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Local Government Fiscal Regulation in the EU: The Impact of Balanced Budget Rules

Jochimsen, Beate; Raffer, Christian

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Abstract: In the past decades many European countries implemented numerical fiscal rules in order to strengthen fiscal discipline on all levels of government. This development was intensified by the financial crisis in 2008. Although plenty of research points to the discipline-enhancing effect of these rules on the national level, comparably little is known about their impact on local governments. This is even truer when it comes to the effect of specific rules like the so-called Balanced Budget Rule (BBR). With this contribution, we shed some light on the question if BBRs are an effective instrument to put local government budget balances on a sound footing. We estimate a dynamic fiscal reaction function within a LSDVC framework using a panel of 19 European countries over a period of 19 years (1997-2015). Although a potential endogeneity bias cannot be fully ruled out, the results suggest a discipline enhancing effect of BBRs over a range of different specifications. Other fiscal rules seem to be less important. Disentangling the effect of the mere existence of a BBR from its institutional implementation reveals that there is no significant effect for simply making a BBR part of an intergovernmental fiscal framework; what counts is its proper implementation in terms of characteristics like regulatory embeddedness, monitoring, enforcement, and media visibility.

1 Introduction

Numerical fiscal rules are at the center of the European debate about strengthening fiscal frameworks on the national as well as on the supranational level (Reuter 2017).¹ They are often applied by central governments to combat one of the ‘most formidable challenges facing multi-tiered systems of government: fiscal indiscipline among subnational governments’ (Rodden 2002: 670). Numerical fiscal rules shall constrain lower level governments’ fiscal policy in order to keep municipalities, counties, provinces, etc. on a sound financial path (Lledó and Pereira, 2015). In 2016 only 10.5 percent of all national fiscal rules in the EU were solely dedicated to the central government whereas 21 percent restricted the fiscal freedom of the local level (EC 2018). Adding up the 51 percent of all national fiscal rules referring to the general government, which also might have some distinct local government breakdowns, it is straightforward to conclude that local governments in the EU are already exposed to a dense web of numerical fiscal rules. In our descriptions we show that during the past two decades, numerical fiscal rules not only increased in numbers but also in institutional strength. The most common rule type on the local level by now is the Balanced Budget Rule (henceforth: BBR, see Figure 3).

Following the gain in importance of the topic, also research on fiscal rules becomes more diversified. Although there are plenty of publications on national fiscal regulation, local government fiscal rules are only slowly drawing the interest of the empiricists among public economics, finance, and administration scholars (Foremny 2014). Existing research is largely confined on theoretical analyses and qualitative case studies; empirical work mainly focuses on single countries (Kotia and Lledó 2016). This might be due to two reasons: Firstly, in terms of the public debt distribution within European multi-level governments the local government level is indeed of minor relevance (in terms of public investment this is quite the opposite). Secondly, due to the multitude of institutional arrangements within the European Union there is only limited consistent and comparable data on local fiscal rules (for a qualitative overview, see Geißler et al. 2019). The one exemption is the European Commission’s Fiscal Rules Strength Index (EC FRSI) which is provided also for the local level. Only recently some cross-country work on sub-national fiscal regulation entered the field (e.g. Kotia and Lledó 2016, Foremny 2014, Plekanov and Singh 2007). Whereas previous work has not disentangled the relevance of different rule types and focused instead on type-overarching drivers of fiscal discipline, our work concentrates on the importance of different types of existing numerical rules. Our special attention lies on the prevalent BBR. Moreover, and contrary to previous studies, we do not integrate local and regional governments to a summarizing ‘sub-national’ level but concentrate on local government budgets only.

In order to identify the potential impact of the BBR on local governments’

¹See the so-called Six-pack (EU regulation 1173/2011 to 1176/2011, EU directive 2011/85/EU), the Two-pack regulations (EU regulations 472/2013 and 473/2013) and also the Fiscal Compact (Treaty on Stability, Coordination and Governance in the Economic and Monetary Union)

budgetary discipline we estimate a dynamic fiscal reaction function in the tradition of Debrun et al. (2008). The fiscal reaction function is estimated for a sample of 20 EU members for a period of 19 years (1997-2015). We do that within a LSDVC framework with time and country fixed effects, which helps us to overcome the Nickel (1981) bias arising in dynamic models with small panels. This is in contrast to the work of Kotia and Lledó (2016) who implement a First Difference (FD) GMM model with the help of external instrumental variables drawn from the central government level and apply LSDVC only as robustness check. Since in our case the very instruments did not show the necessary correlation pattern with the dependent and independent variables of our model and, moreover, we have some doubts regarding the validity of these central level instruments, we refrain from putting an Arellano-Bond (1991) dynamic panel GMM estimator in the centre of our analysis. However, we add a preliminary FD GMM without external instruments as robustness check.

Our results show a robust positive relation of a BBR on local level and the respective primary balance. Although not being significant in most specifications, an interaction term of the BBR and a Vertical Fiscal Imbalance (VFI) variable indicates decreasing rule effectiveness at higher levels of transfer dependency. By estimating the fiscal reaction function in two specifications, first with the Fiscal Rules Strength Index for the BBR (BBR FRSI) and second with a BBR dummy we can show that the pure existence of a BBR does not improve the local primary balance what counts is the rules' institutional implementation. Other rules like the debt rule (DR) and the expenditure rule (ER) seem to have no influence on the local primary balance. The results are robust against different model specifications and estimation techniques. In sum, our findings indicate that a well-institutionalized BBR for local level governments can be a proper tool against the local government deficit bias.

In section 2 we provide a quick theoretical detour to the deficit bias and its origins which pave the way to the necessity of fiscal regulation; moreover we discuss existing literature. Section 3 provides some descriptives about the current state of local level fiscal regulation within the European Union. In section 4 and 5 we explain the data, the model and the estimation strategy before we discuss our results in section 6. Section 7 concludes.

2 Theory and Existing Literature

The theoretical background for fiscal rules is based on the theory of deficit bias of politicians and governments (Wyplosz, 2013).² It describes a government's adverse incentive to over-spend, under-tax, or excessively borrow and is on the local level usually associated with the presence of soft budget constraints (Kotia and Lledó 2016). A soft budget constraint comes up once a higher-level governments' promise not to step in and bail out becomes ineffective and consequently local level governments form bail out expectations (Kornay et al. 2003). Next

²For a detailed discussion of this and other potential theoretical approaches to numerical fiscal rules for local-level governments, see Plekhanov and Singh (2006).

to the soft budget constraint also interregional competition, unfinanced public services mandated by the central government, or short electoral cycles may play a role (Plekhanov and Singh 2006).

Although recently challenged by empirical work on the Netherlands (Allers 2015) and Sweden (Diedrichson and Ellegard 2015), the theoretical origins of the soft budget constraint are attributed to common pool problems and moral hazard (Kotia and Lledó 2016). Whereas moral hazard among politicians is assumed to appear in the expectation of a future bailout, common pool issues arise since local governments usually receive most of their resources as either conditional or unconditional transfer from the central government, hence from a common pool. This prevents them from fully internalizing the cost of their public expenditure and may lead to excesses in expenditure and borrowing (Hallerberg and von Hagen 1999). Consequently, large vertical transfers as indicator of high levels of common pool revenues on the sub-national level may soften the budget constraint. Von Hagen and Eichengreen (1996) were the first who identified the interrelatedness of high vertical transfers/low local revenue or local tax autonomy with bailout expectations. Effective numerical fiscal rules can build a dam to the deficit bias on the local level (Foremny 2014).

Following the definition of Kopits and Symansky (1998) a fiscal rule is a permanent constraint on fiscal policy, expressed in terms of a summary indicator of fiscal performance like the budget deficit, debt, etc. In its FRSI Database, the European Commission (EC 2010) broadly differentiates four types of numerical fiscal rules: Balanced Budget Rules, Debt Rules, Expenditure Rules, and Revenue Rules and aggregates several institutional features of these rules on all government levels to one country index, the FRSI. The two most recent empirical publications being closest to our work use the FRSI (or reformulations of it) for sub-national, i.e. regional and local, governments to estimate its impact on fiscal discipline. Kotia and Lledó (2016) show a discipline-enhancing effect of sub-national fiscal rules which becomes weaker at high levels of VFIs: the more sub-national governments are reliant on transfers from higher-level governments, the more the disciplining effect of numerical fiscal rules vanishes.

Close to these results are the findings of Foremny (2014) who shows that fiscal rules decrease deficits only in unitary countries. Due to higher legal autonomy of local and regional governments in federal countries, a rule-based framework is not supposed to help here. Instead, Foremny sees higher tax autonomy as effective measure against large deficits at the sub-national level. For his analysis, he constructs his own FRSI by aggregating the EC's index values for all sub-national fiscal rules which can have an impact on the budget balance.

Rodden (2002) investigates a dataset of 43 OECD developing and developed countries over a period of ten years (1986-1996). He applies the FD GMM Arellano and Bond (1991) estimator like Kotia and Lledó (2016), however with lagged explanatory variables and the dependent variable as instruments. He finds that long-term balanced budgets among sub-national governments occur when the central government imposes certain borrowing restrictions or when sub-national governments have both far-going tax- and borrowing autonomy. Furthermore, Rodden provides empirical evidence for the negative impact of

large VFIs on the budget balance. One limitation of Rodden is the lack of a consistent indicator for fiscal rules. His borrowing autonomy indicator itself is a fitted value of a regression based on theoretical assumptions.

Using a sample of 44 countries for a period of 1982-2000, Plekhanov and Singh (2006) investigate which specific institutional design of borrowing constraints prevents large sub-national deficits. According to their findings, there is no specific framework but rather other characteristics of the multi-level fiscal relations like the existence of bailouts, the degree of VFIs, the existence of a bailout history and the quality of fiscal reporting. Plekhanov and Singh's classification of fiscal rules is based on dummies indicating the way of implementation (self-imposed, centrally imposed, etc.). With a broader focus Hopland and Nyhus show for Norwegian municipalities, that being within a structured recovery procedure after having broken a BBR does not drive down their productive efficiency (Hopland and Nyhus 2015). In addition, Hopland (2013) provides evidence for cost reductions in this situation (Hopland 2013).

Although focusing on the question of institutional implementation, all empirical contributions discussed so far do not differentiate rule types.³ Our work differs from Foremny (2014) and Kotia and Lledó (2016) by refraining from any higher aggregation of the complex FRSI values. Foremny, Plekhanov and Singh, and Rodden operate with the rather broad notion of borrowing restrictions or regimes. Sticking with the FRSI for specific rule types on the local (and not the sub-national) level allows us to isolate the effect of BBR, DR, and ER (revenue rules are not existent on the European local level) for the local level.

3 Local Government Fiscal Rules in the EU

Within the European Union, the local government level is exposed to a dense web of numerical fiscal rules. Following the EC FRSI, in 2016 21.9 percent of all existing rules refer to the local level (see Figure 1), only 7.9 percent to the regional level and 10.5 percent to the central level. In addition, 50.9 percent regulate the general government with potential local level breakdowns. However, well-defined local government numerical rules stemming from general government rules are somewhat seldom. In 2016, the by far most important rule type on the local level was the BBR, followed by DRs and ERs. As mentioned above, revenue rules were not in place.

Over time, the number of fiscal rules on the local level is clearly increasing (Figure 2). This indicates the gain in importance which fiscal rules as a tool against the deficit bias experience. In our sample of 19 member states the number of numerical fiscal rules increased from 6 in 1995 to 26 in 2015. While the number of BBRs more than tripled, the number of DRs increased more than

³Earlier empirical publications of von Hagen and Eichengreen (1996), Fornasari, Webb, and Zou (2000), and Jin and Zou (2002) use dummies for the presence of controls and therefore do not account for variation over time (Plekhanov and Singh 2006). The studies of Hagen (2006), Debrun et al. (2008), Hallerberg et al. (2007/2009), or Reuter (2017) focus on the central or general government. Rodden et al. (2003) provide a collection of case studies.

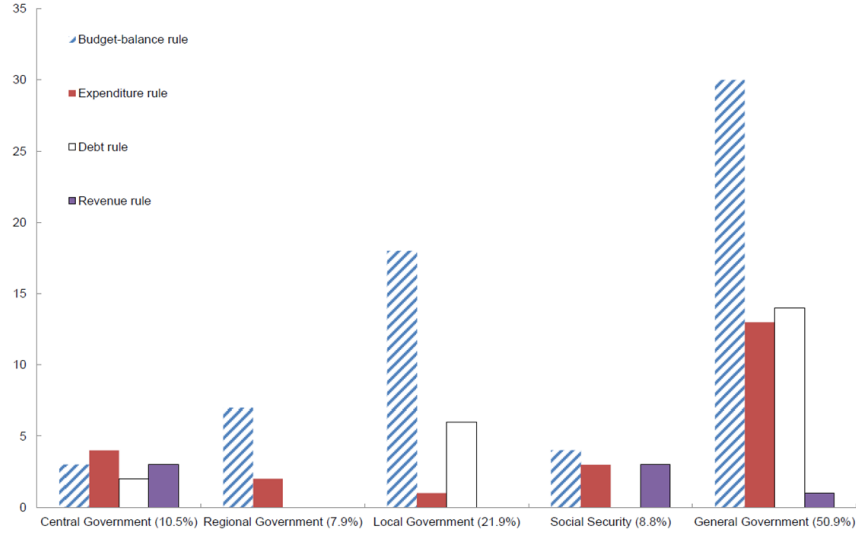


Figure 1: Number of numerical fiscal rules in European Union member countries in the year 2016 (Source: EC 2018).

fourfold (albeit starting from a lower level). Although the number of ERs on the local level also increased, it remained on a fairly moderate level. As can be clearly seen revenue rules do not exist on local level.

For the general and the sub-national level, previous research has shown that it is not the simple existence of numerical fiscal rules which counts but its institutional implementation. The latter is mirrored by the EC FRSI database for all EU member countries. The EC FRSI is a highly aggregated indicator on the characteristics of fiscal rules (EC 2018). It is a composite index based on five criteria of institutional implementation. These are (1) the statutory base of the rule (constitution, legal act, coalition agreement, political commitment), (2) the room for setting or revising objectives, (3) the nature of the body in charge of monitoring respect and enforcement of the rule, (4) enforcement mechanisms (ranging from automatic correction and sanction down to absence of ex-ante defined actions), and (5) media visibility of the rule. The composite FRSI is calculated for each existing rule by aggregating assigned scores for each criteria (ranging from 1 to 3 or 4) with a random weights technique. A rule-overarching FRSI for each country is gained by aggregating the rule-specific index values country wise. In our work, we concentrate on the FRSI for single rules applicable on local level, not on the rule-overarching FRSI. The maximum value assigned to a numerical fiscal rule within the EC FRSI database over all government levels between 1990 and 2015 was 10, indicating the maximum of institutional implementation concerning the above-mentioned criteria, the minimum was 3.3. However, the variable used in our estimation only covers the local level (here, the sample maximum over the entire period of analysis is 9.43 and the minimum

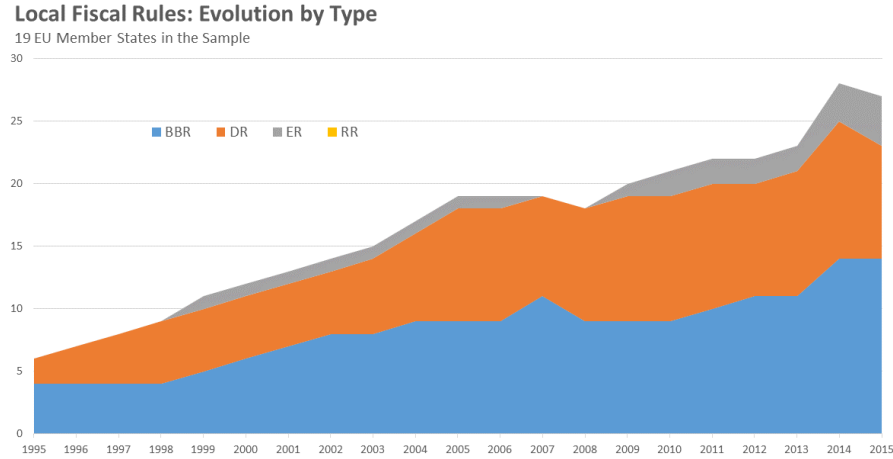


Figure 2: Development of the number of different fiscal rules over time (1995-2015) for all 19 sample countries. For the EU28 see Annex. (Own graph, Data Source: European Commission Fiscal Rules Strength Index.)

5.15).

The average rule strengths of the BBR and the DR imposed on local level governments show some variation within the period of our analysis (1997-2015). We refrain from integrating the expenditure rule in Figure 3 because there is no ER over the entire period of analysis (see Figure 2). Whereas the sample average rule strength for local government BBRs (BBR FRSI) varies around a level of 7 and followed a decreasing path until 2006, it is increasing thereafter. This development indicates a relation to the global financial crisis starting in 2007. That is: after the onset of the crisis, most central governments, which already had imposed a BBR on their local governments improved on institutional implementation while most of the newly implemented BBRs after 2006 showed above-average strength. The average rule strength for debt rules (DR FRSI) shows an increasing tendency throughout the whole period of interest, even overtaking the strength level of the BBR in 2015. Similar to the BBR FRSI development, also the DR FRSI shows its strongest increases after the years 2010/11. This may be seen as indication that post-crisis EU fiscal regulation like the Six Pack of 2011 was channelled down to local governments.

The impact of the vertical fiscal imbalances (VFI) on the primary balance of the local level can be regarded as stylized fact within the field of multilevel fiscal relations saying that rising VFIs are associated with a deteriorating primary balance. Von Hagen and Eichengreen (1996) show that fiscal restrictions are indeed most often found in countries with high levels of VFIs. Following Kotia and Lledó (2016) and Eyraud and Lusinyan (2013) we calculate the national

Development of Local Government Rule Strength

Sample: 19 EU Members, 1997-2015

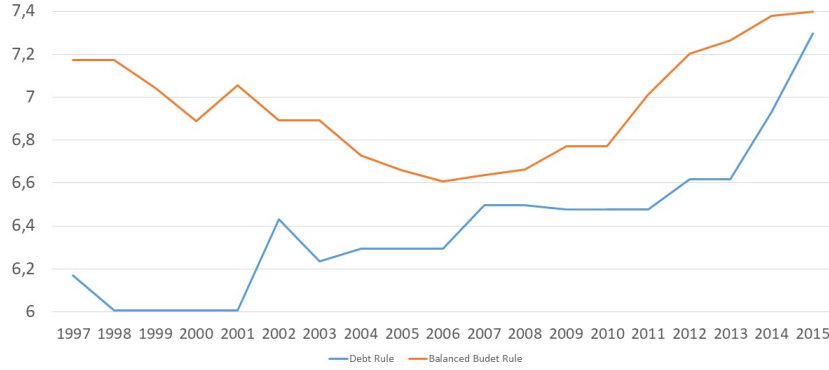


Figure 3: Own graph. Data Source: European Commission Fiscal Rules Strength Index.

VFI_{it} for our sample as share of subnational spending not financed through own revenues:

$$VFI_{it} = 1 - \frac{OwnRevenue_{it}}{OwnSpending_{it}} \quad (1)$$

Whereas own revenue corresponds to total local level revenues minus transfers received from higher level governments, own spending is total local level expenditure minus transfers paid to higher level governments. As Figure 4 shows, the median VFI development after the fiscal crisis is clearly associated with increasing primary deficits on the local level. This finding is broadly in line with Kotia and Lledó (2016). In recent years, intergovernmental fiscal frameworks are characterized by an asymmetric development of expenditure and revenue decentralization leading to an increase in VFIs (Bloechliger and Vammalle, 2012). This development indicates the necessity to control for VFIs in any fiscal reaction function which aims at isolating the effect of fiscal rule strength.

Figures 5 and 6 depict the country-wise development of the main dependent variable, the BBR FRSI, and the independent variable, the national local level primary balances. As can be seen in figure 5, there is a set of countries (Czech Republic, Denmark, UK, Estonia, Greece, Hungary and Slovenia) in which the EC FRSI does not report a distinct BBR for the local level. That, however, does not mean that there is no general government BBR with a local level breakdown. Since it does not become entirely clear from the EC FRSI database

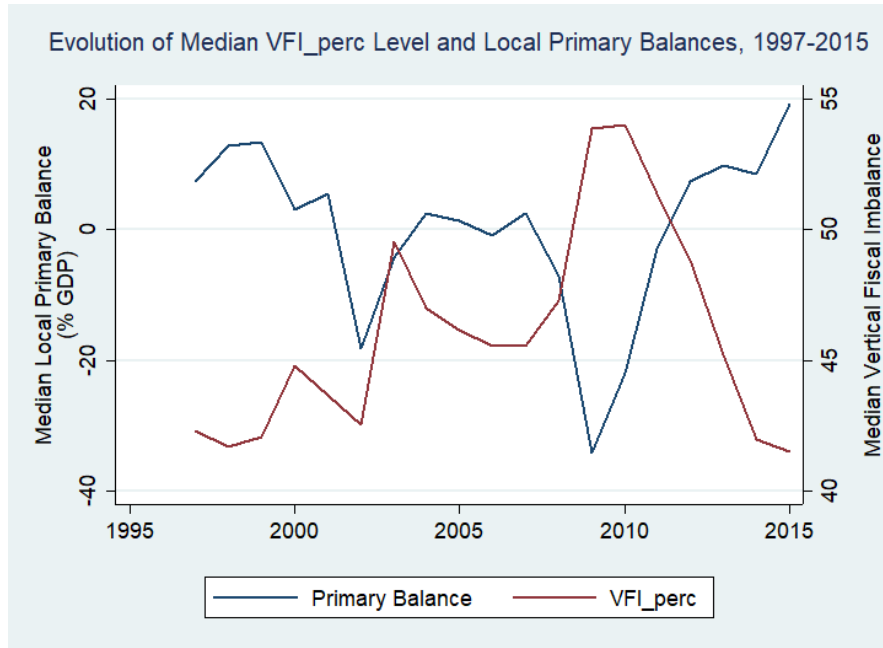


Figure 4: Own graph. Data Sources: Eurostat Government Finance Statistics and OECD Fiscal Decentralization Database.

in which cases a general government BBR comprises a distinct numerical rule for local governments we do not consider general government numerical rules in our analysis. This prevents us from misinterpreting a general government rule whenever there is no distinct local level breakdown.⁴

⁴In the Netherlands, for example, there is a general government BBR (the so called ‘EMU deficit ceiling’) which has only very limited impact on local governments’ decision making.



Figure 5: Development of the balanced budget rule strength over time (1997-2015) by sample countries (own graph. Data Source: European Commission Fiscal Rules Strength Index.)



Figure 6: Development of the primary balance (1997-2015) by sample countries (own graph. Data Source: Eurostat Government Finance Database.)

4 Testable Hypotheses, Empirical Model, Data

On the basis of the existing literature it is possible to formulate five distinct research hypotheses which may be tested with the fiscal reaction function presented below. They are as follows:

- **H 1:** The strength of fiscal rules on the local level has a mitigating effect on primary deficits, that is: it improves local governments' fiscal discipline.
- **H 2:** Due to its direct connection to the primary balance, the BBR is the most important numerical rule for a sound primary balance.
- **H 3:** It is not the primitive existence of a numerical fiscal rule but its institutional implementation which drives the discipline-enhancing effect on local governments.
- **H 4:** High VFIs deteriorate the fiscal discipline on the local level.
- **H 5:** The impact of local level numerical fiscal rules decreases with increasing VFIs.

For the empirical analysis of these hypotheses we estimate a dynamic fiscal reaction function in the tradition of Bohn (1998), Debrun et al. (2008), Kotia and Lledó (2016), and others. Debrun et al. (2008) point out that the most natural way to assess the impact of numerical rules on fiscal discipline is to implement the respective fiscal rule into a fiscal reaction function - which basically is a model of fiscal behavior - and check whether the estimated coefficient is meaningful and significant. In this spirit, we framed the following baseline model:

$$y_{it} = \alpha + \beta_1 y_{it-1} + \beta_2 bbr_{it} + \beta_3 vfi_{it} + \beta_4 bbr_{it} * v_{it} + \gamma X_{it} + \eta_i + \rho_t + \epsilon_{it} \quad (2)$$

$$i = 1, \dots, N; t = 1, \dots, T$$

The model describes the response of the sum of the local level primary balances y of country i in year t as percent of GDP to its own one period lagged values y_{it-1} which accounts for the persistent behavior of the primary balance (Kotia and Lledó 2016). Furthermore, our independent variables are strength levels of balanced budget rules (BBR FRSI), bbr_{it} , the level of vertical fiscal imbalances (VFI), vfi_{it} , an interaction term of the latter two, and a vector X_{it} of control variables. This vector comprises fiscal rule strength indicators for further numerical rules (debt, DR, and expenditure, ER), the output gap accounting for cyclical fluctuations and the share of population older than 65 which proxies the local governments' spending needs.⁵ Although the lagged

⁵Data stems from the European Commission's Fiscal Rule Database, Eurostat and the OECD Fiscal Decentralization Database. For summary statistics of all employed variables, see Appendix.

dependent variable y_{it-1} may not add much to the analysis of our hypotheses it may be important for consistently estimating other parameters of interest (Bond, 2002).

The country fixed effects η_i account for unobserved time-invariant characteristics of the country which may impact on the local primary balance and the time fixed effects ρ_t cover unobserved macro-developments like common shocks affecting all countries simultaneously. A prominent example for the latter is the global financial crisis. Accounting for fixed effects in the dynamic fiscal reaction function may push the estimates closer to a causal interpretation.

In order to assess the robustness of the results, we manipulate the baseline specification (2) in several ways. First, we add an interaction term. Secondly, we drop the two additional fiscal rules (DR and EP), and thirdly we gradually add a set of further control variables. This set comprises commonly used political indicators: the Herfindahl Index to account for political fragmentation and an ideology indicator, both for the central level, as well as an election dummy for the national elections and a measurement for expenditure decentralization, which is the share of local level expenditure in general government expenditure.⁶ Kotia and Lledó (2016) use the Herfindahl index and the election dummy in a similar empirical setting as external instruments in a FD GMM specification for the sub-central government. In our setting the correlation structure of these two policy variables with the independent and the dependent variables as well as the error term does limit their applicability as instruments. Hence, we add them as additional controls to the baseline LSDVC model in order to evaluate if and how the estimates of interest react.

In order to disentangle the effect of institutional implementation of a BBR from its mere existence on the local level we estimate the LSDVC baseline model by applying two different notions of the variable bbr_{it} :

$$bbr_{it} = \begin{cases} bbr_{it,FRSI} = FRSI \\ bbr_{it,dummy} = 0/1 \end{cases}$$

Whereas $bbr_{it,FRSI}$ is the rule type specific BBR FRSI as explained in the previous section, $bbr_{it,dummy}$ is a dummy variable which takes on the value 1 if there is a BBR in a given year and 0 otherwise. Hence, the latter only displays unit values of existence and ignores variation over time. Consequently, the coefficient of this dummy measures the impact of the pure existence of a BBR irrespective of rule strength variation within and between countries.

With regards to our testable hypotheses, **H1** hinges on significant β_2 and $\gamma_{1/2}$ coefficients of the respective numeric fiscal rule in equation (2). **H2** can be tested by comparing the strength and significance of these three coefficients.

⁶Expenditure decentralization is based on data from Eurostat Government Finance Statistics and the political economy variables come from the Database of Political Institutions, provided by the Inter-American Development Bank.

H3 is testable by comparing the β_2 coefficient of the baseline model with the β_2 coefficient for the additional specification with $bbr_{it,dummy}$ instead of the $bbr_{it,FRSI}$. **H4** is linked to the coefficient of the VFI variable, β_3 , and **H5** to the coefficient β_4 of the interaction term once this term has been added.

Our fully balanced panel dataset comprises yearly data for 19 countries⁷ and a period from 1997 to 2015; consequently it includes seven post-crisis years. This is similar to Kotia and Lledó (2016) whose dataset covers a period until 2012. However, having a dataset with three more post-crisis years is a specific advantage since it can be reasonably assumed that new, crisis-induced regulation initiated for example by the EU Fiscal Compact of 2012 took some years to find its way into local level regulation within the member states. The most important data sources for this study are the European Commission’s Fiscal Rule Strength dataset and the Eurostat government finance statistics.

5 Estimation Strategy

For the estimation of the fiscal reaction function (2) we estimate our model with the bias-corrected Least Squares Dummy Variable (LSDVC) approach similar to Kotia and Lledó (2016). We refrain from estimating a dynamic FE regression with country- and time-fixed effects since this method suffers from inconsistent estimators in the case of a dynamic modelling and small to modest panel size (small N/small T). Nickel (1981) showed that the least-squares dummy variable (LSDV) estimator is not consistent for finite T in autoregressive panel-data models (Bruno 2005). In order to overcome the small sample bias and the inconsistency introduced by the lagged dependent variable we make use of Nickel’s bias correction for the LSDV estimator. The best results in terms of initializing bias correction at a rate of $O(1/T)$ came from the Arellano and Bond (1991) estimator. For inference, we used a bootstrap with 1000 repetitions in order to estimate the variance-covariance matrix.

Although being able to rule out the bias resulting from the dynamic nature of equation 2 as well as the small panel we still have to tackle the issue of endogeneity of our fiscal rules indicator, which might suffer from reversed causality arising whenever high local level primary deficits incentivized a sample-country to strengthen fiscal rules. Simultaneity bias may be another source of endogeneity. This issue is at least partly alleviated since most countries chose sub-national borrowing controls before the period under consideration and therefore the local level primary balance could not directly affect the choice (Plekhanov and Singh 2006). However, current average subnational fiscal balances tend to correlate with past averages. Only few empirical studies (e.g., Kotia and Lledó 2016 and Foremny 2014) address this issue by applying instrumental variable estimation. Kotia and Lledó make use of external instruments drawn from the central gov-

⁷The sample countries are Austria, Belgium, Czech Republic, Denmark, UK, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden. We neglect small EU member States as well as those, which joined the Union after 2005.

ernment level. They assume in accordance with Foremny (2014) that since in Europe the decision for local level fiscal rules are taken at the central government level, political characteristics at the national level may be used to proxy the centre’s fiscal attitudes towards general government fiscal discipline (Kotia and Lledó 2016). Because they consider it reasonable to believe that the central governments’ fiscal attitudes are correlated to rule strength but not to the local government primary balance or its unexplained residual, Kotia and Lledó employ the Herfindahl Index and an election dummy as external instruments for a FD GMM.

In our work we do not use these political variables as external instruments for two reasons: First, we have certain doubts concerning their validity and, second, they do not reveal the necessary correlation structure with our y_{it} , the bbr_{it} and the ϵ_{it} of our model (equation 2). Whereas the second reason is a straightforward empirical issue that makes these external instruments simply un-applicable, their non-correlation with our model variables also doesn’t come as a surprise. From our perspective, it is an open question why an election dummy for national elections and a variable of central parliament fractionalization should express the central parliament’s attitudes towards fiscal discipline and therefore could have an effect on local level rule strength but not on the local level primary balance. At the contrary, as Plekhanov and Singh (2006) point out, Rhodden (2002) provided empirical support for a relation of political cohesion of the national government (as proxied by, e.g., the Herfindahl index) and sub-national fiscal outcomes. Johannsson (2003) showed with Swedish municipal data that federal grants can be used as tactical instruments in a national election campaign, which makes a corresponding election dummy potentially correlated to sub-national revenues and consequently to all downstream fiscal indicators like the primary balance. Both results weaken the validity of these variables as external instruments in a FD GMM.

In order to deal with the endogeneity problem in our fiscal reaction function we estimate a typical Arellano-Bond (1991) FD GMM as robustness check and use lags of the dependent and independent variables as instruments. Higher-order lags of the BBR variable instrument the BBR and therefore may account for reversed causality that appears whenever a high local level primary balance incentivizes the central government to impose stricter fiscal rules for local level jurisdictions (similar to Plekhanov and Singh 2006). To avoid over-fitting we restrict the lag order to the 3-5 lags only and use the collapse option of David Roodman’s (2009) Stata `xtabond2` routine, this keeps the number of instruments relatively low.

6 Results

The LSDVC estimations of our baseline model (see models 1-4 in Table 1) yields significant estimates for the BBR FRSI, the VFI, and the output gap with the local level primary balance as dependent variable. In our hypothesis one (**H1**) we claimed that higher fiscal rule strength for the different existing rule types

has a mitigating effect on the aggregate local government primary balance. As the results of model 1 (and 3) show, this can only be claimed for the BBR which has a positive and significant coefficient meaning that a higher BBR FRSI is related to an increasing primary balance (e.g. increasing surplus or decreasing deficit). Neither the DR nor the ER show significant coefficients. This brings us to our first central finding: for the local governments in our sample of 19 EU member countries it seems to be the BBR that correlates with fiscal discipline and not so much other types of rules. This might furthermore indicate that the results of those empirical studies applying a FRSI aggregation of different rule types also may be driven by the BBR only. The general finding also supports our hypothesis 2 (**H2**) stating that the BBR is more important for a sound primary balance than numerical debt or expenditure rules. The reason for that is the direct link of the BBR to the primary balance; compared to that debt regulation has only an indirect impact and expenditure regulation is hardly applied within our sample.

In hypothesis three (**H3**) we state that it is the institutional implementation of a rule and not its pure existence in intergovernmental fiscal relations which drives the effect. By comparing the β_2 of models 1-4 in which the BBR reflects the coefficient of the EC FRSI for the balanced budget rule for local governments with the β_2 of models 5-8 with the coefficient for a BBR dummy (see Table 2) it becomes rather obvious that it is the institutional implementation of a rule that counts. The non-significant BBR coefficients in models 5-8 provide evidence that it is not sufficient to have a not-enforced rule. This result is fully in line with previous findings and sheds some light on BBRs which are part of the national regulatory system but not linked to monitoring and sanctioning mechanisms (Kopits and Symansky 1998).

Hypotheses 4 and 5 (**H4** and **H5**) take the VFI into account. Referring to a vast empirical literature on the impact of VFI on local or sub-national fiscal discipline we state that high VFIs not only deteriorate the budget outcomes of local governments but also weaken the impact of numerical fiscal rules. The respective estimates of models 1-4 strengthen the fourth hypothesis but cannot explain the fifth. The coefficient of the VFI variable is negative and significant, meaning that higher VFI and therefore transfer dependency of local governments are significantly linked to a lower primary balance. The theoretical reasoning behind that is the deficit bias due to common pool and moral hazard problems. The coefficient of the interaction term ($BBR_{FRSI} * VFI$) however is insignificant.

The results for the hypotheses 1 to 4 are robust over a broad set of different specifications. In the models 9 to 12 (Appendix) we stepwisely add the central level policy variables (the Herfindahl Index (HHI) for political fragmentation, election years and ideology of the central government) as well as a variable for expenditure decentralization to the baseline model and end up with rather similar results. Only the coefficient of election years is significant. Its negative sign means that the primary balance is lower in election years, i.e. in election years we observe a decreasing surplus or an increasing deficit. This is well in line with theoretical predictions (opportunistic business cycles) or empirical research as incumbent politicians tend to show their competence in election

Table 1: LSDVC: Estimates with FRSI

Dep. Var. Pim. Bal./GDP	(1)	(2)	(3)	(4)
Y_{t-1}	0.520*** (0.05)	0.522*** (0.049)	0.518*** (0.05)	0.519*** (0.05)
BBR_{FRSI}	0.018* (0.011)	0.014 (0.010)	0.047** (0.023)	0.041* (0.022)
DR	-0.013 (0.011)		-0.014 (0.011)	
ER	-0.013 (0.015)		-0.012 (0.015)	
VFI	-0.008*** (0.002)	-0.008*** (0.002)	-0.006** (0.003)	-0.007*** (0.003)
$BBR_{FRSI} * VFI$			-0.0006 (0.0005)	-0.0006 (0.0004)
Output Gap	-0.015** (0.008)	-0.016** (0.008)	-0.014* (0.008)	-0.015** (0.008)
Pop. over 65	0.014 (0.036)	0.007 (0.035)	0.019 (0.036)	0.012 (0.035)
Obs.	361	361	361	361

Variance-covariance matrix and inference based on bootstrap (1000 rep.).

Correction of the bias is at the rate $O(1/T)$. For bias correction initialization was conducted by the Arellano Bond (1991) First Difference GMM estimator.

Standard errors in parantheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

years by benefiting their electorate with additional expenditure programs (see e.g. Persson and Tabellini 1997, Jochimsen and Nuscheler (2011)).

In order to prove the robustness of these results and, what might be even more important, to get a more precise understanding of the endogeneity that may bias our LSDVC results we additionally estimated the baseline with interaction term specification with a FD GMM. Results are displayed in Table 5 in the Annex. The estimates support our central findings. In this alternative estimation the coefficients increase considerably in size; the significance of the BBR_{FRSI} and the output gap remain. Now also the interaction term $BBR_{FRSI} * VFI$ is significant at the 5-percent level what strengthens the support of Hypothesis 5. However, although we cannot dismiss the null hypothesis

Table 2: LSDVC: Estimates with rule existence dummy

Dep. Var. Pim. Bal./GDP	(5)	(6)	(7)	(8)
Y_{t-1}	0.514*** (0.05)	0.52*** (0.05)	0.513*** (0.051)	0.520*** (0.05)
BBR_{dummy}	0.102 (0.073)	0.069 (0.071)	0.148 (0.142)	0.127 (0.137)
DR	-0.106 (0.074)		-0.106 (0.075)	
ER	-0.096 (0.103)		-0.089 (0.105)	
VFI	-0.008*** (0.002)	-0.008*** (0.002)	-0.007*** (0.003)	-0.008*** (0.003)
$BBR_{dummy} * VFI$			-0.0002 (0.0004)	-0.0002 (0.0004)
Output Gap	-0.015* (0.008)	-0.016** (0.008)	-0.015* (0.008)	-0.016** (0.008)
Pop. over 65	0.015 (0.036)	0.006 (0.035)	0.017 (0.036)	0.009 (0.035)
Obs.	361	361	361	361

Variance-covariance matrix and inference based on bootstrap (1000 rep.).

Correction of the bias is at the rate $O(1/T)$. For bias correction initialization was conducted by the Arellano Bond (1991) First Difference GMM estimator.

Standard errors in parantheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

of the Sargan Test (validity of instruments) at the 5-percent level, the p-value is still relatively low. In addition, these results are not overly robust against changing the lag structure of the instruments. Hence, the FD GMM results need to be interpreted with caution.

Although our results are - overall - robust over different specifications and estimation techniques limitations remain. First and foremost, our approach to rule out endogeneity resulting from simultaneity bias and/or reversed causality does not rely on external instruments and the alternatively used internal instruments bear the risk of low validity. However, since our central findings are in line with previous results we believe that this shortcoming is of minor relevance. Kotia and Lledó (2016) show that removing this bias increases the estimates of

fiscal rule strength and so does our FD GMM approach. Hence, we assume our central LSDVC results being more under than of over-estimated.

7 Conclusion

Based on the idea of reducing the deficit bias of sub-national governments numerical fiscal rules are usually imposed by the central government. They often constrain municipal, county- and/or provincial fiscal policy by defining a summary indicator of fiscal performance plus target values like a balanced budget for the primary balance. Although these rules have become increasingly popular in the past decades there is still not much cross-country empirical literature trying to isolate the effect of those rules on sub-national fiscal discipline. Whereas previous publications in this field operated with a rule-overarching notion of strength for sub-national governments, we add the perspective of distinct rule types for local level governments. We do not consider regional governments within federations.

We estimate a dynamic fiscal reaction function with a LSDVC framework and find a robust and positive coefficient for the balanced budget rule strength with the local level primary balance as dependent variable. Coefficients for other rule types (debt rule and expenditure rule) remain insignificant. This leads us to the assumption that in terms of fostering fiscal discipline on the local level the balanced budget rule is most important. By comparing fiscal rule strength in terms of implementation with the pure existence of a balanced budget rule, we find - in line with the literature - that it is not enough to implement it in intergovernmental fiscal relations. Instead, strong enforcement mechanisms are necessary for its success. In addition, we find that a rising share of higher-level transfers to local governments (as measured by the vertical fiscal imbalance) is significantly linked to deteriorating local budget balances. Put differently, a higher level of vertical fiscal imbalances leads to a decreasing effectiveness of numerical fiscal rules on local level. The main results of our analysis are supported by an alternative FD GMM estimation of our baseline specification which deals with the risk of endogeneity. We cannot completely rule out endogeneity due to reversed causality. Hence, more work in this direction is necessary. In addition, one could think of differentiating between unitary and federal states or to account for national bailout histories and resulting expectations.

The findings are in line with previous results. Thus, our major contributions are, first, the central relevance of the balanced budget rule compared to other rules, second, the importance of a proper implementation of this rule, and third, the narrow focus on local governments only. Looking at these new core results the following policy recommendations might be drawn. If governments want to strengthen fiscal discipline they should not only focus on national or regional level but on local level, too. As the balanced budget rule seems to be superior to other fiscal rules in supporting fiscal discipline it should be implemented with higher priority. However, for its success the kind of implementation is

crucial. Special attention has to be dedicated to its regulatory embeddedness, monitoring, enforcement as well as visibility in the public.

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9 Annex

Table 3: Descriptive statistics

	Obs.	Mean	Std. Dev.	Min	Max
Primary Balance (percentage of GDP)	361	-0.004	0.373	-1.305	2.553
BBR_{FRSI}	361	3.336	3.549	0	9.43
DR	361	1.816	2.941	0	8.18
ER	361	0.451	1.740	0	8.55
Vertical Fiscal Imbalance	361	46.381	16.305	-2.023	79.139
Output Gap	361	-0.375	2.919	-15.81	6.992
Population older than 65	361	16.135	2.435	10.569	22.363
Herfindal Index	361	0.295	0.101	0.097	0.504
Election Dummy	361	0.272	0.445	0	1
Ideology	361	1.956	1.026	0	3
Expenditure Decentralization	361	25.015	13.377	5.116	65.29

Provided numbers represent 19 countries for the period 1997-2015. Note that not in each year a fiscal rule type was implemented in each country.

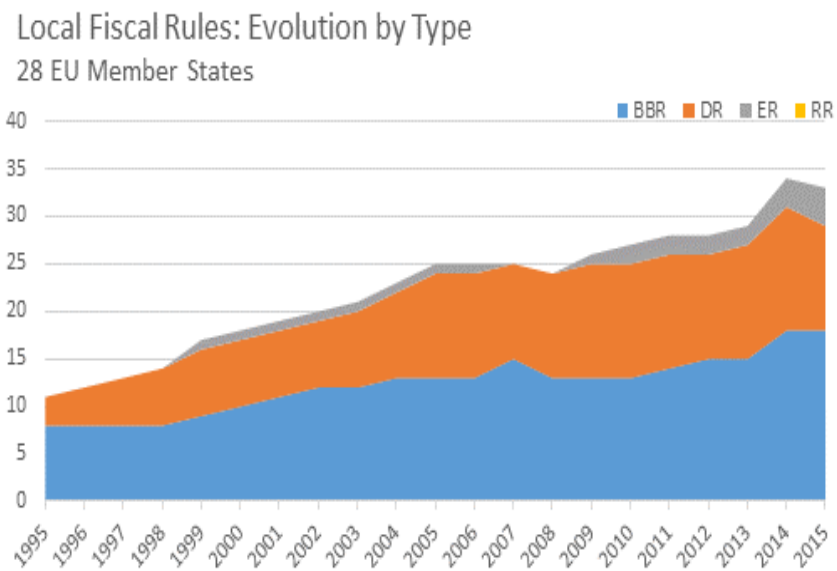


Figure 7: Number of numerical fiscal rules in European Union member countries in the year 2016 (Source: EC 2018).

Table 4: LSDVC Estimates - Robustness Checks

DepVar: Primary Balance/GDP	(9)	(10)	(11)	(12)
Y_{t-1}	0.52*** (0.049)	0.521*** (0.05)	0.524*** (0.049)	0.522*** (0.05)
BBR_{FRSI}	0.022** (0.011)	0.022** (0.011)	0.022** (0.011)	0.022** (0.011)
DR	-0.016 (0.012)	-0.016 (0.012)	-0.016 (0.012)	-0.016 (0.012)
ER	-0.014 (0.015)	-0.012 (0.016)	-0.014 (0.016)	-0.013 (0.016)
VFI	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.010*** (0.003)
Output Gap	-0.015* (0.008)	-0.015* (0.008)	-0.015* (0.008)	-0.016* (0.008)
Population over 65	0.004 (0.036)	0.006 (0.037)	0.007 (0.037)	0.007 (0.038)
Expend. Dec.	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)
HHI		0.17 (0.402)	0.174 (0.401)	0.177 (0.404)
Election			-0.059* (0.034)	-0.058* (0.033)
Ideology				-0.004 (0.018)
Number of Observations	361	361	361	361

Variance-covariance matrix for estimates and inference is based on bootstrap (1000 repetitions).

The correction of the bias is at the rate $O(1/T)$. For bias correction the initialization was conducted by the Arellano Bond (1991) First Difference GMM estimator.

Standard errors in parantheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Difference-GMM Results as Robustness Check

	(1) Primary Balance
Y_{t-1}	0.34* (0.217)
BBR_{FRSI}	0.181** (0.091)
VFI	-0.015 (0.012)
$BBR_{FRSI} * VFI$	-0.004** (-0.002)
Output Gap	-0.043* (0.024)
Population over 65	0.041 (0.072)
DR_{FRSI}	0.072 (0.092)
ER_{FRSI}	0.055 (0.117)
N	323
<i>Instruments</i>	39
$AB(1)$	0.109
$AB(2)$	0.555
<i>Sargan</i>	0.023

AB(1) and AB(2) are autocorrelation tests (Arellano-Bond test of order 1 and 2) - displayed $Pr > z$ values. The Sargan test of overidentified restrictions has the H_0 of validity of instruments - displayed: $Pr > \chi^2$. Note: Value is close to 0.05 sig. level and may indicate a limited validity of instruments. Standard errors in parantheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$