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Fiscal Decentralisation and Fiscal Outcomes([1])

By Matteo Governatori[§] and David Yim[†]

Abstract

In recent years, the concern that the behaviour of subnational governments may hinder the achievement of national budgetary targets has been increasingly raised across the EU. In this paper the relationship between fiscal decentralisation and budgetary outcomes of the general government is analysed. Results suggest that fiscal decentralisation is not harmful per se for budgetary discipline, although it is likely to have an adverse effect if predominantly financed by transfers from the central government rather than by subnational taxes and fees. Moreover, borrowing rules applying to subnational governments appear to partly counteract the adverse effect of transfers on fiscal balances. Therefore, policy concerns should not focus on decentralisation as such but rather on a 'bad' design of decentralisation, i.e. one which is not accompanied by subnational financial responsibility.

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1. INTRODUCTION

In recent years, EU policymakers have increasingly raised the concern that the behaviour of subnational governments may be one of the factors hindering the achievement of budgetary targets at general government level. This concern becomes even more pressing since government's responsibilities, from both the expenditure and revenue side, have been increasingly transferred from central to subnational governments across the EU and, although the extent and pace of this trend varies across countries, it is no longer confined to federal countries and increasingly involves traditionally centralised ones (European Commission, 2012). Moreover, budgetary targets set within the EU fiscal surveillance framework apply to the whole of general government – which consists of central government, subnational governments and social security funds, whereas the responsibility for their achievement rests solely on central government, which may weaken the incentive to run public finances prudently at subnational level.

In this paper the relationship between fiscal decentralisation at national level and fiscal outcomes of the general government, is analysed. Decentralisation is measured through a set of indicators which are generally used in the fiscal federalism literature (European Commission, 2012, Blöchliger and Petzold, 2009 and IMF, 2009). The purpose is to assess whether devolving expenditure functions and revenue sources to subnational entities may have adverse consequences on overall fiscal balances of the general government due to a loss of control of the central government on subnational fiscal behaviour and lower incentives for fiscal discipline at subnational level. This concern is very relevant and increasingly raised by EU policy-makers given that fiscal policy governance at the EU level and, with the recently adopted Fiscal Compact, at the national level, is based on general government definitions.

The fiscal outcomes considered are the budget balance and expenditures and revenues, taken separately. The analysis is done in two steps. Firstly, correlations between decentralisation and fiscal outcomes are presented and analysed in order to have *prima face* evidence on the budgetary impact of decentralisation. Secondly, the relationship between indicators of decentralisation and fiscal outcomes is also estimated via regression analysis.

2. FISCAL DECENTRALISATION AND FISCAL OUTCOMES: THEORETICAL CONSIDERATIONS

Theoretical priors can be highlighted as regards the sign of the effect of different dimensions of fiscal decentralisation on the main fiscal aggregates of the general government, according to the fiscal federalism literature (see among others Oates, 1999 and 2006; Blöchliger and Petzold, 2009; Blöchliger and King, 2006; Blöchliger and Rabesona, 2009; IMF, 2009; Neyapti, 2010; De Mello, 2007; Darby et al., 2002). However, in most cases the net impact is *a priori* ambiguous as a result of conflicting arguments.

Decentralization of expenditures

The decentralisation of expenditures could have either positive or negative effects on the fiscal balance. The government balance is expected to improve via lower expenditures due to:

(1) A more efficient expenditure allocation as public good provision by subnational governments is better tailored to subnational needs and preferences.

(2) Competition across subnational governments with respect to the technology and methods of production of public goods, which encourages them to select and adopt the more cost-effective ones.

(3) Failure to internalise positive spill-overs of public expenditures to citizens of other subnational communities.

On the other hand, there are arguments pointing to an increase in expenditures due to decentralisation of expenditures with adverse implications for the primary balance, i.e.:

(1) Decentralisation may prevent the exploitation of economies of scale in the production of public goods.

(2) Decentralisation entails unnecessary multiplication/overlapping of administrative procedures, especially due to shared competences across different territorial levels of administration over the same government function and unclear division of responsibilities among them.

(3) Lower productivity of subnational administration compared to the national one, due to greater capability of the latter to attract a more skilled labour force.

(4) Greater proximity of subnational policy-makers to subnational interest groups, which make the former more sensitive than national policy-makers to lobbying for increased expenditures from the latter.

Overall, the prediction of economic theory is that the impact on expenditures and the primary balance is a priori ambiguous. Moreover, a significant share of subnational governments' expenditures is likely to be mandated by national directives and legislation, leaving only limited room for subnational governments to affect their overall size and evolution. If that is the case, expenditure decentralisation taken at face value would not tell much on the effective devolution of spending powers to subnational governments, and could then have no real impact on the magnitude of expenditures.([1])

Decentralization of revenues

Decentralisation of revenue sources can also affect fiscal balances. The literature generally underlines that if subnational governments can finance a large part of their expenditures with their own revenue sources (taxes and fees) they have stronger incentives to behave in a fiscally responsible way, with positive effects on the fiscal balance of the general government. The following arguments can explain this effect:

(1) Subnational governments are more accountable to subnational voters on the way they manage their resources as the link between public services provided at subnational level and the taxes raised to finance them is stronger.

([1]) On the other hand, evidence suggests that subnational governments are often assigned also increasing decision-making powers on devolved expenditures (European Commission, 2012)

(2) The central government can more easily resist pressures of subnational governments to cover an excess in their expenditures as the latter have sufficient revenue autonomy to deal with their expenditure obligations on their own.

(3) Subnational policy-makers have a stronger incentive to provide high quality public services in order to contribute to greater economic growth in their community, as they would get the resulting dividend in the form of higher tax receipts, although the strength of this argument varies according to the type of tax devolved to subnational authorities.([2])

On the other hand, if subnational governments largely rely on transfers from the central government to finance their expenditures, they can easily justify large unfunded expenditures with the lack of own revenue sources and threaten to scale down public service provision, which is often mandated by national legislation, eventually forcing the central government to intervene to bail them out. This implies that subnational governments face a 'soft-budget constraint', with adverse effects on the general government fiscal balance.([3])

Moreover, in presence of equalising transfers, i.e. transfers which are allocated in such a way as to fill the gap between expenditure needs and own revenues of subnational entities and hence imply some degree of redistribution from the richer to the poorer of them, subnational governments may fail to internalise the cost of financing additional expenditures, thereby contributing to expenditure and deficit bias.

Finally the composition of subnational expenditure by government function and economic function, normally a neglected aspect in the fiscal federalism literature, may also weigh on the impact of decentralisation on fiscal outcomes. A higher relative weight of subnational governments in expenditure items more affected by demographic and political pressures, such as health care and social protection, may have an adverse effect on fiscal balances, since subnational governments may have lower incentives or ability to counteract such pressures.([4]) The same reasoning can by and large be extended to cases of strong decentralisation of expenditures on compensation of employees and social benefits. This effect can be tested by using figures on the breakdown of expenditure decentralisation by functions (such as health, education etc.) or economic category (European Commission, 2012).

Overall, although a number of theoretical predictions can be drawn from the literature about the impact of fiscal decentralisation on fiscal outcomes of the general government, they are often conflicting as regards its sign, implying that this is ultimately an empirical question. Therefore, the remainder of this paper turns to the empirical analysis of these issues. In Section 3 stylized facts will be presented. Then, in Section 4 the main hypotheses derived

([2]) It is likely to be weaker for property taxes than for local income or business taxes.

([3]) However, a counter-argument is proposed in some papers. A larger weight of transfers may give the central government a stronger lever to control the fiscal behaviour of subnational governments and, hence, reduce the risk of subnational fiscal slippages. This effect should be especially relevant if most transfers to subnational governments are earmarked to specific expenditures, leaving little leeway to subnational governments to decide upon their use.

([4]) For instance, subnational administrations may lack the technical expertise to anticipate the future evolution of health expenditure or may have less political will to curb health expenditure because they would assume that the central government would eventually intervene to provide additional funding for such a politically and socially sensitive expenditure item.

from theoretical predictions are reformulated and qualified based on the stylised facts (Subsection 4.1 below) and then tested through regression analysis.

The effect of fiscal decentralisation can be tested by using the following indicators which allow to quantify and characterise decentralisation across the EU:

i) Expenditure decentralisation, defined as the percentage of subnational governments' expenditures in total expenditures of the general government;

ii) Own revenue decentralisation, defined as the percentage of subnational taxes and fees (i.e. subnational own revenues) in general government revenues;

iii) Revenue decentralisation, defined as the percentage of subnational revenues (including transfers) in general government revenues (this indicator will be used exclusively in the Section on stylised facts and not in the one on econometric analysis);

iv) The percentage of tax revenues in subnational revenues;

v) The percentage of transfers from the central government in subnational revenues;

vi) Subnational expenditure coverage by own revenues, defined as the percentage of subnational expenditures covered by subnational taxes and fees. ([5])

vii) Transfer dependency, defined as the percentage of subnational expenditures covered by transfers.

3. STYLISED FACTS ON DECENTRALISATION AND FISCAL OUTCOMES

3.1 Pair-wise correlations between fiscal decentralisation and fiscal outcomes

This Subsection presents evidence on pair-wise correlations between fiscal decentralisation and general government fiscal outcomes in order to identify a few stylised facts before moving to econometric analysis of the fiscal impact of decentralisation in Section 4 below. The data sample used consists of annual data covering all EU27 Member States in the period 1995-2010.([6])

The first exercise consists of a comparison of average values of main fiscal outcomes, across high and low decentralisation subsamples of the data. To do this, the data are divided into two subsamples, with values of the different decentralisation indicators lower and higher,

([5]) The latter measures the decentralisation of revenues relative to expenditures. The complement to one of this indicator, i.e. the share of subnational expenditure not covered by own subnational revenues is generally called 'vertical fiscal imbalance' (Eyraud and Lusinyan, 2011 and Karpowicz, 2012), as it captures the gap between expenditures and own revenues of subnational governments which must be covered either by transfers or subnational borrowing. It follows from the above considerations that a lower vertical fiscal imbalance should lead to a 'harder budget constraint' for subnational governments, with positive effects on fiscal balances.

([6]) This is the longest time period with available data by sector of government in Eurostat, except for the breakdown by functions (cofog) which is shorter, see below.

respectively, than their overall sample average.([7]) The exercise is undertaken for four indicators of decentralisation mentioned in Section 2 above: expenditure decentralisation, own revenue decentralisation, subnational expenditure coverage by own revenues, share of transfers in subnational revenues. The comparison is carried out for the following fiscal variables: primary balance([8]), cyclically-adjusted primary balance, primary expenditures and total revenues of the general government, in order to assess the correlation of decentralisation with both the net fiscal balance and the spending and revenue side, separately. Results are shown in Table 1.

Table 1: Fiscal outcomes of general government (% of GDP), averages for observations with low and high values of different indicators of fiscal decentralisation (EU27 Member States, 1995-2010 period)

		pb	capb	exp	rev
Expenditure decentralisation	Low	-0.8	-0.9	35.6	39.1
	High	1.3	1.2	39.8	44.5
Subnational expenditure coverage by own revenues	Low	-0.2	-0.2	36.0	39.6
	High	0.6	0.4	38.9	43.3
Own revenue decentralisation	Low	0.0	-0.3	35.9	39.8
	High	0.7	0.7	40.2	44.7
Share of transfers in subnational revenues	Low	0.5	0.4	38.8	43.2
	High	-0.1	-0.2	36.0	39.6

Notes: pb = primary balance of general government, capb = cyclically adjusted primary balance of general government, exp = primary expenditure of general government (% of GDP), rev = total revenues of general government (% of GDP).
Source: Commission services.

The following patterns emerge:

i) High expenditure decentralisation goes together with a higher primary balance on average, higher (primary) expenditure and higher revenues of general government.([9]) The same occurs with own revenue decentralisation.

ii) High subnational expenditure coverage by own revenues is associated to higher primary balance, higher (primary) expenditures and revenues although the difference is smaller than between low and high decentralisation of expenditures.

iii) Conversely, a higher share of transfers (or a lower share of own revenues) in subnational revenues is associated to lower primary balance, lower primary expenditure and lower revenues.([10])

These main messages are by and large confirmed by computing correlations between country averages for the 1995-2010 period of the decentralisation indicators considered and country averages over the same period of the primary balance, expenditures and revenues.([11])

([7]) For instance, in the case of the indicator of overall expenditure decentralisation, the sample is divided between observations where the value of this indicator is below or above its sample average.
([8]) ESA95 figures, Excessive Deficit Procedure.
([9]) +2.1pp of GDP for the primary balance, +4pp for expenditures and +5½pp of GDP for revenues**.**
([10]) Looking at the link between decentralisation and the magnitude of subnational government expenditure (not shown), data show that the latter is significantly larger when decentralisation of either expenditures or revenues is higher than average. Less obviously, it is around 2pp higher on average when subnational expenditure coverage by own revenues is *higher* and transfer dependency *lower*.

However, comparisons of fiscal outcomes across low and high levels of a single decentralisation indicator do not control for the fact that different aspects of decentralisation may go together. It is quite likely, for instance, that decentralisation of expenditures goes together with decentralisation of own revenues and larger subnational responsibility to cover their expenditures with their own resources. Therefore, it is possible that the positive effect of expenditure decentralisation on the primary balance is in fact due to the greater subnational financial autonomy and responsibility which may often go with it. Controlling simultaneously for the fiscal impact of different decentralisation variables requires econometric analysis, which is carried out in Section 4 below; however two simpler exercises can already shed some light on these issues:

(1) Looking at the relationship between different aspects of decentralisation to test whether expenditure decentralisation tends to be accompanied by greater subnational responsibility on the revenue side and a lower reliance on transfers and to assess how the different aspects of revenue decentralisation considered so far (revenue decentralisation, share of taxes, share of transfers and subnational expenditure coverage by own revenues) tend to be combined with each other.

(2) Computing averages of fiscal outcomes for low vs. high expenditure decentralisation controlling for high vs. low levels of the other indicators of decentralisation.

Both exercises are carried out in the remainder of this Section.

The upper part of Table 2 below compares the average values of the indicators capturing the different aspects of revenue decentralisation for low vs. high decentralisation of expenditures, whereas the bottom part compares the average shares of taxes and transfers in subnational revenues and the average level of subnational financial responsibility (i.e. coverage of their spending with own revenues) for low vs. high revenue decentralisation.([12])

The Table shows that higher expenditure decentralisation is on average associated with higher revenue decentralisation, both including (first column) and excluding (second column) transfers, higher rate of coverage of subnational expenditure by own revenues, as well as a higher share of taxes and a (marginally) lower share of transfers in subnational revenues. Moreover, revenue decentralisation is accompanied by a higher share of taxes and a lower share of transfers in subnational revenues, as well as by higher subnational expenditure coverage with own revenues.

([11]) The figures are not shown. Specifically, across the EU the average of both expenditure and own revenue decentralisation is positively correlated with the average primary balance, cyclically adjusted primary balance, primary expenditures and revenues in the 1995–2010 period. The correlation coefficients are always in the range of 0.5-0.6. The average rate of coverage of subnational expenditures by subnational own revenues is positively correlated with primary expenditures and revenues, whereas both expenditures and revenues are negatively correlated with subnational dependency on transfers. As for the mix of revenue sources of subnational governments, the average share of taxes in total subnational revenues is positively correlated with expenditures and revenues.

([12]) I.e. the share of all revenues of subnational governments, including transfers from the central government, in general government revenues (see above). This indicator differs from own revenue decentralisation by the inclusion of transfers.

Table 2: Conditional means of selected indicators of fiscal decentralisation for high vs. low expenditure and revenue decentralisation

Expenditure decentralisation	Revenue decentralisation	Own revenue decentralisation	% of transfers in subnational revenues	Subnational expenditure coverage by own resources	% of taxes in subnational revenues
Low	0.17	0.08	0.53	0.45	0.32
High	0.37	0.18	0.5	0.49	0.39
Revenue decentralisation (transfers included)			% of transfers in subnational revenues	Subnational expenditure coverage by own resources	% of taxes in subnational revenues
Low			0.53	0.46	0.32
High			0.51	0.49	0.38

Source: Commission sources.

These findings are by and large confirmed by pair-wise correlations between the mean values of decentralisation indicators by country in the 1995-2010 period.([13])

Overall, it appears that expenditure decentralisation, own revenue decentralisation and subnational responsibility to cover their expenditures with their tax revenues and fees tend to go hand-in-hand across the EU. Moreover, in countries where total revenue decentralisation is high, taxes tend to be more important than transfers as subnational revenue source. These findings imply that simple relationships between individual aspects of decentralisation and fiscal outcomes should be interpreted with caution, without inferring too easily causal effects and that it is important to look at the effects of different decentralisation aspects simultaneously. A first attempt to do this is done with the exercise mentioned in point (2) and discussed below, whereas an econometric analysis is carried out in Section 4.

Table 3 below compares the average values of primary balance, expenditures and revenues across the two sub-samples with low and high expenditure decentralisation, *conditional on low or high level of own revenue decentralisation, subnational expenditure coverage by own resources and shares of taxes and transfers in subnational revenues.*

([13]) These are not shown. The correlations between decentralisation of expenditures, on the one hand, and decentralisation of own revenues (taxes and fees), share of taxes in subnational revenues and subnational expenditure coverage with own resources are all positive and significant. Also, overall revenue decentralisation (including transfers) is positively correlated with the share of taxes in subnational revenues and negatively correlated with the share of transfers, although it is significant only in the first case.

Table 3: Conditional means of fiscal outcomes of general government (% of GDP) for low vs. high expenditure decentralisation, controlling for low vs. high values of other decentralisation indicators (by column) - EU-27 Member States, 1995-2010

Expenditure decentralisation	Own Revenue decentralisation		Own Revenue decentralisation		Own Revenue decentralisation	
	Low	High	Low	High	Low	High
	Primary balance		Primary expenditure		Total revenues	
Low	-0.62	-2.42	35.55	35.63	39.13	38.50
High	1.67	1.20	37.11	40.96	41.73	45.77
	Subnational expenditure coverage by own resources		Subnational expenditure coverage by own resources		Subnational expenditure coverage by own resources	
	Low	High	Low	High	Low	High
	Primary balance		Primary expenditure		Total revenues	
Low	-1.23	-0.52	34.61	36.30	37.70	40.10
High	0.93	1.65	37.52	41.39	41.74	46.53
	Transfers (% subnational revenues)		Transfers (% subnational revenues)		Transfers (% subnational revenues)	
	Low	High	Low	High	Low	High
	Primary balance		Primary expenditure		Total revenues	
Low	-0.57	-1.20	36.30	34.54	40.10	37.60
High	1.62	0.97	41.38	37.52	46.50	41.77
	Taxes (% subnational revenues)		Taxes (% subnational revenues)		Taxes (% subnational revenues)	
	Low	High	Low	High	Low	High
	Primary balance		Primary expenditure		Total revenues	
Low	-1.01	-0.58	35.08	36.26	38.39	40.00
High	1.12	1.48	37.47	41.07	41.77	46.08

Notes: the Table should be read in the following way, taking the example of the first four figures in the top-left corner (primary balance): the sample is broken down between observations with lower and higher than average expenditure decentralisation. Each of these subsamples is then broken down across cases with lower and higher than average own revenue decentralisation, so that the relationship between own revenue decentralisation and the primary balance can be (partly) isolated from the relationship between expenditure decentralisation and the primary balance.
Source: Commission services.

Compared to Table 1, this exercise allows to better disentangle the relationship between expenditure decentralisation and fiscal outturns from the one between the different aspects of revenue decentralisation and fiscal outturns**.**

As regards the primary balance, the following patterns emerge:

(i) Restricting the analysis to observations with low own-revenue decentralisation, low subnational expenditure coverage by own resources, low share of taxes and low share of transfers in subnational revenues, moving from low to high expenditure decentralisation is associated to an increase in primary balance.

(ii) For high levels of expenditure decentralisation, moving from low to high own revenue decentralisation is associated to a decrease of primary balance, contrary to findings in Table 1.

(iii) For high levels of expenditure decentralisation, moving from low to high share of transfers in subnational revenues is associated to a decrease in primary balance, whereas moving from low to high subnational expenditure coverage and from low to high share of taxes in subnational revenues goes together with an increase of the primary balance.

As regards expenditures and revenues:

(i) For low levels of own revenue decentralisation, subnational expenditure coverage and share of taxes and transfers in subnational revenues, moving from low to high expenditure decentralisation is associated to both higher expenditures and revenues.

(ii) Once the level of expenditure decentralisation is high moving from low to high own revenue decentralisation, from low to high subnational expenditure coverage by own resources and from low to high share of taxes in subnational revenues is associated with a (quite sizeable) increase in expenditures and revenues.

(iii) Once the level of expenditure decentralisation is high, moving from low to high weight of transfers in subnational revenues is associated with a decrease in expenditures and revenues.

3.2 Conclusions on stylised facts on the link between fiscal decentralisation and fiscal outcomes

Overall, preliminary evidence based on comparing average fiscal outcomes in the EU for low vs. high fiscal decentralisation, looking at both the expenditure and revenue side of the latter, suggests that:

(1) Decentralising expenditures does not appear to increase government deficit. On the contrary, it is associated with improved primary balance. This relationship is strengthened if accompanied by a large rate of coverage of subnational expenditures by own resources (i.e. taxes and fees) and a high weight of taxes in subnational revenues. Conversely this relationship is attenuated if transfers from the central government account for a large share of subnational revenues.

(2) Expenditure decentralisation appears to go together with higher expenditures and revenues and this link is strengthened if accompanied by a large coverage of subnational expenditure with own resources, large share of taxes in subnational revenues, whereas it is weakened in case of a large share of transfers in subnational revenues.

These facts appear to confirm the argument that subnational governments do not fully exploit economies of scale in public goods provision and tend to generate inefficiencies via overlapping and duplications of administrative procedures, leading to higher expenditures in more decentralised countries. However expenditure decentralisation is also associated with higher government revenues and this appears to more than offset the relationship with expenditures, resulting in a net positive link between expenditure decentralisation and the primary balance.

All these relationships seem to be strengthened if expenditure decentralisation is accompanied by larger financial responsibility of subnational governments([14]) and a larger share of taxes in their revenues whereas they are partly counteracted if transfers account for a large share of subnational revenues. This appears to confirm the prediction that if subnational governments have to finance most of their spending with their own taxes and fees and these make up most of their revenues they tend to raise more revenues to cover their expenditure needs, whereas a large reliance on transfers creates a soft-budget constraint on subnational

([14]) They cover a large part of their expenditures with their tax revenues and fees.

governments, reducing the positive effect of expenditure decentralisation on the primary balance.

3.3 Stylised facts on decentralisation of individual expenditure functions and fiscal outcomes

This Subsection complements the discussion in Subsections 3.1 and 3.2 above, by presenting the main stylised facts on the link between expenditure decentralisation in individual government functions (i.e. education, public order, health care etc., see European Commission, 2012) and fiscal outcomes based on comparison of conditional means as done in Subsection 3.1. Essentially, the goal is to assess whether the main messages on the relationship between decentralisation and fiscal outcomes are enriched by looking also at the break-down of decentralisation by functions. For simplicity, no charts or tables are shown in this Subsection and only the main findings are briefly presented and discussed.

(1) Looking at the relationship between the total expenditure in each function and its degree of decentralisation suggests that there is no systematic relationship between these two variables, except for social expenditure and, to a lesser extent, health care**.** Social and health care expenditures are on average around 4pp of GDP and 1pp of GDP higher, respectively, in countries where such functions are highly decentralised.

(2) Looking at the relationship between decentralisation by function and the primary balance of the general government conditional on a high level of total expenditure decentralisation (in order to control for the effect of overall decentralisation) suggests that decentralising general services and education is associated with a lower primary balance, whereas higher decentralisation of health, economic affairs and social protection goes together with a higher primary balance.

(3) Repeating the exercise in (2) for expenditures and revenues (instead of the fiscal balance) suggests that overall expenditure decentralisation is no longer associated to higher total expenditures if education, social protection and health remain centralised, whereas it is associated to substantially higher expenditures if these three functions are decentralised. Similarly, expenditure decentralisation is no longer associated to larger total revenues when social protection and education are relatively centralised.

The same caveat as for evidence presented in Subsection 3.1 also applies to stylised facts on the relationship between decentralisation by function and fiscal outcomes, i.e. no conclusions on causal effects should be drawn from them as their robustness should be tested with econometric analysis. In any case the above stylised facts suggest that the fiscal impact of total decentralisation of expenditure and of its composition by function should be tested at the same time. The next Section turns to econometric analysis of the effect of fiscal decentralisation on fiscal outcomes.

4. REGRESSION ANALYSIS OF THE IMPACT OF DECENTRALISATION ON FISCAL BALANCE

4.1 Model specification and main hypotheses

This Section presents an econometric analysis of the impact of fiscal decentralisation on the primary balance of general government and on primary expenditures and revenues, taken separately. The model used is the fiscal reaction function – an equation which tests the impact of the outstanding government debt ratio on the primary balance after controlling for a number of macroeconomic and institutional variables. The basic underlying assumption is that governments are fiscally responsible and hence react to increasing (decreasing) levels of accumulated debt by increasing (decreasing) the primary balance. This methodology has become quite widespread in the empirical literature on fiscal policy (see Bohn, 1998 and European Commission, 2011a) and has also been used recently to investigate the budgetary impact of fiscal decentralisation (Eyraud and Lusinyan, 2011 and Escolano et al., 2012).([15])

Therefore, this Section presents and discusses estimates of fiscal reaction functions for the EU enriched with the indicators of fiscal decentralisation previously discussed. The dependent variable of the model is alternatively the primary balance, primary expenditures and total revenues of the general government. As discussed in Section 2 above, it is difficult to formulate clear cut predictions on the impact of the different aspects of fiscal decentralisation on fiscal outcomes as theoretical arguments are often conflicting. However, the literature presented in Section 2 above and the stylised facts discussed in Section 3 suggest a list of main hypotheses to be tested with regression analysis.

(1) Expenditure decentralisation may lead to larger primary expenditures due to a number of reasons such as less exploitation of economies of scale, duplication and overlapping of administrative procedures, lower productivity of subnational administrations as they are less able to attract more skilled civil servants and greater proximity of subnational policy-makers to subnational interest groups.

(2) The net effect of expenditure decentralisation on the primary balance should depend on how the former is combined with revenue decentralisation. Essentially, stylised facts suggest that if decentralised expenditures go together with large financial responsibility of subnational governments to cover them with their own resources (i.e. taxes and fees assigned to subnational governments) and taxes account for a large share of subnational revenues compared to transfers, there should be no adverse effect on the primary balance (or possibly even a positive one) as subnational governments are encouraged to raise more revenues to cover their larger expenditure responsibilities. On the other hand, the combination of high expenditure decentralisation with a strong reliance on transfers from the central government would be more harmful for fiscal balances as subnational governments would face a soft budget constraint and are likely to be less concerned about balancing their expenditures with their revenues.

(3) The effect of total expenditure decentralisation on fiscal outcomes may differ according to the specific expenditure item which is decentralised. Decentralisation of health-

([15]) Both these papers use decentralisation indicators similar to those considered here.

care, social protection, education or general services may be particularly likely to lead to larger expenditures and/or a worse fiscal balance.

(4) Finally, a greater share of subnational expenditures covered by subnational own taxes and fees (low vertical fiscal imbalance) implies greater financial responsibility at subnational level as the central government can more easily resist pressures to 'bail-out' subnational entities if the latter are endowed with sufficient own resources to finance their expenditures. In these situations there should be a positive effect on the fiscal balance, reflecting a positive effect on revenues and a negative effect on expenditures. However, descriptive evidence discussed in Section 3 suggests a positive effect on both expenditures and revenues which needs to be tested through econometric analysis.

(5) As for own revenue decentralisation – the share of subnational own revenues (taxes and fees, as transfers are excluded from own subnational revenues) in general government revenues – theory does not provide clear predictions on its impact on fiscal balances. On the one hand, a high value on this variable means that subnational governments have more own resources to cover a given amount of expenditures, leading to better fiscal balances. On the other hand, this variable tells us nothing on the relative size of subnational own revenues *compared to their expenditures* which is probably a better way to capture subnational incentives to behave in a financially responsible way. Moreover, the impact of own revenue decentralisation may also differ based on whether it goes together with a high or low share of transfers/taxes in subnational revenues, similarly to the case of expenditure decentralisation discussed above.

4.2 Regression results on the effect of decentralisation on the primary balance

The first set of estimates test the impact of decentralisation on the general government primary balance (as a share of GDP). The number of independent variables (apart from decentralisation) is limited in order to keep the specification of the model parsimonious, and includes (i) the lagged debt-to-GDP ratio, (ii) the lagged output gap to control for the budgetary effect of cyclical fluctuations, (iii) the occurrence of legislative election in the year.([16]) Further control variables are included in the regressions for expenditures and revenues (see below).

Then, the different decentralisation indicators are included to test the above hypotheses (see Subsection 4.1 above): expenditure decentralisation([17]), own revenue decentralisation([18]), the share of taxes and transfers in subnational revenues and the share of subnational expenditure that is covered by subnational own revenues. Moreover, as the above hypotheses (points 2 and 5) also concern the impact of combinations of different aspects of decentralisation, the following interactive terms (i.e. the product of two variables) are also included in the regressions:

(i) Expenditure decentralisation and the share of transfers in subnational revenues**;**

([16]) This is systematically found to have good explanatory power of the developments of fiscal balances (see among others Mendoza and Ostry, 2008 and Gali and Perotti, 2003).
([17]) Percentage of subnational government expenditures in general government expenditures.
([18]) Percentage of subnational government own revenues (taxes and fees) in general government revenues.

(ii) Expenditure decentralisation and the share of taxes in subnational revenues;

(iii) Own revenue decentralisation and the share of transfers in subnational revenues;

(iv) Own revenue decentralisation and the share of taxes in subnational revenues.

As in Section 3 above, the sample includes all 27 EU Member States and covers the 1995–2010 period. As the model specification considered includes lagged dependent variable among the explanatory variables([19]) estimations are carried out with the Least Squares Dummy Variables Bias-Corrected estimator (LSDVC, Bruno, 2005), which corrects for the bias of Fixed Effect estimators in dynamic panel data models, i.e. panels which include the lagged dependent variable.

Results of estimates for the primary balance are shown in Table 4 The lagged debt has an expected statistically significant positive coefficient in all specifications of the model, suggesting the existence of a debt-sustainability motive in the setting of fiscal policies, whereas the lagged output gap has a negative and mostly significant coefficient suggesting some degree of pro-cyclicality of fiscal policy across the EU. The occurrence of elections has, as expected, a negative impact on the primary balance, albeit not always significant.

As for the indicators of decentralisation, expenditure decentralisation has a positive and statistically significant effect on the primary balance, whereas own revenue decentralisation has a negative and significant effect. Subnational expenditure coverage has a positive and significant effect on the primary balance, which is in line with expectations.

Expenditure decentralisation interacted with the share of transfers in subnational revenues has a negative effect on the primary balance (columns 2, 10, 12 and 13) whereas it has a (further) positive effect if interacted with the share of taxes in subnational revenues (column 3). This confirms the expectation that expenditure decentralisation has a more favourable impact on the primary balance if accompanied by a large share of own taxes and fees in subnational governments and a small share of transfers from the central government.

The interactive term of own revenue decentralisation with the share of taxes in subnational revenues, has a positive and significant coefficient (columns 6 and 8). Such an effect approximately offsets the negative effect on primary balance of own revenue decentralisation *per se*. On the other hand, the interactive term of own revenue decentralisation and the share of transfers in subnational revenues has a negative and significant coefficient (column 9). The shares of taxes and transfers have, respectively, a positive and negative effect on the primary balance also when included individually (columns 4 and 5).

However, figures on the shares of taxes in subnational revenues do not distinguish autonomous taxes, i.e. on which subnational governments are allowed to change rate and/or base, from the assignment of revenues from national taxes to subnational governments (shared taxes). This may prevent to fully capture the 'true' degree of subnational financial autonomy. Hence, a robustness check for the hypothesis (2) above is carried out (for the first time in the literature to our knowledge) by estimating the effect of 'true' subnational tax autonomy as measured by an indicator compiled by the OECD Secretariat. ([20]) This is done via three interactive terms:

([19]) This is the case, for instance, for the primary balance as it is commonly found to exhibit a high degree of time persistence

([20]) This indicator measures the share of subnational tax revenues on which subnational governments can change the rate and/or base. However, its inclusion entails a substantial reduction of available observations as it is not available for non-OECD EU Member States. Moreover, it has not been computed with annual frequency, being available only for 1995, 2002, 2005 and 2008, which implies that the assumption of constant tax autonomy had to be made for missing years in order to compute regressions.

(i) Share of subnational tax revenues on which subnational governments can exert autonomy multiplied by the share of taxes in total subnational revenues; this would capture the share of 'truly' autonomous revenues (column 13);

(ii) Expenditure decentralisation times the term (i), in order to test the joint impact of large decentralisation on the spending side and large 'true' revenue autonomy (column 11);

(iii) Share of subnational expenditures covered by subnational taxes and fees times the share of subnational tax revenues on which subnational governments can exert autonomy; this would capture the coverage of subnational expenditures by effectively autonomous revenues (column 12).

Results confirm expectations: greater 'true' tax autonomy improves the primary balance as all the three terms have a positive and significant coefficient.([21])

Table 4: Regressions on the effect of fiscal decentralisation on the primary balance of general government (LSDVC estimator, EU27, 1995-2010)

	1	2	3	4	5	6	7	8	9	10	11	12	13
VARIABLES	Pb												
L.D	0.03*	0.03***	0.03**	0.03*	0.03**	0.03**	0.02*	0.03**	0.03**	0.03***	0.04**	0.04***	0.04***
L.og	-0.1**	-0.12***	-0.1**	-0.09*	-0.09**	-0.08*	-0.06	-0.05	-0.06	-0.09	-0.08	-0.1**	-0.1**
Expdec.	0.12**	1.19***	0.13**	0.22***	0.28***	0.22***	0.4***	0.47***	0.52***	1.22***	0.57***	1.2***	1.2***
Revdec	-0.12*	-1.15***	-0.43***	-0.36***	-0.45***	-0.81***	-0.73***	-1.27***	-0.5***	-1.48***	-1.34***	-1.7***	-1.7***
Expcov							0.19***	0.18***	0.16***	0.17***	0.37***	0.3***	0.3***
Expdec* *trsf		-1.12***								-0.89***		-0.76***	-0.74***
Ele	-0.45*	-0.43*	-0.44*	-0.44*	-0.37	-0.42*	-0.29	-0.28	-0.25	-0.3	-0.31	-0.26	-0.26
Expdec* tax			0.34**								-0.02		
% tax				0.08***									
% trsf					-0.11***								
Revdec* tax						0.87***		0.73***					
Revdec *trsf									-1.15***				
Tax *auton													0.06**
Expdec *tax*auton											0.04***		
Expcov* auton												0.05***	
Obs.	405	405	405	405	405	405	405	405	405	405	297	297	297
Number of panel	27	27	27	27	27	27	27	27	27	27	21	21	21

Notes: List of variables: pb = primary balance of general government (% of GDP), L.D = lagged stock of debt of general government (% of GDP), L.og = Lagged output gap (% of potential output), Expdec = expenditure decentralisation, Revdec = own revenue decentralisation, Expcov = coverage of subnational expenditures by own resources, Expdec*trsf = expenditure decentralisation*share of transfers in subnational revenues, Ele = legislative elections (1 if elections occurred in the year, 0 otherwise), Expdec*tax = expenditure decentralisation*share of taxes in subnational revenues, % tax = share of taxes in subnational revenues, % trsf = % of transfers in subnational revenues, revdec*tax = own revenue decentralisation* share of taxes in subnational revenues, revdec*trsf = own revenue decentralisation* share of transfers in subnational revenues, tax*auton = share of taxes in subnational revenues*share of autonomous taxes in subnational tax revenues, expdec*tax*auton = expenditure decentralisation*share of taxes in subnational revenues*share of autonomous taxes in subnational tax revenues, expcov*auton = coverage of subnational expenditures by own resources* share of autonomous taxes in subnational tax revenues.
***, **, *: coefficient estimates statistically significant at the 1, 5 and 10% level, respectively.
Source: Commission services.

Table 5 presents the results of a model similar to the one used for Table 4, but enriched with the addition of terms interacting overall expenditure decentralisation with the decentralisation

([21]) Moreover, when the term (ii) is included the interactive term of expenditure decentralisation and the share of taxes in subnational revenues is no longer significant (column 11), suggesting that it is the true tax autonomy rather than the share of tax revenues assigned to subnational governments as such which improves fiscal balances.

of expenditures in three government functions, i.e. health care, social protection and general services (columns 1 to 3) in order to test the hypothesis in point 3 above. These terms all have negative and significant coefficients, implying that if overall expenditure decentralisation is positive per se for the primary balance, this effect is partly counteracted if accompanied by large decentralisation in general services, social protection and health.([22]) This was already detected among the stylised facts in Section 3 only for general services.

Interactive effects between overall expenditure decentralisation and decentralisation by *economic* function are also tested for public consumption, compensation of employees and social benefits (columns 4 to 6.) The coefficients for the first and the third term are insignificant, whereas the coefficient on employee compensation is positive and significant, suggesting, quite surprisingly, that a large subnational share in the expenditure for compensation of employees improves the positive effect of overall expenditure decentralisation on the primary balance.([23]) The other indicators of decentralisation retain the usual sign and significance.

Table 5: Results of regressions with the primary balance of general government as dependent variable and decentralisation by government function and by economic function included among regressors (LSDVC estimator, EU27, 1995-2010)

	1	2	3	4	5	6
VARIABLES	pb					
L.D	0.0530***	0.0483***	0.0358***	0.0335***	0.0286**	0.0333***
L.og	-0.154***	-0.148***	-0.152***	-0.128***	-0.131***	-0.116***
Expdec	1.414***	1.315***	1.529***	1.215***	1.018***	1.148***
Revdec	-1.297***	-1.288***	-1.340***	-1.151***	-1.151***	-1.144***
Ele	-0.504**	-0.474*	-0.518**	-0.425*	-0.395*	-0.448**
Expdec * trsf	-1.191***	-1.123***	-1.348***	-1.127***	-1.119***	-1.108***
Expdec * decHealth	-0.123***					
Expdec. * decSoc		-0.242**				
Expdec * decGS			-0.528***			
Expdec. * decCons				-0.0788		
Expdec * decWag					0.417**	
Expdec. * decSocBen						0.188
Observations	382	382	383	405	405	405
Number of panel	27	27	27	27	27	27

Notes: List of variables: see Table 4 above. New variables added: Expdec * decHealth = expenditure decentralisation * subnational share of general government expenditure for health care, Expdec * decSoc = expenditure decentralisation * subnational share of general government expenditure for social protection, Expdec * decGS = expenditure decentralisation * subnational share of general government expenditure for general services, Expdec * decCons = expenditure decentralisation * subnational share of general government expenditure for consumption, Expdec * decWag = expenditure decentralisation * subnational share of general government expenditure for compensation of employees, Expdec * decSocBen = expenditure decentralisation * subnational share of general government expenditure for social benefits. ***, **, *: coefficients estimates statistically significant at the 1, 5 and 10% level, respectively.
Source: Commission services.

([22]) The same test was carried out also for decentralisation of education expenditures, which turned out to be insignificant.
([23]) Clearly, it is quite difficult to interpret this finding as there are no clear economic reasons on why local governments should be more disciplined than the central government in their wage expenditures.

4.3 Regression results on the effect of decentralisation on expenditures and revenues

Expenditures

Regressions were also estimated with general government primary expenditure (as a share of GDP), instead of the primary balance, as the dependent variable (Table 6). The model is adapted relative to the one for primary balance with the addition of inflation and trade openness as further control variables (Eyraud and Lusinyan, 2011.) Focusing on the decentralisation indicators the following findings can be highlighted:

(i) Overall expenditure decentralisation has a negative and significant coefficient, suggesting that expenditure decentralisation per se tends to *decrease* the magnitude of overall expenditures of the general government.

(ii) Subnational own revenue decentralisation has a positive and significant effect on expenditures.

(iii) The interaction between expenditure decentralisation and the share of transfers and of taxes in subnational revenues have a *positive and negative* effect, respectively (both significant).

(iv) The same is found for the interaction between own revenue decentralisation and the share of transfers and taxes in subnational revenues, respectively.

Table 6: Results of regressions with primary expenditure of general government as dependent variable (LSDVC estimator, EU27, 1995-2010)

	1	2	3	4	5	6	7	8	9
VARIABLES	primexp	primexp	primexp	primexp	primexp	primexp	primexp	primexp	primexp
lagdebt	-0.0204*	-0.0173	-0.0144	-0.0192	-0.0125	-0.00912	-0.0118	-0.00653	-0.0168
L. og.	0.190***	0.166***	0.159***	0.166***	0.173***	0.219***	0.220***	0.223***	0.188***
expdec	-0.784***	-0.0405	-0.185***	-0.222***	-0.216***	-0.699***	-0.723***	-0.782***	-0.715***
revdec	0.800***	0.346***	0.437***	0.803***	0.212***	0.863***	0.865***	0.864***	0.957***
Expdec* trsf	0.792***					0.577***	0.607***	0.691***	0.662***
ele	0.123	0.116	0.0258	0.0311	0.0607	0.114	0.118	0.137	0.059
L infl	0.0290**	0.0259*	0.0355***	0.0323***	0.0264**	0.113***	0.112**	0.117***	0.0344***
tradeopen	-0.736*	-0.736	-0.850**	-0.871**	-0.965***	-1.056***	-1.027***	-1.084***	-0.672*
Expdec* tax		-0.298**							
expcov			-0.109***	-0.0953***	-0.0683***	-0.0833***	-0.0805***	-0.0685***	-0.0848***
Expdec* decSoc						0.138			
Expdec* decHealth							0.0405		
Expdec* decGS								0.213**	
Snownrevdec* %tax				-0.524***					
Snownrevdec* trsf					0.744***				
Expdec* decWag									-0.145
Observations	401	401	401	401	401	380	380	381	401
Number of panel	27	27	27	27	27	27	27	27	27

Notes: List of variables: see Table 4 above. New variables added: Primexp = general government primary expenditures (% of GDP), L.infl = lagged inflation rate, TO = Trade Openness (% of exports plus imports in GDP). ***, **, *: coefficients estimates statistically significant at the 1, 5 and 10% level, respectively.
Source: Commission services.

These findings contradict the stylised facts discussed in Section 3 above, which suggested a positive correlation between expenditure decentralisation and total expenditures. This confirms the need to interpret stylised facts based on simple correlations with special caution and the importance to check their robustness through econometric analysis. This finding also disconfirms the hypothesis (1) above and confirms opposite arguments proposed in the literature whereby decentralising expenditures should increase public sector efficiency due to better tailoring of public services to subnational preferences and 'healthy' competition and mutual learning across subnational governments on the most efficient ways to provide public services.

Stylised facts in Section 3 also suggested that large subnational financial responsibility, a large share of taxes in subnational revenues and a lower share of transfers were also associated to higher expenditures, whereas the reverse is found in the above regression which properly controls for the impact of several variables. In other words, whereas from the stylised facts it seemed that the positive effect of high subnational financial responsibility and high subnational taxes/low transfers on the primary balance only came from the revenue side, the regression shows that it also comes from restraints on expenditures, which is more consistent with literature predictions.

As regards the functional composition of expenditures, the interactive term of expenditure decentralisation with decentralisation by function has a positive and significant coefficient only for expenditure on general services, meaning that if overall decentralisation leads per se to lower expenditures this is partly undone by large decentralisation of general services. Therefore, stylised facts suggesting a specific role of decentralisation of health, education and social protection in affecting expenditures are not confirmed.

Revenues

Finally, the impact of fiscal decentralisation on revenues was estimated through regressions with, alternatively, general government revenues and the tax burden (both as shares of GDP) as the dependent variable to add a further robustness check (Table 7).([24])

Expenditure decentralisation does not appear to have a significant effect on revenues or on the tax burden. On the other hand, own revenue decentralisation has a negative and significant effect, whereas its interaction with the share of transfers becomes insignificant and its interaction with the share of taxes in subnational governments has a positive and significant effect on the tax burden only. Similarly the interaction between expenditure decentralisation and the share of transfers in subnational revenues is insignificant, whereas the interaction with the share of taxes is positive and significant. The subnational expenditure coverage by own resources has a positive and significant coefficient.

Overall it appears that the impact of decentralisation is stronger on the expenditure than on the revenue side, although two dimensions of it also affect revenues in a way which is consistent with their impact on primary balance and expenditures. These are the decentralisation of own revenues, which according to these results increases spending and decreases revenues, thereby adversely affecting fiscal balances from both sides, and the subnational expenditure coverage by own resources, which decreases expenditures and increases revenues, hence positively affecting fiscal balances from both sides. Also, a high

([24]) To check for the possibility that tax revenues may be more affected by the economic incentives created by the governance structure of a country.

relative weight of taxes in subnational revenues appears to (weakly) improve revenues for a given level of expenditure and revenue decentralisation.

Table 7: Results of regressions with total revenues and tax burden of general government as dependent variable (LSDVC estimator, EU27, 1995-2010)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	totalrev	totalrev	totalrev	totalrev	taxburden	taxburden	totalrev	taxburden
L.D	0.0235***	0.0191**	0.0185**	0,0117	0,0114	0,00967	0.0194**	0.0154*
Rgrowth		-3.697***	-3.612***		-2.333**	-2.235**	-3.643***	-2.350**
Expdec	-0,000552	0,166	0,0297	0,0116	0,142	0,0402	0,0141	0,0292
Revdec	-0,0863	-0.239**	-0.218**	-0.192**	-0.253**	-0.265***	-0.227***	-0.283***
Expdec* trsf		-0,168			-0,131			
Expcov	0.0308**	0.0372***	0.0406***	0.0359***	0.0411***	0.0397***	0.0402***	0.0465***
Ele	-0.201*	-0,0795	-0,0658	-0,0723	-0,107	-0,096	-0,0816	-0,103
L.infl	0,0034	-0,00538	-0,00458		0,00259	0,00312	-0,00428	0,00353
TO	-0,108	-0,327	-0,299	0,111	-0,0995	-0,0683	-0,316	-0,142
L.og	0,00922							
Revdec * tax			0,149	0,115		0.184*		
L.rgrowth				0,536				
Expdec * tax							0.146*	0.128*
Constant								
Observations	405	375	375	348	373	373	375	373
Number of panel	27	27	27	27	27	27	27	27
R-squared								

Notes: List of variables: see Tables 4 and 6 above. New variables added: totalrev = general government total revenues (% of GDP), taxburden = tax revenues of general government (% of GDP), Rgrowth = real growth rate of GDP, L.rgrowth = lagged real growth rate of GDP.
***, **, *: coefficients estimates statistically significant at the 1, 5 and 10% level, respectively.
Source: Commission services.

5. FISCAL RULES, DECENTRALISATION AND FISCAL OUTCOMES

This Section complements the analysis carried out so far by looking at the role of fiscal rules constraining the fiscal behaviour of subnational governments. Data used are the indexes of strictness of such rules computed by DG ECFIN based on information provided by the Member States.([25]) Essentially, the aim is to assess two aspects:

(1) Whether fiscal rules constraining the behaviour of subnational governments are used more frequently in highly decentralised countries and whether there is a tendency to adopt a specific type of rules (i.e. balanced budget vs. debt rules) at subnational level.([26]) As regards the first question, it is logical to expect that when subnational governments have more fiscal power on both the expenditure and revenue side central governments attempt to constrain their behaviour via fiscal rules.

(2) Whether the relationship between fiscal decentralisation and fiscal outcomes changes in presence of strict subnational fiscal rules so that rules act as a substitute to subnational financial responsibility/large reliance on taxes as a tool to increase fiscal discipline.

As regards question (1), Table 8 below, looks at whether different dimensions of fiscal decentralisation go together with stricter fiscal rules at subnational level.

([25]) http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/index_en.htm
([26]) As regards the second point, it is expected that balanced budget rules should be more frequently used than debt rules at subnational level as subnational governments are quite constrained in their possibility to issue debt anyway (e.g. due to lower access to capital markets).

The Table shows that subnational fiscal rules tend to be much stricter when expenditure decentralisation and own revenue decentralisation are high. As for the type of rules used, on average, balanced budget rules applying to subnational governments are much stricter when expenditure and own revenue decentralisation are high, as well as when the tax share in subnational revenues and the subnational financial responsibility([27]) are high, while they are looser when transfer dependency is higher. On the other hand, strictness of debt rules does not change significantly with expenditure decentralisation; however it is correlated with the other decentralisation indicators with opposite sign compared to balanced budget rules, i.e. debt rules are looser with high own revenue decentralisation, high expenditure coverage with own subnational revenues and high share of taxes in subnational revenues, whereas they are stricter when transfer dependency is lower.

Table 8: Strictness of fiscal rules applying to subnational governments, averages for observations with low and high values of different indicators of fiscal decentralisation (EU27 Member States, 1995-2010 period)

Expenditure decentralisation	Strictness fiscal rules – subnational gov.	Strictness debt rules – subnational gov.	Strictness balanced budget rules – subnational gov.
Low	1.9	1.2	0.6
High	4.9	1.1	2.4
Own revenues decentralisation			
Low	2.6	1.3	0.7
High	4.4	0.9	2.7
Subnational expenditure coverage by own subnational resources			
Low	3.5	1.6	1.0
High	3.2	0.8	1.9
% of taxes in subnational revenues			
Low	3.3	1.7	0.7
High	3.4	0.6	2.2
Transfer dependency			
Low	3.2	0.7	2.0
High	3.6	1.7	0.9

Source: Commission services.

Overall, fiscal rules applying to subnational governments are stricter in more fiscally decentralised countries, in line with expectations. With respect to the type of rules applying to subnational governments, balanced budget rules are stricter in countries with higher subnational financial responsibility and greater reliance on taxes compared to transfers, whereas debt rules are stricter in the opposite case.

This appears to disconfirm the substitutability story as far as balanced budget rules are concerned, i.e. they are not used to correct for weak subnational fiscal discipline in case of high transfers and vertical fiscal imbalances. On the other hand, the argument may be valid as far as debt rules are concerned. Moreover, this finding raises the hypothesis that the positive effect of financial responsibility and high taxes/low transfers on the fiscal balance found in Section 4 above may in reality be due to the more frequent use of balanced budget rules constraining subnational behaviour.

These hypotheses were tested through regression analysis (see Table 9). The above model with the primary balance as dependent variable was enriched by including the strictness of rules applying to subnational governments (column 1), its balanced budget rule and debt rule component (column 2 and 3, respectively). Further tests were carried out with interactive terms testing the joint impact of balanced budget rules and, respectively, expenditure decentralisation with high share of taxes in subnational revenues and the subnational

([27]) High expenditure coverage with own resources.

expenditure coverage by own resources (columns 4 and 5 respectively, to test whether the effect of the latter variables is in fact due to the fact that they tend to be accompanied by balanced budget rules), the joint impact of balanced budget rules and, respectively, expenditure decentralisation (column 6) and own revenue decentralisation (column 7) and the joint impact of debt rules and expenditure decentralisation with large share of transfers in subnational revenues (column 8, to test whether decentralisation with large transfers is less harmful for fiscal balance if accompanied by debt rules).

Overall, regression results suggest that strictness of fiscal rules in general and of balanced budget rules in particular applying to subnational governments do not affect the impact of fiscal decentralisation on the primary balance. Specifically, the positive impact of subnational financial responsibility and a large reliance on taxes compared to transfers does not appear to be due to their positive correlation with the presence of balanced budget rules applying to subnational governments, as all the corresponding interactive terms are insignificant. On the other hand, debt rules applying to subnational governments appear to have a positive effect on fiscal balance on their own (column 4) and to slightly counteract the negative budgetary effect of expenditure decentralisation accompanied by large transfers.([28])

Finally, in order to test if the positive effect of debt rules occurs via the expenditure side, two further tests were carried out by enriching the model for primary expenditures discussed in Section 4 above with the two terms capturing the impact of debt rules (see above). Results show that debt rules have a negative and significant effect on primary expenditures (column 9) and that they reduce the positive impact on expenditures of expenditure decentralisation accompanied by large transfers (column 10).

Table 9: Results of regressions on the effect of fiscal decentralisation and fiscal rules on primary balance and expenditures of the general government (EU27, 1995-2010, LSDVC estimator)

	1	2	3	4	5	6	7	8	9	10
VARIABLES	pb								primexp	
L.D	0.03**	0.0289**	0.0346***	0.0289**	0.0294**	0.0283**	0.0287**	0.0337***	-0.0234*	-0.0223*
L.og	-0.0691*	-0.0691*	-0.0750*	-0.0681*	-0.0667	-0.0702*	-0.0681	-0.0947**	0.174***	0.179***
Expdec	0.398***	0.400***	0.403***	0.397***	0.399***	0.402***	0.396***	1.232***	-0.782***	-0.790***
Revdec	-0.995***	-1.004***	-1.012***	-0.995***	-1.000***	-1.001***	-0.988***	-1.494***	0.936***	0.951***
Expdec * tax	0.292**	0.328**	0.311**	0.333**	0.315**	0.337**	0.327**			
Expcov	0.190***	0.187***	0.197***	0.186***	0.190***	0.186***	0.186***	0.176***	-0.0850***	-0.0850***
frilg	-0.0376									
fribbr		-0.137								
fridr			0.183*						-0.240**	
Expcov * fribbr					-0.00164					
Expdec * fribbr						-0.00403				
Expdec * trsf								-0.910***	0.662***	0.682***
Revdec * fribbr							-0.00565			
Expdec * trsf * fridr								0.0100*		-0.0130**
fridr										
Expdec * tax * fribbr				-0.0055						
fribbr										
Ele	-0.282	-0.286	-0.288	-0.299	-0.29	-0.296	-0.297	-0.288	0.0739	0.0553
L.infl	0.0358***								0.0358***	0.0354***
TO									-0.539	-0.625
Observations	405	405	405	405	405	405	405	405	401	401
Number of panel	27	27	27	27	27	27	27	27	27	27

Notes: List of variables: see Table 4 above, new variables added: Primexp = general government primary expenditures (% of GDP), L.infl = lagged inflation rate, TO = trade openness (% of exports plus imports in GDP), frilg = strictness of fiscal rules applying to Subnational Governments (SNG), fribbr = strictness of balanced budget rules applying to SNG, fridr = strictness of debt rules applying to SNG, Expcov * fribbr = coverage of subnational expenditures by own resources * strictness of balanced budget rules applying to SNG, Expdec * fribbr = expenditure decentralisation * strictness of balanced budget rules applying to SNG, Revdec * fribbr = own revenue decentralisation * strictness of balanced budget rules applying to SNG, Expdec * trsf * fridr = expenditure decentralisation*share of transfers in subnational revenues* strictness of debt rules applying to SNG, Expdec * tax * fribbr = expenditure decentralisation*share of taxes in subnational revenues* strictness of balanced budget rules applying to SNG. ***, **, *: coefficients estimates statistically significant at the 1, 5 and 10% level, respectively.

Source: Commission services.

([28]) See positive and significant coefficient of the corresponding interactive term in column 8.

Overall, the conclusion is that, while balanced budget rules do not change the relationship between decentralisation and fiscal outcomes, debt rules applying to subnational governments reduce the negative effect on the fiscal balance of a large weight of transfers in subnational revenues, and this effect occurs through the expenditure side.

6. CONCLUSIONS

Although it is highly challenging to summarise in a few lines all the analysis shown in this paper, a number of key points can be highlighted as regards the effect of fiscal decentralisation on general government fiscal outcomes.

(1) Expenditure decentralisation per se appears to be associated with better fiscal balances compared to cases of low decentralisation. This reflects a negative effect on expenditures whereas the effect on revenues is not significant according to regression analysis. This finding lends support to a few economic arguments proposed in the literature which underline that subnational governments should be more able to tailor public goods to subnational preferences and that competition and mutual learning among subnational governments should help them select more cost-effective techniques for the production of public goods. This should in turn lead to more efficient expenditure in more decentralised countries ceteris paribus with positive effects on the primary balance.

(2) The revenue side of decentralisation plays a key role in shaping the net effects of decentralisation on fiscal outcomes. Regression results suggest that expenditure decentralisation accompanied by low subnational financial responsibility to cover their expenditures with their own resources (i.e. taxes and fees) and by a large share of transfers from the central government in subnational revenues is likely to be overall detrimental for the fiscal balance. On the other hand, the budgetary effect of decentralisation is more favourable if it goes together with a large coverage of subnational expenditures by own resources and a large weight of taxes in total subnational revenues. This result reflects effects on both the expenditure and (albeit to a lesser extent) the revenue side.

This result confirms literature predictions which underline that if subnational governments largely depend on transfers from the central government they would be subject to a soft-budget constraint as they would take it for granted that possible excess spending from their part would be eventually covered by a 'bail-out' from the central government. On the other hand, if they can raise sufficient own resources to cover most of their expenditures and the weight of transfers is low the central government can more easily resist bail-out pressures. Moreover, in the latter case subnational policy-makers are more accountable to subnational voters as the link between subnational taxes paid and subnational public goods delivered is stronger which also exerts a disciplining effect on subnational governments fiscal behaviour.

(3) This conclusion is strengthened by the finding on the positive effect on the primary balance of 'effective' tax autonomy, i.e. of a large weight of taxes on which subnational governments can exert autonomy with respect to the rate and/or the base. This suggests that the positive effect of decentralisation on primary balance is improved not only if subnational tax revenues are high and transfers low but also if subnational governments can set those taxes autonomously.

(4) The most puzzling result concerns decentralisation of own revenue sources, i.e. a high share of tax revenues and fees assigned to subnational governments in total general

government revenues, which has an adverse effect on the primary balance, reflecting an increasing effect on expenditures and a decreasing one on revenues. On the one hand, this contradicts the idea that devolving relatively large own revenue sources to subnational governments is positive for fiscal discipline which would follow logically from the above mentioned arguments on the benefit of subnational revenue autonomy, responsibility, avoiding soft-budget constraints etc. Upon closer reflection, though, this variable is less suitable than those discussed in point 2 above to capture those aspects as it tells nothing on the size of own revenues relative to subnational expenditures and on the relative weight of transfers vs. taxes and fees in subnational revenues. This does not yet explain the fact that it has an adverse effect on the budget balance, though, rather than being simply insignificant.([29]) Further research would be advisable on this issue.

(5) Finally, divergences between stylised facts based on simple or conditional correlations and results of regression analysis, in particular with respect to the impact of expenditure decentralisation, subnational financial responsibility and the relative size of taxes vs. transfers on expenditures, highlight the need to simultaneously control for several features of fiscal decentralisation to disentangle their impact on the fiscal outcomes of the general government.

(6) As for the impact of rules constraining the fiscal behaviour of subnational governments; stricter debt rules appear to affect positively the primary balance via restraints on expenditures. Moreover, they partly alleviate the negative effect of expenditure decentralisation combined with a large share of transfers in subnational revenues, suggesting a partial substitutability between debt rules and subnational fiscal responsibility/large share of own resources as a tool to encourage fiscal discipline. On the other hand, the budgetary impact of fiscal decentralisation does not appear to be affected by stricter balanced budget rules applying to subnational governments.

Overall, it appears that fiscal decentralisation matters for fiscal outcomes and that the interplay between the expenditure and the revenue side of it is crucial to determine its net effect on fiscal balances. Overly pessimistic statements, often heard recently, on a generalised fiscal deterioration caused by increasing fiscal decentralisation across the EU do not seem to find support in the data. This may have occurred in some Member States, but probably not as a result of decentralisation *per se* but of a 'bad' design of decentralisation, i.e. one which does not ensure strong financial responsibility of subnational governments.

In methodological terms, the econometric analysis carried out in this paper draws on Escolano et al. (2012). However, several enrichments are introduced compared to this paper, such as testing the impact of subnational expenditure coverage by own resources, of effective subnational tax autonomy (as measured by the OECD Secretariat), of several interactions between different aspects of decentralisation (i.e. between expenditure and own revenue decentralisation, on the one hand, and the share of taxes and transfers, on the other hand; between effective tax autonomy, on the one hand, and expenditure decentralisation and expenditure coverage by own resources, on the other hand) and of the functional composition

([29]) Although an explanation could be that own revenue decentralisation may capture other effects than the devolvement of revenue sources to subnational governments, such as business cycle effects. An economic downturn would decrease general government revenues and so (if subnational revenues are kept constant) increase own revenue decentralisation via its denominator, even though no policy measure to increase decentralisation is enacted. At the same time this would also lead to a worse primary balance, being consistent with a negative sign of the revenue decentralisation coefficient in the regression.

of expenditure decentralisation. Furthermore, the paper extends the analysis of the impact of subnational fiscal rules by looking at the joint impact of expenditure decentralisation, share of transfers and rules, finding statistically significant results for debt rules as opposed to the above mentioned paper, and, finally, runs separate estimates on the impact of decentralisation on expenditures and revenues, in addition to those on the primary balance.

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