Is State Fiscal Policy Asymmetric Over the Business Cycle?

By Bent E. Sorensen and Oved Yosha

A number of stabilizers are thought to mute the business cycle. One key stabilizer is federal fiscal policy. The federal budget surplus tends to rise during economic booms and fall in downturns, helping to stabilize consumers' disposable income and thereby mitigate economic fluctuations. During booms, for example, the budget surplus typically rises because tax revenues rise more than expenditures.

Another stabilizer that has traditionally received less attention is state fiscal policy. Like the federal budget surplus, state government surpluses tend to rise during economic expansions and decline during downturns. For instance, Nebraska's budget surplus rose from $91 per capita in the recession year 1990 to $326 (in 1990 prices) per capita in 1998, when the economy was booming. Moreover, like the federal budget, state budgets represent large shares of the economy. For example, in 1998 state government expenditure was 10 percent of gross state product in Kansas, and 9 percent in Missouri.

The stabilizing influence of state fiscal policy, however, may differ across business cycle expansions and downturns—making state fiscal policy *asymmetric*. For example, state budgets could be more effective at mitigating economic slumps than at muting booms if taxes fall more

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sharply during a slump than they rise in an expansion of equal magnitude. Asymmetry in fiscal policy could be caused by a number of factors, such as balanced budget rules, which are constitutionally imposed restrictions on a state government's ability to incur debt.

This article examines the business cycle behavior of state fiscal policy to determine whether policy is asymmetric and, if so, to identify the causes. The first section of the article reviews the general business cycle behavior of state budgets. The second section discusses some theoretical explanations of asymmetry and then examines whether the fiscal policies of U.S. states are asymmetric. The third section explores whether stringent balanced budget rules are associated with stronger asymmetry in state fiscal policy. The article concludes that state revenue and expenditure display significant asymmetry over the business cycle, with nearly offsetting effects on the budget surplus. As a result, state fiscal policy tends to mute economic booms to roughly the same degree it mitigates slowdowns. The asymmetries in revenue and expenditure appear to be associated with balanced budget rules, although their fundamental causes cannot be clearly identified.

I.   EVIDENCE OF GENERALLY COUNTERCYCLICAL STATE FISCAL POLICY

State government budget surpluses generally follow the ups and downs of the business cycle, typically rising during economic expansions and falling in recessions. This procyclical behavior of budget surpluses helps stabilize consumers' disposable income and thereby mitigates economic fluctuations.[1] As a result, when budget surpluses are *procyclical*, fiscal policy is usually referred to as *countercyclical*.

This section documents the general countercyclicality of state fiscal policy. During economic expansions, government tax revenue increases more than spending, causing the budget surplus to grow. Because this section's analysis abstracts from the potential for asymmetry in fiscal policy, economic downturns are presumed to lead to identical, reversed movements in revenue, expenditure, and the surplus.

Data description

In the state-level data used in this article, government spending and revenue are defined as the total outlays and receipts, respectively, of state governments. These definitions differ somewhat from "government purchases" in the national income and product accounts of the United States. The key difference lies in the treatment of transfer payments. In the national data economists are most familiar with, transfer payments are not counted as spending (government consumption and investment expenditures), and they are netted out of tax revenues. In state-level data, however, transfer payments are simply counted as expenditures. More specifically, the state expenditure data include government consumption, investment, and transfer payments to individuals and local governments. The state revenue data include all receipts of state governments.[2]

The data set used throughout the article spans the 48 continental states from 1963 to 1998. The set of states is limited to those within the continental United States because Alaska has an extremely high dependence on oil revenue and Hawaii has a highly unusual fiscal structure. Most previous analyses of state fiscal policy have also excluded these states. The time period 1963–98 is the longest over which annual data are available.

Methodology for gauging cyclical behavior of fiscal policy

With revenue and expenditure defined in this way, the general cyclical behavior of state fiscal policy is gauged by regressing the annual changes in a state government's revenue and expenditure on changes in the state's gross state product (GSP). The behavior of the budget surplus can then be inferred from the estimated responses of revenue and expenditure.

The regressions take two simple forms:

$$\Delta revenue_{it} = \alpha_{Ri} + \sum_{k=0}^{5} \beta_{Rk} \Delta gsp_{it-k} + \varepsilon_{it}, \qquad (1)$$

$$\Delta expenditure_{it} = \alpha_{Ei} + \sum_{k=0}^{5} \beta_{Ek} \Delta gsp_{it-k} + \varepsilon_{it}. \qquad (2)$$

In equations (1) and (2), $\Delta revenue_{it}$ and $\Delta expenditure_{it}$ are the change in state i's revenue and expenditure, respectively, from fiscal year t-1 to fiscal year t.[3] Δgsp_{it} is the change in state i's GSP from calendar year t-1 to year t; Δgsp_{it-1} is the change in GSP from year t-2 to t-1; and so on. Revenue, expenditure, and GSP are measured in per capita terms to abstract from the possible effects of population changes.[4]

The β coefficients capture, in dollar terms, the average responses—across state governments and over time—of revenue and expenditure to changes in GSP. The coefficient β_{R0}, for example, measures the average response of state revenue to a current-year increase in GSP; a positive value indicates a procyclical response of revenue. Similarly, β_{R1} measures the response to an increase in GSP last year. The coefficients from equation (2) provide corresponding results for expenditure. The units are chosen so that the β coefficients measure the response of revenue and expenditure to a $100 increase in GSP. The a coefficients simply represent the constant term that usually appears in a regression. The constant term is allowed to differ across states in order to capture the average increases over time in each state's revenue and expenditure. This approach ensures that differences across states in the average rate of increase do not affect the estimates of the business cycle patterns in fiscal policy.

Estimates of the cyclical behavior of fiscal policy

The regression estimates indicate state fiscal policy is generally countercyclical. Revenue rises within the year in response to an increase in GSP, while expenditure increases more sluggishly, with the result that the budget surplus rises when GSP does (Table 1). More specifically, revenue initially increases $4.7 in response to a $100 increase in GSP and then stays roughly constant in the following years (the slight subsequent changes are not statistically significant). Expenditure increases only $1.1 in the initial year, declines in the next year, then rises slowly but steadily until expenditure catches up with the increase in revenue.[5] As a result, the budget surplus is on the order of $3–5 for about three years, after which the surplus declines to about $1 as expenditure rises.[6] The procyclicality in the budget surplus means that fiscal policy is countercyclical.

Table 1

THE RESPONSE OF STATE BUDGETS TO A RISE IN GSP

	Years since rise in output					
	0	1	2	3	4	5
	Dollar response to a $100 rise in GSP					
Revenue	4.7	5.1	4.8	3.6	4.5	5.0
	(14.3)	(13.4)	(8.6)	(5.8)	(6.4)	(6.4)
Expenditure	1.1	-.7	1.5	2.6	3.4	3.9
	(3.5)	(1.9)	(3.1)	(4.6)	(5.5)	(5.6)
Surplus	3.6	5.8	3.3	1.0	1.1	1.1

Notes: The first two rows are obtained from the regressions in equations (1) and (2) as follows. Consider the first row. Column 0 displays β_{R0}, which is the response of revenue to a current year $100 rise in GSP; column 1 displays $\beta_{R0} + \beta_{R1}$, which is the cumulative response of revenue to a one year lagged $100 rise in GSP; and so forth. The displayed numbers are, therefore, best interpreted as representing the response of the budget components to a $100 *permanent* rise in GSP. The second row is interpreted in an analogous manner. The third row is obtained by subtracting the second from the first row. Absolute values of t-statistics appear in parentheses.

Sources: DRI, BEA, and authors' calculations

Previous studies using somewhat different methodologies and data have also found state or local budget surpluses to be procyclical. For example, for the period 1971–90, Eichengreen and Bayoumi (1994) show that, as GSP growth rises, the budget surpluses of state and local governments (combined) rise more than proportionately, suggesting that fiscal policy stabilizes aggregate demand and income.[7] For a sample of U.S. local governments, Holtz-Eakin, Newey, and Rosen (1989) find that changes in revenue typically precede changes in expenditure, implying procyclical budget surpluses.[8]

II.   IS STATE FISCAL POLICY ASYMMETRIC?

State fiscal policy is generally countercyclical. However, several factors could lead to asymmetry in policy—so that fiscal policy responds in varying degrees to expansions and recessions of equal magnitudes. In particular, revenue, expenditure, and the budget surplus may respond more or less sharply to increases in GSP than to decreases. This section reviews the potential sources of business cycle asymmetry, describes the methodology used to detect asymmetry, and then presents evidence of significant asymmetry in state fiscal policy.

Potential causes of asymmetric fiscal policy

Asymmetry in fiscal policy may arise for a variety of reasons, including credit market constraints, balanced budget rules, lack of budget discipline in upturns, and incumbent political parties trying to influence voting patterns or force the hand of future governments.

First, governments may find it hard to borrow in credit markets during recessions. In general, the creditworthiness of governments declines during recessions. As a result, U.S. state governments may face significantly higher interest rates during recessions.[9] The difficulty in borrowing could limit spending during economic downturns, creating asymmetry in the responses of government spending. Gavin and Perrotti suggest credit market problems as an explanation of their finding that fiscal policy in Latin America is highly asymmetric.

A second potential source of borrowing constraints and asymmetry in fiscal policy is balanced budget rules, which are imposed by state constitutions rather than by credit markets. Balanced budget rules limit the ability of state governments to incur debt and therefore may prevent governments from borrowing in recessions. Virtually all states have such rules.[10] For example, Kansas recently cut planned spending to meet balanced budget requirements (The [Kansas] Governor's Budget Report for Fiscal Year 2001). If balanced budget rules limit government borrowing, states' fiscal response in economic downturns will be constrained by the amount of surplus accumulated during expansions and, hence, the response will be weaker for governments which have not accumulated enough surpluses in upturns. Thus, balanced budget rules may limit the flexibility of governments (Alesina and Bayoumi). Admittedly, however, balanced budget rules may benefit states in other important dimensions outside the scope of this article.

A third source of asymmetry in fiscal policy could be so-called "voracity" effects. In the theoretical model developed by Tornell and Lane, influential political groups engage in wasteful pork barrel spending that favors their constituencies. Governments are then unable to accumulate surpluses, or reluctant for fear the surpluses will be spent by "voracious" pressure groups, and do not accumulate surpluses in rainy day funds during upswings to help maintain spending during recessions.[11]

So-called "political economy" models identify a fourth, related source of asymmetry. In the theoretical model of Persson, Persson, and Svensson, a fiscally conservative government accumulates debt (refraining from building up rainy day funds) in order to make it harder for successor governments to increase spending. If states face credit constraints during recessions, the shortage of rainy day funds leads to asymmetric fiscal policy.[12] Some sentiments expressed by state policymakers appear consistent with such models. For example, the Kansas Treasurer, commenting on the 2001 tight budgets in Kansas, said that many people like to blame tax cuts for the budget problems but "if taxes had not been cut, the legislature would have spent the money and the state would still have been saddled with budget problems" (Dvorak).

Political "sacred cows" are a fifth potential source of asymmetry in fiscal policy. Cutting state spending on popular programs such as Medicaid is hard to do, especially during recessions, when these programs may be most needed. Politicians who expand such programs during upswings may not fully recognize their irreversible nature or, on the contrary, may use this inherent irreversibility as yet another way of tying the hands of successor governments. This intuition is closely related to models of the "political business cycle" in which incumbent politicians have an incentive to increase spending before elections. If that form of electioneering is more attractive in upswings than in downturns, it may lead to asymmetry in fiscal policy. Sorensen, Wu, and Yosha find evidence of such political business cycle asymmetry in the fiscal policy of U.S. state and local governments during the period 1978–94.[13]

Various other factors could also lead to asymmetry in fiscal policy. For example, state governments may prefer to limit taxation in upturns but may have a strong desire to mitigate recessions. In this case, state fiscal policy might respond more aggressively to recessions than expansions. Alternatively, even if borrowing is not constrained by forces such as balanced budget rules, governments may respond less forcefully to downturns than to upturns because deficit spending is perceived as a political embarrassment. More generally, political attitudes may lead to asymmetry in state fiscal policy.

Methodology for measuring asymmetry in fiscal policy

Whether asymmetry exists in state fiscal policy can be gauged with regressions of annual changes in a state's revenue and expenditure on changes in its GSP, with upturns in GSP distinguished from downturns. The behavior of the budget surplus during upturns and downturns can then be calculated from the estimated responses of revenue and expenditure.

The regressions take the forms

$$\Delta revenue_{it} = \alpha_{Ri} + \sum_{k=0}^{5} \beta_{Rk}^{+} \Delta gsp_{it-k}^{+} + \sum_{k=0}^{5} \beta_{Rk}^{-} \Delta gsp_{it-k}^{-} + \varepsilon_{it}, \qquad (3)$$

$$\Delta expenditure_{it} = \alpha_{Ei} + \sum_{k=0}^{5} \beta_{Ek}^{+} \Delta gsp_{it-k}^{+} + \sum_{k=0}^{5} \beta_{Ek}^{-} \Delta gsp_{it-k}^{-} + \varepsilon_{it}. \qquad (4)$$

In equations (3) and (4), the variables Δgsp_{it}^{+} and Δgsp_{it}^{-} represent measures of, respectively, upturns and downturns in state i's economy. For each state, an upturn is defined as an above-average change in its GSP. A downturn is defined as a below-average change in a state's GSP; a downturn may correspond to below-trend growth or an outright decline in GSP. More specifically, Δgsp_{it}^{+} equals Δgsp_{it} (the change in state i's GSP from year t-1 to year t) if Δgsp_{it} is above its average over time for state i; otherwise Δgsp_{it}^{+} is zero. Similarly, Δgsp_{it}^{-} equals Δgsp_{it} if the latter is below its average over time for state i; otherwise Δgsp_{it}^{-} is zero. The β^{+} coefficients measure the dollar response of the left-hand side variable in response to a \$100 increase in GSP in years with an above-average rise in GSP, while the β^{-} coefficients measure the dollar response of the left-hand side variable to a \$100 decline in GSP (where "decline" is defined relative to the average change in GSP).

Estimates of the asymmetry in fiscal policy

The regression estimates indicate significant asymmetries in the business cycle behavior of both revenue and expenditure, but only weak asymmetry in the movements of the budget surplus. Revenue reacts within the first year to upturns in the economy, increasing by \$4 in response to a \$100 increase in GSP, and then slowly declines to almost its initial level (Table 2). In contrast, expenditure does not rise and even

Table 2

THE RESPONSE OF STATE BUDGETS TO A CHANGE IN GSP DURING UPTURNS

| | Years since rise in output | | | | | |
	0	1	2	3	4	5
	Dollar response to a $100 rise in GSP					
Revenue	4.0	3.5	3.5	2.1	1.3	.9
	(8.4)	(5.8)	(4.7)	(2.3)	(1.3)	(.8)
Expenditure	.3	-1.7	-.1	1.9	1.2	1.5
	(.7)	(3.0)	(.2)	(2.3)	(1.3)	(1.4)
Surplus	3.7	5.2	3.6	.2	.1	-.6

Notes: The first two rows in each panel are obtained from the regressions in equations (3) and (4) as follows. Consider the first row. Column 0 displays β_{R0}^{+}, which is the response of the revenue to a current year $100 rise in GSP in years with an above average rise in GSP; column 1 displays $\beta_{R0}^{+} + \beta_{R1}^{+}$, which is the cumulative response of revenue to a one year lagged $100 rise in GSP; and so forth. The displayed numbers are, therefore, best interpreted as representing the response of the budget components to a $100 *permanent* rise in GSP. The second row is interpreted in an analogous manner. The third row is obtained by subtracting the second from the first row. Absolute values of t-statistics appear in parentheses.

Sources: DRI, BEA, and authors' calculations

declines in the second year after an upswing, perhaps due to a reduction in transfer payments. With revenue rising relative to expenditure, the budget surplus increases for three years following the initial rise in GSP. These findings are very different from Gavin and Perrotti's results for Latin America, indicating U.S. state governments do not scramble to spend surpluses as predicted by the Tornell and Lane voracity model.

Economic downturns produce very different patterns in government revenue and expenditure, although not the budget surplus. In Table 3, the estimated regression coefficients are reported such that the negative values represent the dollar *decline* in revenue, expenditure, or the surplus in response to a $100 *decline* in GSP during downturns.[14] Not surprisingly, revenue declines within the year in response to a decline in GSP, probably because the legislative difficulty of changing tax rates makes them largely fixed in the short run. More interestingly, revenue keeps falling for many years after the initial decline in state income. Expenditure also reacts within the year to a decline in output, but less strongly than revenue. As a result, the budget surplus drops within the year. However, the deterioration in the surplus lasts only two to three years.

Table 3

THE RESPONSE OF STATE BUDGETS TO A CHANGE IN GSP DURING DOWNTURNS

| | Years since decline in output | | | | | |
	0	1	2	3	4	5
	Dollar response to a $100 decline in GSP					
Revenue	-5.5	-7.1	-5.6	-4.5	-7.9	-9.3
	(9.3)	(9.1)	(5.7)	(4.3)	(7.0)	(7.7)
Expenditure	-2.1	-.9	-3.5	-3.5	-6.0	-6.6
	(3.7)	(1.2)	(3.9)	(3.5)	(5.5)	(5.7)
Surplus	-3.4	-6.2	-2.1	-1.0	-1.9	-2.7

Notes: The first two rows in each panel are obtained from the regressions in equations (3) and (4) as follows. The displayed numbers are the *negative* of the coefficients. Consider the first row. Column 0 displays $-\beta_{R0}$, which is the response of the revenue to a current year $100 decline in GSP (in years with a below-average rise in GSP); column 1 displays $-(\beta_{R0} + \beta_{R1})$, which is the cumulative response of revenue to a one year lagged $100 decline in GSP; and so forth. The displayed numbers are, therefore, best interpreted as representing the response of the budget components to a $100 *permanent* decline in GSP. The second row is interpreted in an analogous manner. The third row is obtained by subtracting the second from the first row. Absolute values of t-statistics appear in parentheses.

Sources: DRI, BEA, and authors' calculations

Thus, the reduction in the surplus following a slowing of the economy is similar in magnitude to the pickup in the surplus that typically follows an increase in GSP growth. The changes in revenue, expenditure, and the surplus following economic downturns are consistent with state governments cutting budgets in response to "budget crises."

Overall, state fiscal policy displays significant asymmetry. Revenue and expenditure each behave asymmetrically, responding to economic upturns and downturns by very different degrees. However, the budget surplus displays only weak asymmetry—just modest differences in the responsiveness of the surplus to upturns and downturns in the economy. One simple interpretation of the behavior of state governments is that, during upturns, tax rates are slowly lowered, so that revenue initially rises with GSP but then gradually declines to its baseline level. During downturns, tax rates are held roughly constant. Thus, revenue follows GSP in the initial year of the economic slowdown and remains low in subsequent years. States appear to change expenditure little during upturns but cut spending as revenue falls during downturns. These results are broadly

consistent with Holtz-Eakin, Newey, and Rosen's finding that, for local governments, revenue leads expenditure in time. The evidence in this article, however, indicates this effect occurs only in downturns.[15]

III. ARE BALANCED BUDGET RULES A SOURCE OF ASYMMETRY?

As shown in the last section, the evidence on asymmetries in the business cycle behavior of state government revenue and expenditure rules out some potential explanations, such as the voracity effect of Tornell and Lane. This section examines another potential explanation for these asymmetries: balanced budget rules. Some observers might view such rules as the most likely source of asymmetry. However, asymmetry in fiscal policy could be caused by other factors that are somehow related to balanced budget rules. In particular, states that have relatively tight balanced budget rules tend to be fiscally and politically conservative. The asymmetry in fiscal policy could then truly be due to conservatism. This section also examines whether the conservatism of state voters is associated with asymmetry in fiscal policy.

This analysis examines whether there is an association between asymmetry in fiscal policy and balanced budget rules and, in turn, conservatism. No attempt is made to judge the merits of stringent versus less stringent rules or conservative versus liberal government. Such evaluations are beyond the scope of this article.

Fiscal policy asymmetry and the stringency of balanced budget rules

To examine the relationship between asymmetry and balanced budget rules, the states are classified in two groups—states with tight balanced budget rules and states with less stringent or no balanced budget rules. The states are classified using an index developed by the National Association of State Budget Officers. The NASBO index ranks states according to the stringency of their balanced budget rules. The index ranges from 0 in Vermont—the only state with no balanced budget constraints—to 10 in the states with the tightest rules. Colorado and Missouri, for example, have an index of 10. The "tight balanced budget rules" group consists of the 35 states with an index of 8 or

Chart 1

STATES WITH TIGHT VS. LESS STRICT
BALANCED BUDGET RULES
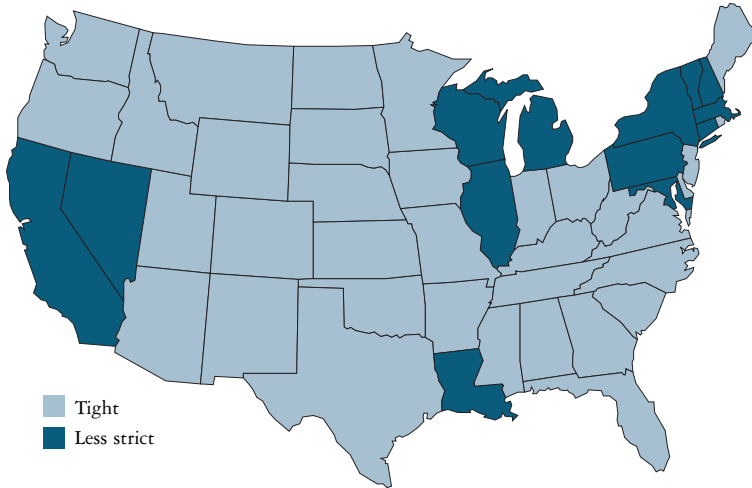
Sources: NASBO and authors' calculations

higher and the "less strict" group consists of 13 states with an index of 7 or lower (Chart 1). Then the regression equations (3) and (4) presented in the last section are estimated for each group separately.

The regression estimates show that the stringency of balanced budget rules has a strong bearing on asymmetry in state fiscal policy. The patterns of asymmetries in revenue and expenditure differ sharply across the tight rules and less strict rules groups. Moreover, the budget surplus is significantly more asymmetric in states with less strict budget rules than in states with tight rules.

In states with tight balanced budget rules, fiscal policy displays the same pattern of asymmetries described in the last section for the full set of states (Table 4). A rise in GSP has little effect on revenue and expenditure apart from a temporary increase in revenue, while both revenue and expenditure decline markedly (with a lag) in downturns. As a result, in states with tight rules the budget surplus displays only weak

Table 4

THE RESPONSE OF STATE BUDGETS TO CHANGES IN GSP
States with Tight Balanced Budget Rules

	Upturns						Downturns					
	Years since rise in output						Years since decline in output					
	0	1	2	3	4	5	0	1	2	3	4	5
	Dollar response to a $100 rise in GSP						Dollar response to a $100 decline in GSP					
Revenue	3.5	2.8	3.1	2.4	1.3	.3	-4.9	-7.5	-5.9	-3.4	-6.8	-8.4
	(7.0)	(4.2)	(3.9)	(2.4)	(1.1)	(.2)	(7.4)	(8.8)	(5.4)	(3.0)	(5.5)	(6.2)
Expenditure	-.1	-2.0	-.7	1.0	.2	-.2	-2.2	-1.8	-4.1	-3.7	-6.1	-6.6
	(.1)	(3.1)	(.9)	(1.0)	(.2)	(.1)	(3.5)	(2.1)	(4.0)	(3.3)	(5.1)	(5.1)
Surplus	3.6	4.8	3.8	1.4	1.1	.5	-2.7	-5.7	-1.8	.3	-.7	-1.8

Notes: Table 2 explains the calculation of the figures in the left side of the table. Table 3 explains the calculation of the figures in the right side of the table.

Sources: DRI, BEA, NASBO, and authors' calculations

asymmetry over the business cycle. Thus, in states such as Missouri and Colorado, fiscal policy provides nearly equal degrees of stabilization in economic expansions and downturns.

States with less strict rules, however, follow very different fiscal policies, characterized by unique asymmetries in revenue and expenditure and pronounced asymmetry in the budget surplus (Table 5). During upturns, states with less strict balanced budget rules significantly increase both revenue and expenditure, by much more than states with tight rules. With revenue rising considerably more in states with less strict rules, states with less strict rules experience a larger increase in the budget surplus in the first few years of the upturn. During downturns, both revenue and expenditure fall sharply for these states. Because revenue falls by increasing amounts over time, the budget surplus continues to drop after its initial, substantial falloff.[16] Thus, the budget surplus displays more asymmetry in states with less strict budget rules. In particular, in states with less strict budget rules, such as Massachusetts and New York, fiscal policy appears to mitigate economic slowdowns more than it mutes booms.

Table 5

THE RESPONSE OF STATE BUDGETS TO CHANGES IN GSP
States with Less Strict Balanced Budget Rules

	Upturns						Downturns					
	Years since rise in output						Years since decline in output					
	0	1	2	3	4	5	0	1	2	3	4	5
	Dollar response to a $100 rise in GSP						Dollar response to a $100 decline in GSP					
Revenue	8.4	7.7	5.9	2.9	4.5	7.1	-7.8	-6.4	-5.9	-13.0	-15.9	-18.0
	(8.0)	(6.2)	(3.9)	(1.6)	(2.5)	(3.2)	(6.6)	(4.1)	(3.2)	(5.8)	(6.3)	(6.7)
Expenditure	2.1	-.7	2.2	3.6	3.4	5.4	-1.9	2.2	-1.4	-3.3	-4.9	-6.8
	(2.2)	(.7)	(1.7)	(2.6)	(2.4)	(3.2)	(1.7)	(1.6)	(.8)	(1.7)	(2.2)	(2.9)
Surplus	6.3	8.4	3.7	-.7	1.1	1.7	-5.9	-8.6	-4.5	-9.7	-11.0	-11.2

Notes: Table 2 explains the calculation of the figures in the left side of the table. Table 3 explains the calculation of the figures in the right side of the table.

Sources: DRI, BEA, NASBO, and authors' calculations

One interpretation of these findings is that states with less strict rules accumulate larger surpluses in good times to finance deficit spending in downturns, while states with tight balanced budget restrictions do not engage in as much deficit spending in downturns and thereby do not need to accumulate savings in upturns.

Fiscal policy asymmetry and political conservatism

Because voters can change the balanced budget rules of states through amendments to state constitutions, the stringency of a state's budget rules may reflect political attitudes within the state. States which are more fiscally and politically conservative are more likely to have tight balanced budget rules.

As a result, the asymmetry in fiscal policy that appears to be associated with the stringency of these rules may instead reflect political differences. For instance, as discussed above, states with tight balanced budget rules accumulate less revenue during economic expansions than states with less strict rules. But the driving force could be fiscal conservatism, which is a consequence of more conservative political attitudes in general. Conservative states may *prefer* not to have large rainy day

funds and therefore not accumulate them. By the same token, in light of their voters' preferences, these states may also choose to have tight balanced budget rules.

To examine the relationship between asymmetry and political conservatism, the states are again divided into two groups, "conservative" or "less conservative." The division is based on the classification of states developed by Erikson, Wright, and McIver, who surveyed voters in all states and recorded the percentage of voters declaring themselves conservative or liberal. These survey results are used to form a simple index of conservatism—the percentage of voters declaring themselves conservative minus the percentage of voters declaring themselves liberal.[17] The groups of conservative and less conservative states include, respectively, 13 and 35 states.[18] The regression equations (3) and (4) presented in the last section are estimated separately for each group.

The estimates suggest the fiscal behavior of state governments with tighter balanced budget rules could indeed be the general result of political conservatism instead of a direct outcome of balanced budget rules (Tables 6 and 7). The regression estimates based on the conservative and less conservative groups are virtually identical to those based on the tight and less strict groups (Tables 4 and 5). During downturns, for example, in states with either less strict budget rules or less conservative attitudes, revenue initially falls sharply and then declines even further over time.

Ultimately, whether asymmetry in state fiscal policy is more a result of balanced budget rules than the degree of conservatism cannot be readily determined. There is considerable overlap in the tight rules and conservative groups of states.[19] For example, among the group of 13 conservative states, seven also have tight balanced budget rules. Such overlap makes it hard to distinguish the roles of balanced budget rules and conservatism in the asymmetry of state fiscal policy.

IV. CONCLUSION

This article examines the evidence of asymmetry in state fiscal policy and the factors behind it. The article finds that state government budgets display significant asymmetries over the business cycle. For example, when state income rises, government revenue initially increases and then reverts to its initial level, while expenditure remains roughly constant.

Table 6

THE RESPONSE OF STATE BUDGETS TO CHANGES IN GSP
States with Conservative Political Attitudes

	Upturns							Downturns					
	Years since rise in output							Years since decline in output					
	0	1	2	3	4	5		0	1	2	3	4	5
	Dollar response to a $100 rise in GSP							Dollar response to a $100 decline in GSP					
Revenue	3.4	2.6	2.8	2.0	1.0	.3		-4.6	-6.8	-5.2	-3.2	-6.5	-7.7
	(6.8)	(3.8)	(3.4)	(1.9)	(.9)	(.2)		(6.9)	(7.9)	(4.8)	(2.8)	(5.2)	(5.7)
Expenditure	-.0	-1.6	-.8	.6	-.4	-.6		-1.4	-1.1	-3.5	-3.3	-5.9	-6.2
	(.1)	(2.7)	(1.0)	(.7)	(.4)	(.5)		(2.3)	(1.3)	(3.6)	(3.1)	(5.1)	(5.0)
Surplus	3.4	4.2	3.6	1.4	1.4	.9		-3.2	-5.7	-1.7	.1	-.6	-1.5

Notes: Table 2 explains the calculation of the figures in the left side of the table. Table 3 explains the calculation of the figures in the right side of the table.

Sources: DRI; BEA; Erikson, Wright, and McIver; and authors' calculations

Table 7

THE RESPONSE OF STATE BUDGETS TO CHANGES IN GSP
States with Less Conservative Political Attitudes

	Upturns							Downturns					
	Years since rise in output							Years since decline in output					
	0	1	2	3	4	5		0	1	2	3	4	5
	Dollar response to a $100 rise in GSP							Dollar response to a $100 decline in GSP					
Revenue	7.5	7.5	4.1	3.3	4.8	5.2		-9.9	-8.9	-6.5	-12.5	-14.9	-17.3
	(6.7)	(5.9)	(2.7)	(1.8)	(2.5)	(2.3)		(7.3)	(4.9)	(2.9)	(4.8)	(5.2)	(5.7)
Expenditure	2.9	-1.6	1.1	4.4	4.1	5.8		-4.7	.8	-1.8	-5.6	-6.6	-10.6
	(2.8)	(2.7)	(.8)	(3.0)	(2.7)	(3.2)		(3.7)	(.5)	(.9)	(2.5)	(2.6)	(3.8)
Surplus	4.6	10.3	3.0	-1.1	.7	-.6		-5.2	-8.1	-4.7	-6.9	-8.3	-6.7

Notes: Table 2 explains the calculation of the figures in the left side of the table. Table 3 explains the calculation of the figures in the right side of the table.

Sources: DRI; BEA; Erikson, Wright, and McIver; and authors' calculations

But when state income falls, both revenue and expenditure decline, with revenue remaining low for a sustained period. Such asymmetries appear to be associated with balanced budget rules. However, because the asymmetries also appear to be associated with conservatism, the fundamental causes of the asymmetry cannot be precisely determined.

IMPLICATIONS FOR THE
EUROPEAN MONETARY UNION

In 1992, in the Dutch town of Maastricht, the members of the European Community agreed to impose a set of restrictions on government budget deficits and the ratio of internal debt to GDP for countries wishing to become members of the future European Monetary Union (EMU). In essence, it was agreed that budget deficits would be kept below 3 percent of GDP and the ratio of government debt to GDP would be capped at 60 percent. The accord, which became known as the Maastricht Treaty, has been under heavy debate ever since its inception. In particular, observers have questioned whether such restrictions on deficit spending are necessary or optimal for maintaining fiscal discipline. Because these are hard questions to answer based on theoretical models, researchers—as is often the case in debates relating to European unification—have looked to the experiences of the members of one of the world's most durable economic and monetary unions, namely, the United States.[20]

Indeed, the fiscal restraints on EMU countries imposed by the Maastricht Treaty are similar to the balanced budget rules that U.S. states face. To the extent the asymmetry in state fiscal policy is believed to be due to balanced budget rules, the results of this article have potentially important implications for country members of the EMU. The results of this article suggest restrictions of this type could limit the ability of EMU nations to use fiscal policy to stabilize their economies during recessions. Such constraints may be of particular concern if the effectiveness of monetary policy is asymmetric, with policy less effective at stimulating the economy than slowing it. Studies have found such asymmetries in monetary policy for the United States and for many other countries.[21] Admittedly, however, this article does not address the benefits balanced budget rules may yield by preventing excessive deficits.

Even if asymmetries have been created by the Maastricht Treaty, changing the restrictions would be difficult because the rules are imposed by a multilateral agreement that took years to negotiate. These rules cannot simply be changed unilaterally by a member of the EMU. Therefore, such budget restrictions could affect Europe differently than the United States, where the balanced budget rules that state governments face are self-imposed. The U.S. rules are part of state constitutions and, therefore, hard to change, but they could be adjusted unilaterally by the voters of a state if sentiments were strong enough.

ENDNOTES

[1] Using methods developed by Asdrubali, Sorensen, and Yosha in 1996, Sorensen, Wu, and Yosha find that state and local government fiscal policy smoothes fluctuations in the disposable income of state residents. However, state and local fiscal policy provides less income smoothing than federal fiscal policy.

[2] State governments also (partly) control the revenue of insurance trust funds, utilities, and liquor stores.

In general, trust funds, utilities, and liquor stores are excluded because they are "off-budget." State governments may be tempted to off-load fiscal burdens to insurance trust funds, utilities, and liquor stores in downturns in order to balance the general fund. To some extent state governments are also able to off-load fiscal burdens to local governments. Although there are examples of states engaging in such burden shifting, on average such shifting does not seem to be important enough to significantly affect the business cycle behavior of budgets. Sorensen, Wu, and Yosha find that the budgets of local governments, utilities, and pension funds all tend to move together, with the state government budget being the most cyclical, and their results indicate that state governments do not systematically use "off-budget" accounts to circumvent balanced budget rules.

[3] In addition, regressions are performed in a two-step procedure to allow for separate error variances for each state and year and for first order autocorrelation in the residual (assuming the same autoregressive coefficient for each state).

[4] Data on state revenue and expenditure were obtained from the Data Resources Inc. (DRI) database. GSP and population data were obtained from the Bureau of Economic Analysis (BEA).

[5] These qualitative patterns are robust to the number of lags that are included in the regressions.

[6] These numbers are obtained by subtracting the second from the third row (therefore, t-statistics are not displayed). Alternatively, the reaction of the surplus to GSP fluctuations could be estimated directly from regressions of the state budget surplus—the level of the surplus, not the change—on changes in GSP. In such a regression, the level of the surplus would be used because, unlike revenue and expenditure, the surplus does not change *permanently* in response to changes in GSP. The results from estimating this regression would, however, be qualitatively the same as those displayed in Table 1.

[7] Gramlich obtains somewhat different results using national data on state and local government budgets for the period 1955-90. He finds that the ratio of government spending to GNP is affected positively by the national unemployment rate, whereas the results in Table 1 indicate that spending is affected positively when GSP *rises*. The results do not point in the same direction, but need not be regarded as contradictory since there is no year-by-year correspondence between GSP changes and the unemployment rate. Gramlich further finds that taxes are affected negatively by the lagged unemployment rate, which is consistent with this article's finding that government revenue rises with GDP.

[8] Of related interest are Poterba's (1994) study of the fiscal response of state governments to fiscal "surprises" (shocks) and Gavin and Perotti's analysis of the cyclical patterns of fiscal policy in Latin American countries. Other related studies include Drazen; Wagner; Fatas and Mihov; Poterba and von Hagen; Lane;

Arreaza, Sorensen, and Yosha; Sorensen and Yosha (1999, 1998); Bohn; Talvi and Vegh; Alesina, Roubini, and Cohen; Bohn and Inman; von Hagen and Eichengreen; and Goodhart and Smith.

[9] Poterba and Reuben find that large state government deficits are associated with higher interest rates on state government bonds.

[10] A few states, such as Missouri, have constitutional amendments that limit the growth in state revenue relative to personal income.

[11] Such behavior during upswings justifies the reluctance of markets to lend to governments during recessions.

[12] The model of Persson, Persson, and Svensson was not explicitly formulated for the purpose of explaining asymmetric spending.

[13] For comprehensive discussions of "political business cycles," see Alesina, Roubini, and Cohen; and Drazen.

[14] Formally, Table 3 reports the *negative* of the β^--coefficients from regression equations (3) and (4).

[15] Table 2 may leave the impression that state government expenditure and revenue will ratchet down over time. This is true, but only relative to the upward trend in these components: on average state government revenue was about 7 percent of GSP in the 1960s and about 12 percent of GSP in the 1990s.

[16] Because the results in Table 5 relate only to the deviations from the state average growth rates of the fiscal variables, the results have no implications for whether budget deficits are sustainable or not.

[17] Sorensen, Wu, and Yosha found that conservative states display less procyclical surpluses than liberal states. However, they did not find any difference in the cyclicality of budget surpluses between "republican" and "democratic" states (similarly defined). Thus, the results for more or less conservative states should not be identified with results for states with an affinity for any particular political party.

[18] Accordingly, the sizes of the conservative and less conservative groups match the sizes of the tight and less strict balanced budget rule groups. Classifying the states into 24 conservative and 24 less conservative states produced very similar results.

[19] The correlation between the two indices is 0.4.

[20] See, for example, von Hagen and Eichengreen.

[21] See Cover; and Morgan for evidence regarding the United States, and Karras for results for European countries.

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