan (2011) and expand equation (1) to include the VFI defined as the share of subnational spending financed through net borrowing or transfers. Surprisingly, we find that the coefficient of the VFI is not significant (Table 2, column 15). A possible explanation is that the inclusion of the crisis period (2008-11) in our sample may create a bias due to reverse causality from the VFI to the overall balance.[21] To abstract from this, we re-estimate the model over the sample prior to the crisis (1995-2007). In this case, we find that VFI has a negative effect on fiscal performance: a 10 percent increase in VFI—that is shifting financing equivalent to to one tenth of the subnational expenditure from own revenue to transfers and/or borrowing—is associated with a 0.4 percent of GDP decline in the primary balance (Table 2, column 16).

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[19]To ensure that we keep other factors constant, each specification includes the complement to the variable of interest. For instance, the model testing the effect of health decentralization also includes the ratio of subnational own expenditure excluding health to general government spending.

[20]One reason for choosing this indicator is that some countries in our sample only have one level of subnational government (i.e. municipalities). By dividing the number of municipalities per million inhabitants, we take into account that larger countries are likely to have more municipalities without necessarily implying they are more fragmented. In an alternative specification, we used the absolute number of municipalities, and the results were not affected. Finally, a shortcoming of our indicator is that it is time-invariant due to the lack of time series data.

[21]The deterioration of the fiscal position during the crisis prompted some countries to adopt consolidation measures which resulted, in some cases, in a reduction of transfers, thereby lowering the VFI.

One could argue, however, that the effect of decentralization may, to a large extent, depend on the fiscal institutions in place within a country. Indeed, properly-designed institutional arrangements can "correct" the incentive of subnational governments to overspend and address the coordination problems created by the decentralization framework. By enforcing and signaling fiscal discipline, subnational fiscal rules are likely to improve the general government fiscal performance. Based on the European Commission database on fiscal rules (EC, 2012b), we create a composite indicator measuring the strength of the subnational fiscal rule framework.[22] This indicator is included in the baseline specification both as stand-alone variable and in an interaction term with expenditure decentralization. Overall, subnational fiscal rules do not have a significant effect on the general government performance, confirming the findings of Escolano and others (2012) (Table 2, column 17). This could potentially signal that rule implementation is weak, or that subnational rules are introduced where fiscal performance is weaker in the first place. Another possible explanation is that subnational rules might not be sufficient to ensure good performance when spending mandates of subnational governments are underfunded.

### B. Does Decentralization Result in Expenditure Overlap?

One of the main questions about expenditure decentralization is whether the transfer of responsibilities to lower levels of government results in waste. The argument is that expenditure decentralization may result in inefficiencies if shared responsibilities across different levels of government have not been clearly defined, thereby leading to spending overlap. In other words, some of the responsibilities transferred to the subnational government would continue to be carried out by the central government after decentralization, thereby duplicating spending.

To test this hypothesis, we look at the relationship between national and subnational spending over 1995-2011—where national encompasses the central government and social security. Let's assume for the sake of argument that the national government reassigns spending responsibilities to the subnational government and provides transfer money to finance them.[23] If there is no overlap, we would expect *total* national spending remains unchanged, as national "own" spending would decrease but this would be offset by an equivalent increase in transfers.[24] At the same time, subnational spending would increase. Thus, there would be a zero correlation between the changes in subnational and national spending. On the other hand, if there is full expenditure overlap, the correlation should be 1: national spending would increase by the same amount as subnational spending, because the increase in transfers is not matched by a decline in own spending.

[22]The variable is both country-specific and time-varying.

[23]Our argument assumes that the increase in subnational spending is matched by equivalent transfers, meaning that there is no unfunded mandate.

[24]By definition, "own spending" is total spending minus transfers paid to other levels of government.

Following this logic and drawing from Fornasari et al. (2000), we estimate the following model:

$$\Delta Nate_{it} = \alpha_0 + \beta \Delta Sube_{it} + \gamma \Delta RB_{it} + X_{it-1}\delta + \eta_i + d_t + \varepsilon_{it}, \quad (2)$$

where *Nate* is national spending in percent of GDP; *Sube* is subnational spending in percent of GDP; *RB* is subnational own revenue plus net borrowing as percent of GDP; *X* denotes a vector of control variables, $\eta_i$ represents country-specific fixed effects; $d_t$ are time dummies; and $\varepsilon_{it}$ is a time- and country-specific error term. Our preferred specification includes two control variables: the real GDP growth *(growth)*; and the general government debt in percent of GDP (*debt)*. The model is estimated using least square dummy variable (LSDV) estimator with robust standard errors clustered at the country level.[25]

By including *RB* in equation (2), the coefficient $\beta$ can be interpreted as the impact of an increase in subnational spending assuming subnational own revenue and borrowing remain constant. This allows us to identify the effect of an increase in subnational spending financed with transfers. Under the no-overlap hypothesis, we expect $\beta$ to be zero. If, on the other hand, there is perfect overlap, $\beta$ would be equal to 1. Finally, if $0 < \beta < 1$, there is partial overlap.[26]

Our results suggest there is partial overlap between subnational and national spending over the sample period (Table 3, column 1). In particular, the coefficient $\beta$ is estimated at 0.5, meaning that a 1 percent of GDP increase in subnational spending results in a half percent of GDP increase in national spending. Thus, based on this estimate, it seems that half of the increase in subnational spending has been additional and not a substitute for national spending.

Given our findings, it is natural to ask whether overlap is more pronounced for some particular types of spending. To answer this, we conduct two exercises:[27]

- First, we repeat the analysis but splitting subnational spending into the same 8 *functions* as before. Overall, we find that there is expenditure overlap in four

[25]Our model is not a dynamic reaction function, so there is little rationale for including lags of Δ*Nate* or Δ*Sube*. Indeed, the experiment consists in assessing the "mechanical" effect of a change in subnational spending financed by a change in transfers, which, by definition, has an immediate impact on national spending, as transfers are one of its components.

[26]Our model implicitly assumes that a change in subnational spending financed by an equivalent change in central transfers corresponds to a devolution of responsibilities from the center to subnational governments. This assumption is debatable.

[27]Again, our analysis by expenditure component keeps other factors constant by including the complements to the variable of interest (not reported in Table 3). For instance, the model testing the effect ofsubnational health also includes the change in the GDP ratio of non-health spending of subnational governments.

functions: social protection, environmental protection, housing and community service, and recreation and culture (Table 3, columns 2-11). Moreover, the overlap is quite sizable for social protection (0.85) and housing and community service (0.9). This result raises some concerns, given that these two functional categories account for about one-fourth of subnational spending in the EU15 on average. Nevertheless, we cannot definitely assert that decentralization has created waste as the increase in expenditure may have just been a response to the underprovision of services at the subnational level.

- Second, we repeat the exercise splitting spending by *economic* categories. In this case, we focus more specifically on two main groups: wages and capital spending. Surprisingly, we do not find evidence of spending overlap in wages (Table 3, column 12). However, our estimates suggest that there might have been large overlap for capital spending (0.88) (Table 3, column 13). This result should be interpreted with caution as investment at the subnational level might have been suboptimal prior to decentralizion and simply increased later on with no duplication. In addition, there may be complementarities between national and subnational spending.

As a robusnteness checks, we resestimated the model over the pre-crisis period, and results are broadly unchanged. Excluding Ireland and Spain does not significantly affect the results either.

### C. How Prevalent Are Soft Budget Constraints at the Subnational Level?

The term of "soft budget constraint" (SBC) describes the situation where an entity can unduly influence its access to funding (Rodden et al., 2003). This term was introduced by Kornai (1979) to describe how state-owned enterprises could rely on increased subsidies if they incurred losses. The concept was later applied to the relation between subnational and national governments with intergovernmental transfers being the most common vehicle (Vigneault, 2007). In the context of fiscal decentralization, the SBC can simply be characterized as a time inconsistency problem arising from the inability of the central government to commit to a transfer scheme announced before subnational governments make their spending and borrowing decisions. The central government may, for instance, be unable to credibly pre-commit because subnational governments are "too big to fail" and provide regional public goods that benefit people residing in other jurisdictions (Wildasin, 2004).[28] As a result, subnational governments do not face a fixed resource envelope within which they must function. Anticipating this, they have an incentive to engage in riskier fiscal policies, overspend, and/or undertax.

To test whether there is evidence of SBC in the EU15 over 1995-2011, we draw from the methodology developed by Rodden (2000). Appendix II presents a simplified model

[28]The SBCs can also take more subtle forms. For example, subnational governments can have access to subsidized lending from public enterprises or public banks.

explaining our identification strategy. This model has two testable implications. In the presence of SBCs, (i) a negative revenue shock should have no effect on subnational expenditure;[29] and (ii) the response to negative and positive revenue shocks should be asymmetric.[30]

Our empirical analysis proceeds in two stages. The first step is to estimate the revenue shocks. There are two ways to separate empirically expected and unexpected components of revenue. Poterba (1994) and Rattso (2000) compare actual values with budget forecasts and view the residuals as the shock. Unfortunately, we cannot take this avenue given data constraints. An alternative is to use a revenue forecasting model to estimate "expected values" based on past information and identify the difference between the actual and expected as "shocks," in line with Holtz-Eakin and Rosen (1993) and Rattso (1999). For that purpose we estimate the following revenue growth model:[31]

$$\dot{Subr}_{it} = \alpha_0 + X_{it-1}\beta + \eta_i + d_t + \varepsilon_{it} \qquad (3)$$

where $\dot{Subr}_{it}$ is subnational revenue growth (in nominal terms; including transfers), $X$ is a vector of macro determinants, $\eta_i$ represents country-specific fixed effects; $d_t$ are time dummies; and $\varepsilon_{it}$ is a time- and country-specific error term.

We estimated several models of subnational revenue growth (not reported here), including a dynamic model. Our preferred specification includes the following variables: the nominal GDP growth (*growth*); the general government balance growth (denoted *GGbal*); the share of the population older than 65 (*Pop65*), and the unemployment rate (*ur*), some variables entering the equation in first difference and/or with lags. We use the LSDV estimator with robust standard errors clustered at the country level. Revenue shocks are then calculated by subtracting expected from actual values (Table 4, column 1 reports the results of the first-stage model).

The second step is to analyze how subnational spending adjusts to the revenue shocks.[32] With that view, we estimate a parsimonious spending model:

$$\Delta Sube_{it} = \alpha_0 + \gamma_1 Negshock_{it} + \gamma_2 Posshock_{it} + Z_{it-1}\beta + \eta_i + d_t + \varepsilon_{it} \qquad (4)$$

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[29]A revenue shock is defined as the unanticipated component of a revenue change, given past information.

[30]By asymmetry, we mean that subnational governments increase expenditure in the face of positive revenue shocks, but keep it unchanged (or decrease it by less) in the case of negative shocks.

[31]We use a growth model, as the variables of interest are non-stationary in level.

[32]In order to include the revenue shock in equation (4), we need to multiply the residuals of equation (3) by the lagged revenue since we are interested in the surprise on the revenue level itself (and not the growth surprise).

where *Sube* is subnational spending; *Posshock* the positive revenue shocks[33]; *Negshock* denotes the negative revenue shocks; *Z* denotes a vector of control variables, $\eta_i$ represents country-specific fixed effects; $d_t$ are time dummies; and $\varepsilon_{it}$ is a time- and country-specific error term. The control variables that were found significant are the output gap *(gap)*; the change in the subnational government balance *(*Δ*Subbal);* a parliamentary election dummy (*elec*), and inflation based on the GDP deflator (*inf*); The model is estimated using the LSDV estimator with robust standard errors clustered at the country level.

We test the following hypotheses:

- *Response to a negative shock*. Appendix II shows that if subnational governments expect the central government will fill in the financing gap resulting from negative revenue shocks, they will not adjust spending downward (SBC); $\gamma_1$ would be zero or small. On the other hand, if subnational governments do not expect any support, they will adjust (no SBC): $\gamma_1$ would be positive (with a value lower than 1 if the adjustment is partial).[34]

- *Response to a positive shock*. Subnational spending should respond positively to a windfall (positive revenue shock) irrespective of whether the subnational government is prudent or not, i.e. $\gamma_2$ would be positive.

- *Asymmetry*. In the absence of SBCs, the behavior of subnational governments should be broadly symmetric in the face of positive and negative shocks, i.e. $\gamma_1 = \gamma_2$. In contrast, the response will be asymmetric ($\gamma_1 \neq \gamma_2$) in the presence of SBCs.

Table 4 (column 2) suggests there is evidence of SBCs.[35] In particular, the coefficient of the negative revenue shock is not statistically significant, indicating that subnational governments do not immediately adjust spending when revenues decline unexpectedly. On the other hand, subnational governments do increase their spending in response to a positive revenue shock, but not by the full amount (about one fourth).[36] This result should nonetheless be qualified. When the model is reestimated for the pre-crisis period 1995-2007 (Table 4,

[33]The positive (negative) revenue shock vector includes the revenue shocks when they are positive (negative), and zero otherwise.

[34]Because the shocks are negative, a positive $\gamma_1$ means that subnational governments decrease spending in response to a negative revenue shock.

[35]We also find that subnational spending was procyclical over the period considered (positive coefficient of GDP growth). In addition, our estimates indicate that, to a certain extent, subnational spending adjusts ex-post when the subnational balance deteriorates (positive coefficient for the change in subnational balance variable).

[36]This may be an indication of liquidity constraints as the subnational government will likely save part of the revenue windfalls if it does not have access to borrowing.

column 3), we do not find evidence of SBCs, and the test of equality of the positive and negative shocks' coefficients cannot be rejected. This suggests that SBCs and expectation of bailouts may have increased during the recent crisis.[37]

An important question is whether the institutional framework can make a difference in hardening budget constraints. To analyze this, we consider the effect of subnational and general government rules. For the general government, we use the fiscal rule strength index produced by the European Commission (EC, 2012b). For subnational governments, we use the indicator constructed in the context of the first model (Section IV.A). We split the sample into two groups depending on whether the strength of the rules is above/below the median value of the full sample. Then, we compare the coefficients of the revenue shocks between the two groups.

Columns 4 and 5 (resp. columns 6 and 7) present the results of the split according to the general government (resp. subnational government) fiscal rule strength index. Both splits yield similar results. In countries with strong general government or subnational rules, spending does not adjust in response to a negative fiscal shock while in those with weaker rules it does, suggesting that SBCs are more prevalent in countries with more stringent rules. A possible explanation is that fiscal rules may have been introduced precisely in those countries were SBCs were more prevalent but it is unclear whether they have been effective (consistent with the findings of our first model).

These results, however, should be interpreted with caution. First, we use aggregated statistics for subnational governments because of data constraints, thereby assuming there are no differences across subnational units within a country. Although our results suggest that subnational behavior is consistent (on average) with SBCs, dynamics are more complex. Second, this paper does not consider whether the subnational reaction to revenue shocks depend on the source and expected persistence of these shocks. Even in the case of hard budget constraint, subnational governments may not respond to negative revenue shocks if they are too small and/or transitory, because permanent income is not significantly revised. Finally, the indicators of fiscal rules may not adequately capture the effectiveness of the rules, thereby introducing a bias.

## V. CONCLUDING REMARKS

This paper has examined to what extent expenditure decentralization affects fiscal performance in EU15 countries, with a focus on the recent crisis. Conventional wisdom would suggest that, because subnational deficits are generally small, the problem lies at the central government level. However, looking at subnational spending tells a somewhat different story. Our findings point to three main conclusions:

[37]We also reestimated the expenditure model excluding Spain and Ireland, and the results are broadly unchanged.

- *Not all spending decentralizations are created equal.* In other words, there are good and not so good ways to decentralize expenditure. Our results suggest that not all categories of expenditure generate efficiency gains when decentralized. More importantly, decentralization financed through transfers and borrowing may have contributed to weaken the fiscal position in the run up to the crisis.

- *Decentralization may produce duplication, and possibly waste of resources*. Expenditure overlap seems to be particularly important for social protection and housing and community services, which account for one-fourth of subnational spending in the EU15. Although the increase in spending may originate from a genuine need for public services at the subnational level, these pressures, particularly if unmatched by sustainable own revenue, could have contributed to the deterioration in fiscal accounts.

- *Soft budget constraints may have distorted subnational spending decisions.* In particular, we find evidence that subnational governments do not fully accommodate negative revenue shocks, probably because they expected the central government to fill in their funding gap.

Despite these findings, it would be pretentious to say that the current problems European countries are facing are solely explained by the vertical structure of the government. Moreover, we do not claim that fiscal decentralization creates moral hazard in all circumstances, as our analysis is subject to many caveats and has focused on a narrow set of questions. In particular, our main focus has been on expenditure decentralization, leaving aside the important question of the devolution of taxing powers. However, the evidence presented in this paper suggests that addressing fiscal challenges in Europe will require better decentralization. Going forward, the most important issues to improve the decentralization design include:

- ***Matching subnational resources and responsibilities***. The adverse incentives created by decentralization cannot simply be solved by cutting grants to subnational governments as this may result in arrears, excessive subnational borrowing, and unfunded mandates. Givin subnational governments sufficient own revenues is particularly important, as it prompts them to better internalize the cost of expenditure (IMF, 2009). However, identifying tax bases well suited for local management can be challenging—some have suggested raising property taxes or introducing PIT surcharges (Norregaard, 1997). There are many practical difficulties, including the tax base mobility, higher administrative costs at the local level, and horizontal disparities in revenue-raising capacity. Beyond revenue autonomy, it would also be equally important to improve the transfer system, for example by introducing performance-based transfers, or basing allocation criteria on expenditure needs rather than actual costs.

- ***Better defining spending assignments***. Fully reshaping assignments across government levels is neither feasible nor desirable. However, the design of responsibilities can certainly be improved in three main directions. First, responsibilities should be clarified as much as possible to limit overlap between government levels and to enhance accountability. From a fiscal management perspective, more clarity on expenditure assignments also introduces certainty for local budget planning. Second, some specific functions may be recentralized when agency problems, negative externalities and loss of economies of scale are too pronounced. In this regard, it is interesting to note the trend toward recentralization of health spending in several European countries (Saltman, 2008). Third, although our econometric analysis does not provide evidence for the negative effect of government fragmentation, it is likely that the provision of public services at the local level comes up against the problem of insufficient exploitation of economies of scale. Countries have attempted to address this issue through a gradual increase in the average size of municipalities (either by reducing their number, or by encouraging mergers) and the creation of inter-municipal associations to jointly provide certain services.

- ***Introducing expenditure rules.*** The most widespread rules at the subnational level are budget balance rules and borrowing limits. However, there is not clear evidence that this type of rules have improved fiscal performance in Europe. Expenditure rules may be a promising addition to the fiscal framework given that subnational spending is often procyclical, with high spending growth being one of the main culprits for the inability of some countries to achieve fiscal targets. Surprisingly, however, subnational expenditure rules are mostly non-existent across the EU15. In any case, for rules to be effective, they should be accompanied by strong monitoring mechanisms and credible sanctions. In addition, any fiscal rule would remain ineffective if there is a structural problem of unfunded mandates.

- ***Ensuring sound local public financial management practices.*** Capacity building is particularly important in the following areas: subnational governments should be able to draft realistic budgets; there should be effective means for audit and control; fiscal risks should be appropriately disclosed; and transparency and reporting should be improved (IMF, 2009). Also, subnational governments may benefit from introducing performance budgeting in due course.

- ***Local accountability***. If subnational expenditure management is to translate into cost-effective services, local governments need to be accountable to citizens. Such accountability can be better achieved if local officials' performance comes under closer public scrutiny by the means of institutions such as external auditors, representative local assemblies, public interest bodies and civil society (Mountfield and Wong, 2005).

**Table 2. Expenditure Decentralization and Fiscal Performance 1/**

| | (1995-2011) | | | | | | | | | | | | | | | (1995-2007) | (1995-2011) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) |
| Dependent variable *(t-1)* | 0.69*** | 0.86*** | 0.79*** | 0.84*** | 0.86*** | 0.86*** | 0.85*** | 0.86*** | 0.87*** | 0.85*** | 0.86*** | 0.86*** | 0.86*** | 0.68*** | 0.69*** | 0.66*** | 0.89*** |
| | (12.36) | (17.69) | (16.04) | (14.99) | (14.43) | (15.32) | (14.64) | (14.68) | (14.56) | (14.22) | (13.94) | (14.86) | (14.20) | (12.14) | (12.56) | (10.15) | (15.84) |
| Government debt *(t-1)* | 0.04** | 0.04*** | 0.05*** | 0.06*** | 0.04** | 0.04** | 0.05*** | 0.04*** | 0.04** | 0.04** | 0.04*** | 0.04*** | 0.04** | 0.05*** | 0.05** | 0.02 | 0.02 |
| | (2.33) | (2.60) | (2.72) | (3.41) | (2.30) | (2.50) | (3.11) | (2.77) | (1.98) | (2.39) | (2.77) | (2.60) | (2.52) | (2.74) | (2.53) | (1.43) | (1.31) |
| Output gap *(t-1)* | -0.08 | -0.10 | -0.03 | -0.14 | -0.08 | -0.07 | -0.12 | -0.09 | -0.09 | -0.09 | -0.08 | -0.08 | -0.08 | -0.19** | -0.08 | -0.02 | -0.00 |
| | (-0.87) | (-1.53) | (-0.35) | (-1.58) | (-0.81) | (-0.78) | (-1.34) | (-1.00) | (-1.00) | (-1.01) | (-0.85) | (-0.93) | (-0.89) | (-2.18) | (-0.81) | (-0.28) | (-0.01) |
| Expenditure decentralization | 0.13*** | 0.01 | 0.08 | | | | | | | | | | | 0.18*** | 0.15*** | 0.08** | 0.22*** |
| | (2.83) | (0.12) | (0.93) | | | | | | | | | | | (2.84) | (2.82) | (2.10) | (4.16) |
| Decentralization: *h* | | | | 0.02 | | | | | | | | | | | | | |
| | | | | (0.28) | | | | | | | | | | | | | |
| Decentralization: *non-h* | | | | 0.45*** | | | | | | | | | | | | | |
| | | | | (3.34) | | | | | | | | | | | | | |
| Decentralization: *educ* | | | | | -0.07 | | | | | | | | | | | | |
| | | | | | (-0.22) | | | | | | | | | | | | |
| Decentralization: *non-educ* | | | | | 0.18*** | | | | | | | | | | | | |
| | | | | | (3.18) | | | | | | | | | | | | |
| Decentralization: *socp* | | | | | | 0.55** | | | | | | | | | | | |
| | | | | | | (2.16) | | | | | | | | | | | |
| Decentralization: *non-socp* | | | | | | 0.09 | | | | | | | | | | | |
| | | | | | | (1.39) | | | | | | | | | | | |
| Decentralization: *ea* | | | | | | | 0.94** | | | | | | | | | | |
| | | | | | | | (2.19) | | | | | | | | | | |
| Decentralization: *non-ea* | | | | | | | 0.13*** | | | | | | | | | | |
| | | | | | | | (2.91) | | | | | | | | | | |
| Decentralization: *envip* | | | | | | | | 0.80 | | | | | | | | | |
| | | | | | | | | (1.12) | | | | | | | | | |
| Decentralization: *non-envip* | | | | | | | | 0.16*** | | | | | | | | | |
| | | | | | | | | (3.81) | | | | | | | | | |
| Decentralization: *def* | | | | | | | | | 29.84 | | | | | | | | |
| | | | | | | | | | (0.60) | | | | | | | | |
| Decentralization: *non-def* | | | | | | | | | 0.17*** | | | | | | | | |
| | | | | | | | | | (2.95) | | | | | | | | |
| Decentralization: *gps* | | | | | | | | | | 0.39 | | | | | | | |
| | | | | | | | | | | (1.01) | | | | | | | |
| Decentralization: *non-gps* | | | | | | | | | | 0.16*** | | | | | | | |
| | | | | | | | | | | (3.44) | | | | | | | |
| Decentralization: poas | | | | | | | | | | | 1.02 | | | | | | |
| | | | | | | | | | | | (0.78) | | | | | | |
| Decentralization: *non-poas* | | | | | | | | | | | 0.15*** | | | | | | |
| | | | | | | | | | | | (3.09) | | | | | | |
| Decentralization: *haca* | | | | | | | | | | | | 0.52 | | | | | |
| | | | | | | | | | | | | (1.14) | | | | | |
| Decentralization: *non-haca* | | | | | | | | | | | | 0.17*** | | | | | |
| | | | | | | | | | | | | (3.96) | | | | | |
| Decentralization: *rcar* | | | | | | | | | | | | | 0.31 | | | | |
| | | | | | | | | | | | | | (0.42) | | | | |
| Decentralization: *non-rcar* | | | | | | | | | | | | | 0.16*** | | | | |
| | | | | | | | | | | | | | (3.43) | | | | |
| Fragmentation x Expenditure Decentralization | | | | | | | | | | | | | | -0.00 | | | |
| | | | | | | | | | | | | | | (-1.36) | | | |
| Vertical Fiscal Imbalance | | | | | | | | | | | | | | | -0.04 | -0.04** | |
| | | | | | | | | | | | | | | | (-1.25) | (-1.97) | |
| Subnational Fiscal Rule | | | | | | | | | | | | | | | | | 0.35 |
| | | | | | | | | | | | | | | | | | (0.51) |
| Subnational Fiscal Rule x Expenditure Decentralization | | | | | | | | | | | | | | | | | -0.01 |
| | | | | | | | | | | | | | | | | | (-0.91) |
| Observations | 236 | 231 | 220 | 222 | 222 | 222 | 222 | 222 | 209 | 222 | 222 | 222 | 222 | 236 | 236 | 176 | 221 |
| Number of countries | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |

Notes: z-statistics in parentheses; *** (**, *)=significant at the 1 (5, 10) percent level; time dummies are included but not reported here.

1/ Dependent variable is the general government primary balance in percent of GDP for all columns except for column (2) w here it is the cyclically-adjusted balance. Column (3) estimates the baseline model excluding Ireland. Columns (4) to (13) look at expenditure decentralization by functions: health (*h*); education (*educ*); social protection (*socp*); economic affairs (*ea*); environmental protection (*envip*); defence (*def*); general public services (*gps*); public order and safety (poas); housing and community assistance (haca); and recreation, culture and religion (rcar). Estimated using the biased-corrected estimator for dynamic panel data model proposed by Bruno (2005).

**Table 3. Expenditure Overlap 1/**

| Dependent Variable: ΔNational spending | Total | Health | Education | Social protection | Economic affairs | Environmental protection | Defense | General public services | Public order & safety | Housing & community assistance | Recreation, culture & religion | Wage | Capital |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| ΔSubnational spending | 0.51* | | | | | | | | | | | | |
| | (1.95) | | | | | | | | | | | | |
| ΔSubnational own revenue plus borrowing | -0.91*** | -0.15 | -0.03 | 0.12 | -0.07 | 0.00 | -0.01 | -0.51*** | 0.00 | -0.05 | -0.00 | 0.03 | -0.19 |
| | (-8.65) | (-1.50) | (-0.70) | (1.34) | (-1.06) | (0.16) | (-0.83) | (-4.27) | (0.51) | (-1.44) | (-0.17) | (0.65) | (-1.62) |
| Growth *(t-1)* | -0.17 | 0.00 | -0.01** | -0.09*** | -0.13 | 0.00 | -0.00 | -0.04*** | 0.00 | -0.01** | 0.00 | 0.01 | -0.14 |
| | (-1.72) | (0.54) | (-2.71) | (-4.28) | (-1.08) | (1.19) | (-0.35) | (-4.31) | (0.07) | (-2.30) | (0.81) | (1.66) | (-1.69) |
| Debt *(t-1)* | -0.06* | -0.00 | -0.00* | -0.02** | 0.01 | 0.00* | -0.00 | -0.01** | -0.00* | -0.00 | -0.00 | -0.01*** | -0.03 |
| | (-1.95) | (-1.56) | (-2.02) | (-2.49) | (0.48) | (2.02) | (-1.09) | (-2.24) | (-1.84) | (-0.02) | (-0.50) | (-2.98) | (-1.69) |
| ΔSubnational health spending | | -0.09 | | | | | | | | | | | |
| | | (-1.70) | | | | | | | | | | | |
| ΔSubnational education spending | | | 0.32 | | | | | | | | | | |
| | | | (1.03) | | | | | | | | | | |
| ΔSubnational social protection spending | | | | 0.85*** | | | | | | | | | |
| | | | | (3.27) | | | | | | | | | |
| ΔSubnational economic affairs spending | | | | | -1.56 | | | | | | | | |
| | | | | | (-1.74) | | | | | | | | |
| ΔSubnational environmental spending | | | | | | 0.07** | | | | | | | |
| | | | | | | (2.15) | | | | | | | |
| ΔSubnational defense spending | | | | | | | -4.42* | | | | | | |
| | | | | | | | (-1.79) | | | | | | |
| ΔSubnational general public services spending | | | | | | | | 0.38 | | | | | |
| | | | | | | | | (1.14) | | | | | |
| ΔSubnational public order and safety spending | | | | | | | | | 0.18 | | | | |
| | | | | | | | | | (1.25) | | | | |
| ΔSubnational housing & community assistance spending | | | | | | | | | | 0.90*** | | | |
| | | | | | | | | | | (17.32) | | | |
| ΔSubnational recreation, culture & religion spending | | | | | | | | | | | 0.07** | | |
| | | | | | | | | | | | (2.22) | | |
| ΔSubnational wage spending | | | | | | | | | | | | -0.50* | |
| | | | | | | | | | | | | (-1.94) | |
| ΔSubnational capital spending | | | | | | | | | | | | | 0.88*** |
| | | | | | | | | | | | | | (5.64) |
| Observations | 240 | 226 | 226 | 226 | 226 | 226 | 212 | 226 | 226 | 226 | 226 | 240 | 240 |
| Number of countries | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |

Notes: robust t-statistics in parentheses; *** (**, *)=significant at the 1 (5, 10) percent level; time dummies are included but not reported here.

1/ Dependent variable is the change in the national total spending. All fiscal variables are in percent of GDP. In columns (2) to (13) we also control for the other categories of subnational functional/economic spending so that we can ensure that an increase in the functional spending considered is financed through transfers and not through a decline in other categories of spending. Estimated using fixed-effect estimator with robust standard errors clustered at the country level.

**Table 4. Soft Budget Constraints**

| | First Stage | Second Stage | | | | | |
|---|---|---|---|---|---|---|---|
| | | (1995-2011) | (1995-2007) | General Government Rules | | Subnational Rules | |
| Dependent variable | Subnational revenue growth | ΔSubnational spending | ΔSubnational spending | ΔSubnational spending | ΔSubnational spending | ΔSubnational spending | ΔSubnational spending |
| | | | | Strong rule | Weak rule | Strong rule | Weak rule |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Nominal GDP growth *(t-1)* | 0.01*** | | | | | | |
| | (3.53) | | | | | | |
| Change general government balance *(t-1)* | 0.00** | | | | | | |
| | (2.85) | | | | | | |
| Change share population 65 *(t-2)* | 0.04*** | | | | | | |
| | (3.06) | | | | | | |
| Change unemployment rate (t-2) | -0.01 | | | | | | |
| | (-1.72) | | | | | | |
| Change GDP deflator *(t-1)* | | 437.27** | 413.42 | 345.61 | 327.89** | 379.34 | 366.85 |
| | | (2.54) | (1.68) | (1.08) | (2.73) | (1.49) | (1.11) |
| Output gap *(t-1)* | | 571.31** | 572.42** | 943.71* | 239.05 | 1,078.07** | 262.02 |
| | | (2.24) | (2.29) | (2.21) | (1.32) | (2.66) | (1.31) |
| Change subnational balance *(t-2)* | | 0.17** | 0.17 | 0.28** | -0.21*** | 0.14* | 0.83*** |
| | | (2.38) | (1.00) | (3.06) | (-5.38) | (2.17) | (5.54) |
| Elections *(t-2)* | | -1,435.79 | -1,904.06 | -2,843.77** | -739.88 | -2,447.87* | -592.07 |
| | | (-1.75) | (-1.76) | (-2.43) | (-0.91) | (-2.04) | (-1.05) |
| Negative revenue shock | | 0.32 | 0.48** | 0.34 | 0.56** | 0.13 | 0.61*** |
| | | (1.55) | (2.75) | (1.36) | (2.24) | (0.44) | (18.49) |
| Positive revenue shock | | 0.25*** | 0.37*** | 0.17 | 0.59*** | 0.07 | 0.33*** |
| | | (3.80) | (4.02) | (1.44) | (7.97) | (0.53) | (5.79) |
| Observations | 245 | 238 | 178 | 107 | 88 | 104 | 91 |
| Number of countries | 15 | 15 | 15 | 11 | 12 | 9 | 10 |

Notes: robust t-statistics in parentheses; *** (**, *)=significant at the 1 (5, 10) percent level; time dummies are included but not reported here.

1/ Columns (4) and (6) include countries for those years in which the strength of the national and subnational fiscal rule (respectively) are above the median for the sample. Columns (5) and (6) include countries for those years in which the strength of the national and subnational fiscal rule (respectively) are below the median. Estimated using fixed-effect estimator with robust standard errors clustered at the country level.

## Appendix I. Data Sources and Definitions

We use fiscal data from Eurostat covering the period 1995-2011. The data set is an unbalanced panel including the EU15 countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom). This yielded a sample with about 17 observations per country on average. Throughout the paper all subnational measures are calculated by aggregating the regional and local subsectors (S1312 and S1313 in ESA95). The "national" level refers to the consolidated central government and social security funds (S1311 and S1314).

| Variable | Definition | Source |
|---|---|---|
| Expenditure decentralization | Share of subnational own expenditure in total general government expenditure. | Eurostat |
| Expenditure decentralization per function | Same ratio but for specific function (COFOG classification) | Eurostat |
| National (resp. subnational) Government Size | Ratio of national (resp. subnational) government expenditure to GDP | Eurostat |
| Government Debt | General government gross debt | Eurostat |
| Output gap | Percentage difference between actual GDP in constant prices and estimated potential GDP. | IMF WEO database |
| General Government Fiscal Rule | Fiscal Rule Strength Index | European Commission (2012b) |
| Subnational Government Fiscal Rule | Composite Indicator aggregating the subnational rule strength indexes using coverage data for weights | IMF Staff using EC (2012) |
| Government fragmentation | Number of municipalities per million of inhabitants | Dexia |
| National (resp. subnational) balance | Total revenue minus total expenditure of the national (resp. subnational) government | Eurostat |
| National (resp. subnational) own balance | Total revenue (excluding transfers received from other levels of government) minus total expenditure (minus transfers paid to other levels of government) of the national (resp. subnational) government | Eurostat |
| VFI (vertical fiscal imbalance) | Share of subnational own expenditure (i.e., excluding transfers paid to other general government units) not financed with subnational own revenue (i.e., excluding transfers received from other general government units). Subnational government is a consolidated state (when applicable) and local government. Transfers include both current and capital transfers. | Eurostat |
| General government primary balance | General government revenue minus general government expenditure (excluding net interest) | IMF WEO database |
| 65+ population | Population above 65 as a percentage of the total population. | World Bank |
| GDP deflator | GDP deflator | IMF WEO database |
| GDP | GDP, constant prices. | Eurostat |

## Appendix II. A Simple Model of Soft Budget Constraints

We posit that the response of subnational governments to revenue changes can be used to identify the existence of SBCs.

Let's assume that subnational governments are characterized by two features:

- *Consumption smoothing behavior.* (i) If subnational government spending is determined by the permanent income/consumption smoothing model, the response to anticipated versus unanticipated revenue changes should be asymmetric (Holtz-Eakin and Rosen, 1989; Holtz-Eakin et al., 1993). When changes in revenue are anticipated, they do not lead to revisions in the government's permanent resources, and should not affect spending. Subnational governments use financial markets to accommodate these expected fluctuations in revenue. By contrast, revenue shocks (unanticipated revenue changes) affect spending as long as they result in revisions of permanent income. (ii) If subnational governments do not smooth consumption (either because they are credit-constrained, subject to a budget balance rule, or just myopic), they should respond similarly to unanticipated and anticipated revenue changes.

- *Bailout expectations.* If subnational governments expect bailouts, their response to positive and negative revenue changes should be asymmetric. In case of negative revenue change, spending is not adjusted downward (or is adjusted less than in the case of no-bailout expectation).

Based on these priors, subnational governments could be one of three types:[38]

- Type 1 is the prudent subnational government. It does not have bailout expectations, and smoothes consumption.
- Type 2 is the imprudent government. It has bailout expectations, and does not smooth consumption.
- Type 3 is the constrained type. It does not have bailout expectations, but does not smooth consumption, for instance because it has no access to financial markets.

The following table summarizes the response of the three types to revenue changes:

[38]We do not examine the fourth type, defined as subnational governments with bailout expectations and expenditure smoothing. This would complicate the discussion without affecting the testable implications.

Appendix Table 1: Subnational Expenditure Response

| | | Type 1 | Type 2 | Type 3 |
|---|---|---|---|---|
| Unexpected revenue change (revenue shock) | positive | + | + | + |
| | negative | - | 0 | - |
| Expected revenue change | positive | 0 | + | + |
| | negative | 0 | 0 | - |

Our objective is to discriminate between subnational governments with or without bailout expectations, that is between type 2 (imprudent) and types 1/3 (prudent and constrained). Our simple model has three main implications:

- First, *anticipated revenue changes* are not informative to discriminate between type 2 and types 1/3. Indeed, both types 2 and 3 raise expenditure in response to positive anticipated revenue changes, while types 1 and 2 may have the same response to negative anticipated revenue changes.

- Second, the response to *negative revenue shocks* provides sufficient information to reveal the type of "imprudent" governments. In the face of these shocks, subnational governments without bailout expectations reduce spending (regardless of whether they are of type 1 or 3), while expenditure of type 2 does not adjust (or do so by less).[39]

- Third, type 2 has asymmetric *responses to positive and negative shocks*, while types 1 and 3 should react in a similar way (although in opposite directions: i.e. they increase spending in the face of positive revenue shocks and decrease it when hit by negative shocks).

Based on this model, our econometric approach focuses on revenue shocks to identify whether European subnational governments have behaved, on average, as type 2, which would be consistent with the existence of SBCs.

[39]A limitation of our model is that in exceptional circumstances (e.g., natural disaster, terrorist attack), prudent governments may legitimately expect ad hoc transfers, without facing soft budget constraints.

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