# THE MACROECONOMIC EFFECTS OF FISCAL RULES IN THE U.S. STATES*

Antonio Fatás and Ilian Mihov
INSEAD and CEPR

**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 (i.e. less discretion in conducting fiscal policy); (2) fiscal restrictions reduce the responsiveness of fiscal policy to output shocks and decrease the persistence of spending fluctuations. These two results should have opposite effects on output volatility. While less discretion should reduce volatility, less responsiveness of fiscal policy might amplify business cycle. Our analysis shows that the first effect dominates and that restrictions on fiscal policy lead to less volatility in output.

**JEL Codes:** E32, H30

**Keywords:** Fiscal Policy, Business Cycles, Fiscal Rules

* We would like to thank Carlo Favero, Roberto Perotti and seminar participants at Bocconi University, DIW-Berlin, Banco de España and INSEAD for useful comments. Address for correspondence: Antonio Fatás, fatas@econ.insead.edu, INSEAD, Boulevard de Constance, 77305 Fontainebleau (France). Tel.: +33160724419. Fax: +33160745500.

# I. Introduction: The Debate on Restricting Fiscal Policy

Should fiscal policy be restricted? Recent developments in the EMU, where some countries have had difficulties to stick to 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 (2001), 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.

[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 outcomes.

[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

[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.

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 makes

[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 or smaller governments) 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 focus 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), Hallerberg

[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.

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]

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

Budget constraints are captured by the following three variables: *No Carry-over* is a dummy variable that takes a value of 1 or 2 for states that do not 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. Bohn and Inman (1996) have identified this variable as one of the important determinants of state fiscal policy. The next 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*. This dummy is capturing the role of implicit restrictions, i.e. via the budgetary process, for fiscal policy outcomes.

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

[9] When it comes to debt levels, von Hagen (1991) presents evidence that these restrictions do not have significant effects on fiscal policy outcomes. See Besley and Case (2003) for a comprehensive survey of this literature.

**Table 1. Description of Budget Restrictions**

| | Stabilization Funds | | | Balanced Budget | | |
|---|---|---|---|---|---|---|
| State | Year of Adoption | Deposit Rules | Withdr. Rules | No Carry Over | ACIR Index | Governor Veto |
| AL | 1927 | 4 | 1 | 2 | 10 | 1 |
| AR | - | 0 | 0 | 1 | 9 | 1 |
| AZ | 1990 | 4 | 4 | 2 | 10 | 1 |
| CA | 1976 | 2 | 2 | 0 | 6 | 1 |
| CO | 1982 | 3 | 2 | 2 | 10 | 1 |
| CT | 1979 | 2 | 3 | 0 | 5 | 1 |
| DE | 1979 | 2 | 3 | 2 | 10 | 1 |
| FL | 1959 | 2 | 2 | 2 | 10 | 1 |
| GA | 1976 | 2 | 1 | 2 | 10 | 1 |
| IA | 1984 | 1 | 1 | 2 | 10 | 1 |
| ID | 1984 | 1 | 1 | 2 | 10 | 1 |
| IL | 2001 | 2 | 1 | 0 | 4 | 1 |
| IN | 1982 | 4 | 4 | 2 | 10 | 0 |
| KS | 1993 | 3 | 1 | 2 | 10 | 1 |
| KY | 1983 | 2 | 1 | 1 | 10 | 1 |
| LA | 1990 | 2 | 1 | 0 | 4 | 1 |
| MA | 1985 | 2 | 1 | 0 | 3 | 1 |
| MD | 1985 | 3 | 1 | 0 | 6 | 1 |
| ME | 1985 | 2 | 1 | 1 | 9 | 0 |
| MI | 1977 | 4 | 4 | 0 | 6 | 1 |
| MN | 1981 | 1 | 1 | 0 | 8 | 1 |
| MO | 1992 | 1 | 1 | 2 | 10 | 1 |
| MS | 1982 | 1 | 1 | 1 | 9 | 1 |
| MT | - | 0 | 0 | 2 | 10 | 1 |
| NC | 1991 | 2 | 1 | 2 | 10 | 0 |
| ND | 1987 | 2 | 4 | 0 | 8 | 1 |
| NE | 1983 | 2 | 2 | 2 | 10 | 1 |
| NH | 1987 | 2 | 2 | 0 | 2 | 0 |
| NJ | 1990 | 2 | 2 | 2 | 10 | 1 |
| NM | 1966 | 2 | 1 | 2 | 10 | 1 |
| NV | 1994 | 4 | 2 | 0 | 4 | 0 |
| NY | 1945 | 4 | 2 | 0 | 3 | 1 |
| OH | 1981 | 2 | 1 | 2 | 10 | 1 |
| OK | 1986 | 2 | 3 | 2 | 10 | 1 |
| OR | 1995 | 1 | 1 | 0 | 8 | 1 |
| PA | 1985 | 2 | 3 | 0 | 6 | 1 |
| RI | 1985 | 1 | 2 | 2 | 10 | 0 |
| SC | 1978 | 3 | 2 | 2 | 10 | 1 |
| SD | 1991 | 2 | 2 | 2 | 10 | 1 |
| TN | 1972 | 3 | 2 | 2 | 10 | 1 |
| TX | 1987 | 2 | 2 | 0 | 8 | 1 |
| UT | 1986 | 2 | 2 | 2 | 10 | 1 |
| VA | 1992 | 4 | 4 | 0 | 8 | 1 |
| VT | 1988 | 2 | 2 | 0 | 0 | 0 |
| WA | 1981 | 2 | 3 | 0 | 8 | 1 |
| WI | 1985 | 3 | 2 | 0 | 6 | 1 |
| WV | 1994 | 2 | 2 | 2 | 10 | 1 |
| WY | 1982 | 1 | 1 | 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. Table 1 provides the key data related to these stabilization funds. The first column reports the year of adoption of such fund, while the second and the third columns report an index from 0 to 4 of deposit and withdrawal rules. When the index is at 4, it means that discretion is minimized and deposit or withdrawal occurs according to a predetermined formula.

## 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]

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:

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

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 $\sigma_i^{\epsilon}$. This variables can be interpreted as the typical size of a discretionary change in fiscal spending for state $i$.

We are also interested in the persistence of changes in government spending. This persistence is captured by the coefficient on the lagged dependent variable ($\gamma_i$). Yet another object of interest in equation (1) is the elasticity of government spending with respect to output, which is the coefficient $\beta_i$ 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 $\sigma_i^{\epsilon}$). 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. In addition we expect that changes in government spending are less persistent in states with strict budget constraints. Our second hypothesis is that the negative effect of budget rules will show up as lower responsiveness of fiscal policy to output fluctuations in states with strict balanced-budget rules (higher and possibly positive $\beta_i$'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,

[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.

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

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 trend.

*B. What Determines Policy Volatility?*

We focus on three institutional restrictions (*No carryover*, the stringency index, *ACIR*, and *Governor's veto*) and on two characteristics of Rainy Day funds *Deposit rule* and *Withdrawal rule*. We also 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 main question of our analysis: the effect of rules on discretionary policy, on persistence and on elasticity.

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

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

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 $\lambda$ from estimating equation (3) by least squares are reported in Table 2 (the coefficients on controls are not reported to conserve

**Table 2. What Determines Volatility of Fiscal Policy?**

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

| | Dependent variable: Volatility of Government Spending ($\sigma^\epsilon$) | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| No Carryover | -0.144 | - | - | -0.173 | - |
| | (0.092) | | | (0.028) | |
| ACIR | - | -0.035 | - | - | -0.033 |
| | | (0.016) | | - | (0.033) |
| Governor's veto | -0.061 | 0.002 | - | -0.063 | -0.007 |
| | (0.355) | (0.976) | | (0.343) | (0.924) |
| Deposit rule | - | - | 0.153 | 0.178 | 0.145 |
| | | | (0.007) | (0.000) | (0.006) |
| Withdrawal rule | - | - | -0.264 | -0.282 | -0.253 |
| | | | (0.003) | (0.002) | (0.007) |
| Democrats | -0.888 | -0.823 | -0.741 | -0.970 | -0.863 |
| | (0.014) | (0.024) | (0.035) | (0.009) | (0.017) |
| Split | -0.019 | 0.045 | -0.098 | -0.053 | -0.001 |
| | (0.909) | (0.814) | (0.559) | (0.704) | (0.997) |
| Concentration | 0.669 | 0.643 | 0.406 | 0.497 | 0.475 |
| | (0.074) | (0.069) | (0.297) | (0.183) | (0.187) |
| $R^2$ | 0.370 | 0.389 | 0.416 | 0.493 | 0.482 |

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.

space).

The first column documents the 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 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. Because the ACIR stringency index and the no carryover dummy measure essentially the same thing, we do not include them together in a regression. The two variables are highly correlated (simple correlation is 0.73, rank-order correlation is 0.90) and a regression that includes both of them inflates standard errors and most of the variables lose significance. 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, but we note that this variable is not always significant at conventional levels.

In the last three columns of Table 2 we report coefficients from regressions that include the two main characteristics of Rainy Day funds. As Wagner and Elder (2002) argue, the only constraints that have some explanatory power for expenditure volatility are the strictness of the deposit and the withdrawal rules. This is certainly reasonable because a budget stabilization fund that is easy to access will not serve the role of a stabilization fund in the strict sense. Across specifications (3), (4) and (5) we find consistent evidence that strict withdrawal rules lead to lower volatility of discretionary fiscal policy. On the other hand strict deposit rules lead to more volatility in government spending. At first glance, this result seems counter-intuitive but it might be the case that when strict deposit rules are combined with lax withdrawal rules, then this combination may allow politicians to use at some point a larger chunk of the fund (generated by the strict deposit rule) and generate high volatility.

Overall we find that spending volatility is effectively reduced by strict and explicit budgetary restrictions as captured by the ACIR stringency index.

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. We will consider the evidence for this cost, but first we will establish how budgetary restrictions affect the persistence of government spending.

*C. What Affects Policy Persistence?*

One of the well-recognized pitfalls of discretionary fiscal policy is the possibility that certain increases in spending are hard to reverse, i.e. fiscal consolidations are politically difficult because they require cuts in spending that are not easy to implement. Fiscal restrictions might also help in this case by forcing policy makers to retrench faster an earlier spending increase.

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

$$\gamma_i = \alpha + \lambda' P_i + \delta' \mathbf{X_i} + \nu_i \tag{3}$$

The persistence parameters ($\gamma$) are based on regression (1) and they are estimated for each state. The results are reported in Table 3, which is organized in a similar way to Table 2 — we use the same controls and the same set of budget rules. A state with persistent government spending will have a higher $\gamma$. The first two columns show that both the no-carryover restriction and the ACIR index have strong negative effects on persistence, i.e. states with strict budgetary rules have less persistent spending dynamics. Again the veto power of the governor plays no role in determining how persistent is spending. None of the stabilization funds characteristics matters for policy persistence as columns (3) to (5) indicate. Although few of the variables are significant and the fit of the regression is rather poor, it is worth noting that the conditional correlation between the persistence parameter and the ACIR index is always significant and robust to alterations in the baseline specification.

We can also compare the persistence by calculating the average for states with no carryover restrictions and states without such restrictions. The results — reported in Table 4 — suggest that the states without restrictions have on average autoregressive coefficients in the spending equations of about 0.66, while states with a no-carryover rule have persistence parameter of about 0.47. This

**Table 3. What Determines the Persistence of Government Spending?**

$$\gamma_i = \alpha + \lambda' P_i + \delta' \mathbf{X_i} + \nu_i$$

| | Dependent variable: Persistence of Government Spending ($\gamma$) | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| No Carryover | -0.163 | - | - | -0.139 | - |
| | (0.079) | | | (0.122) | |
| ACIR | - | -0.041 | - | - | -0.044 |
| | | (0.015) | | - | (0.015) |
| Governor's veto | -0.120 | -0.044 | - | -0.120 | -0.035 |
| | (0.322) | (0.725) | | (0.349) | (0.783) |
| Deposit rule | - | - | -0.139 | -0.118 | -0.149 |
| | | | (0.355) | (0.426) | (0.273) |
| Withdrawal rule | - | - | 0.134 | 0.119 | 0.148 |
| | | | (0.353) | (0.423) | (0.274) |
| Democrats | -0.453 | -0.383 | -0.154 | -0.394 | -0.339 |
| | (0.309) | (0.352) | (0.713) | (0.403) | (0.437) |
| Split | 0.032 | 0.109 | -0.001 | 0.040 | 0.132 |
| | (0.874) | (0.576) | (0.995) | (0.842) | (0.479) |
| Concentration | 0.308 | 0.278 | 0.225 | 0.352 | 0.337 |
| | (0.460) | (0.511) | (0.545) | (0.390) | (0.406) |
| $R^2$ | 0.219 | 0.250 | 0.200 | 0.261 | 0.320 |

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.

is consistent with the argument that more restrictions imply that governments reverse faster spending increases.

*D. What Affects Policy Elasticity?*

So far, our analysis has focused on the component of fiscal policy that is orthogonal to the business cycle and on the persistence of policy changes. Discretionary fiscal policy, in our view, is a source of business cycles and restrictions on fiscal policy can help reduce its costs. On the other side of the

**Table 4. Comparing persistence across regimes**

| | Carryover Allowed (1) | No Carryover (2) |
|---|---|---|
| Persistence | 0.661 | 0.467 |
| | [0.064] | [0.054] |
| T-test of equality | 2.316 | |
| (p-value) | (0.025) | |
| Number of States | 24 | 24 |
| Spearman's Rank Order Correlation | | |
| -with ACIR | -0.376 | |
| (p-value) | (0.008) | |
| -with No carryover | -0.274 | |
| (p-value) | (0.060) | |

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

debate are those who oppose restriction on fiscal policy by arguing that these restrictions have a negative effect on the economy through the limits they impose on counter-cyclical fiscal policy. A standard measure of cyclicality of fiscal policy is the elasticity of government spending with respect to output growth as it is 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.[12]

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

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

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

Table 5 reports the results and it is organized in a similar way to Tables 2 and 3 — we use again the same controls and the same set of budget rules. To

[12] 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.

**Table 5. Do Budget Rules Affect Policy Responsiveness?**

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

| | Dependent variable: Elasticity of Government Spending | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| No Carryover | 0.008 | - | - | 0.008 | - |
| | (0.077) | | | (0.087) | |
| ACIR | - | 0.002 | - | - | 0.002 |
| | | (0.011) | | | (0.011) |
| Governor's veto | 0.009 | 0.005 | - | 0.009 | 0.005 |
| | (0.030) | (0.245) | | (0.043) | (0.005) |
| Deposit rule | - | - | 0.004 | 0.003 | 0.005 |
| | | | (0.408) | (0.516) | (0.259) |
| Withdrawal rule | - | - | -0.007 | -0.006 | -0.008 |
| | | | (0.200) | (0.264) | (0.140) |
| Democrats | 0.029 | 0.026 | 0.012 | 0.028 | 0.024 |
| | (0.179) | (0.189) | (0.543) | (0.192) | (0.206) |
| Split | 0.000 | -0.004 | 0.002 | - 0.001 | -0.006 |
| | (0.993) | (0.650) | (0.893) | (0.928) | (0.538) |
| Concentration | -0.015 | -0.014 | -0.011 | -0.020 | -0.019 |
| | (0.340) | (0.377) | (0.527) | (0.216) | (0.211) |
| $R^2$ | 0.263 | 0.316 | 0.177 | 0.289 | 0.357 |

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

facilitate the interpretation of the results in Table 5, we emphasize that higher $\beta$'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 result confirms the findings of Lane (2003) that separation of powers in terms of the budget lead to more pro-cyclicality of government spending. The results in columns (3) to (5) suggest that the rules governing the use of rainy day funds have no impact on elasticity or on the correlation between elasticity and the stringency of teh budget rules.

It is useful again to group these elasticities by states with strict constitutionally determined no carryover rules and states without such strict rules. Table 6 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. The non-parametric measures of association show high significance in the positive link between rules and elasticities, which suggests that the relationship is not driven by outliers.

**Table 6. Comparing average elasticities across regimes**

| | Carryover Allowed | No Carryover |
|---|---|---|
| | (1) | (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

After establishing the link between institutions and policy characteristics in the previous section, we now ask the question: How do these policy characteristics — volatility, persistence, and elasticity — affect business cycle fluctuations? The main goal of this section is to establish how macroeconomic stability (measured as the standard deviation of output growth, $\sigma_i^y$) is affected by policy. To document the link between economic stability and the three characteristics of fiscal policy we run the following regression.

$$\log(\sigma_i^y) = \alpha + \lambda_v \log(\sigma_i^\epsilon) + \lambda_e \beta_i + \lambda_p \gamma_i + \delta' \mathbf{X_i} + \nu_i \tag{4}$$

In addition to the three variables of interest (volatility, persistence and elasticity), 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 rules governing the operation of stabilization funds (deposit and withdrawal rules), 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).

Although it is certainly 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 7 the claim that the institutional variables affect output directly. As it turns out the two characteristics of Rainy Day funds enter the regression with significant coefficients and therefore we will use them as controls in the main regression and not only as instruments. None of the budget variables is significant and we proceed to the next four columns where we use these variables as instruments.

Column (2) includes only policy volatility 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.

**Table 7. Does Fiscal Policy Affect Business Cycles?**

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

| | Dependent variable: Volatility of output | | | | |
|---|---|---|---|---|---|
| | (1) OLS | (2) IV | (3) IV | (4) IV | (5) IV |
| Discretionary fiscal policy | - | 0.706 (0.006) | - | - | 0.647 (0.041) |
| Persistence fiscal of spending | - | - | -0.253 (0.293) | - | -0.572 (0.753) |
| Responsiveness of fiscal policy | - | - | - | 2.603 (0.571) | -10.70 (0.753) |
| No Carryover | -0.021 (0.799) | - | - | - | - |
| Governor veto | 0.037 (0.548) | - | - | - | - |
| ACIR | -0.011 (0.331) | - | - | - | - |
| Deposit rule | -0.088 (0.010) | -0.171 (0.016) | -0.149 (0.016) | -0.133 (0.010) | -0.195 (0.103) |
| Withdrawal rule | 0.230 (0.012) | 0.385 (0.013) | 0.235 (0.029) | 0.230 (0.024) | 0.363 (0.036) |
| Government size | -0.416 (0.044) | -1.980 (0.017) | -0.427 (0.418) | -0.513 (0.364) | -1.941 (0.041) |
| GSP per capita | 0.023 (0.905) | 0.033 (0.892) | 0.158 (0.446) | 0.080 (0.718) | 0.156 (0.757) |
| $R^2$ | 0.484 | - | - | - | - |
| Test of OID (p-value) | | (0.826) | (0.030) | (0.019) | (0.538) |

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.

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 columns (3) and (4) where we use the persistence and elasticity of spending respectively, we note that these two variables have no impact on output volatility, i.e. the cross-sectional variation of policy persistence and policy elasticity in the US states is not strong enough to generate a link between output volatility and elasticity. Another interesting result from these two columns 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 or policy persistence. This result is not surprising in light of the regressions in Table 2 and the evidence from column (2) of Table 7 as both of these tables suggest that there is a link from institutions to policy volatility and then to output volatility. When we omit policy volatility from regression (4) then its effects will be captured by the residual and the residuals will be correlated with the instruments.

Finally, in column (5) we report that including spending elasticity, persistence and discretionary volatility together 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). Importantly policy restrictions do curb this volatility and they affect also the elasticity of policy, but the effect on elasticity is not strong enough to generate significant correlation between policy and output fluctuations.

## V. Conclusion

This paper provides an empirical study of the macroeconomic effects of explicit and implicit constraints on fiscal policy. In the first round of analysis, our results provide arguments to both sides of the debate on the appropriateness of restricting fiscal policy. We provide evidence 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 to study the validity of

this claim. We find that limits on fiscal policy have a significant effect on the cyclical elasticities of government spending. As expected, fiscal policy becomes more procyclical in the presence of strict constraints.

We also find evidence of the potential benefits of restrictions on fiscal policy. We find 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. Our results strongly support the notion that both implicit and explicit constraints on fiscal policy reduce the use of discretion in fiscal policy. In addition, we find that discretionary changes in fiscal policy are more persistent when government face less restrictions.

Finally, we assess which of the two above effects dominates. Our analysis is very simple, we only look at the business cycle effects of these restrictions and we ask whether states where governments face tighter restrictions display more or less volatile business cycles. To be able to answer this question 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.[13]

Our results lend support to the notion that the benefits of constraints outweigh their costs. We show that indeed fiscal policy is a significant source of business cycle volatility among US states, and, as a result, constraints on politicians lead to a less volatile economic fluctuations. This conclusion confirms our analysis for a large sample of countries where we also showed that constraints on fiscal policy reduce the volatility of the business cycle (see Fatás and Mihov (2003)).

[13] It is also possible that policy outcomes and institutions are a results of a third variable, e.g. voters' preferences. But as Poterba (1995) argues, empirical attempts to dissociate institutions and policy by controlling for voters' preferences have been rather unsuccessful.

# VI. References

Advisory Commission on Intergovernmental Relations (ACIR) (1987), *Fiscal Discipline in the Federal System: Experience of the States,* Washington, D.C.

Alesina, Alberto and Tamim Bayoumi (1996). "The Costs and Benefits of Fiscal Rules: Evidence from U.S. States". NBER Working Paper No. 5614.

Alesina, Alberto and Roberto Perotti (1996), "Budget Deficits and Budget Institutions," NBER Working Paper No 5556.

Alt, James and Robert Lowry (1994). "Divided Governments, Fiscal Institutions and Budget Deficits: Evidence for the States". *American Political Science Review,* 88.

Blanchard, Olivier and Roberto Perotti (2002). "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output," *Quarterly Journal of Economics*, LXVII, 1329-1368.

Besley, Timothy and Anne Case (2003) "Political Institutions and Policy Choices: Evidence from the United States," *Journal of Economic Literature* XLI, pp.7-73.

Bohn, Henning and Robert Inman (1996) "Balanced-budget Rules and Public Deficits: Evidence from the U.S. States," *Carnegie-Rochester Conference Series on Public Policy* 45, pp.13-76.

deHaan, Jakob, Win Moessen and Bjorn Volkerink (1999), "Budgetary Procedures – Aspects and Changes: New Evidence for Some European Countries." In Poterba and von Hagen (Eds.), *Fiscal Institutions and Fiscal Performance.* NBER and University of Chicago Press, Chicago, IL, pp. 265-300.

Fatás, Antonio and Ilian Mihov (2001). "Government Size and Automatic Stabilizers: International and Intranational Evidence," *Journal of International Economics.*

Fatás, Antonio and Ilian Mihov, "The Effects of Fiscal Policy on Consumption and Employment: Theory and Evidence," INSEAD Working Paper, 2002.

Fatás, Antonio and Ilian Mihov (2003) "The Case for Restricting Fiscal Policy Discretion," *Quarterly Journal of Economics.*

Gali, Jordi, David Lopez-Salido and Javier Valles (2002) "Understanding the Effects of Government Spending on Consumption," manuscript.

Gonzales, Christian and Vicente Paqueo (2003), "Social Sector Expenditures and Rainy-Day Funds," World Bank Policy Research Working Paper 3131.

Hallerberg, Mark and von Hagen, Jürgen (1999), "Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the European Union." In Poterba and von Hagen (Eds.), *Fiscal Institutions and Fiscal Performance*. NBER and University of Chicago Press, Chicago, IL, pp. 265-300.

Lane, Philip (2003) "The Cyclical Behavior of Fiscal Policy: Evidence from the OECD," *Journal of Public Economics,* 87(12), pp. 2661-2675.

Levinson, Arik (1998), "Balanced Budgets and Business Cycles: Evidence from the States," *National Tax Journal* LI.

Milesi-Ferretti, Gian-Maria, Roberto Perotti and Massimo Rostagno, "Electoral Systems and Public Spending," *Quarterly Journal of Economics* CXVIII (2002), 609-658.

Mountford, Andrew and Harald Uhlig (2002) "What Are the Effects of Fiscal Policy Shocks?" CEPR Discussion paper.

National Association of State Budget Officers (NASBO) (2002), *Budget Processes in the States.*

Perotti, Roberto and Yianos Kontopoulos (2002) "Fragmented Fiscal Policy," *Journal of Public Economics.*

Persson, Torsten and Guido Tabellini, *Political Economics: Explaining Economic Policy,* (Cambridge, MA: MIT Press, 2000).

Persson, Torsten and Guido Tabellini, "Political Institutions and Policy Outcomes: What are the Stylized Facts?" CEPR DP No 2872, 2001.

Poterba, James (1994). "State Responses to Fiscal Crises: The Effects of Budgetary Institutions". *Journal of Political Economy,* 102.

Poterba, James (1995). "Balanced Budget Rules and Fiscal Policy: Evidence from the States," *National Tax Journal,* 48.

Roubini and Sachs (1989). "Government Spending and Budget Deficits in the Industrialized Countries". *Economic Policy,* 8.

Sorensen, Bent, Lisa Wu and Oved Yosha (2001). "Output Fluctuations and Fiscal Policy: U.S. State and Local Governments 1978-1994" *European Economic Review,* 45.

von Hagen, Jürgen (1991). "A Note on the Empirical Effectiveness of Formal

Fiscal Restraints" *Journal of Public Economics,* 44(2). pp. 199-210.

Wagner, Gary and Erick Elder (2002), "Fiscal Policy and Cyclical Fluctuations: An Investigation of U.S. State Budget Stabilization Funds," manuscript.

Wyplosz, Charles (2001) "Fiscal Policy: Institutions vs. Rules," manuscript.