

Fiscal Policy Cyclicalities and Growth within the US States

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Abstract

This paper exploits differences in the stringency of balanced budget rules across US states to estimate the effect of the cyclicalities of fiscal policy on state GDP growth. While most states have passed laws restricting deficits, the nature and strictness of these laws vary greatly. States with more stringent balanced budget restrictions run more procyclical fiscal policy. We use the diversity in these laws as an instrument for the cyclicalities of policy. We find evidence that a more counter-cyclical primary deficit increases a state's average growth rate per capita. This effect is robust to a number of alternative specifications. One concrete policy implication of this analysis is that a state could increase its annual growth rate by relaxing its balanced budget restrictions.

JEL Codes: E62, H72

Keywords: Fiscal policy, cyclicalities

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1 Introduction:

The recent financial crisis has brought the role of fiscal policy to the forefront of American politics. On February 17th, 2009, President Obama signed an economic stimulus package worth \$787 billion into law. The package combined increases in fiscal expenditures with tax cuts, raising the federal primary deficit. The purpose of this stimulus was to "boost economic activity by increasing short-term aggregate demand" (Congressional Budget Office 2008).

Whereas the federal government has the flexibility to run counter-cyclical policy, state governments are more restricted in their options. This is because almost all states (the exception being Vermont) are bound by balanced budget restrictions. With varying degrees of stringency, these rules restrict a state government's ability to run deficits and hence counter-cyclical fiscal policy. One worry is that these constraints might exacerbate an economic downturn. That is, just as private demand has fallen, state governments are forced to reduce their spending and raise taxes to balance their budgets. As Robert Rubin has said, these actions "could turn slowdowns into recessions, and recessions into more severe recessions or even depressions".¹

This relationship between the cyclicity of fiscal policy and macroeconomic volatility has been extensively analyzed in the empirical literature. Examples include Fatas and Mihov (2006), Lane (2003), Levinson (1998), and Sorensen, Wu, and Yosha (2001). Little empirical work, however, has been devoted to studying whether the cyclicity of fiscal policy affects long-run growth. This paper, using US state-level data from 1977 - 1997, examines this topic.² Specifically, we seek to answer the following question: does the cyclicity of fiscal policy affect long-run growth within the US states?

One potential channel through which the cyclicity of fiscal policy could affect growth has been identified by Aghion and Howitt (2006). In their theoretical model, firms choose

¹From "White House Briefing on the Balanced Budget Amendment", 1995.

²Our dataset extends until 2005, however we limit our time-frame because of changing variable definitions.

to invest in either capital or a productivity-enhancing technology. This investment in technology is subject to liquidity shocks that must be paid by each firm. The firms, though, face a credit constraint and can only borrow up to a fraction of their earnings. This constraint tightens during recessions when firms have low earnings, limiting the ability of the firms to finance the liquidity shock in these periods. Anticipating this, firms reduce their investment in the productivity-enhancing technology in earlier periods. As a result, long-run growth slows. Critically, the authors suggest that a counter-cyclical fiscal policy could improve growth by relaxing the firms' credit constraint in downturns. An example of a policy that accomplishes this goal would be for the government to implement a counter-cyclical policy of public investment. This policy would raise the earnings of the firms during recessions and so ease their credit constraint. Forecasting the implications of this policy, firms would then increase their investment in the productivity-enhancing technology, raising the growth rate. All else equal, this model implies that states running more counter-cyclical fiscal policy should have higher growth rates than those running more procyclical fiscal policy.

The current paper explores empirically whether counter-cyclical fiscal policy does indeed promote growth, as suggested by Aghion and Howitt (2006). Since the cyclicity of policy is a choice variable of state governments, endogeneity is a concern. To get around this, we exploit the differences in the stringency of balanced budget rules across states as our instrument for cyclicity. These budget restrictions limit the state government's ability to run counter-cyclical fiscal policy. The theory discussed above would then imply that states with strict balanced budget restrictions, forced to run more procyclical fiscal policy, would have lower growth rates on average than those with less strict restrictions.

The balanced budget restrictions, largely implemented before the Civil War, were often enacted as amendments to each state's constitution. As a result, modification of these restrictions was difficult because it required a public referendum. Further, there is a great deal of variation in the rules across states. In this paper we will consider five types of

balanced budget restrictions. Two of these restrictions require that the proposed budget is balanced. These "ex-ante" requirements are silent about end-of-the-year deficits. The remaining three restrictions mandate that the enacted budget is balanced over a specified timeframe. The most stringent of these "ex-post" balanced budget restrictions stipulates that a state cannot carry a deficit into the following fiscal year. These rules typically apply to the general fund, the fund dedicated to operating expenses and discretionary money. The rules do not affect other funds, including the capital, pension, and sinking funds.

To estimate the impact of cyclical policy on state growth, we run an instrumental variables regression of growth per capita on our measure of fiscal policy cyclical policy, instrumenting cyclical policy with the balanced budget restrictions.³ In the first stage of this analysis, we find strong evidence that the budget restrictions constrain the cyclical policy of fiscal policy. In particular, a state with the most stringent balanced budget restriction runs a primary deficit that is approximately one standard deviation more procyclical than a state without the restriction.

The second stage of our analysis indicates that counter-cyclical fiscal policy has a positive impact on growth. The point estimate from our baseline specification suggests that a state could increase its average annual growth rate by 0.4% by increasing the counter-cyclical policy of its primary deficit by one standard deviation. This estimated effect is statistically significant at the 1% level. The sign, size, and significance of this coefficient remain largely unchanged even after controlling for initial population, political variables, Federal transfers to the state governments, and each state's initial debt to GDP ratio.

The result that a more counter-cyclical fiscal policy increases growth is reminiscent of Aghion and Marinescu (2007) and Woo (2009). Both papers examine the impact of fiscal cyclical policy on growth across OECD countries, finding that procyclical fiscal policy reduces growth. Aghion and Marinescu (2007), using a panel dataset, explores the dynamic effects of cyclical policy. The authors find that the positive effect of counter-cyclical policy on growth

³Because the restrictions were enacted so long ago, we cannot exploit the timing of the rule introduction. Consequently, our IV regressions are all cross-sectional tests.

falls with the degree of financial development. Woo (2009) develops a theoretical model in which he links society's polarization to fiscal cyclicity. In his cross-country empirical analysis, the author finds evidence of this relationship as well as support for the notion that procyclicality of fiscal policy harms growth.

One important difference between Aghion and Marinescu (2007) and our paper is the choice of identification strategy. Our analysis exploits the variation in balanced budget rules as an instrument for cyclicity whereas they use a dummy variable that indicates whether the country has an inflation target or not. This difference, we believe, allows us to make more of a causal argument that cyclicity affects growth, even though it limits our ability to assess the dynamic effects of fiscal cyclicity.

Our paper diverges from both Aghion and Marinescu (2007) and Woo (2009) in that we focus on US states rather than OECD countries. This focus yields more consistently defined and measured variables. Furthermore, and perhaps just as crucially, the institutional environment (monetary policy, the labor market, and trade openness, for example) is more similar across states than across OECD countries. This better enables us to attribute the growth differences across states to policy cyclicity, rather than to unobserved heterogeneity or variation in other institutional characteristics. This is an important consideration given the contributions of Acemoglu et al (2003) and Easterly (2005). These authors argue that the variation in macroeconomic performance across countries is better explained by the quality of the underlying institutions than by the type of fiscal policy implemented. Studying the impact of cyclicity on growth across the US states allows us to explore the consequences of policy within a given set of institutions.

In exploring the macroeconomic consequences of cyclicity, we use the variation in the stringency of the balanced budget restrictions as an instrument for cyclicity. Many other studies have analyzed the implications of these restrictions, mainly concentrating on their impact on fiscal policy. Poterba (1994) examines whether the budget restrictions affect how a state responds to an unexpected deficit. He shows that states with strict balanced

budget rules, when faced with a deficit shock, cut their spending by more than states with weak rules, a conclusion supported by Alt and Lowery (1994). Bohn and Inman (1996) show that both the size and likelihood of running a primary deficit in the general fund are lower in states with the strict budget restriction. Both Alesina and Bayoumi (1996) and Fatas and Mihov (2006) explore whether the balanced budget rules affect a state's output volatility. The latter work finds that a tight budget restriction reduces policy discretion, which leads to lower volatility in the state's growth rate. Our paper complements this literature by analyzing how the restrictions affect a state's fiscal cyclicalities which in turn influences that state's average growth rate.

The rest of the paper is structured as follows. In section 2, we describe the data and general properties of both state fiscal policy and the balanced budget rules. In section 3, we characterize our estimation technique. Section 4 discusses our results and checks the robustness of our findings. Section 5 concludes.

2 Data:

Yearly data on the gross domestic product by state was obtained from the website of the US Bureau of Economic Analysis. The BEA also provided (through the US Government Printing Office) the data on the GDP deflator. Our sources of information for the balanced budget rules are the Advisory Commission on Intergovernmental Relations (1987), Bohn and Inman (1996), the National Association of State Budget Officers (2002), and the National Conference of State Legislatures (2004).

Data on state and local total expenditures, the primary deficit, current operations, capital outlays, total debt, and intergovernmental transfers are from the US Department of Commerce and the Census Bureau. We use data for the years 1977 - 1997.⁴ Because state

⁴Even though the dataset includes annual statistics from 1977-1999 and biannual statistics from 2001 to 2005, we limit ourselves for a number of reasons. First, and most importantly, the approach used to measure gross domestic product by state switched in 1997 from SIC to NAICS. By limiting our time frame, we are using only consistently measured data. Second, in 2001, the Census Bureau stopped collecting

governments often delegate their fiscal responsibilities to local governments in an effort to evade the balanced budget requirements, we use the sum of state and local expenditures as our measure of "state expenditures".⁵ Additionally, we exclude both Alaska and Hawaii from our main analysis.⁶ We have made this choice because both states have unique fiscal environments. Alaska, for example, is unique because of the large revenues generated from severance taxes on oil. This same choice was made by others in the literature, including Levinson (1998) and Fatas and Mihov (2006). Further, both states are outliers when measuring the cyclicity of the primary deficit.⁷

To control for voter preferences, we have obtained two political variables from the National Governors Association website. The first is the political party to which each governor belonged in 1977.⁸ The second is the number of times the political party of the governor has switched over the timeframe of our analysis. This second variable is meant to capture the voracity effect, highlighted by Lane and Tornell (1999). This effect suggests that a greater degree of political competition increases the cyclicity of fiscal policy because each party has the incentive to spend its available resources, since they would lose access to the funds if the other party is elected. Finally, we have data on both the level of education and population across states in 1977.

States, unlike the federal government, practice fund accounting. This means that all revenues and expenditures are designed specifically to enter and leave a particular fund. This practice is a vestige from the 19th century when states did not have a unified budget. Examples of funds include the capital fund, which allocates capital borrowings; the sinking

state and local government data annually, limiting the value of extending the time frame.

⁵We test this inclusion for robustness in Section 4.3 by not including the local statistics. This alternative specification does not qualitatively change our results and even increases the magnitude of the coefficient describing the growth impact of counter-cyclical policy.

⁶In Section 4.3, we test to see whether our results are robust to this exclusion. As we show, adding Alaska and Hawaii does not change our results.

⁷Hawaii runs the most counter-cyclical primary deficit among the 50 states with a measured value of -0.368. Alaska runs the most procyclical primary deficit with a measured value of 0.114. The mean value of cyclicity across states is -0.086, and the standard deviation is 0.087.

⁸Every state except Maine had a governor that belonged to either the Democratic or Republican parties in 1977. Maine had an Independent governor.

fund, which directs money to debt repayment; and the pension fund, which collects money for state employee retirement. One of the most important funds is the general fund. The general fund receives between 50 - 60% of all state revenue and finances most legislative expenditures. The majority of a state's discretionary budget comes from this fund.

Balanced budget restrictions typically apply to the general fund. Because of this, a considerable portion of a state's spending is affected by the balanced budget rules. The National Conference of State Legislatures (2004) has estimated that, in more than two-thirds of all states, at least 75% of a state's spending is affected by the rules. Further, at least 25% of expenditures are affected by the rules in 48 states.

There are numerous types of these balanced budget restrictions across states. In this paper we exploit the variation across states in five types of balanced budget restrictions. The first two restrictions mandate that the proposed budget is balanced. After excluding Alaska and Hawaii from the dataset, ten states require that the governor must submit a balanced budget to the state legislature. This restriction is labeled `BBR_Gov`. Eight states require that the legislature must pass a balanced budget. This restriction is labeled `BBR_Leg`. The last three restrictions are more stringent and require that a budget deficit is closed within a specified timeframe. Eight states have a restriction that stipulates that they may carry over a deficit as long as it is corrected in the following fiscal year. Nine states mandate that they cannot carry over a deficit into the following biennium. Finally, the most restrictive balanced budget rule requires that a state cannot carry over a deficit into the following fiscal year. Twenty-eight states have this last restriction. These three rules are labeled `BBR_May`, `BBR_Bie`, and `BBR_Fis`, respectively. In Figure 1, we have drawn a map that displays which states have the `BBR_Fis` restriction. Enforcement of these rules falls upon the state courts.

As a summary of the stringency of the restrictions, the Advisory Commission created an index that ranges from 0 to 10. This index gives a 0 to states with the least stringent requirements and a 10 to states with the most stringent. Two-thirds of states were given

an 8 or higher, and only three states were given scores below 4. Our analysis exploits either the set of individual rules or the ACIR index as potential instruments for cyclicalty.

The majority of these balanced budget rules were enacted as amendments to the state's constitution following the Panic of 1837. Between 1835 and 1837, private banks multiplied and credit expanded quickly. Investors used the credit to buy land west of the Mississippi River from the federal government. The Treasury Department tried to curb this credit growth by issuing "Specie Circular" in 1836, which stipulated that all federal land transactions must be made in specie. As a result, "the nation's complex and interwoven system of credit tumbled like a house of cards. Specie fled the Eastern states to accommodate land transactions in the West, leaving Eastern business and Southern agriculture to wither on the financial vine" (Savage 1988). The Panic of 1837 ensued. During this period state tax revenue fell dramatically, forcing states to run large deficits. The financial condition of states deteriorated to such a degree that numerous states defaulted, including Florida, Indiana, Illinois, Louisiana, Michigan, and Pennsylvania. Many others were on the brink of default.

Politicians blamed the budget problems on the surpluses generated by the tariff of 1828, which they said encouraged excessive state spending. This prompted a movement to impose balanced budget constraints on state governments. The purpose of these measures was to constrain legislative spending and prevent debt from crippling state governments. Rhode Island, debt-free at the time, was the first state to adopt the restriction in 1842. Its lead was quickly followed by others.⁹ In Table 1, we have listed the year that select states adopted their balanced budget rule.

These balanced budget rules have persisted until today, discouraging states from running deficits in their general fund. Now, when states face a budget shortfall, they can respond by raising taxes, reducing expenditures, or going into debt. In addition to these

⁹Many states adopted balanced budget restrictions similar to New Jersey's, another debt-free state. This provision states "The legislature shall not, in any manner, create any debt or debts ... which shall singly or in the aggregate ... exceed one hundred thousand dollars, except for purposes of war ... unless the same shall be authorized by a law for some single object or work, to be distinctly specified therein".

standard actions, states can resort to budget gimmicks. These gimmicks include pushing fiscal responsibilities onto local governments and altering the state's accounting standards. These manipulations obviate the states' need to abide by their balanced budget rules. Our analysis accounts for the first gimmick by including both local and state government finances in our empirical work. Further, the Government Accounting Office (1993) suggests that the second gimmick is used only rarely. In fact, the GAO estimates that 49% of a budget shortfall is closed through spending reductions, 32% by increases in taxes, and only the remaining 19% by budget gimmicks.

Table 2 shows the summary statistics of the states' characteristics, broken down by whether the state has the BBR_Fis balanced budget rule. The average nominal and real GDP growth rates across the 48 states from 1977 - 1997 are 6.00% and 1.93%, respectively. Evidently, the average growth rate is slightly higher in states without the balanced budget rule than in states with the rule, although the difference is not statistically significant. The average primary deficit to state GDP ratio is -1.09%. The negative primary deficit implies that, on average, the tax revenue received by the states exceeds total expenditures, where the latter figure excludes debt repayment. There is no difference between the size of the primary deficit run by states with the rule and states without it. The characteristics in 1977 indicate that states without the BBR_Fis rule were on average richer, better educated, and had larger populations. They also had larger debt to GDP ratios.

2.1 Cyclical Measure:

The goal of our analysis is to estimate the impact of the cyclical policy on growth. However, there is little consensus in the literature on how to measure fiscal cyclical policy. In this analysis, we use the degree of co-movement between a state's primary deficit and its output growth as our measure of the cyclical policy. We choose this for two reasons. First, the balanced budget restrictions constrain a state's deficit, so a natural choice for policy is then the primary deficit. Second, using the primary deficit captures

both the expenditure and revenue components of policy. If we would have formulated our measure using only one of the components, then we would have missed changes in the other component that alter the overall cyclicity of policy. The disadvantage of our approach, though, is that tax revenues, in particular, depend upon the level of GDP in a state and so are endogenous.

To derive our measure of fiscal cyclicity, we follow the literature and use a regression-based approach. This type of approach can be seen in Alesina, Campante, and Tabellini (2008), Lane (2003), and Woo (2009). Specifically, for each state, we run the following regression:

$$\frac{G_{st} - T_{st}}{Y_{st}} = \alpha_{1,s} + \alpha_{2,s} \Delta \log Y_{st} + \alpha_{3,s} \pi_t + \alpha_{4,s} t + \epsilon_{st}, \quad (1)$$

where G_{st} is the per-capita level of state government expenditure in state s at time t , T_{st} is the per-capita level of tax revenue collected in state s at time t , Y_{st} is the per-capita level of gross domestic product in state s at time t , and π_t is the change in the GDP deflator at time t . This rate of inflation applies to all states. This regression yields the time-invariant coefficients, $\alpha_{2,s}$, which are our measure of each state's fiscal cyclicity. We denote the coefficients cyc_s .¹⁰

With this formulation, the average cyclicity of the primary deficit across states is -0.086, which means that a 1 percentage-point increase in a state's GDP growth rate is associated with a decline in the primary deficit ratio of 0.086. On average, then, states run a counter-cyclical fiscal policy, as measured by the primary deficit. There is a great deal of diversity across states, though. The level of cyclicity of primary deficit in the most procyclical of the 48 states (Wyoming) is 0.071, while in the most counter-cyclical state (Maine), the level of cyclicity is -0.301. Table 3 presents the calculated cyclicity

¹⁰One potential criticism of this measure of cyclicity is that we are not accounting for the feedback between public spending and output growth. This would mean that our measure of cyclicity is biased. However, as long as the bias is uncorrelated to the stringency of the balanced budget restrictions (or even constant across states), then our IV analysis should correctly identify the impact of cyclicity on growth. This is because we exploit the variation in the balanced budget restrictions as a source of exogenous movement in cyclicity.

for each state. The standard deviation of cyc_s is 0.087.

3 Estimation:

To determine the impact of fiscal cyclicity on real per capita growth, we estimate the following cross-section growth regression:

$$\overline{\Delta \log Y_s} = \beta_1 + \beta_2 cyc_s + \beta_3 X_s + \nu_s \quad (2)$$

where $\overline{\Delta \log Y_s}$ is the average growth rate in the per capita real GDP by state for the period of 1977-1997, X_s is a vector of other covariates, and ν_s is a random error term. In our basic regression, X_s includes the initial levels of education and income in 1977. In our fuller regressions, we include two political variables and the initial levels of population, Federal transfers, and the total debt to GDP ratio in each state. cyc_s was derived in the previous section. Except where otherwise mentioned, each state is weighted by the inverse of the variance of that state's calculated cyclicity. The mean of the weighted cyclicity measure is -0.058, and the standard deviation is 0.0724. In (2), the coefficient of interest is $\hat{\beta}_2$, the estimated effect of fiscal policy cyclicity on per capita growth.

Endogeneity is likely to be a concern in these growth regressions, since a state government could alter its fiscal policy in response to low growth rates, for example. Ordinary least squares therefore would not produce a consistent estimate of β_2 . To account for this endogeneity, we instrument the cyclicity of the primary deficit with the state balanced budget restrictions. Our hypothesis is that balanced budget rules impinge upon the state government's ability to run counter-cyclical policy, and this, in turn, affects the state's growth rate per capita. The exclusion restriction is that, given the control variables, the balanced budget rules are not correlated to the unexpected component of a state's average growth rate. For expositional purposes, we run an additional test in which we instrument the cyclicity of the primary deficit with the ACIR index.

One potential criticism of our approach is that the type of balanced budget rule implemented by each state may reflect the voters' taste for deficits. These preferences then may be correlated to other variables related to growth. We attempt to control for this by including the states' political characteristics as explanatory variables. But, there is a deeper reason that leads us to believe that this type of endogeneity is not plaguing our results. The balanced budget rules were largely enacted from 1842 to the outbreak of the Civil War as amendments to the states' constitutions. This made it challenging for the states to modify their restrictions, since modification requires a public referendum. An indication of this difficulty is that no state within the timeframe of our dataset has altered their balanced budget rules. Thus, there is an element of historical legacy to these restrictions. Then, if voter preferences over deficits, for example, have changed over time, this change was not reflected in the balanced budget rules. If this is the case, there is an exogenous component to the rules. A similar argument is made in Poterba (1996). Consistent with this story, it is shown later that the overidentifying test does not reject the null hypothesis that the rules are uncorrelated to the unexpected component of a state's average growth rate.

The first stage of our two-stage least squares approach estimates the impact of the balanced budget restrictions on the cyclicity of the state's primary deficit ratio:

$$cyc_s = \gamma_1 + \gamma_{2,i}BBR_{i,s} + \gamma_3X_s + v_s \quad (3)$$

where $BBR_{i,s}$ reflects whether state s has the i th balanced budget restriction. To be clear, there are five dummy variables characterizing each state's balanced budget restrictions: BBR_Gov , BBR_Leg , BBR_May , BBR_Bie , and BBR_Fis . If state s has the rule that its legislature must pass a balanced budget, for example, then BBR_Leg_s would take a 1. Otherwise, $BBR_Leg_s = 0$. In all regressions, we report the heteroskedasticity-robust standard errors of each coefficient. When we use the ACIR index as the instrument,

we replace all five balanced budget rules with the index. With this formulation, $Index_s$ takes on the value that each state is given in the index.

4 Empirical Results:

4.1 OLS Results:

The results of the ordinary least squares regression of (2) are presented in Table 4. The first column, our baseline specification, includes initial income and education as controls. The other columns augment the list of covariates with population and political variables, intergovernmental transfers, and the initial debt to GDP ratio. As shown in Table 4, the coefficient on cyc_s is negative and significant at the 1% level across all specifications. This is an initial indication that a more counter-cyclical primary deficit increases a state's growth rate. The OLS estimates presented in Table 4, however, should be interpreted with caution. This is because of the likely endogeneity of fiscal policy. In the next section, we account for this endogeneity by instrumenting the cyclicity of fiscal policy with each state's balanced budget restrictions.

4.2 IV Results:

Assuming that the balanced budget rules satisfy the exclusion principle, our instrumental variables approach should provide an unbiased estimate of the effect of fiscal cyclicity on growth. The first stage of this empirical strategy then is to determine the impact of the balanced budget rules on the degree of cyclicity of fiscal policy. The results from this stage are presented in Table 5. If balanced budget restriction i constrains a state's ability to run a counter-cyclical primary deficit, we would expect a positive coefficient on $BBR_{i,s}$.

The results from Table 5 suggest that, indeed, states with strict balanced budget restrictions run a more procyclical primary deficit than states with loose restrictions. This

can be seen in two ways. First, the coefficient on the ACIR Index is positive and significant at the 10% level. This positive relationship can be seen in Figure 2, which plots each state’s cyclical and ACIR index value. Second, with one exception,¹¹ whenever a balanced budget rule is statistically significant, the coefficient is positive. This is particularly evident when focusing on the strictest rule, BBR_Fis. The coefficient suggests that, holding all else equal, a state with the BBR_Fis rule runs a primary deficit that is approximately one standard deviation more procyclical than a state without the rule.

The F-statistics at the bottom of Table 5 show whether the balanced budget restrictions are sufficiently correlated to the cyclical of the primary deficit, thus satisfying the first condition of a good instrument. In the first two columns, the F-statistics are around or above 10, the threshold cited by Stock, Wright, and Yogo (2002). However, as we add additional explanatory variables, the value of the F-statistic falls. This is especially true when we add the initial debt to GDP ratio as a covariate. One potential reason for this fall is that the initial debt to GDP ratio is highly correlated to the balanced budget rules, as can be seen in Appendix Table A3. This would tend to raise the standard errors on the balanced budget restrictions, resulting in potentially weak instruments in this case.

Table 6 reports the results from the second stage estimation. Column 1 presents our baseline specification with initial income and education as explanatory variables and the balanced budget restrictions as the instruments. Columns 2 - 4 augment our baseline specifications with the additional explanatory variables of initial population, political party, Federal transfers, and the debt ratio. Column 5 repeats the full regression, using the ACIR index as the instrument. For completeness, we present the results from the same set of regressions in Appendix Table 2, except in that table we do not weight the cyclical measure by the inverse of the variance. We have done this in order to test for over-identification. The p-values from that test are always greater than 0.1, meaning that the null hypothesis that any rule is uncorrelated to the unexpected component of a state’s

¹¹One potential cause of this negative coefficient is that BBR_Gov, the weakest balanced budget rule, is negatively correlated to BBR_Fis, the strictest balanced budget rule.

average growth rate cannot be rejected, assuming that the other rules are uncorrelated to the error term.

Given that the balanced budget restrictions satisfy both the exogeneity and relevance criteria, we can now examine whether the cyclical policy affects long-run growth within the US states. As shown in Table 6, the coefficient on the cyclical policy is negative and statistically significant across all specifications. This result suggests that a more counter-cyclical primary deficit significantly increases a state's average growth rate. Interpreted directly, the coefficient implies that a 1 standard deviation fall in the cyclical policy is related to a 0.4% increase in the average growth rate per year. Moreover, the coefficients on cyclical policy in Table 6 are close, and in fact slightly larger, than the coefficients in Table 4, suggesting that the endogeneity bias in the OLS estimates is not very large. We draw this same conclusion from Appendix Table 2 where we test the exogeneity of our cyclical policy measure using the Durbin-Wu-Hausman type tests. We find that we cannot reject the hypothesis that the cyclical policy is exogenous.

The size of this effect is consistent with the results in Aghion and Marinescu (2007). In their paper they argue that counter-cyclical fiscal policy should be more growth-enhancing in less financially developed countries than in more financially developed countries. This is because firms in the less financially developed countries are more credit-constrained during downturns. Using a panel data set focused on OECD countries, the authors find evidence that a 1 standard deviation increase in the counter-cyclical policy would lead to a yearly increase in growth of approximately 1% for the least financially developed countries and 0.2% for the most financially developed countries. Thus, our coefficient of 0.4% corroborates their findings by falling within the lower part of their range.

The above analysis suggests that states could increase their average rate of growth by implementing a more counter-cyclical primary deficit. With our regression-based estimate of cyclical policy, this policy suggestion can be viewed as a somewhat nebulous recommenda-

tion. However, our analysis does offer a specific policy prescription: a state government could increase its average annual growth by relaxing its balanced budget restrictions. This conclusion can be seen in Table 7, where we assess the direct effect of the ACIR index on the states' growth rates. Under our baseline specification, the coefficient on ACIR_Index is -0.064 and is statistically significant at the 10% level. This suggests that a 1 point fall in a state's ACIR index value is associated with a 0.06% rise in its annual growth rate. Put another way, a state like Delaware (whose ACIR index value is 10) could increase its average growth rate by 0.32% per year if it implemented the same set of balanced budget restrictions as Connecticut (Connecticut's index value is 5). When augmenting the list of covariates with population and political control variables, the size of the coefficient and the statistical significance both rise. Only when we add the initial debt to GDP ratio does the statistical significance fall outside of the 10% threshold.

We draw two main conclusions from these results. First, states with tight balanced budget restrictions implement policy that is significantly more procyclical than states with lenient restrictions. Second, we find that a more counter-cyclical fiscal policy increases a state's average rate of growth. This effect is statistically and economically significant across a range of specifications. One concrete policy conclusion implied by these results is that a loosening of the balanced budget restrictions is associated with a higher average growth rate.

4.3 Robustness Checks:

We now examine whether our conclusion that a counter-cyclical primary deficit increases a state's average growth rate hinges upon some of the modeling assumptions made above. Our first robustness check seeks to determine whether our results are contingent upon our exclusion of Alaska and Hawaii from the dataset. Whereas above, we excluded the two states due to their unique fiscal environments, in this section we include them in our analysis. We report our findings from the second stage of our IV regression in Table

8. As shown in that table, the coefficient on the cyclical-ity of the primary deficit is negative and statistically significant at the 1% level. Also, the size of the coefficient on cyc_s remains largely unchanged from our main analysis. Evidently, our qualitative results are not sensitive to excluding the outliers of Alaska and Hawaii.

A second variation checks the robustness of including both local and state government finances in our measure of the cyclical-ity of the primary deficit. We do this by excluding the local government's primary deficit from our measure of cyclical-ity. The results from the second stage of this analysis are reported in Table 9. The results from this regression are even more supportive of the conclusion that a state could increase its average growth rate by implementing a more counter-cyclical primary deficit. The coefficient on the cyclical-ity of the primary deficit is significant at the 1% level in all specifications. Further, the coefficient on cyclical-ity is now of a larger magnitude than we found in our main analysis. This implies that our conclusions are not contingent upon our inclusion of the local government's primary deficit.

In our final robustness check, we include regional dummy variables in our list of covariates to account for the possibility of spatial correlation in the balanced budget restrictions. The results from the second stage of the IV analysis are displayed in Table 10. The coefficient on cyclical-ity remains negative across all specifications and statistically significant in all but one of the specifications. The magnitude of the coefficient, though, is lower than what it was in our main analysis. Taken together, we believe that our result that a more counter-cyclical primary deficit increases growth still remains valid. However, this last robustness check has decreased the magnitude of the growth impact relative to our main analysis.

5 Conclusion:

This analysis examines the impact of the cyclical nature of the primary deficit on state per capita growth. Because cyclical nature is potentially endogenous, we exploit the variation in the stringency of balanced budget restrictions across states as an instrument for cyclical nature. We find that states with strict balanced budget requirements run significantly more procyclical fiscal policies. The coefficient describing this effect is significant at the 1% level across all specifications. This result is intuitive, since states with strict balanced budget requirements are forced to reduce their spending during recessions, so as to avoid running deficits. In particular, states that have the BBR_Fis budget rule run a primary deficit that is approximately one standard deviation more procyclical than states without the rule.

We then regress the average growth rate per capita by state on each state's fiscal cyclical nature, using the results from the first stage regression. We find that a more counter-cyclical primary deficit has a positive effect on growth. Specifically, a one standard deviation increase in the counter-cyclical nature of the primary deficit is related to a 0.4% rise in the average growth rate. The sign, size, and significance of this coefficient hold across a variety of specifications. One concrete policy implication of this work is that a state can increase its annual growth rate by 0.06% for each 1 point drop in that state's ACIR index value.

We conclude by highlighting one possible route for future research. The current analysis studies whether the cyclical nature of fiscal policy promotes growth within the US states, using the aggregate variable of the primary deficit as our measure of fiscal policy. In our future work, we plan to decompose this measure to determine which components are most effective at spurring growth.

A Appendix

To get around the balanced budget rules, states have created budget stabilization funds. These 'rainy day' funds act as a cushion for the states, absorbing a general fund surplus during good times and financing spending during bad times. Forty-five states have rainy day funds. The funds were typically implemented in the 1980s.

As these funds were designed to influence the cyclicity of a state's primary deficit, one would think that we should add an additional covariate that characterizes the presence or the flexibility of each state's rainy day fund. However, we do not include this variable in our regressions. Our reasoning goes as follows. The timeframe analyzed in this paper is from 1977 to 1997. The rainy day funds, though, were largely implemented in the 1980s, meaning that their introduction was likely endogenous. To prevent this source of endogeneity, we do not include a variable characterizing the rainy day funds in our list of covariates.

Through a series of regressions, though, we have checked to see whether this is a costly omission by testing whether the rainy day funds are correlated with the balanced budget restrictions. The information we use on the rainy day funds, including the stringency of the deposit and withdrawal rules, as well as the adoption year, comes from Wagner and Elder (2005).

First, we regress the stringency of the withdrawal rules placed on each state's rainy day fund on the balanced budget rules. As shown in the first column of Table A1, the balanced budget rules are not jointly significant. Second, we follow the same procedure for the stringency of the deposit rules placed on the rainy day funds. We again find that the balanced budget rules are not jointly significant. This can be seen in the second column. Finally, we examine whether the year of adoption of the rules is related to the presence of the balanced budget rules. The results, seen in column 3, suggest that the independent variables are not related to the year of adoption. We have run the same set of regressions using the ACIR index as the independent variable rather than the balanced

budget restrictions. The results, exhibited in the bottom half of Table A1, indicate that the value of the ACIR index is not related to the stringency of the withdrawal or deposit rules or to the year of adoption of the rainy day funds. Thus, the balanced budget rules do not seem to be correlated to the characteristics of the rainy day funds. Because we exploit only the variation in cyclicity due to the balanced budget rules, we do not believe that omitting a variable characterizing the states' rainy day funds is costly.

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