The Earmarked Transfers Multiplier

Shaoqing Huang [a], Jingchao Li [b], and Bing Ye [c]

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Abstract

This paper estimates the multiplier of earmarked transfers to local governments. We find that earmarked transfers boost government expenditure but also increase tax rates, leading to a multiplier of around 1. The multiplier is larger in expansion than in recession. We then compare the stimulative effects of earmarked transfers among different regions. Our results suggest that regions with a lower degree of industrialization should be preferably granted earmarked transfers, compared to highly industrialized cities. Finally, we examine the influence of earmarked transfers on the structure of government expenditure. We find that earmarked transfers play an essential role in promoting government expenditure on education.

Key Words: earmarked transfers, multipliers, China.
JEL Codes: E62, H77.

1 Introduction

While there is a considerable amount of empirical studies on the size of government spending multipliers, there has been relatively less research on the size of transfer multipliers. The motivation for our focus on transfers is two-fold. First, the scale of transfers is quite remarkable, especially in China. Table 1 compares the size of transfers in China with that in other countries.[1] The magnitude of transfers in China is twice as large

[a] Shanghai Jiao Tong University, sqhuang@sjtu.edu.cn.
[b] Corresponding Author: East China University of Science and Technology, jingchaoli@ecust.edu.cn, jingchaol@gmail.com.
[c] Corresponding Author: Nanjing University of Finance and Economics, 121657961@163.com.

[1] The second row reports local government revenues as a percent of total government revenues. The third row

as the average of OECD countries, and is substantially more sizable than the average of either developing countries or transitional economies. Second, unlike an equalization transfer, which aims to promote balanced fiscal capabilities among localities, the objective of an earmarked transfer is to help advance local development.[2] For example, each year, the Chinese central government allocates enormous amounts of earmarked transfers to national level poor counties. The effectiveness of these transfers is essential information for policy makers to make future poverty alleviation plans. In this paper, we use China's regional economic data and estimate the effects of earmarked transfers received by prefecture-level cities.[3]

Table 1

Each year, the Chinese central government assigns a certain amount of money to be earmarked transfers due to ad hoc considerations.[4] Earmarked transfers are especially important for Chinese prefectural cities in two aspects. First, as shown in Figure 1, earmarked transfers serve as a significant source of financing government spending. The ratio of earmarked transfers over budgetary expenditure ranges from 12.4% in 1997 to 23.8% in 2009. Earmarked transfers could well influence the economic performance of a prefectural city by allowing the city to expand its spending. Second, earmarked transfers are a powerful tool that the central government employs to smooth economic fluctuations, especially in recessions. Figure 2 documents the national growth rate of earmarked transfers between 1998 and 2009. There are spikes of the growth rate during both the Asian financial crisis and the 2007 global financial crisis. Soon after the Asian financial crisis

documents local government expenditures as a percent of total government expenditures. The difference between these two variables, which is presented in the last row, represents approximately the size of transfers.

[2] There are three types of intergovernmental transfers: unconditional (or general) such as an equalization transfer, conditional (or specific) such as a capital transfer, and direct cost reimbursement such as a tax rebate. In China, earmarked transfers fall into the category of conditional transfers.

[3] There are four levels of local governments in China: the provincial (province, autonomous region, municipality, and special administrative region), prefecture, county and township.

[4] Then, each region applies for these transfers. Ministries in the central government cooperate to make final decisions on which will receive the transfers and how much they will obtain.

ends, earmarked transfers are sharply reduced by the central government. Earmarked transfers have been playing an active role in smoothing economic fluctuations in China.

Figure 1

What is the size of the earmarked transfers multiplier? Through which channels do transfers impact economic growth? Which regions or cities should be preferably granted transfers? How do transfers influence the structure of government expenditures? Currently, there is limited empirical evidence to answer these critical questions. This paper aims to fill this gap.

We conduct an empirical analysis that examines the effectiveness of earmarked transfers in stimulating economic growth. From 1998 to 2009, our point estimate of earmarked transfers multiplier is around 1. This magnitude can be attributed to two opposing forces. On one hand, earmarked transfers raise budgetary expenditure, boosting economic output. On the other hand, earmarked transfers lift tax rates, dampening economic activities. We also find that the earmarked transfers are more effective when the prefectural cities are in expansion.

We continue to explore the effects of increased earmarked transfers on the output growth rate in the primary, secondary, and tertiary sectors. It turns out that output growth in all three sectors are significantly enhanced by increased earmarked transfers. The improvement of output growth in the secondary sector is the most salient, followed by that in the primary sector and then the tertiary sector. We then sort prefectural cities based on their degree of industrialization. The transfer multiplier is lager in cities with a lower degree of industrialization. Therefore, our results shed some light on who should receive earmarked transfers from the central government. Prefectural cities with a lower degree of industrialization would benefit more from obtaining transfers than highly industrialized cities.

Turning to the structure of local government expenditures, we find that, unsurprisingly, earmarked transfers increase government expenditure on infrastructure most prominently. However, we emphasize that earmarked transfers substantially raise government expenditure on education as well. And the rise of expenditure on education is much larger than that on social security benefits or public administration.

This paper is a part of a literature on estimating the multiplier of transfer payments. One closely related paper is Ma et al. (2016). The authors use the regression discontinuity design (RDD) method to estimate the multiplier of intergovernmental transfers to Chinese county governments. Their instrumental variable is a dummy variable according to whether a county qualifies as a national level poor county. However, national level poor counties not only receive much more earmarked transfers, but also obtain more credit support and "welfare-to-work" funds.[5] Both aspects would influence economic growth. This paper is also related to Feyrer and Sacerdote (2011) and Serrato and Wingender (2016). The authors examine the multiplier of transfers from the central government to states or counties in the United States. In addition, this paper falls into the increasing literature using regional variation to estimate fiscal multipliers (for example, Nakamura and Steinsson, 2014; Guo et al., 2016; Dupor and McCrory, 2018).

The remainder of the paper is organized as follows. Section 2 describes our empirical strategy and the data used to estimate the model. Section 3 summarizes the estimation results. Section 4 concludes.

2 Empirical Strategy and Data

The baseline regression is:

$$\frac{y_{it}-y_{i,t-1}}{y_{i,t-1}} = \alpha \frac{x_{it}-x_{i,t-1}}{y_{i,t-1}} + \beta z_{it} + u_i + \gamma_t + \varepsilon_{it} \quad (1)$$

[5] "Welfare-to-work" is a supporting policy for rural poverty alleviation. The government initiates infrastructure projects, wherein poor participants receive remuneration from their labor services instead of directly getting poverty relief money.

where the subscripts i and t represent prefectures and years, respectively. Let y denote GDP. The dependent variable is the GDP growth rate (*ggdp* hereafter). Let x denote earmarked transfers. We normalize the change in earmarked transfers by GDP in the previous year (*gtspe* hereafter). Thus, the coefficient of *gtspe* measures the multiplier of earmarked transfers, which is the focus of this paper. z represents control variables, which include previous year's GDP per capita (*gdppc* hereafter), the proportion of the primary GDP in GDP (*str* hereafter) and the natural population growth rate (*nrate* hereafter). u_i, γ_t and ε_{it} represent the individual effect, the time effect and the error term, respectively. Because the individual effect may be correlated with the error term, we use the fixed effect model to ensure that the estimator is consistent. The time period ranges from 1998 to 2009.[6]

In equation (1), earmarked transfers may be endogenous. Earmarked transfers are used to support several programs set up by the State Council. Once the State Council sets up a program, local governments apply to join the program. The applications are examined by the relevant ministry of the central government. Only some applications are approved. Then, Ministry of Finance allocates funds for the program to the local governments whose applications are approved (Fan and Li, 2014). In this process, the relevant ministry of the central government has plenty of freedom regarding the approval of the applications. This means that local governments can increase its probability to join the program and obtain the corresponding funds through lobbying or bribery. Both lobbying and bribery require financial resources, which rely on GDP growth. Hence, there may be reverse causality from economic growth to the growth of earmarked transfers.

Apart from the reverse causality, there is another possibility for the endogeneity of earmarked transfers. Fan and Li (2014) show that prefectures which have a closer tie with the ministries of the central government receive more earmarked transfers. In addition to money, the relation with the ministries of the central government may generate other resources such as preferential policies, which will promote economic growth as well. As a

[6] The data of earmarked transfers are only available up to 2009.

result, the omitted variable problem arises.

To handle the potential endogeneity of earmarked transfers, we follow the method of Nakamura and Steinsson (2014) to construct an instrumental variable. The method proceeds in two steps. In the first step, we simulate the predicted values for earmarked transfers. The amount of earmarked transfers received by a particular local government depends on: the total amount of earmarked transfers, the time-varying intentions of the central government, and the efforts of the local government to contend for earmarked transfers. The efforts of local governments are endogenous. However, the total amount of earmarked transfers is determined by the central government before the decisions of the distribution of earmarked transfers. Thus, it is exogenous to each prefectural government. Moreover, the time-varying intentions of the central government have an impact on the distribution of earmarked transfers. For instance, the central government initiated the western development strategy in 2001. To support the strategy, the central government increased earmarked transfers to the West (Guo et al., 2016). The time-varying intentions of the central government are exogenous to prefectural governments as well.

The two exogenous sources of earmarked transfers can be measured by one indicator: the provincial growth rate of earmarked transfers. We employ this indicator to simulate the predicted values for earmarked transfers. Using 1997 as the base year, we assume that the amount of earmarked transfers received by a prefectural government grows at the provincial growth rate after 1997. Note that when calculating the provincial growth rate of earmarked transfers for a prefecture, we exclude that prefecture to avoid endogeneity. Then we get the predicted values for earmarked transfers. In the second step, we normalize the change in the predicted values of earmarked transfers by previous year's GDP and use it as our instrumental variable.

The identification strategy exploits the interaction of two variations: the time variation in the provincial growth rate of earmarked transfers and the spatial variation in local economies' reliance on earmarked transfers.

The first variation can be decomposed into two components: the time variation in the national growth rate of earmarked transfers and the time variation in the proportion of earmarked transfers for each province. As shown in Figure 2, the national growth rate of earmarked transfers was volatile during the period 1998-2009. In addition, the national growth rate during both the Asian Financial Crisis and the Great Recession of 2008 was high, suggesting that earmarked transfers were used as an active fiscal tool to stimulate economic activities in recession. Figure 3 shows the time variation in the proportion of earmarked transfers for each province. The horizontal axis represents the proportion of earmarked transfers in 1997, while the vertical axis represents the proportion of earmarked transfers in 2003, 2006, and 2009. For year 2009, all the eastern provinces (from North to South: Liaoning, Hebei, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong and Hainan) were below the 45-degree line, implying that the richer eastern provinces obtained fewer earmarked transfers as time went on. And the pattern of the change in the proportion of earmarked transfers during the period 1997-2009 varied across provinces. For instance, the proportion of earmarked transfers declined for Guangdong, increased for Sichuan, and first declined but then remained stable for Yunnan. Overall, we can conclude that there is considerable time variation in the provincial growth rate of earmarked transfers.

Figure 2

Figure 3

Figure 4 shows the spatial variation in the ratio of earmarked transfers to GDP in 1997. As illustrated by the figure, there is some degree of variation, with the coefficient of variation (the ratio of the standard error to the mean) being 1.51. Because there is considerable variation in the provincial growth rate of earmarked transfers and some variation in local economies' reliance on earmarked transfers, it is feasible to identify the

causality of earmarked transfers on local output.

Figure 4

The empirical strategy of this paper follows Nakamura and Steinsson (2014). The authors exploit the time variation in the national growth rate of military expenditure of the US and the spatial variation in the reliance on military expenditure to identify the fiscal multiplier. Broadly speaking, both papers build on the literature that applies the Bartik IV. To construct the Bartik IV, the time variation of the national growth rate and the spatial variation in the industrial structure are used. Similar to the Bartik IV, the identification assumptions for the instrumental variable in this paper are: first, the provincial growth rate of earmarked transfers is exogenous to each prefectural government, which is reasonable according to the above analysis; second, the distribution of earmarked transfers in 1997 is independent of the error terms in the following years, which we will discuss in detail in Section 3.

All data are from Support System for China Statistics Application. We use prefectural-level data. That is, we exclude four municipalities under the direct administration of the central government, because they are provincial units and may not be comparable with prefectures. We also exclude prefectures with missing values regarding earmarked transfers during the period 1997~2009 to ensure that the computed provincial growth rate is comparable across years. Then, we get a sample consisting of 275 prefectures. Furthermore, we drop: (1) observations with the (real) GDP growth rate above 0.266 (the 95% percentile) or below 0.00829 (the 5% percentile);[7] (2) observations with *gtspe* above 0.0593 (the 99% percentile) or below -0.0307 (the 1% percentile).

[7] Annual growth rate above 0.266 cannot be regarded as normal conditions. The 99% percentile is as large as 1.86, while the 1% percentile as small as -0.119.

3 Results

3.1 Basic Results

Table 2

Column (2) of Table 2 reports estimates for the linear model, given in (1). The point estimate of the earmarked transfers multiplier is 1.031, which is a bit larger than the estimation of Ma et al. (2016), comparable with the estimation of Feyrer and Sacerdote (2011), but smaller than the estimation of Serrato and Wingender (2016). The coefficient of the IV is significant in the first stage regression (Column (3)), and the F statistics is as large as 192, rejecting the null hypothesis that the IV is weak.

The OLS estimation is also presented in Column (1) for comparison. It turns out that the OLS estimation underestimates the multiplier. To test the second identification assumption discussed in Section 2, we drop the data of year 1998 in Column (5), and additionally those of year 1999 in Column (7). The results change little, implying that the error term is not likely to be persistent. With respect to the estimated coefficients of the control variables (not reported here to save space), the estimated coefficients of the lagged GDP per capita and the population growth rate are significantly negative in all the regressions except Column (3). This is consistent with the growth theory. The estimated coefficients of the ratio of the primary GDP to GDP are also significantly negative in all the regressions except Column (3).

Our regression model could be subject to an omitted variable bias if earmarked transfers and other types of transfers are correlated. It turns out that the degree of correlation between earmarked transfers and other types of transfers are minimal. The correlation coefficient is -0.0036. We also carry out a robustness check by including other types of transfers in the regression. Again, the results change little.

Table 3

Next, we examine the mechanisms through which earmarked transfers affect economic growth. We do so by looking at the responses of government expenditures and revenues to earmarked transfers shocks.

In Column (2), we replace the dependent variable by the change of budgetary expenditure relative to lagged GDP. It shows that a one-unit increase in earmarked transfers raises budgetary expenditure by 1.022 units, boosting economic growth by increasing aggregate demand.[8] In Column (4), the dependent variable is replaced by the change of the ratio of budgetary revenue to GDP, which is an approximate measure of the overall tax rate in the region. The results show that earmarked transfers raise the tax rate. Increased tax rate pushes up the aggregate supply curve, imposing downward pressure on output. The increase in both output and the tax rate leads to an increase in budgetary revenue (Column (6)).

In summary, earmarked transfers influence economic growth through two opposing channels. On one hand, earmarked transfers help enhancing output by increasing government expenditure, which in turn raises aggregate demand. On the other hand, earmarked transfers lead to a higher tax rate, dampening economic activities. The combined effect of these two forces gives rise to a multiplier of around 1.

3.2 Multipliers in Recession and Expansion

Table 4

Table 4 compares earmarked transfers multipliers in recession and expansion. We introduce two alternative dummy variables representing economic cycles. The variable

[8] Note that only a proportion of the increase in budgetary expenditure forms aggregate demand of the home jurisdiction, because some of the increase in budgetary expenditure is used to buy products from other prefectures.

Drec is set to equal one when the growth rate of GDP is lower than the median of all years. The variable *Drec2* is set to equal one when the growth rate of GDP is lower than the median in a particular year. The interaction of *gtspe* and the dummy variable is added into the regression equation given in (1).

The two specifications yield similar results. The transfer multiplier is approximately 2.5 in expansion and -1.0 (that is, 2.5 - 3.5) in recession. Therefore, earmarked transfers are more effective in stimulating economic growth when the economy is in expansion. The two numbers are in contrast with the estimated government spending multipliers in recession and those in expansion, respectively, in Auerbach and Gorodnichenko (2013). Government spending multipliers range from 4.63 to 6.72 in recession and from -2.56 to -0.93 in expansion.

3.3 Multipliers by Industry and Region

In this subsection, we explore the effects of earmarked transfers in the primary, secondary, and tertiary industry. The dependent variable in equation (1) is replaced by the change of the primary, secondary, and tertiary industry GDP relative to lagged GDP, respectively. The regression results are summarized in Table 5. Columns (1) and (2) document results for the primary industry, columns (3) and (4) for the secondary industry, and columns (5) and (6) for the tertiary industry, respectively.

Table 5

As can be seen from the table, earmarked transfers increase output growth in all three industries. The impact of earmarked transfers on the secondary industry is the largest. The multiplier in the primary industry is larger than that in the tertiary industry. This is because many earmarked transfers are granted to prefectural cities to promote their agricultural development.

Table 6

Next, we examine varying responses to earmarked transfers across different regions in China. Specifically, we consider whether the size of the multiplier depends on the degree of industrialization. In Column (2) of Table 6, we add the interaction of $\frac{x_{it}-x_{i,t-1}}{y_{i,t-1}}$ and the dummy for industrialized prefectures. A prefecture is classified into industrialized prefectures if the ratio of its primary industry GDP to its GDP in 2001 is smaller than the median in the same year.[9] The results show that the multiplier is smaller among industrialized prefectures. One possible explanation is that industrialized prefectures already have abundant resources, and hence marginal gains from transfers are relatively small. Therefore, our results suggest that earmarked transfers should preferably be allocated to prefectural cities with a lower degree of industrialization.

3.4 Effects on the Structure of Government Expenditures

Not only can earmarked transfers strengthen economic growth by stimulating aggregate demand but also they may possibly enhance long-run growth by boosting aggregate supply. For example, some of the transfers received by prefectural cities are used to increase spending on education, accelerating human capital accumulation and hence promoting long-run economic growth. This subsector investigates how the structure of government expenditures responds to earmarked transfer shocks. Since the classification of government expenditures was changed in year 2007, data from 1998 to 2006 are used to examine the influence of earmarked transfers on government expenditure structure. The results are summarized in Table 7.

Table 7

[9] We use the data in 2001, rather than 1997, because this is the first year in which the data of the primary industry GDP is complete.

Columns (1) and (2) rerun equation (1) using data from 1998 to 2006. The multiplier becomes slightly smaller. The dependent variable in columns (4), (6), (8), and (10) are the ratio of spending on infrastructure over lagged GDP, the ratio of spending on education over lagged GDP, the ratio of spending on social security over lagged GDP, and the ratio of spending on administration over lagged GDP, respectively. Unsurprisingly, earmarked transfers lift spending on infrastructure most prominently. Here we emphasize that spending on education is also strengthened, much more strongly than spending on either social security or administration.

4 Conclusion

In this paper, we estimate the multiplier of earmarked transfers. We obtain five main results.

1. The point estimate of the earmarked transfers multiplier is around 1. Two opposing channels contribute to this magnitude of the multiplier. On one hand, earmarked transfers raise budgetary expenditure, boosting economic output. On the other hand, earmarked transfers lift tax rates, dampening economic activities.
2. Earmarked transfers have a larger impact when the affected region is in expansion.
3. Output growth in the primary, secondary, and tertiary sectors are all significantly enhanced by increased earmarked transfers. The improvement of output growth in the secondary sector is the most salient, followed by that in the primary sector and then the tertiary sector.
4. The multiplier is larger in prefectural cities with a lower degree of industrialization, compared to that in highly industrialized cities.
5. Earmarked transfers act as a crucial instrument in promoting government expenditure on education.

Our results have important policy implications. Among regions which apply for earmarked transfers, those with a lower degree of industrialization should be given priority

to receive transfers. Moreover, earmarked transfers could be a good candidate of policy tool if the central government is considering enhancing educational development in a certain region.

Note that our estimates are subject to an important caveat: the multipliers are local multipliers. They can be smaller or larger than aggregate multipliers, depending on whether spillovers are positive or negative. Estimating the spillover effects of earmarked transfers is beyond the scope of this paper and is left for future research.

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Figure 1. The ratio of earmarked transfers over budgetary expenditure

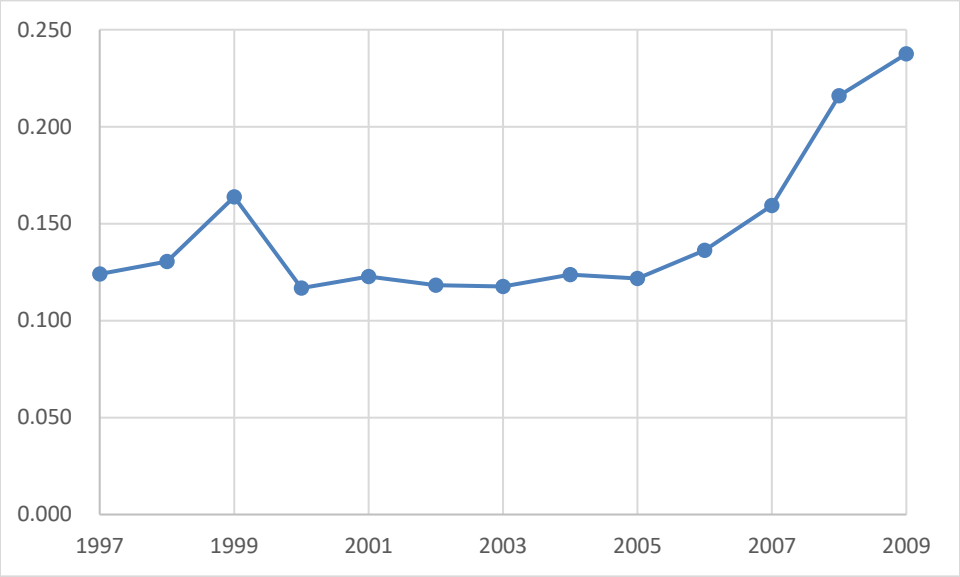


Figure 2. The national growth rate of earmarked transfers

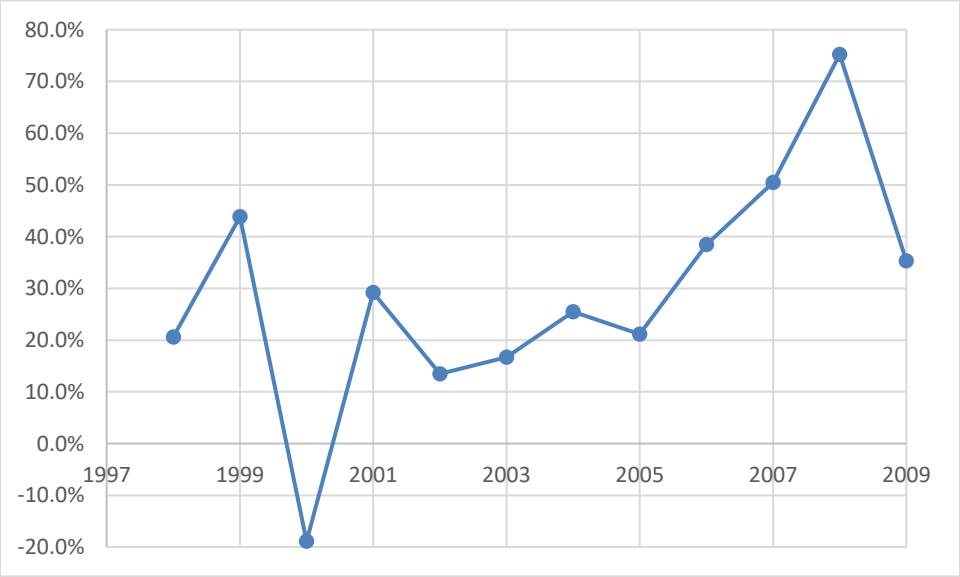
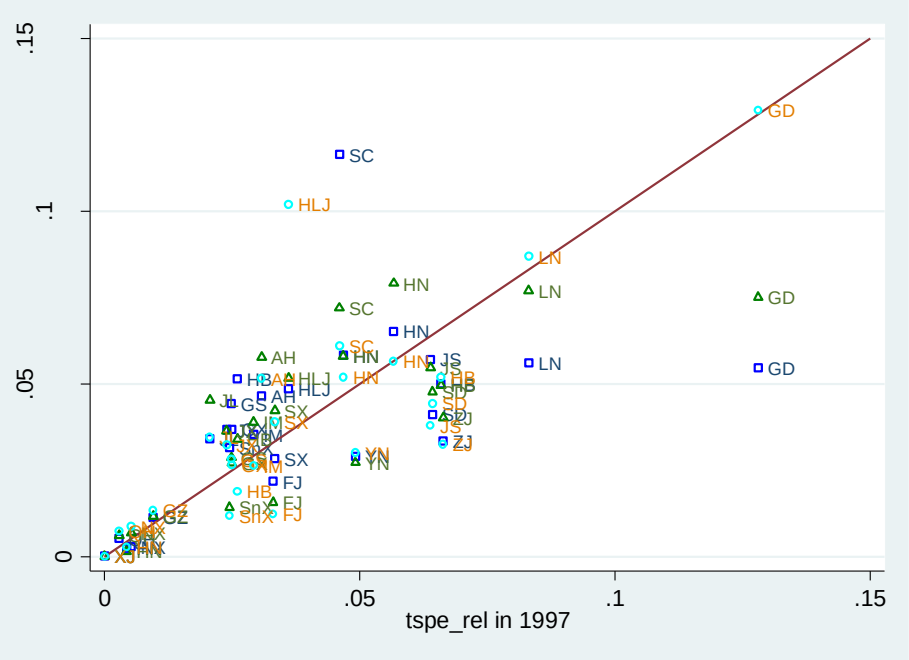


Figure 3. Provincial earmarked transfers as a proportion of total earmarked transfers



Notes: The horizontal axis represents 1997 data. For the vertical axis, circles represent 2003 data; triangles represent 2006 data; squares represent 2009 data. AH for Anhui, FJ for Fujian, GS for Gansu, GD for Guangdong, GX for Guangxi, GZ for Guizhou, HN for Hainan, HB for Hebei, HN for Henan, HLJ for Heilongjiang, HB for Hubei, HN for Hunan, JL for Jilin, JS for Jiangsu, JX for Jiangxi, LN for Liaoning, IM for Inner Mongolia, NX for Ningxia, QH for Qinghai, SD for Shandong, SX for Shanxi, SnX for Shannxi, SC for Sichuan, XJ for Xinjiang, YN for Yunnan, and ZJ for Zhejiang.

Figure 4. Ratio of earmarked transfers to GDP in 1997

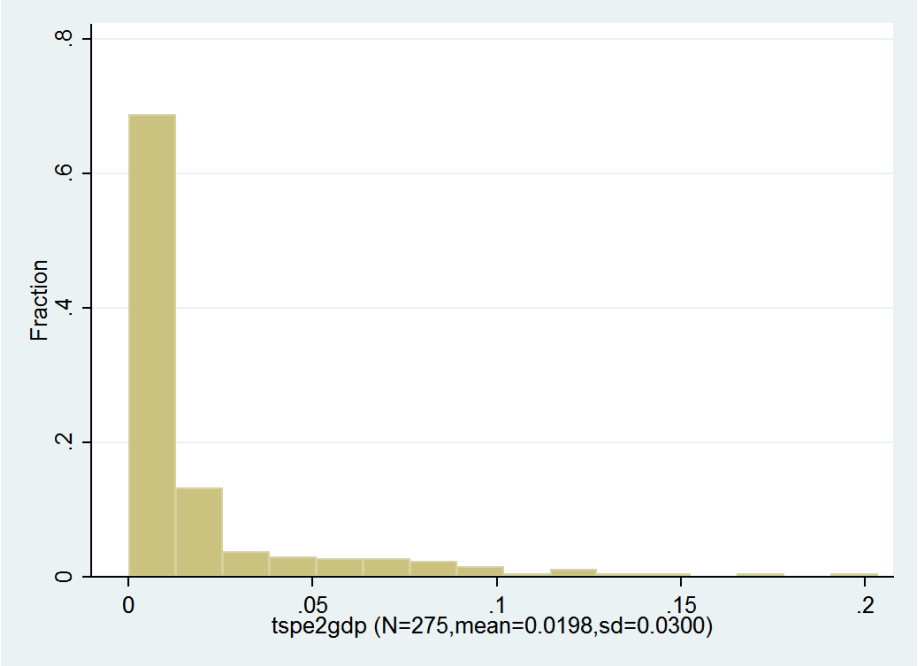


Table 1. Local government revenues and expenditures (% of total government revenues)

	China	Developing countries [b]	Transition economies [b]	OECD countries [b]
Revenues	48	16.6	18.4	19
Expenditures	74	19.6	22.3	32
Difference [a]	26	3	3.9	13

Notes: a. Difference = | Revenues - Expenditures |. b. In each group, the average is used. Source: Shen et al. (2012).

Table 2. Earmarked transfers multipliers

	(1) OLS	(2) IV	(3) IV-FR	(4) OLS	(5) IV	(6) OLS	(7) IV
	ggdp	*ggdp*	*gtspe*	*ggdp*	*ggdp*	*ggdp*	*ggdp*
gtspe	0.473***	1.031***		0.482***	1.013***	0.489***	1.176***
	(0.101)	(0.231)		(0.104)	(0.234)	(0.112)	(0.268)
gtspe _iv			0.301***				
			(0.0121)				
L.gdppc	-0.00887***	-0.00830***	-0.00114***	-0.00937***	-0.00908***	-0.0103***	-0.00956***
	(0.00102)	(0.00114)	(0.000188)	(0.00109)	(0.00122)	(0.00121)	(0.00140)
str	-0.0223**	-0.0234**	-0.00201	-0.0915***	-0.0864***	-0.0879**	-0.0885**
	(0.0102)	(0.0102)	(0.00179)	(0.0303)	(0.0304)	(0.0347)	(0.0348)
nrate	-0.988***	-1.013***	0.111**	-0.834**	-0.856**	-0.893**	-0.962***
	(0.316)	(0.317)	(0.0553)	(0.345)	(0.345)	(0.363)	(0.365)
t	1998-2009	1998-2009	1998-2009	1999-2009	1999-2009	2000-2009	2000-2009
N	2853	2846	2846	2656	2649	2439	2433

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3. Government expenditure, tax rates, and government revenue

	(1) OLS	(2) IV	(3)	(4)	(5)	(6)
	gexp	*gexp*	*dtaxr*	*dtaxr*	*grev*	*grev*
gtspe	0.967***	1.022***	0.0765***	0.130***	0.126***	0.216***
	(0.0251)	(0.0572)	(0.0154)	(0.0350)	(0.0169)	(0.0386)
L.gdppc	-0.00213***	-0.00216***	-0.000303**	-0.000205	-0.000811***	-0.000663***
	(0.000252)	(0.000283)	(0.000154)	(0.000173)	(0.000169)	(0.000191)
str	0.0114***	0.0113***	0.00558***	0.00549***	0.0121***	0.0119***
	(0.00253)	(0.00253)	(0.00155)	(0.00155)	(0.00170)	(0.00171)
nrate	-0.0592	-0.0610	-0.0545	-0.0577	-0.133**	-0.138***
	(0.0783)	(0.0784)	(0.0480)	(0.0480)	(0.0525)	(0.0529)
t	1998-2009	1998-2009	1998-2009	1998-2009	1998-2009	1998-2009
N	2853	2846	2853	2846	2853	2846

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Earmarked transfers multipliers during recessions and expansions

	(1) OLS	(2) IV	(3) OLS	(4) IV
	ggdp	*ggdp*	*ggdp*	*ggdp*
gtspe	1.638***	2.452***	1.808***	2.754***
	(0.113)	(0.257)	(0.111)	(0.226)
gtspe×Drec	-2.645***	-3.558***		
	(0.139)	(0.209)		
gtspe×Drec2			-2.797***	-3.385***
			(0.127)	(0.194)
L.gdppc	-0.00772***	-0.00695***	-0.00867***	-0.00783***
	(0.000954)	(0.00109)	(0.000933)	(0.00106)
str	-0.0128	-0.0104	-0.0142	-0.0139
	(0.00958)	(0.00965)	(0.00938)	(0.00947)
nrate	-0.928***	-0.923***	-0.875***	-0.883***
	(0.296)	(0.298)	(0.290)	(0.293)
t	1998-2009	1998-2009	1998-2009	1998-2009
N	2853	2846	2853	2846

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Earmarked transfers multipliers by industry

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
	ggdpp	*ggdpp*	*ggdps*	*ggdps*	*ggdpt*	*ggdpt*
gtspe	0.0618	0.350***	0.409***	0.736***	-0.00344	0.234*
	(0.0446)	(0.111)	(0.0879)	(0.216)	(0.0570)	(0.141)
L.gdppc	-0.00131***	-0.000871*	-0.00792***	-0.00779***	-0.000521	0.0000597
	(0.000429)	(0.000497)	(0.000847)	(0.000965)	(0.000549)	(0.000632)
str	0.0537***	0.0526***	0.0519***	0.0506***	0.0565***	0.0556***
	(0.00433)	(0.00439)	(0.00854)	(0.00854)	(0.00554)	(0.00559)
nrate	0.00411	-0.0188	-0.784***	-0.804***	-0.0440	-0.0654
	(0.134)	(0.135)	(0.263)	(0.263)	(0.171)	(0.172)
t	1998-2009	1998-2009	1998-2009	1998-2009	1998-2009	1998-2009
N	2832	2825	2833	2826	2833	2826

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6. Earmarked transfers multipliers by region

	(1) OLS	(2) IV
	ggdp	*ggdp*
gtspe	0.604***	1.137***
	(0.116)	(0.249)
gtspe Dstr*	-0.430**	-0.576*
	(0.186)	(0.301)
L. gtspe		
L.gdppc	-0.00875***	-0.00824***
	(0.00102)	(0.00114)
str	-0.0211**	-0.0217**
	(0.0102)	(0.0102)
nrate	-1.005***	-1.031***
	(0.316)	(0.316)
t	1998-2009	1998-2009
N	2853	2846

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7. Effects on the structure of government expenditures

	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV	(7) OLS	(8) IV	(9) OLS	(10) IV
	gexp	*gexp*	*gexpjj*	*gexpjj*	*gexpjy*	*gexpjy*	*gexpsb*	*gexpsb*	*gexpxz*	*gexpxz*
gtspe	0.902***	0.988***	0.130***	0.207***	0.0829***	0.154***	0.265***	0.0976***	0.0456***	0.0796***
	(0.0314)	(0.0662)	(0.0166)	(0.0364)	(0.00742)	(0.0160)	(0.0119)	(0.0263)	(0.00520)	(0.0111)
L.gdppc	-0.00312***	-0.00334***	-0.000484**	-0.000558**	-0.000344***	-0.000285**	0.000339*	0.000274	-0.000169**	-0.000169**
	(0.000449)	(0.000485)	(0.000225)	(0.000245)	(0.000106)	(0.000117)	(0.000177)	(0.000205)	(0.0000743)	(0.0000813)
str	0.0119***	0.0118***	0.00144	0.00128	-0.00378***	-0.00391***	-0.000726	-0.00623	0.000454	0.000389
	(0.00263)	(0.00264)	(0.00130)	(0.00131)	(0.000622)	(0.000637)	(0.00390)	(0.00420)	(0.000436)	(0.000442)
nrate	-0.0162	-0.0153	-0.0319	-0.0306	-0.0251	-0.0264	0.0371	0.0413	-0.00505	-0.00545
	(0.0913)	(0.0913)	(0.0470)	(0.0473)	(0.0215)	(0.0221)	(0.0373)	(0.0395)	(0.0151)	(0.0153)
t	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006	1998-2006
N	2097	2092	1867	1862	2097	2092	1900	1895	2097	2092

Notes: Time effects and individual effects have been controlled for. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.