THE MACROECONOMIC EFFECTS OF FISCAL RULES

IN THE U.S. STATES[*]

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Abstract: Fiscal policy restrictions are often criticized for limiting the ability of governments to react to business cycle fluctuations. Therefore, the adoption of quantitative restrictions is viewed as inevitably leading to increased macroeconomic volatility. In this paper we use data from 48 U.S. states to investigate how budget rules affect fiscal policy outcomes. Our key findings are that (1) strict budgetary restrictions lead to lower policy volatility, which translates in lower output volatility; (2) fiscal restrictions do affect the responsiveness of fiscal policy to output shocks. These results give support to the conventional view of the negative effects of fiscal rules but they also show that these rules might improve macroeconomic outcomes by reducing policy volatility.

I. Introduction: The Debate on Restricting Fiscal Policy

Should fiscal policy be restricted? Recent developments in the EMU, where several large countries breached the budget limits set by the Stability and Growth Pact, and in the US, where the budget balance plummeted from a surplus to one of the largest peacetime deficits, have ignited interest again in the various institutional and political arrangements that can impose restrictions on fiscal policy. In the context of EMU, the proposals designed to improve fiscal discipline while increasing policy flexibility range from radical changes in policy-making — like the proposal of Wyplosz (2002), according to which the size of the deficit should be determined by an independent fiscal policy committee — to proposals that barely change the institutional setup and only increase the quantitative limit on the deficit (e.g. proposals to change the ceiling from 3% to 4%). Despite the overwhelming importance of policy restrictions for public welfare, however, there is little empirical evidence on the overall macroeconomic effects of policy restrictions.[1]

The central argument of those who oppose limits to fiscal policy is that fiscal policy is a powerful tool to control business cycles and that tying government's hands leads to an increase in the amplitude of business cycles (see Levinson (1998)).[2] This argument frequently appears in the pubic debate as summarized by the following quotes:

> *"These so-called built-in stabilizers limit declines of after-tax income and purchasing power. To keep the budget balanced every year would aggravate recessions"* – Petition signed by 1,100 economists, February 1997.

> *"The Balanced Budget Amendment could turn slowdowns into recessions, and recessions into more severe recessions or even depressions"* – Robert Rubin, White House Briefing on the Balanced Budget Amendment, Federal News Service Transcript, February 24, 1995.

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[1] There are several studies that document how policy institutions shape policy outcomes (see Persson and Tabellini, 2001, and Milesi-Ferretti et al., 2002, for recent contributions to this literature). Our paper draws a lot of insights from this literature and attempts to advance it by considering how policy institutions affect macroeconomic outcome.

[2] There is a growing literature that has documented the effectiveness of fiscal policy. See Blanchard and Perotti (2002), Fatás and Mihov (2002), Mountford and Uhlig (2002) or Gali, Lopez-Salido and Valles (2002).

On the other side of the debate are those in favor of setting limits to fiscal policy. The proponents of restrictions argue that the negative effect of restrictions can be easily outweighed by at least two positive results: (1) Limits on fiscal policy guarantee that governments will not run excessive deficits and pile up unsustainable levels of debt; and (2) restrictions on policy will eliminate or at least reduce the possibility that fiscal policy itself is a source of macroeconomic volatility.[3]

Both of the arguments in favor of restrictions are based on the claim that governments engage in behavior that can be considered suboptimal from a social welfare point of view in order to meet certain electoral or narrowly-defined political goals. This is probably the key reason why we observe restrictions on fiscal policy among many US states or among EMU countries. Among the biases that unrestricted fiscal policy might create is the inability of governments to control spending with the consequence of persistent and large deficits and accumulation of debt. This behavior can lead to an intertemporal path of taxes that violates the principle of tax smoothing or, in the worse case scenario, to debt default. There is a large body of academic literature on the macroeconomic effects of fiscal policy constraints that has focused on this bias.[4] The papers in this line of research have studied the behavior of deficits and debt under different institutional settings that can be characterized by differences in explicit constraints or budget procedures. The overwhelming majority of the papers conclude that institutions (budget processes, explicit constraints) do matter for fiscal policy.

The second motivation for restricting policy discretion — the argument that fiscal policy itself might be a source of business cycle fluctuations — has received much less attention. As argued above, critics of fiscal policy constraints base their arguments on the notion that they lead to larger business cycles. But if we accept that fiscal policy is in some cases driven by considerations which are not linked to macroeconomic stability, then there is the possibility that by limiting such actions the society will gain by having less volatility and smoother business cycles. In essence there are two opposing effects of policy constraints on macroeconomic volatility: the inability to stabilize the cycle effectively when constraints are present and the reduction in policy volatility stemming from

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[3] There are also considerations of intergenerational fairness that we ignore in our analysis.

[4] See Alesina and Perotti (1996) for a review of the main arguments and some empirical evidence.

policy restrictions. Our goal in this paper is to decompose the overall effect of restrictions on macroeconomic volatility into two components: the effects of restrictions on policy volatility and the effects on the stabilization role of governments.

The discussion of restrictions requires that we clarify the broad categories in which policy constraints can be grouped. In our view, there are three categories: (1) explicit budgetary rules like the balanced budget requirements or spending limits in several U.S. states; (2) the structure of political and electoral institutions that establishes checks and balances across policy-makers and (3) the ideological alignment across policy-making institutions, which can be determined by voters via split-ticket voting. The cross sectional variation in the explicit rules governing the budget in the U.S. states provides, as Besley and Case (2003) argue, an excellent laboratory for studying the effect of different rules on policy outcomes and macroeconomic performance.

In our previous work (Fatás and Mihov (2003)) we have put together data for a large sample of countries that display significant variation in the behavior of fiscal policy. We have documented that fiscal policy is indeed a source of business cycle volatility.[5] Moreover, we characterized the environments in which this effect becomes more pronounced. In summary, governments that face less restrictions in the political process of setting budgets are the ones who add more volatility to their business cycle. Our interpretation of this empirical result is that the tradeoff that characterizes fiscal policy restrictions seems to be resolved in favor of the positive benefits of limiting politically-induced changes in fiscal policy as these benefits seem to dominate the negative effects of limiting counter-cyclical fiscal policy.

Most of the debate nowadays is not about setting up a new institutional framework that will generate as a natural outcome optimal fiscal policy. To the contrary, almost exclusively public debates are about imposing explicit budget rules (e.g. balanced budget amendments or 3% ceilings). In an international sample, however, we observe only few explicit limits on fiscal policy and, as a result, differences come from implicit constraints embedded in the political process. At the same time, there is significant variation across US states in terms of the explicit restrictions on fiscal policy. In this sense, this variation make

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[5] This is also the conclusion of the recent literature that looks at the dynamic effects of fiscal policy shocks.

U.S. states an ideal sample to test whether explicit restrictions on fiscal policy increase or reduce the amplitude of the business cycle.

Our analysis of the direct effects of budget constraints on fiscal policy outcomes and macroeconomic performance will be carried out at two levels. First, we investigate how constraints limit the ability of governments to introduce discretionary changes in fiscal policy. Second, we document how these constraints affect the ability of governments to react to changes in economic conditions (the endogenous part of fiscal policy). It is well understood that the consequences of restrictions stretch along different dimensions of macroeconomic performance at different frequencies (business cycle, long term). Our approach is to focus only on the effects of these constraints on the business cycle. We ignore the possible benefits in terms of more sustainable budgetary plans and we focus on the short term: do fiscal policy restrictions exacerbate or smooth the business cycle?[6] By ignoring some long-term benefits possibly associated to fiscal policy restrictions (e.g. low deficits) we probably bias the conclusions in favor of those who oppose constraints.

Several papers have looked at the specific mechanisms through which fiscal policy can affect the business cycle (but without assessing the overall effects). Most of these papers have studied the negative side of constraints; i.e. the limits that constraints set on government to react to the economic cycle. Poterba (1994), Alt and Lowry (1994), Roubini and Sachs (1989), document how constraints (explicit or implicit) result in slower adjustments to unexpected shocks. Similarly, Lane (forthcoming) studies the effects of political constraints on the cyclicality of fiscal policy to conclude that governments who are subject to stronger constraints lead to more procyclical fiscal policy. All these papers are simply one side of the debate as they measure the costs of inaction caused by dispersed power and limits on fiscal policy without looking into the positive effects of constraints. The papers that have studied these positive effects are focused on the effects on budget balances. Bohn and Inman (1996) or Alesina and Bayoumi (1996) conclude that explicit restrictions on fiscal policy reduce the likelihood of deficits.[7] At the international level, Perotti and Kontopoulos (2002),

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[6] Obviously there is no clear-cut distinction between short-term and long-term effects of fiscal policy rules. For example, policies that are unsustainable in the long run might lead to large adjustments (or even crises) that would have an effect on the business cycle.

[7] See also Besley and Case (2003) for a survey of the effects of political institutions on fiscal policy outcomes in US states.

Hallerberg and von Hagen (1999) or deHaan et al. (1999) present evidence on the effects of political constraints (divided government) and budget processes on budget deficits.

The two papers that are the closest to out approach are Levinson (1998) and Alesina and Bayoumi (1996) who address directly the effects of fiscal policy restrictions on the volatility of the business cycle. Their conclusions are, however, contradictory. Levinson (1998) presents evidence that the presence of explicit constraints leads to more volatile business cycles. Alesina and Bayoumi (1996) find that fiscal policy restrictions have little effect on output volatility and they argue that both of the effects considered above must cancel each other out. Their explanation is that while it is true that these constraints limit the ability of governments to respond to business cycle fluctuations (consistent with Alt and Lowry (1994) or Poterba (1994)), there is an effect in the opposite direction. Constraints on fiscal policy also limit discretionary changes in fiscal policy that induce business cycles. One goal of our paper is to quantify the magnitudes of these opposing effects.

The rest of the paper is structured as follows: The next section provides a brief analysis of the institutional environment relevant for the budget process. Section III constructs a measure of discretionary fiscal policy and a measure of government's responsiveness to output fluctuations. We then explore the link between budget rules and discretionary fiscal policy as well as the effect of rules on policy responsiveness. Section IV reports estimation of the effects of fiscal policy on output volatility. The last section provides discussion and concluding remarks.

II. The Institutional Environment and Fiscal Rules in the U.S. States.

Almost all US states have some form of explicit or implicit restrictions in their budget processes. There are explicit restrictions on different parts of the budget (revenues or expenditures growth, the overall balance) and there are implicit restrictions on the process through which the budget gets proposed, amended or approved (details of all these restrictions can be found in NASBO (2002)). Among these constraints, the ones that have received the most attention,

both in public debates and in the academic literature, are the ones that apply to the overall budget balance.

Following ACIR (1987) and Bohn and Inman (1996) we characterize balanced budget restrictions according to the different phases of the budget process that they refer to as well as their strictness. The weakest form of restrictions apply to the ex-ante budget. Some (or most) states require the governor to submit a balanced budget or the legislature to pass a balanced budget. These restrictions have a weak impact on the final budget outcome as they do not impose any constraints on the balance of the budget at the end of the year.

States with stricter constraints impose limits on the amount of deficits that can be carried over to the next year and if these limits are about to be violated, emergency policies need to be implemented. In its weakest form, states need to budget any current deficit into next year's budget. This never requires to balance any deficit as deficits can be run again in subsequent years. In its strictest form, some states do not allow any carry over. In other cases the carry over is allowed during the budgetary period (two years in most cases). Details on these constraints and how they are enforced can be found in Bohn and Inman (1996).

Are these constraints binding? One can argue that constraints on balanced budgets can be circumvented through accounting adjustments, but there is evidence that there is not much room for these adjustments as documented in Bohn and Inman (1996) or Sorensen, Wu and Yosha (2001). The second way of avoiding these constraints is to finance spending out of funds other than the General Fund since balanced budget constraints apply only to the General Fund. Most states have what are known as rainy-day funds or stabilization funds that can be used to smooth out fluctuations that would otherwise be imposed by changes in tax revenues. These funds might play a role in reducing the consequences of strict balanced budget rules. The key characteristics of balanced budget constraints and of rainy-day funds are reported in Table 1. For the case of rainy-day or stabilization funds we note the year in which these funds were created. We also characterize the strictness of the withdrawal and deposit rules in a scale 1 to 4 (following the classification of Wagner and Elder (2002). The lowest index corresponds to discretion (appropriation), the highest index corresponds to a statutory formula. Finally we also use an index from 1 to 3 to measure the limits (if any) on the size of these funds, where 3 means no limits.[8]

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[8]   Once again we follow Wagner and Elder (2002) in this classification.

Budget constraints are captured by the following four variables: *Carryover* is a dummy variable that takes a value of 1 or 2 for states that allow budget deficits to be carried over to the next budget year. If the restriction is written in the constitution, then the value is 2, otherwise it is 1. The next variable — *No carryover* — records whether the government is required to balance the budget within a year. Bohn and Inman (1996) have identified this variable as one of the most important determinants of state fiscal policy. The third index (*ACIR*) is a composite index of fiscal rules stringency constructed by the Advisory Council on Intergovernmental Relations (1987). This index rates the stringency of fiscal rules in each state from 0 to 10, with 10 being assigned to states with the strictest rules. Finally we use also a dummy variable for states, in which the governor has a line item veto power — *Governor veto*.

Do balanced budget constraints affect the behavior of fiscal policy? There is plenty of evidence in the academic literature, that the strictest forms of constraints on budget balances do matter while there is mixed evidence (more on the negative side) on the effects of weak constraints. Most papers have focused on three dimensions of fiscal policy: the budget deficit, the ability to respond to changes in economic conditions and the volatility of government spending.

There is an agreement in the literature that budget restrictions reduce the likelihood of running deficits and increase the size of surpluses. Bohn and Inman (1996), ACIR (1987) or Alesina and Bayoumi (1996) find that surpluses are larger in states with tight constraints and that increased surpluses originate in reduced spending. Alt and Lowry (1994) and Poterba (1994) report that in the presence of unexpected budget deficits, states with constraints reduce deficits faster, through a large adjustment in government spending.[9]

These results suggest that while balanced budget rules are effective in limiting the size of deficits, they also impose costs to the states' economies because of the large adjustment in government spending that is required during downturns. Poterba (1994) supports this hypothesis but the analysis is limited to the natural experiments of specific recessions (the late 80s). In the case of Alt and Lowry (1994), they estimate a dynamic reduced-form equations for revenues and expenditures on the basis of which it is difficult to extract general conclusions on the overall macroeconomic effects of budget constraints. Bohn

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[9] For an assessment of the overall effects of political institutions, including budget restrictions, on fiscal policy, see the survey of Besley and Case (2003).

Table 1. Description of Budget Restrictions

| State | Stabilization Funds | | | | Balanced Budget | | | |
	Year of Adoption	Deposit Rules	Withdr. Rules	Fund Size	Carry Over Allowed	No Carry Over	ACIR Index	Governor Veto
AL	1927	4	1	1	0	2	10	1
AR	9999	0	0	0	0	1	9	1
AZ	1990	4	4	2	0	2	10	1
CA	1976	2	2	3	2	0	6	1
CO	1982	3	2	1	0	2	10	1
CT	1979	2	3	1	1	0	5	1
DE	1979	2	3	1	0	2	10	1
FL	1959	2	2	2	0	2	10	1
GA	1976	2	1	3	0	2	10	1
IA	1984	1	1	1	0	2	10	1
ID	1984	1	1	3	0	2	10	1
IL	2001	2	1	3	0	0	4	1
IN	1982	4	4	2	0	2	10	0
KS	1993	3	1	3	0	2	10	1
KY	1983	2	1	1	0	1	10	1
LA	1990	2	1	3	0	0	4	1
MA	1985	2	1	1	0	0	3	1
MD	1985	3	1	1	2	0	6	1
ME	1985	2	1	1	0	1	9	0
MI	1977	4	4	2	2	0	6	1
MN	1981	1	1	2	0	0	8	1
MO	1992	1	1	1	0	2	10	1
MS	1982	1	1	2	0	1	9	1
MT	9999	0	0	0	0	2	10	1
NC	1991	2	1	1	0	2	10	0
ND	1987	2	4	3	0	0	8	1
NE	1983	2	2	3	0	2	10	1
NH	1987	2	2	1	0	0	2	0
NJ	1990	2	2	1	0	2	10	1
NM	1966	2	1	1	0	2	10	1
NV	1994	4	2	2	0	0	4	0
NY	1945	4	2	3	0	0	3	1
OH	1981	2	1	3	0	2	10	1
OK	1986	2	3	3	0	2	10	1
OR	1995	1	1	3	0	0	8	1
PA	1985	2	3	1	2	0	6	1
RI	1985	1	2	1	0	2	10	0
SC	1978	3	2	3	2	2	10	1
SD	1991	2	2	1	0	2	10	1
TN	1972	3	2	1	2	2	10	1
TX	1987	2	2	2	0	0	8	1
UT	1986	2	2	2	0	2	10	1
VA	1992	4	4	2	0	0	8	1
VT	1988	2	2	1	0	0	0	0
WA	1981	2	3	1	0	0	8	1
WI	1985	3	2	3	2	0	6	1
WV	1994	2	2	1	0	2	10	1
WY	1982	1	1	1	0	0	8	1

and Inman (1996) measure the elasticity of government revenues, expenditures and deficit to cyclical conditions to conclude that budget balance constraints do not have a clear effect on these elasticities. As an explanation they suggest that states with tighter constraints save more during good times on rainy-day funds and then use them during recessions to avoid large reductions in spending. This hypothesis is further corroborated by Wagner and Elder (2002). In a recent study about the role of state budget stabilization funds they find that these funds can help smooth fluctuations in government spending. This is especially true in states where funds are transferred automatically as deposits and where there is little room for discretion when it comes to withdrawals. Gonzales and Paqueo (2003) reach similar conclusions. Rainy-day funds allow states to smooth fluctuations in social spending and those states with more restrictions on deposit and withdrawal rules tend to make more (and better) use of these funds.

III. Do Budget Rules Restrict Fiscal Policy?

In this section we investigate the effects of institutional and political variables on fiscal policy outcomes. First we construct measures of discretionary policy for each state and the elasticity of government spending with respect to output fluctuations. Then we explore the role that rules play in determining discretionary fiscal policy and the cyclical elasticities of fiscal policy.

A. Characterizing Fiscal Policy

As in Fatás and Mihov (2003), we use the term discretionary fiscal policy to refer to changes in fiscal policy that do not represent reaction to economic conditions. We focus only on government spending. There are at least two reasons for this choice. First, most of the fluctuations on the revenue side of the budget comes from automatic reaction of tax revenues to the state of the economy. Second, it seems that a finding that spending behavior is affected by the presence of fiscal rules is more challenging and more policy relevant than the finding that the budget is affected by rules that in fact are applied to the budget.[10]

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[10] Notwithstanding this remark, in a previous version of the paper we did explore how the balance reacts to macroeconomic fluctuations in the presence of fiscal rules. Most of the results are in line with expectations and are available from the authors.

To construct measures of discretionary fiscal policy we use annual data for forty-eight U.S. States over the period 1963-2000.[11] We estimate the following equation for each state in our sample:

$$\log(G)_{i,t} = \alpha_i + \beta_i\,\Delta\log(Y_{i,t}) + \gamma_i\log(G)_{i,t-1} + \ \delta_i\,\mathbf{W_{i,t}} + \epsilon_{i,t} \qquad (1)$$

where G is total real state government spending, and Y is real Gross State Product (GSP). We interpret the state-specific volatility of $\epsilon_{i,t}$ as a quantitative estimate of discretionary policy. We calculate this volatility as $\sqrt{Var_i(\epsilon_{i,t})}$ and we will denote it as σ_i^ϵ. This variables can be interpreted as the typical size of a discretionary change in fiscal spending for state i.

Another object of interest in equation (1) is the elasticity of government spending with respect to output. This elasticities is captured by the coefficient β_i for each state.

Now we can re-state our main hypotheses on the effects of fiscal rules in terms of the newly-defined variables: Our first hypothesis is that the beneficial role of budget rules will be reflected in lower volatility of discretionary fiscal policy (lower σ_i^ϵ). We will test not only that the volatility of fiscal policy is lower but also whether the reduction in policy volatility has the expected positive impact on the economy in terms of reduced volatility of business cycles. Our second hypothesis is that the negative effect of budget rules would show up as lower responsiveness of fiscal policy to output fluctuations in states with strict balanced-budget rules (higher and possibly positive β_i's).

In our baseline specification of equation (1) we include the contemporaneous value of output growth. To avoid the possibility of endogeneity bias we use past values of output growth as instrumental variables. We also include as controls (W) the current and lagged value of the index of oil prices, current inflation rate, and a linear time trend. The first set of controls has very general justification – oil prices affect the state of the economy and, more importantly, for some states oil tax revenues contribute significantly to the total revenues in the state budget (e.g. Wyoming). Inflation enters in the regression to control for the possibility that some spending items are indexed automatically to inflation. The inclusion of a time trend in the second is prompted by the argument that government spending might evolve according to a deterministic rather than a stochastic

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[11]   We have dropped Alaska and Hawaii due to data availability problems.

trend.

B. What Determines Policy Volatility?

We focus on three institutional restrictions (*No carryover*, the stringency index, *ACIR*, and *Governor's veto*) and we include three political variables in our regressions: the average number of democrats in the Congress, a dummy variable that takes a value of 1 when the majority in the State Congress and the executive come from different parties, and a measure of political concentration of power in one party. The latter variable is constructed as the squared difference between the percentage of seats taken by the Democrats and the percentage of seats taken by the Republicans. In addition to the main variables of interest we use a set of controls which by now have become standard in cross-sectional studies of the U.S. States (see Wagner and Elder, 2002 and Fatás and Mihov, 2001). First we control for the average GSP per capita in order to capture income effects that might be correlated with rules and affect policy volatility at the same time. Second we use the dependency ratio and average population in the state to control for key social characteristics that affect fiscal policy directly. We turn now to the two key questions of our analysis: the effects of rules on discretionary policy and the effects of rules on elasticity.

To establish the link between policy and budget rules we run the following regression:

$$\log(\sigma_i^\epsilon) = \alpha + \lambda' P_i + \gamma' \mathbf{X_i} + \nu_i \qquad (2)$$

The vector P includes the institutional and political variables discussed in the previous paragraph while X are the economic and social controls. The results for the vector of coefficients λ from estimating equation (3) by least squares are reported in Table 2 (the coefficients on controls are not reported to conserve space).[12]

The first column documents the strong negative effect of no carryover rules on policy volatility. Because we have a log-level specification the interpretation of the results suggests that the imposition of a no carryover rule reduces policy

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[12] All regressions have been estimated also in a univariate framework using one rule at a time and no controls. In all cases the statistical significance of the coefficient of interest is about the same or stronger as the one reported in this table. We do not report these results to conserve space. These additional results are available from the authors upon request.

Table 2. What Determines Volatility of Fiscal Policy?

$$\log(\sigma_i^{\epsilon,m}) = \alpha + \lambda' P_i + \gamma' \mathbf{X_i} + \nu_i$$

	Dependent variable: Volatility of Government Spending (σ^ϵ)		
	(1)	(2)	(3)
No Carryover	-0.144	-	-0.049
	(0.092)		(0.704)
Governor's veto	-0.061	0.002	-0.009
	(0.355)	(0.976)	(0.900)
ACIR	-	-0.035	-0.027
		(0.016)	(0.704)
Democrats	-0.888	-0.823	-0.854
	(0.014)	(0.024)	(0.016)
Split	-0.019	0.045	0.036
	(0.909)	(0.814)	(0.842)
Concentration	0.669	0.643	0.652
	(0.074)	(0.069)	(0.064)
R^2	0.262	0.389	0.261

The p-values in the parentheses are based on heteroscedasticity-robust standard errors. All regressions include an intercept and controls: GSP per capita, dependency ratio and average population

volatility by about 14%. The conclusion that rules are significant determinants of spending variability is corroborated by the coefficient on the ACIR index, which is highly significant and of the expected sign. The coefficient suggests that if Vermont (a state where this index is equal to 0) introduces institutional reforms that impose strict budgetary rules, then its volatility of fiscal policy will drop by about 35%. Interestingly, the power of the governor to impose a line-item veto does not change the volatility of fiscal policy. When we include the ACIR stringency index and the no carryover dummy, then none of the institutional variables is significant. This is not surprising because the ACIR index is highly correlated with the no carryover restriction (simple correlation is 0.73, rank-order correlation is 0.90). In fact, in its construction the ACIR index includes no-carryover restriction.

Focusing now on the political variables we find that states with more

Democrats in the Congress have less volatile fiscal policy. This is an interesting finding given the overwhelming evidence that Congresses dominated by Democrats have larger budget deficits. The finding in Table 2 suggests that larger deficits do not necessarily imply more volatile policy. The variable capturing party mis-alignment between the congress and the governor is never significant. This is somewhat surprising because one would expect that party differences will increase the degree of checks and balances and reduce policy volatility. The last variable, however, lends some support that implicit restrictions in the form of checks and balances also matter in the US states. The absence of serious political competition in the congress (more concentration of power in one party) leads to more volatile fiscal policy.

Overall we find that spending volatility is effectively reduced by strict and explicit budgetary restrictions. This provides and argument for imposing fiscal rules on governments. There is, however, a well-recognized cost of restricting discretion, which is manifested in lower elasticity of fiscal policy with respect to output changes. The next section establishes the evidence for this cost.

C. What Affects Policy Elasticity?

So far, our analysis has focused on the component of fiscal policy that is orthogonal to the business cycle; this component we refer to as discretionary fiscal policy. Discretionary fiscal policy, in our view, is a source of business cycles and restrictions on fiscal policy can help reduce its costs. The other side of the debate, those who oppose restriction on fiscal policy argue that these restrictions have a negative effect on the economy through the limits they impose on counter-cyclical fiscal policy, captured by the elasticities estimated in equation (1). We now take on this claim and look at whether these elasticities are affected by the same rules and institutions that we have found have an effect on discretionary fiscal policy.[13]

The connection between policy elasticity and budget rules are determined by the following regression:

$$\beta_i = \alpha + \lambda' P_i + \gamma' \mathbf{X_i} + \nu_i \tag{3}$$

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[13] A similar analysis has been done by Lane (2003) in an international sample (OECD countries). Cyclicality of government spending varies greatly across countries and it is shown that political constraints tend to make fiscal policy more procyclical. We refer the reader to Lane (2003) for a detailed review of the literature.

The elasticities are based on regression (1) and they are estimated for each state.

Table 3. Do Budget Rules Affect Policy Responsiveness?

$$\beta_i = \alpha + \lambda' P_i + \gamma' \mathbf{X_i} + \nu_i$$

	Dependent variable: Elasticity of Government Spending		
	(1)	(2)	(3)
No Carryover	0.008 (0.077)	-	0.001 (0.854)
Governor's veto	0.009 (0.030)	0.005 (0.045)	0.005 (0.242)
ACIR	-	0.002 (0.011)	0.002 (0.045)
Democrats	0.029 (0.179)	0.026 (0.189)	0.026 (0.200)
Split	0.000 (0.993)	-0.004 (0.650)	-0.004 (0.678)
Concentration	- -0.015 (0.340)	- -0.014 (0.377)	- -0.014 (0.368)
R^2	0.013	0.013	0.013

The p-values in the parentheses are based on heteroscedasticity-robust standard errors. All regressions include an intercept and controls: GSP per capita, dependency ratio and average population

Table 3 reports the results and it is organized in a similar way to Table 2 — we use the same controls and the same set of budget rules. To facilitate the interpretation of the results in Table 3, we emphasize that higher β's correspond to more *pro-cyclical* fiscal policy. The first two columns show that both the no-carryover restriction and the ACIR index exert strong positive effects on policy elasticity – this concords with our priors and confirms that claim that states with more stringent fiscal rules have more pro-cyclical fiscal policy. Interestingly, the veto power of the governor also plays a role in determining how spending reacts to the business cycle – states without line-item veto do react in a more counter-cyclical manner to economic fluctuations than states with a veto power.

The results in column (3) are again affected by the large degree of collinearity albeit the ACIR index remains significant. In this Table none of the political variables is significant and the overall fit is rather disappointing. However, it is worth pointing out that the conditional correlation between fiscal rules and elasticity is strong and robust to variations in the baseline specification.

It is useful to report these elasticities by grouping them into states with strict constitutionally determined no carryover rules and states without such strict rules. Table 4 reports the average elasticities for the two groups of states and a t-test for the significance of the difference between the means. We note that the difference is significant for both elasticities and, more importantly, the difference is in the expected direction — states with strict rules have less countercyclical fiscal policy. In the last two rows the table reports nonparametric measures of association between elasticity and the two key indices – the no carryover rule and the ACIR index. These measures of association are based on rank-order correlation and they represent one way of ensuring that the results are not driven by outliers.

Table 4. Comparing average elasticities across regimes

	Carryover Allowed (1)	No Carryover (2)
Elasticity	-0.0065	0.0022
	[0.0034]	[0.0019]
T-test of equality	-2.247	
(p-value)	(0.029)	
Number of States	24	24
Spearman's Rank Order Correlation		
-with ACIR	0.411	
(p-value)	(0.004)	
-with No carryover	0.295	
(p-value)	(0.042)	

The table reports p-values in parentheses
and standard errors in brackets.

IV. The Effects of Fiscal Policy on Output Volatility

The main goal of this section is to establish how macroeconomic stability (measured as the standard deviation of output growth, σ_i^y) is affected by policy volatility and by the elasticity of fiscal policy. To document the link between economic stability and these two characteristics of fiscal policy we run the following regression.

$$\log(\sigma_i^y) = \alpha + \lambda_v \log(\sigma_i^\epsilon) + \lambda_e\,\beta_i + \gamma'\mathbf{X_i} + \nu_i \qquad (4)$$

In addition to the two variables of interest (volatility and elasticity of policy), we include also as controls government size and average GSP per capita. One problem with this regression is the possibility that there is reverse causation running from output volatility to fiscal policy. To deal with this problem we will estimate equation (4) by instrumental variables. The list of instruments includes the three institutional characteristics (ACIR stringency index; the 'no carryover of budget deficits' dummy; a dummy capturing whether the governor has a line item veto power), the same three political variables (the percentage of democrats in state congress; the dummy for party alignment between the governor and the state legislature; and the degree of fragmentation of the Congress), and also two variables capturing social characteristics of each state (population; dependency ratio). It is quite possible that the institutional variables have an independent effect on output volatility. Although it is certainly more plausible to argue that the effects of fiscal rules on macroeconomic stability are intermediated by fiscal volatility or elasticity, we do investigate in column (1) of Table 5 the claim that the institutional variables affect output directly. None of the variables is significant and we proceed to the next three columns where we use these variables as instruments.

Column (2) omits the elasticity of government spending in the estimation of equation (4). The results are quite eloquent – policy volatility exerts a strong positive effect on output volatility. The coefficient is significant at better than the 2% level. We also note that the test of overidentifying restrictions reported in the last row clearly accepts the null hypothesis that the instruments are uncorrelated with the errors. This is yet another evidence that the institutional variables do not have an autonomous effect on output volatility. Turning now to column (3) where we use the elasticity of spending as a regressor, we find that this variable

Table 5. Does Fiscal Policy Affect Business Cycles?

$$\log(\sigma_i^y) = \alpha + \lambda' \mathbf{P_i} + \gamma' \mathbf{X_i} + \nu_i$$

| | Dependent variable: Volatility of output | | | |
	(1) OLS	(2) IV	(3) IV	(4) IV
Discretionary fiscal policy	-	0.803 (0.017)	-	0.804 (0.016)
Responsiveness of fiscal policy	-	-	1.558 (0.447)	3.660 (0.612)
No Carryover	-0.008 (0.937)	-	-	-
Governor veto	-0.058 (0.073)	-	-	-
ACIR	-0.003 (0.822)	-	-	-
Government size	-0.612 (0.011)	-1.673 (0.052)	-0.295 (0.559)	-1.451 (0.100)
GSP per capita	0.171 (0.414)	0.212 (0.483)	0.212 (0.343)	0.258 (0.361)
R^2	-0.019	-	-	-
Test of OID (p-value)		(0.976)	(0.028)	(0.988)

The p-values in the parentheses are based on heteroscedasticity-robust standard errors. In the IV estimation the OID test reports p-value from a test that the instruments are uncorrelated with the residuals. All regressions include an intercept.

has no impact on volatility, i.e. the cross-sectional variation of policy elasticity in the US states is not strong enough to generate a link between output volatility and elasticity. Another interesting result from column (3) is that now the OID test rejects the orthogonality of the errors and the instruments, which implies that the institutional characteristics have an effect on output volatility which is not running through policy elasticity. This result is not surprising in light of the regressions in Table 2 and the evidence from column (2) of Table 5 because Table documents that fiscal rules have a strong impact on policy volatility while

column (2) of Table 5 shows that the volatility of output is affected by rules only through fiscal policy.

Finally, in column (4) we report that including both spending elasticity and discretionary volatility does not change our main conclusion, which is that discretionary fiscal policy is a source of business cycle volatility. This should not be a surprise as it is simply a confirmation of recent empirical studies that have documented the effects of fiscal policy on economic activity and the fact that there is a component of fiscal policy that is exogenous to economic conditions (i.e. the part of fiscal policy that is not attempting to smooth out the business cycle). This result is also consistent with a similar empirical analysis for a sample of countries in Fatás and Mihov (2003), where discretionary fiscal policy is also shown to be a significant determinant of business cycles.

V. CONCLUSION

This paper provides an empirical study of the macroeconomic effects of explicit and implicit constraints on fiscal policy. Our results provide arguments to both sides of the debate on the appropriateness of restricting fiscal policy. When it comes to the business cycle effects of these restrictions we find that the debate has been one sided as most of the literature has focused on the negative effects of constraints because of the limits it poses to counter-cyclical fiscal policy. While these effects might be important, one cannot ignore the additional volatility that the discretionary use of fiscal policy can bring to the economy. This is the starting point of our empirical analysis and we show that indeed fiscal policy is a significant source of business cycle volatility among US states, confirming our results for a large sample of countries (see Fatás and Mihov (2003)). We conclude from this result that fiscal policy restrictions can be beneficial not only because they might help reduce budget deficits and produce sustainable budgetary plans but also because of their immediate (short-run) benefits through the limits they impose on discretionary changes in fiscal policy.

To be able to reach this conclusion we need to make sure that we are dealing properly with the possibility of reverse causation. For this purpose we use political and institutional variables to instrument for fiscal policy. These variables, which include budget balance restrictions, and their effect on fiscal

policy have an interest in themselves so we study, in a second step which are the main institutional characteristics that explain the differences in the use of discretionary fiscal policy across States.

Finally, we look for evidence supporting the claim of those who oppose fiscal policy constraints that these restrictions impair the ability of governments to run counter-cyclical fiscal policy. We make use of estimates of the elasticities of government spending and the budget deficit to study the validity of this claim. We find that limits on fiscal policy have a significant effect on the cyclical elasticities of budget balances and government spending. As expected, fiscal policy becomes more procyclical under rigid rules such as balanced budget rules.

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