

The Dilemma Between Fiscal Decentralization and Budget Balance

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Abstract

This paper explores the effects of the distribution of fiscal authority for fiscal decentralization on the U.S. state budget balance. Numerous scholars have pointed out that fiscal institutions play an important role in achieving budget balance, but their degree of authority fundamentally determines how fiscal institutions are authorized across the multi-level system in a federal government system. As an empirical exploration, this paper captures the authority of fiscal institutions through multiple dimensions of accounting and financial information. The results revealed that local governments are better able to balance their budgets when fiscal authority over revenue is decentralized, while states are more likely to achieve a balanced budget when authority over expenditure is decentralized. These contradictory effects result from overlapping tax-bases and customers of public services across states and their local governments.

Keywords: fiscal federalism, fiscal decentralization, budget balance, state budget and finance.

1. Introduction

State and local autonomy and responsibility under the U.S. federalism have traditionally been a primary issue in the study of governance. The heterogeneity in a federal system still motivates researchers to examine its effects on government organizational structure and fiscal condition. Fiscal decentralization, a widely known political term, arranges decision-making authority in legal contexts across governments. Although the federal government controls and stabilizes its state and local governments, it also authorizes them to exert their own authority in making fiscal decisions (Prud'Homme, 1995; Rodden, 2002; Rodden, Eskeland and Litvack, 2002; Treisman, 2000; Wibbels, 2000). The independent but mingled fiscal decisions across multiple levels may distort the original purposes of the decisions made by each level, and the distortions may result in unexpected effects on performance. The hierarchical structure of the U.S. government motivates this study to shift the focus from the national level to the state and local levels.

To follow up the studies above, this study aims to explore the effects of fiscal decentralization on budget balance in the sense that the degree of decentralization is a fundamental determinant of the autonomy and responsibility across the layers of state and local governments. Decentralization enables a government to create and change fiscal institutions. However, the degree of decentralization is neither easily interpreted nor easily measured because accounting and financial information is embedded in all levels of government. The U.S. state and local governments establish their own fiscal institutions that influence government budgets such as tax, spending, deficits, and debts, and they have made efforts to promote and maintain their balanced budget (Smith and Hou, 2013). In spite of their efforts toward budget balance, many state and local governments still struggle.

In this regard, this study employs multidimensional indicators of the degree of fiscal decentralization. Such indicators not only capture multiple aspects of fiscal autonomy but also serve as data to analyze the effects of decentralization on the budget balance. The results provide interesting evidence of different and/or contradictory effects on the budget balance. More specifically, state governments are more likely to balance their total and general budgets when fiscal authority over expenditure is more decentralized, while local governments are more likely to do so when the fiscal authority for revenue is more decentralized.

This paper conducts empirical tests of the effects of fiscal decentralization on U.S. state and local budget balance in order to answer the question of whether fiscal decentralization helps governments to achieve their own balanced budget. The next three sections provide a review of the literature on fiscal decentralization, its effects on fiscal performance, and budget balance as a proxy for fiscal performance. The fifth section describes data and methodology including the measurement of the degree of decentralization with five indicators. The sixth section presents regression results along with a brief explanation, and the last section concludes with implications.

2. Fiscal decentralization

Decentralization refers to the degree of autonomy and responsibility of each layer of government in a federal system. The degree of autonomy of a layer of government determines its provision of public services. The degree is not a black and white dichotomy, but a continuum; thus, the U.S. federal system has aimed to construct an outline that places appropriate political-economic functions and instruments at the proper level of government and has explored how to optimize the degree of decentralization for effective allocation of autonomy and responsibility. This function has motivated many researchers to test the degree of fiscal decentralization in various ways. Another reason for this line of research is the theoretical prediction that fiscal decentralization improves the efficiency of the provision of public services as well as enhances accountability and performance.

The scholarly works on fiscal decentralization have been developed with an interest in the impacts of decentralization across layers of governments on their fiscal policy-making process as well as on government performance, which is an issue of growing significance in public administration (Barenstein and De Mello, 2001; Oates, 1972; Rodden, 2002; Rodden, Eskeland and Litvack, 2002; Shah, 2005; Winer, 1983). According to Bird and Vaillancourt (2008), the degree of decentralization determines the type of fiscal decentralization among (de)concentration, delegation and devolution¹. The virtue of American democracy has been its closeness to the people, and local autonomy has contributed to the development of this virtue by allocating responsibilities to and improving potentialities of the lower layers of governments (Brunori, 2007). Local governments have been key providers of public services and have recently enjoyed greater decision-making autonomy in their budget process (De Mello, 2001).

However, fiscal autonomy still threatens the provision of public services because local governments are more vulnerable to changes in their environments, and spillover effects are observed in overlapping jurisdictions. The responsibilities of local governments go beyond their potentialities with the expansion of demands. These expansions cause fiscal crises at local levels and lead to financial crises (Inman, 2003; Rodden, 2002; Rodden, Eskeland and Litvack, 2002). The imbalance between autonomy, responsibilities, and potentialities in local governments raises fiscal threats across the entire government, especially at upper levels. In addition, the imbalance leads federal-state governments to spend extra dollars on protecting the local governments from fiscal threats. Therefore, the federal-state governments have to consider how to change the allocation of autonomy and responsibilities, and such changes in status and responsibility in local governments demand that all levels of

1 The types for fiscal decentralization can be summarized as follows: 1) (de)concentration is the shift of tasks from the central government to local governments, 2) delegation is local discretionary autonomy allowed by the central government for the delivery of public services, and 3) devolution is the perfectly independent decision-making of local governments in the delivery of public services (Kwon, 2003). Deconcentration refers to the low degree of independence of local governments, while devolution refers to a high degree of independence.

governments transform their inter-relationships and organizational structures. The degree of fiscal decentralization determines how to arrange local governance and collaborate on institutional collective actions (Cigler, 1993; Feiock, 2004).

3. Fiscal decentralization and performance

The allocation of autonomy and responsibility in local governments is determined by the federal and state budget constraints. The decentralization theorem asserts that a higher degree of fiscal decentralization reduces government expenditures due to competition between governments. Additionally, the Leviathan theory has pointed out that fiscal decentralization warns against a bureaucrat monopoly and prevents bureaucrats from maximizing their budgets; thus, their power to tax is curtailed by their competitors (Brennan and Buchanan, 1980; Grossman, 1989; Grossman and West, 1994; Marlow, 1988; Nelson, 1987; Oates, 1972). Shadbegian (1999) concluded that a higher degree of fiscal decentralization decreases government expenditures, while greater shares of federal grants increase expenditures. In this vein, reducing expenditures leads governments to balance their budgets by holding revenue constant.

Stein's (1999) study, on the other hand, described how fiscal decentralization expands the expenditures rather than the revenues of sub-national governments, demonstrating that expenditures will be exceeded when governments have more borrowing autonomy. Ebel and Yilmaz (2003) considered revenue autonomy associated with fiscal decentralization in terms of government size and found negative associations. Ebdaje (1994) found out that simultaneous considerations on both revenue and expenditure reduce government size. Jin and Zou (2005) concluded that vertical imbalance is the only factor that expands the aggregate expenditures of governments.

Indeed, some studies have warned that fiscal decentralization may cause too much expansion of expenditure by externalizing the costs (Rodden, 2002; Rodde, Eskeland and Litvack, 2002; Von Hagen *et al.*, 2000). Rodden (2002) added grants to the studies on fiscal decentralization, and asserted that a greater dependence of sub-national governments on inter-governmental transfers leads to budget deficits. Inman (2003) reported that the transition costs of bailouts and transfers from local governments to federal budgets can prevent local governments from providing public services and goods efficiently, which results in inefficient resource allocation. Furthermore, Rodden (2003) added that the reduction of government expenditures depends on funding sources because an analysis of expenditures alone cannot capture the effects on budgets. Studies have found that the effects of fiscal decentralization on government budgets shown in previous research remain inconsistent, though results are somewhat contradictory. The results appear to depend not only on what factors are considered, but also on how fiscal decentralization is measured. Considering either revenue or expenditure alone may not provide sufficient evidence; thus, the vertical imbalance with grants should be discussed in further detail.

4. Budget balance as fiscal performance

Fiscal performance depends on the rules of budgeting decisions. Among the various types of fiscal performance, this paper focuses on budget balance. U.S. state and local governments have established their own fiscal institutions² that have impacts on the reduction of budget deficits and public debts. For example, TELs and BBRs³ have put limitations in place that prevent governments from having deficits and controlled revenue and expenditures in state and local governments in order to achieve balanced budgets. Because budget balance considers revenues and expenditures, it is an important indicator for fiscal performance and helps governments to evade deficits; moreover, current deficits motivate voters to punish their representatives by not re-electing them (Brender, 2003)⁴. The goal of budget balance has prevented governments from overspending and has aimed to remove aggregated debts. Governments with balanced budgets not only make every dollar accountable to the public, but also can cut down waste in their spending. Since the existing studies have asserted that expenditures should be combined with revenues for the analysis of fiscal performance, this paper focuses on budget balance as it depends on the gap between revenues and expenditures. Before analyzing the impacts of fiscal decentralization on budget balance, this paper reviews the historical achievements of balanced budgets in states and all of their local governments. Figure 1 displays the number of state and local governments that have successfully balanced their budgets.

There have been only 10 years⁵ when U.S. states have not had budget deficits, while 48, 40, and 49 states have recently had deficits in FY2002, FY2008 and FY2009, respectively (U.S. Census Bureau, 2016). This paper considers the budget balance of all the local governments in a state, and budget surplus is not observed in the time period⁶. The number of states whose local governments have all had deficits is greater than the number of states

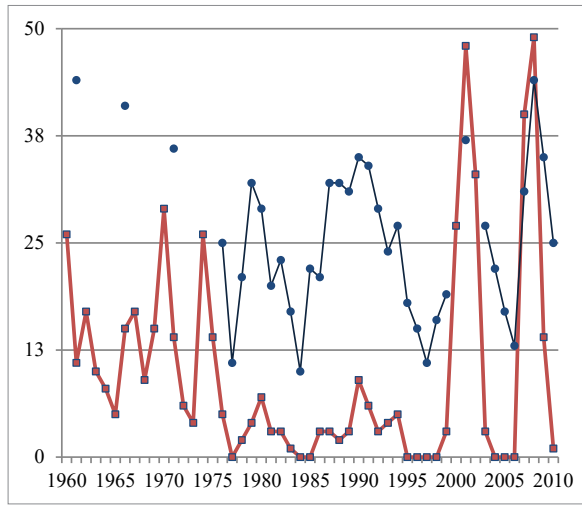
2 Governments have established and innovated many institutions such as Tax and Expenditure Limits (TELs), Balanced Budget Requirements (BBRs), Zero-Based Budgeting (ZBB), Planning, Programing, and Budgeting System (PPBS), and Performance Based Budgeting (PBB) to achieve budget balance.

3 As of 2010, 30 states operate under a tax or expenditure limitation (TEL), and 37 states have legislated balanced budget requirements (BBRs) as of 2008 (Hou and Smith, 2010; NASBO, 2008; Zycher, 2013).

4 According to Bohn and Inman (1996), budget deficits affect allocative and distributive functions, and public debts affect borrowing of resources. Therefore, both have financial and budgetary impacts on monetary and economic policy-making processes in U.S. state-local governments. Budget balance enables the voters to recognize all financial and budgetary aspects, and serves as a more appropriate measure of fiscal performance (Brender, 2003). Fiscal autonomy and budgetary powers of state and local governments have been related to the amounts of revenue and expenditure. How to collect revenue and how to spend it directly influence budgets, and they are determined by the degree of fiscal decentralization.

5 They are FY1978, FY1985, FY1986, FY1996-FY1999, and FY2005-2007.

6 The U.S. Census Bureau does not provide the details of total expenditures in all local governments in a state for FY1961, FY1963-FY1966, FY1968-FY1971, and FY1973-FY1976. Therefore, the graph does not show the number of states whose local governments all achieved a balanced budget.



Note 1: The red line with square marks represents the number of states that have budget deficits in each fiscal year, and the navy line represents the number of states in which all the budgets of their local governments have budget deficits.

Note 2: For the local level, this figure considers the revenues and expenditures of all the local governments within a state. The data in FY2001 and FY2003 is missing, and the number is indicated as 0 because the data of total expenditures are not clear in FY1961, FY1963-FY1966, FY1968-FY1971, and FY1973-FY1976.

Figure 1: States and their local governments with budget deficits (FY1961-FY2010)

Source: U.S. Census Bureau (2016)

with state-budget deficits, except in the three years of the FY2002, FY2008 and FY2009. Although governors and legislators established various fiscal institutions in order to balance their budgets, states and their local governments have rarely been faced with a surplus. Although overspending is restricted, state governments have struggled with their budget deficits.

Budget balance is sensitive to the political culture and regime as well as economic conditions (Hou and Smith, 2006; Schick, 1998; Wildavsky, 1985), and all the conditions determine the degree of fiscal decentralization (Ebel and Yilmaz, 2003; Lockwood, 2005; Oates, 2005; Tiebout, 1961). Though fiscal rules are important, state governments cannot cover all the revenues and expenditures of the lower-level governments, and the degree of fiscal decentralization is the more important factor that changes their revenues and expenditures; additionally, inter-governmental grants across the layers of governments affect budget balance, especially the grants to provide assistance after unexpected events, such as natural disasters.

State and local governments have not balanced their budgets for the last 40 fiscal years. Although the degree of fiscal decentralization as a political-economic decision determines fiscal institutions, little research has linked fiscal decentralization to budget balance. Rather, many studies have researched the impact of fiscal decentralization on economic

development and transparency with various results. Based on the important relationship between fiscal decentralization and budget balance, this paper will investigate the effects of fiscal decentralization on budget balance with multidimensional indicators for fiscal decentralization.

5. Data and methodology

5.1. Dependent variables

The dependent variable considers whether government budgets are balanced or not. A balanced budget is not a single concept because it is part of the whole budget cycle of preparation, approval, and execution; thus, a balanced budget can be obtained in different ways (Hou and Smith, 2010). Analyzing the budget balance at state and local levels, this paper focuses on the two widespread concepts of budget balance among various measures and selects total balance and general balance for the dependent variables because the other measures for budget balance are so specific and stringent that it is difficult to analyze local levels by those measures.

The first dependent variable is total budget balance, which is the difference between total revenues and total expenditures, including every single budget item. The concept of total balance is the most universal but least stringent measure that handles the overall budgetary information. The second dependent variable is general budget balance, which is the gap between general revenues and general expenditures⁷. The benefit of the general balance is to aggregate inflows and outflows. Both variables indicate whether a government balances its own budgets or not rather than specifying the amount of budget surplus/deficits. Therefore, the two dependent variables are coded as 1 when the budget of a government is balanced; otherwise, 0.

5.2. Independent variables

The independent variables are the degrees of fiscal decentralization in U.S. states. Fiscal decentralization is a political term that refers to the distribution of central/federal decision-making authority to its lower levels, but its definitions are varied all over the country because the legal relationships between the higher and lower levels of government are different from each other. The multiplicity of relationships among a state and its local governments leads how to measure the devolutions of fiscal authority to be more complicated; thus, the standard measures of fiscal decentralization⁸ are limited.

7 According to the U.S. Census Bureau (2016), general revenues and general expenditures exclude utilities, liquor store, and insurance trust items.

8 The standard measures depend on two concepts. The first is associated with the number of organizations at each level of government, and the second is associated with accounting information. Both are generally appropriate to measure the degree of fiscal decentralization, but they cannot fully reveal the details of the degree.

Because the existing measures are more concentrated at the national level, this paper considers an alternative approach in order to remove measurement limitations (Akai and Sakata, 2002).⁹ They focused on two perspectives. First, the lower-level governments spend inter-governmental grants authorized by their higher-level government; thus, expenditure shares are not an accurate indicator of the degree of fiscal decentralization. Secondly, the lower levels of governments still have fiscal autonomy, given that their shares of revenue and expenditures are still small; thus, fiscal autonomy should be considered separately when measuring the degree of decentralization from revenues and expenditures. Prior studies have shown that only one indicator is unsatisfactory for research on the effects of fiscal decentralization in U.S. states (Akai and Sakata, 2002; Altunbaş and Thornton, 2012; Jin, Qianb and Weingast, 2005; Thornton, 2007; Xie, Zou and Davoodi, 1999). Thus, this paper employs Akai and Sakata's indicators (2002) that measure the degree of fiscal decentralization that allocates the fiscal autonomy among the layers of governments, which captures the diverse dimensions of the degree of decentralization. The indicators are summarized in Table 1.

5.3. Control variables

Organization environments change organizational structures and decision-making processes (Rainey, 2009), and provide an integrated theory of political competition between parties. This paper controls for the characteristics of politics, economy and demographics, and fiscal and budgetary institutions of each U.S. state. As discussed in the existing literature that Republicans/conservatives tend to prefer balanced budgets (Hou and Smith, 2010; Wildavsky, 1985), the political affiliations of the governor, senators and House members control state politics. When the governor and two senators in a state belong to the Republican Party, each variable is coded as 1; otherwise, 0. The variable indicating the majority in the state House, however, differs from the two variables for the governor and senators because the House members are more than two; thus, this paper codes the political affiliation of House members as the ratio of Republican to Democratic House members. The last variable is the political business cycle, a dichotomous variable indicating whether a state has any election in a given year. The cycle assumes that an incumbent governor is inclined toward slowing down spending to win re-election (Lächler, 1982; Nordhaus, 1975), and this paper adds its current-year and one-year lag terms. Based on the theoretical approach to state political characteristics, this paper expects that all variables will have positive effects on the budget balance.

The economic characteristics of states control for budget balance with per capita income because the wealth of a state influences its revenue capacity. Like the political business cycle, this paper also controls for the unemployment rate of states in order to capture

⁹ Akai and Sakata's measures (2002) make it possible to sort through the details of revenue and expenditures simultaneously. They found out that fiscal decentralization is positively associated with economic growth by using panel data from U.S. states in FY1992 through FY1996.

Table 1: Definition of independent variables

Indicator	Var.	Definition	Equation
Revenue Indicator	RI	Ratio of local government revenue to combined state and local government revenue ⁽¹⁾	$RI = \frac{[Local\ Total\ Revenue - (Grants + Debts)]}{[State + Local\ Total\ Revenue - (Grants + Debts)]}$
Production Indicator	PI	Ratio of local government expenditure to combined state and local government expenditure ⁽²⁾	$PI = \frac{Local\ Total\ Expenditure}{(State + Local\ Total\ Expenditure)}$
Autonomy Indicator ⁽³⁾	AI1	Ratio of local government own-source revenue to local government total revenue, excluding federal grants	$AI1 = \frac{(Local\ Own\ Source\ Revenue - Federal\ Grants)}{(Local\ Total\ Revenue - Federal\ Grants)}$
	AI2	Ratio of local government own-source revenue to local government total revenue, including federal grants	$AI2 = \frac{Local\ Own\ Source\ Revenue}{Local\ Total\ Revenue}$
Production-Revenue Indicator	PRI	PRI represents fiscal decentralization that incorporates both revenue and expenditure shares	$PRI = \frac{(RI + PI)}{2}$

Note (1): The revenues transferred from other governments (inter-governmental grants) and financed by public debts are excluded.

Note (2): Unlike revenue indicator, the expenditure indicator includes the amount of grants (Davoodi and Zou, 1998; Xie, Zou and Davoodi, 1999).

Note (3): AI1 refers to real fiscal independence, while AI2 refers to actual fiscal independence.

Source: Akai and Sakata (2002)

the changes in the turns of the business cycle. Demographic characteristics influence the potential economies of scale in providing the public services of state and local governments; thus, this paper controls for population and population density.

In addition to the political, economic, and demographic characteristics, this paper controls for fiscal and budgetary institutions that have direct impacts on budget balance. U.S. states administer legal limitations on their decision-making process regarding the budget. According to detailed research on those limitations (Mullins and Wallin, 2004), this research includes two more dichotomous variables of revenue and expenditure limitations in state laws¹⁰. Table 2 summarizes all the variables.

5.4. Empirical strategy

For the empirical analysis, this paper specifies the probit regression model to obtain the probability that state and local governments will achieve balanced budgets. For the utmost efficiency in the analysis, a long-term panel data was constructed to include U.S. states for a period of 51 years (FY1961-FY2011). Since the dependent variables are dichotomous, indicating whether budget was or was not balanced, the probit regression for budget balance is constructed as:

$$Pr(BB_{it} = 1|FD, X) = \alpha + \rho FD_{it} + \theta X_{it} + \delta_i + \tau_t + \varepsilon_{it}$$

where the independent variable (FD_{it}) refers to the degree of fiscal decentralization measured in five ways in a state (i) in a fiscal year (t), and X_{it} refers to the control variables for politics, economy, demographics, and fiscal and budgetary institutions in a state (i) in a fiscal year (t). α is a constant term, and δ , τ and ε are state- and year-specific error terms. The dependent variable (BB_{it}) refers to whether a state (i) achieves a balanced budget in a fiscal year (t). The dependent variables are (1) whether the total budget of a state is balanced, (2) whether the general budget of a state is balanced, (3) whether the total budgets of all the local governments in a state are balanced, and (4) whether the general budgets of all the local governments in a state are balanced.

According to Table 2, 80 percent of U.S. states have balanced their total budgets, while 64 percent have balanced their general budgets during 51 fiscal years. 62 percent of U.S. states have balanced the total budgets of their local governments, while 78 percent of U.S. states have balanced the general budgets of their local governments during the same period. Among the independent variables, revenue indicator has a negative value; thus, this study found that South Carolina had a value of -31 percent in 1971¹¹. Since the revenue indicator is obtained after subtracting the amount of inter-governmental grants and public

10 States have legislated tax and expenditure limitations (TEs) at different levels of local government in different years. This paper considers the first year a TEL was legislated at any level of local government.

11 In 1971, all the local governments in South Carolina had a total revenue of \$3,643,985, with \$1,700,087 in inter-governmental grants, and \$2,970,946 in public debts. Thus, the minimum revenue indicator has a negative value.

Table 2: Variable definitions, sources, and descriptions (FY1961-2011)

Var. ⁽¹⁾	Definition	N	Mean	S.D.	Min	Max	SR ⁽²⁾
STB (D)	Whether the total budget of a state is balanced	2,550	0.801	0.399	0.000	1.000	BC
SGB (D)	Whether the general budget of a state is balanced	2,550	0.645	0.479	0.000	1.000	BC
LTB (D)	Whether the total budget of all the local governments in a state is balanced	2,450	0.622	0.485	0.000	1.000	BC
LGB (D)	Whether the general budget of all the local governments in a state is balanced	2,450	0.785	0.411	0.000	1.000	BC
RI (%) ⁽³⁾	Revenue indicator	2,200	39.351	9.411	-31.002	74.303	BC
PI (%)	Production indicator	1,800	52.700	9.870	20.495	100.000	BC
AI1 (%)	Autonomy indicator 1	2,200	64.186	9.457	25.762	90.693	BC
AI2 (%)	Autonomy indicator 2	2,200	65.965	8.589	36.234	90.936	BC
PRI (%)	Production-revenue indicator	1,550	45.784	8.781	19.829	74.804	BC
PCI (L)	Per capita income	2,550	10.230	0.301	9.166	10.978	BEA
UER (%) ⁽⁴⁾	State unemployment rate	2,442	5.743	2.055	1.800	17.442	BLS
POP (L)	Population in thousands	2,550	14.901	1.033	12.380	17.445	BC
POPD (C)	Population density	2,550	139.190	182.336	0.363	1012.930	CQ
GOV_R (D)	Whether a Governor is Republican	2,550	0.441	0.497	0.000	1.000	CQ
GOV_E (D)	Whether an election for a Governor has happened	2,550	0.285	0.451	0.000	1.000	CQ
HOU_R (%)	Ratio of Republican members in state House	2,548	46.037	31.063	0.000	100.000	CQ
SEN_R (D)	Whether state Senators are Republicans	2,550	0.453	0.498	0.000	1.000	CQ
REVL (D)	Whether a state has general revenue limit	2,550	0.068	0.252	0.000	1.000	MW
EXPL (D)	Whether a state has general expenditure limit	2,550	0.111	0.314	0.000	1.000	MW

Note (1): (D) is dichotomous form, (%) is ratio form, and (L) is logged form, and (C) is continuous form.

Note (2): SR represents the source of variable, BC represents the U.S. Census Bureau, BEA represents the Bureau of Economic Analysis, BLS represents the Bureau of Labor Statistics, CQ represents 'Voting and Elections Collection' published by CQ Press, and MW represents the paper published by Mullins and Wallin (2004).

Note (3): For the 1970-1975 period, the Bureau of Labor Statistics (BLS) had different methodology to estimate state unemployment rate by supplementing the state Current Population Survey (CPS) samples. Before the 1970s, each state produces the estimate of its own unemployment rate independently using different methodology in 'Manpower [or Economic] Report of the President', available in the federal depository libraries (<http://www.gpo.gov/libraries>).

debts from revenue, the local governments in South Carolina in 1971 had received greater amounts from both sources than their total revenue. Moreover, the allocation of autonomy over revenue is observed much less than allocation of autonomy over production.

6. Results and discussion

All the models including different dependent and independent variables were run with state- and year-fixed effects, and the marginal effects were improved by incorporating unconditional fixed effects. This paper added all one-year lagged non-dichotomous independent variables to remove endogeneity issues, as well as the lagged dependent variable to control our model (Wooldridge, 2009).

6.1. Results on total budget balance

First, the estimates of the probit regression results for states' total budget balances are shown in Table 3, and those for local budget balances are in Table 4. According to Table 3, the degree of fiscal decentralization is shown to have different effects on whether a state government achieves a balanced budget. When a state government allows its local governments to have more decentralized revenue autonomy and fiscal autonomy, including grants, state governments are less likely to achieve a balanced budget. More specifically, the one percentage-point extended degree of revenue autonomy (RI) will decrease the probability of budget balance in state governments by 8.18 percent ($p=0.002$), and the one percentage-point extended degree of fiscal autonomy including grants (AI2) will decrease the probability by 0.20 percent ($p=0.035$). Unlike these two indicators for fiscal decentralization, a state government is more likely to achieve a balanced budget when it allows its local governments to have a greater degree of expenditure autonomy and fiscal autonomy, excluding grants. The one percentage-point increase in expenditure autonomy (PI) in a state will increase the probability of its budget balance by 25.81 percent ($p=0.000$), and the same increase of fiscal autonomy excluding grants (AI1) will increase the probability by 0.12 percent ($p=0.056$).

Table 4 provides the results of probit estimations for the effects of fiscal decentralization on the total budgets of local governments in a state. All the local governments in a state are more likely to achieve a balanced budget when their revenue autonomy is more decentralized. The one percentage-point increase in revenue autonomy over all local budgets in a state will increase the probability that all local governments in the state will balance their total budgets by 4.97 percent ($p=0.012$). Unlike the revenue indicator, the one percentage-point increase in expenditure autonomy in a state will decrease the probability that the local governments will achieve total budget balance by 3.46 percent ($p=0.066$). The other indicators of fiscal autonomy do not demonstrate any statistically significant effects on the achievement of budget balance.

Table 3: Probit estimation for state total budget balance

Dependent variable: state total budget balance

Model	(1)	(2)	(3)	(4)	(5)
FD	RI	PI	AI1	AI2	PRI
FD (%)	-0.0818*** (0.0270)	0.2581*** (0.0733)	0.0012* (0.0217)	-0.0020** (0.0245)	0.0739 (0.1201)
PCI (L)	0.8537 (1.9841)	-3.0863 (4.1953)	-0.0431 (1.9070)	-0.0735 (1.9006)	-5.7526 (6.6584)
UER (%)	-0.4131*** (0.0779)	-0.5200*** (0.1692)	-0.4241*** (0.0750)	-0.4224*** (0.0742)	-0.6578*** (0.2158)
POP (L)	17.3052* (10.7019)	30.3231 (21.3138)	21.7883** (10.1512)	21.7211** (10.2141)	126.1772*** (35.3507)
POPD	-0.0146 (0.0364)	-0.0206 (0.1369)	-0.0350 (0.0337)	-0.0362 (0.0336)	-0.1510 (0.2030)
GOV_R	-0.0201 (0.1158)	0.0274 (0.2711)	-0.0168 (0.1144)	-0.0174 (0.1143)	0.0334 (0.4074)
GOV_E	-0.2695* (0.1462)	-0.3558 (0.2624)	-0.3009** (0.1449)	-0.3003** (0.1445)	-0.4732* (0.2429)
HOU_R	-0.0021 (0.0030)	0.0013 (0.0061)	-0.0012 (0.0029)	-0.0012 (0.0029)	-0.0076 (0.0077)
SEN_R	0.0349 (0.1233)	0.5044* (0.3116)	0.0049 (0.1209)	0.0131 (0.1199)	0.0719 (0.3716)
REVL	0.2847 (0.8638)	-2.4402 (1.9070)	0.3983 (0.8575)	0.4029 (0.8660)	-3.8997* (2.1907)
EXPL	-0.6852** (0.3081)	-3.3071*** (0.6405)	-0.2766 (0.2923)	-0.2466 (0.2916)	-19.9085 (13.0680)
Constant	24.3699 (18.8372)	29.5429 (33.5778)	36.0674* (18.9164)	35.9200* (19.2559)	167.1907*** (54.3172)
N	1,450	779	1,450	1,450	336
Log pseudolikelihood	-390.375	-132.918	-397.453	-397.113	-89.319
Pseudo R2	0.4157	0.5460	0.4051	0.4056	0.3343

Note: The variables for state and time fixed effects, and all the lagged forms of dependent variable and non-dichotomous independent variables are not shown, but all the variables are included in running the probit regression. Robust standard errors in parentheses, and statistical significance is *** p<0.01, ** p<0.05, * p<0.1

Table 4: Probit estimation for local total budget balance

Dependent variable: local total budget balance

Model	(1)	(2)	(3)	(4)	(5)
FD	RI	PI	AI1	AI2	PRI
FD (%)	0.0497** (0.0198)	-0.0346* (0.0283)	-0.0183 (0.0221)	-0.0164 (0.0251)	-0.0683 (0.0479)
PCI (L)	6.4089** (2.9666)	8.2572*** (2.4723)	6.7745** (2.7444)	6.5573** (2.7775)	9.2098*** (2.6428)
UER (%)	0.0666 (0.0827)	0.0388 (0.0721)	0.0747 (0.0803)	0.0785 (0.0802)	0.1127 (0.0877)
POP (L)	7.5365 (6.1671)	1.0210 (6.5243)	2.5259 (6.0008)	3.1618 (6.0547)	0.1957 (7.3729)
POPD	0.0430 (0.0697)	0.0677 (0.0832)	0.0536 (0.0709)	0.0517 (0.0717)	0.1281 (0.1108)
GOV_R	-0.0760 (0.0856)	-0.1955** (0.0915)	-0.0596 (0.0878)	-0.0611 (0.0874)	-0.1446 (0.1032)
GOV_E	0.1397 (0.1126)	0.1066 (0.1264)	0.1482 (0.1125)	0.1481 (0.1125)	0.1653 (0.1268)
HOU_R	-0.0025 (0.0034)	-0.0013 (0.0041)	-0.0019 (0.0034)	-0.0019 (0.0034)	-0.0034 (0.0042)
SEN_R	-0.0094 (0.0933)	-0.1066 (0.0991)	-0.0175 (0.0941)	-0.0184 (0.0939)	-0.0913 (0.1096)
REVL	-0.7338** (0.3310)	-1.3505*** (0.3209)	-0.6873** (0.2915)	-0.6858** (0.3002)	-1.4056*** (0.3133)
EXPL	0.5157 (0.4476)	0.8814*** (0.2112)	0.3138 (0.4056)	0.3376 (0.4142)	0.8834*** (0.2064)
Constant	-4.5504 (14.2363)	-17.4680 (16.4365)	-11.1989 (14.2222)	-10.0013 (14.1772)	-20.4234 (22.6383)
N	1,364	1,407	1,364	1,364	1,173
Log pseudolikelihood	-666.529	-690.323	-670.185	-670.160	-571.903
Pseudo R2	0.2949	0.2915	0.2911	0.2911	0.2927

Note: The variables for state and time fixed effects, and all the lagged forms of dependent variable and non-dichotomous independent variables are not shown, but all the variables are included in running the probit regression. Robust standard errors in parentheses, and statistical significance is *** p<0.01, ** p<0.05, * p<0.1

6.2. Results on general budget balance

This study has also estimated the probability that states, and local governments can successfully balance their general budgets. Table 5 provides the results for states' general budget balance. They are similar to those for state total budgets shown in Table 3. According to Table 5, the revenue indicator (RI) leads states to have deficits in their general budgets, while the other indicators help them to attain balanced budgets. The one percentage-point higher degree of revenue autonomy (RI) is more likely to decrease the probability that a state will balance its general budget by 5.96 percent ($p=0.001$). However, the production indicator, two fiscal autonomy indicators and production-revenue indicator, are more likely to increase the probability that a state will balance its general budget by 25.18 percent (PI; $p=0.000$), 3.95 percent (AI1; $p=0.009$), 4.62 percent (AI2; $p=0.007$) and 9.05 percent (PRI; $p=0.042$), respectively.

Table 6 provides the probit regression result of the general budget balance of all the local governments in a state. Like the results of state governments, the results are similar to those of total budget balance in local governments displayed in Table 4. The revenue indicator is shown to have positive effects on the achievement of general budget balance by all the local governments in a state, while the expenditure indicator and two fiscal autonomy indicators have negative effects. The one percentage-point increase in revenue autonomy is more likely to increase the probability of general budget balance in all the local governments by 4.10 percent ($p=0.041$). However, the one percent increase in the other three indicators of autonomy is more likely to decrease the probability of general budget balance by 24.75 percent for expenditure autonomy ($p=0.000$), by 2.96 percent for fiscal autonomy excluding grants ($p=0.082$), and by 3.35 percent for fiscal autonomy including grants ($p=0.064$), respectively.

6.3. Discussion of results

With regards to the effects of the five indicators that measure the degree of fiscal decentralization in a state, the findings in Tables 3 through 6 lead us to focus on the indicators for revenue and expenditure autonomy, which have consistently contradictory effects on total and general budget balance between a state and its local governments. When a state has allowed its local governments to have greater autonomy over their revenue, the state is more likely to have budget deficits in both its total and general budgets, while its local governments are more likely to balance both budgets. Given that jurisdictions overlap between a state and its local governments, a state with local governments that have more revenue authority is constrained to expand its revenue sources because the same tax base in the state and its local governments are more burdened by expansions. The effects of production indicator for expenditure autonomy on state and local governments differ from the effects of revenue autonomy. If a state has guaranteed greater expenditure autonomy for its local governments, the state is more likely to have a balanced budget, while its local governments are less likely to. The production indicator helps a state achieve a balanced budget because the state can lessen the burden of public service delivery if its local governments are able to

Table 5: Probit estimation for state general budget balance

Dependent variable: state general budget balance

Model	(1)	(2)	(3)	(4)	(5)
FD	RI	PI	AI1	AI2	PRI
FD (%)	-0.0596*** (0.0187)	0.2518*** (0.0441)	0.0395*** (0.0150)	0.0462*** (0.0169)	0.0905** (0.0443)
PCI (L)	2.9756* (1.6670)	8.4904** (4.2122)	2.2780 (1.6174)	2.2289 (1.6066)	7.2766* (3.7447)
UER (%)	-0.2155*** (0.0713)	-0.3369*** (0.1069)	-0.2325*** (0.0702)	-0.2336*** (0.0704)	-0.3807*** (0.1112)
POP (L)	2.3099 (7.1144)	21.7472** (10.1820)	6.9143 (6.6371)	7.3633 (6.6311)	24.4920** (10.4411)
POPD	0.0137 (0.0453)	0.0593 (0.0735)	-0.0009 (0.0468)	-0.0039 (0.0464)	0.0139 (0.0733)
GOV_R	0.0879 (0.0747)	0.1663 (0.1125)	0.0670 (0.0740)	0.0650 (0.0738)	0.1612 (0.1074)
GOV_E	-0.2732** (0.1072)	-0.2342* (0.1401)	-0.2885*** (0.1078)	-0.2901*** (0.1076)	-0.2526* (0.1333)
HOU_R	-0.0052*** (0.0014)	-0.0062** (0.0026)	-0.0051*** (0.0014)	-0.0051*** (0.0014)	-0.0063** (0.0027)
SEN_R	0.0266 (0.0797)	0.3140** (0.1234)	0.0115 (0.0768)	0.0114 (0.0770)	0.2744** (0.1259)
REVL	0.5246 (0.3195)	0.1865 (0.2818)	0.5229* (0.2800)	0.5110* (0.2767)	0.3441 (0.3052)
EXPL	-0.7000** (0.2832)	1.0174*** (0.3366)	-0.4378* (0.2410)	-0.4150* (0.2362)	0.7651** (0.3334)
Constant	22.8799* (11.9212)	38.4643 (26.0750)	33.0136*** (11.5247)	33.1025*** (11.5748)	34.3552 (26.7001)
N	1,967	1,173	1,967	1,967	1,173
Log pseudolikelihood	-873.194	-427.833	-876.981	-875.498	-444.948
Pseudo R2	0.3255	0.3845	0.3226	0.3238	0.3599

Note: The variables for state and time fixed effects, and all the lagged forms of dependent variable and non-dichotomous independent variables are not shown, but all the variables are included in running the probit regression. Robust standard errors in parentheses, and statistical significance is *** p<0.01, ** p<0.05, * p<0.1

Table 6: Probit estimation for local general budget balance

Dependent variable: local general budget balance

Model	(1)	(2)	(3)	(4)	(5)
FD	RI	PI	AI1	AI2	PRI
FD (%)	0.0410** (0.0199)	-0.2475*** (0.0467)	-0.0296* (0.0272)	-0.0335* (0.0296)	-0.0636 (0.0525)
PCI (L)	6.6437** (2.6779)	6.4435** (3.1903)	7.0746 (2.5402)	6.9427*** (2.5614)	7.4591** (3.1460)
UER (%)	0.0843 (0.0956)	0.0961 (0.1047)	0.0973 (0.0930)	0.1005 (0.0928)	0.1426 (0.1030)
POP (L)	-3.4771 (6.8973)	-7.7522 (8.3012)	-9.0103 (7.1055)	-8.8430 (7.1207)	-8.9558 (8.2843)
POPD	0.0407 (0.0714)	0.0352 (0.1205)	0.0471 (0.0724)	0.0471 (0.0726)	0.0920 (0.1226)
GOV_R	-0.1316 (0.0836)	-0.1450 (0.1112)	-0.1188 (0.0824)	-0.1193 (0.0828)	-0.1668 (0.1063)
GOV_E	0.0432 (0.1161)	0.0293 (0.1290)	0.0503 (0.1146)	0.0499 (0.1145)	0.0479 (0.1244)
HOU_R	-0.0013 (0.0039)	-0.0023 (0.0048)	-0.0004 (0.0040)	-0.0004 (0.0039)	-0.0014 (0.0046)
SEN_R	-0.0244 (0.1067)	-0.2293* (0.1198)	-0.0255 (0.1061)	-0.0257 (0.1058)	-0.2425** (0.1121)
REVL	-0.5864 (0.4167)	-0.4324 (0.5564)	-0.5909 (0.3761)	-0.5868 (0.3816)	-0.7102 (0.5174)
EXPL	-0.5576 (0.6513)	-4.0481*** (0.6391)	-0.7807 (0.5983)	-0.7754 (0.6041)	-3.7340*** (0.5902)
Constant	10.9717 (13.1815)	-3.3543 (21.9256)	2.9254 (14.0788)	3.5765 (14.1333)	4.6558 (21.9699)
N	1,367	1,123	1,367	1,367	1,123
Log pseudolikelihood	-549.497	-436.469	-551.940	-551.857	-452.475
Pseudo R2	0.3701	0.3622	0.3673	0.3674	0.3389

Note: The variables for state and time fixed effects, and all the lagged forms of dependent variable and non-dichotomous independent variables are not shown, but all the variables are included in running the probit regression. Robust standard errors in parentheses, and statistical significance is *** p<0.01, ** p<0.05, * p<0.1

provide the services directly to their residents. Since the customers of the public services are the same, local governments, unlike their state, should expand their expenditures in order to maximize the services provided to their residents because they are more concentrated on the allocation function of delivery than their state.

In addition to the effects of fiscal decentralization on budget balance, micro- and macro-economic conditions have constant effects on state-local budget balance. The two control variables of per capita income and unemployment rate in this paper are used to measure micro- and macro-economic conditions, respectively. According to the four tables of probit estimations, the unemployment rate as the measurement of macro-economic conditions is negatively associated with the probability of total and general budget balance in a state, while per capita income as the measurement of micro-economic conditions is positively associated with the probability of a balanced budget in all local governments. That is, the probability that a state balances its own budgets decreases when the unemployment rate in the state is higher, but the probability of all the local governments in a state balancing their budgets increases when their per capita incomes are higher. The separate effects of micro- and macro-economic conditions on the fiscal performance of budget balance in local and state governments, respectively, depend on the functions that each level of government mainly takes. The fiscal autonomy over revenue and expenditures of a state and its local governments depend on which of Musgrave's three budget functions they focus on. The higher-level governments, especially the federal government in the U.S. federal system, need to stabilize their macro-economy conditions¹². Since shifting a function from one government to another causes a tradeoff, the stabilization function and the multiple layers of government prevent U.S. state governments from collecting and expanding their revenues because of the shared tax bases. This results in a budget deficit through state revenue shrinkage. Furthermore, local governments having greater fiscal autonomy for their revenue will meet a fiscal illusion (Wagner, 1976), which will lead them to make budget decisions to increase their expenditures.

7. Conclusions

This paper has focused on the multidimensional indicators that measure the degree of fiscal decentralization and examined the effects of the degree of decentralization on budget balance. Because the federal government has not consistently satisfied budget balance, most U.S. state governments have created constitutional or statutory institutions of balanced budget requirements (BBRs). Although the BBRs have important impacts on the achievement of budget balance and on financial and budgetary management (Bohn and Inman, 1996; Buchanan, 1997; Hou and Smith, 2010; Poterba, 1995; Schultze, 1995), the balance and management depend on the authority distributed through fiscal decentralization. The

12 Stabilization is still a function of a state government because local governments do not have enough capacity to control their own macro-economic conditions.

examinations of this paper use the multidimensional indicators for the degree of fiscal decentralization by considering revenue, expenditure, own-source revenue, grants and debts (Akai and Sakata, 2002).

This study has estimated the probability that U.S. state-local governments can achieve the balance of their total and general budgets through the multidimensional indicators that measure the degree of fiscal decentralization. The five indicators in this paper consider revenue, expenditures, and fiscal autonomy. This paper originally aimed to determine the effects of fiscal decentralization on budget balance, but the actual findings are rather interesting. Because U.S. state and local governments share the same tax-bases and customers for public services, the estimates of the probability of budget balance are contradictory. According to the results of probit estimations, a state government is less likely to achieve a balance of its total and general budgets, while its local governments are more likely to achieve balanced budgets when the state allows its local governments to have a greater degree of fiscal autonomy over revenue. The findings provide evidence that a state is more likely to balance its total and general budgets, while its local governments are less likely to balance their total and general budgets when the state allows its local governments to have a greater degree of fiscal autonomy in expenditure as a production indicator.

Another interesting finding is the effects of the two indicators that measure micro- and macro-economic conditions in a state. Based on Musgrave's public budgetary and financial functions, the stabilization function is mainly the role of the federal government. State governments support stabilization with inter-governmental grants from the federal government. However, the grants are shown not to control the macro-economic conditions in a state. From the findings, per capita income as a micro-economic condition is positively associated with the probability of total and general budget balance in local governments, while the unemployment rate as measure of macro-economic conditions is negatively associated with the probability of total and general budget balance in a state government. This paper concludes with the interesting finding that fiscal autonomy over revenue and expenditure has contradictory effects on the probability that state and local governments will achieve budget balance; however, there still remains a question regarding the optimality of fiscal autonomy.

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