Fiscal Incentive: Testing for China’s Sub-national Governments

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Abstract

This paper evaluates the fiscal incentive faced by China’s sub-national governments. In 1994, Chinese sub-national governments engaged in one of the largest fiscal reforms in record, which set marginal sharing rates of budgetary taxes across provinces to a uniform level. Using panel data between 1980 and 2005, I exploit heterogeneity in the pre-reform marginal sharing rates of budgetary revenue across provinces to test the impact of marginal sharing rate change on local governments’ tax enforcement effort and extra-budgetary revenue collection effort. In 1994 tax separating reform, regarding the budgetary revenue category, for business tax and enterprise income tax, provinces with lower starting level experienced larger increase in marginal sharing rate, and exhibit higher efforts; for value added tax, provinces with lower starting level experienced smaller decrease in marginal sharing rate, exhibiting higher efforts. Regarding extra-budgetary revenue category, provinces with lower pre-existing sharing rates in budgetary tax put more effort in collecting extra-budgetary revenue before 1994 and put less effort after the 1994 reform relative to provinces with higher pre reform sharing rates. The results suggest that, China’s local governments treat budgetary tax collection and extra budgetary revenue collection as substitutes.

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1 Introduction

1.1 Overview

In the presence of asymmetric information, contracts in organizations, such as firms and political institutions, are designed to provide incentives. In recent years, contract design and the impact of incentives have been analyzed extensively. While there are many empirical studies focused on compensation schemes\(^1\) at the firm level and theoretical research about incentive scheme in public organizations (Besley and Ghatak 2005), fewer empirical studies are about the government.

The purpose of this paper is to study the fiscal compensation scheme between China’s sub-national governments and national government. It evaluates the effects of fiscal incentives on local government’s fiscal effort\(^2\) and sheds light on how government agencies react to incentives.

To this purpose, I collected a comprehensive fiscal data set. The data covers twenty-nine provinces from 1980 to 2005. It contains indices on several budgetary taxes, extra-budgetary revenue, local budgetary expenditure, local extra budgetary expenditure, information on fiscal incentive, namely, marginal sharing rate (the proportion of fiscal revenue local governments could keep), as well as fiscal capacity indicators.

Contract theory predicts that in general, if the agent faces two tasks, the optimal effort on each task will depend on the sharing rates of both tasks. Changing one task’s marginal sharing rate will cause change in the productivity of both tasks.

From 1980 to 1993, China implemented a fiscal contracting regime. Sub-national governments signed fiscal contracts with national government, in which they agreed on local marginal sharing rate\(^3\). Marginal sharing rates during this period exhibited cross province variations: while fourteen provinces had sharing rate smaller than 100%, the other fifteen provinces had sharing rate equal to 100%.

In 1994, China’s national government abolished fiscal contracting regime and initiated a new one called the tax separating system. Taxes are classified as local exclusive tax, central exclusive tax and shared tax. Therefore, the local sharing rates for different taxes were changed. To be detailed, local marginal sharing rate for value-added tax, one of the most important taxes in China, decreased to 25% in all provinces; marginal sharing rates for business tax and enterprise

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1\(^\text{Namely, agreed transfers between parties (from Bandiera 2006)}\)

2\(^\text{To be detailed, the effort is tax enforcement, i.e. less help in firms’ evasions from central taxes or regulations (Cai and Treisman 2004). As in China, nominal tax rates and categories of commodities taxed are set by central government in the law. Therefore, the main way they could change tax revenue is through tax enforcement.}\)

3\(^\text{From 1985 to 1993, the local marginal sharing rate is applied to all industrial-commercial taxes, for example, value-added tax, business tax, enterprise income tax that were mainly discussed in this paper.}\)
income tax were set at 100% in all provinces. Therefore, provinces with pre1994 marginal sharing rate less than 100% will enjoy larger rise in the sharing rate for business tax and enterprise income tax, smaller fall in the sharing rate for value-added tax. Provinces with pre1994 marginal sharing rate equal to 100% will have no increase in the sharing rate for business tax and enterprise income tax, and will experience a larger fall in the sharing rate for value-added tax.

My identification strategy combines the introduction of this reform with the cross-province differences in pre-reform marginal sharing rates. Provinces with initially lower sharing rates had more to gain from the newly established fiscal regime, whereas provinces with initially high rates had more to lose. This heterogeneity allows for a treatment/control strategy.

Moreover, the 1994 tax separating reform- which was fully implemented — did not depend on the factors at the province level. The goal in implementing this reform was to set marginal tax sharing rates across provinces at uniform levels. I argue that it was not related to or somehow catered to special province interests, and therefore should not be thought of as endogenous in this context.

After the reform, on one hand, in the budgetary category, business tax revenue, enterprise income tax revenue and value added tax revenue, all in per capita terms, increased markedly in provinces that previously had lower marginal sharing rates. This is true in absolute terms as well as relative to provinces that had higher marginal sharing rates. On the other hand, in the extra-budgetary revenue category, provinces with lower pre1994 sharing rates in budgetary revenue devote more effort to extra-budgetary revenue collection before the reform and less effort to extra-budgetary revenue collection after the reform, relative to provinces with higher pre1994 marginal sharing rates. The results suggest that local governments treat budgetary revenue collection and extra-budgetary revenue collection as substitutes.

The remainder of the paper is organized as follows. A fiscal reform review in China is given in Section 2. Section 3 provides a simple theoretical model that generates predictions for the effects of marginal sharing rates change on local government's budgetary tax effort and extra-budgetary revenue effort. Section 4 describes the data and identification strategy. Section 5 illustrates the difference in difference analysis and econometric regressions. Section 6 concludes. Before moving to the fiscal reform review, I briefly discuss some related literature.

### 1.2 Related Literature

The incentives in China’s sub-national governments have been discussed widely. There are mainly two strands of relevant literature. One concerns political incentive. Li (1998) suggests that the changing incentives of China’s bureaucracy in early 1980s, which consists of mandatory retirement program that replaced the revolutionary veterans, a drive for administrative and fiscal decentralization,

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and the granting of permissions allowing bureaucrats to quit bureaucracy and join businesses, paved road for China’s economic reforms and local development. Maskin, Qian & Xu (1999), Qian, Roland & Xu (2006) showed the organization structure difference between China (multi-divisional form) and Soviet Union (unitary form). They suggests that under certain assumptions, multi-divisional form is likely to provide better incentives than unitary form as it promotes yardstick competition (i.e. relative performance evaluation) more effectively. They finally provide evidence on the correlation between the provincial economic performance and the provincial representation in the Party Central Committee. Li and Zhou (2004) use more comprehensive data set to show that the central government uses personnel control over promotion and dismissal of provincial top leaders to induce provincial economic growth.

The other line focuses on fiscal incentive. Zhang and Zou (1998), using provincial panel data from 1980 to 1993, suggested that during the fiscal contracting period, fiscal decentralization, which is denoted as the increasing trend in the ratio of local expenditure to central expenditure, has negative effect on growth. Zhang and Gong (2005) followed a similar procedure, extending panel time series to include the 1994 tax separating reform. They got consistent result that fiscal decentralization between 1985 and 1993 was negatively correlated with growth while fiscal decentralization between 1994 and 2004 was positively correlated with growth. However, there is potential endogeneity regarding fiscal incentive index as it is highly correlated with provincial characteristics. Lin and Liu (2000) used marginal sharing rate as the indicator for fiscal incentive, and obtained positive result of fiscal decentralization on growth. Jin and Qian (2005) explored the 1982-1993 fiscal contracting reform in more details and also got positive relationship between fiscal incentive and regional economic development. Similarly, the endogeneity might make their results pick up the effect of other reform measures which contribute to economic growth. Yao (2005) discussed local fiscal incentive within the inter-government grant framework. He argued that the current grant system has highly equalizing effect towards poor area; also, his results reveal an economically significant crowding-out effect of equalization grants, indicating that the grant seeking incentives, which reduce local revenues, can undermine the economic efficiency of current grant policies.

As we have seen, though incentives have been discussed a lot in China, no paper has investigated local government’s budgetary revenue collection effort and extra-budgetary revenue collection effort corresponding to fiscal incentive yet. My work is the first trial to explore this aspect, with a stronger identification strategy.
2 Fiscal Reform Review

China’s fiscal system has five hierarchical levels of government: (1) central; (2) provincial; (3) prefecture; (4) county; and (5) township. (Figure 1)

In this paper, I focus on the provincial level.

2.1 1980-1993 Fiscal contracting stage

Since early 1980s\textsuperscript{5}, China began its so-called transitional period. It changed its price system to dual-track, i.e. market price and planned price coexisted at the same time, as well as initiated modest reform in state-owned enterprises (SOE) by introducing management and payment incentives. These reforms diluted central government's monitoring ability over local governments' tax enforcement effort, as the real economy became more complicated than the purely central planned regime. Therefore, the central government decided to endow more fiscal power to the local governments, in order to encourage them to cooperate with ongoing reforms and collect more taxes. In 1982, China started its fiscal contracting trial. The budgetary fiscal revenue is classified as central fixed, local fixed and adjustable income\textsuperscript{6}. The local governments are allowed to keep part of the local revenue (local fixed and adjustable income). It was considered as a big movement compared to the former centralized fiscal system and thus had a new name ‘eating from separate kitchens’ (fen zao chi fan). However, the local revenue was small compared with central revenue part. Also, the initial trial was short-lived and changed frequently across year. Actually, the system became more favorable and stable for local governments since 1985 with local governments enjoying higher marginal sharing rates and also larger local revenue base. From 1985 to 1987, and 1988 to 1993, long term fiscal contracts were reached between the central government and local governments. Many provinces (15 out of 29 in the sample), generally inland poorer ones, enjoyed 100% marginal sharing rate in major taxes such as value-added tax, business tax and enterprise income tax\textsuperscript{7}, while other provinces, generally rich coastal provinces (15 out of 29 in the sample), generally inland poorer ones, enjoyed 100% marginal sharing rate in major taxes such as value-added tax, business tax and enterprise income tax\textsuperscript{7}, while other provinces, generally rich coastal

\textsuperscript{5}Before 1980s, China’s fiscal system was highly centralized. Local governments were acting as the collecting and spending agents for the central government. All revenue and expenditure were allocated by the central government, according to its fiscal year plan. Thus, the highly redistributed system was described vividly as “eating from the same stove” (Da Guo Fan). This unitary fiscal system relied heavily on China’s whole economic system. During that time, China’s national economy was dominated by state owned enterprises (SOE). Tax revenue was highly concentrated in SOE sector guaranteed by the planned price system. It made taxes easy to collect and local tax efforts easy to monitor. As a result, the fiscal system functioned well before 1980s.

\textsuperscript{6}For detailed revenue assignment and sharing rule details, refer to Appendix A and B.

\textsuperscript{7}Enterprise income tax for local governments is from locally owned SOEs, collective enterprises.
ones, had marginal sharing rates less than 100%. In figure 2, areas in light are
provinces with pre94 100% marginal sharing rates; areas in grey are provinces
with pre1994 less marginal sharing rates.

### 2.2 1994-2004 Tax separating system

As the local government got significant amount of fiscal revenue via fiscal con-
tracting, the central government lost its dominant control over the whole fiscal
system. According to National Statistical Bureau (1999), the ratio of central
budgetary/total budgetary revenue declined to 22% by 1993. Some serious
distortions occurred due to increasing local fiscal incentives, such as local pro-
tectionism, local collusion with enterprises in tax evasion, increasing regional
disparity, expanding extra-budgetary revenue. The Ministry of Finance decided
to adopt a new system called tax separating system to strengthen the control of
the central government over the fiscal regime. It reversed the situation between
local and central government in two aspects. Firstly, the fiscal contracting sys-
tem was abolished. Fiscal revenue was reclassified as central exclusive tax (local
sharing rate 0%), local exclusive tax (local sharing rate 100%), and shared tax
(local sharing rate between 0 and 1). The central government created a new
consumption tax (central 100%) and also adjusted share over several important
tax categories. For example, the local sharing rate of VAT (value-added tax),
the major tax in China, decreased to 25% for all provinces after the reform.
As a compensation for the loss in VAT, the local sharing rate of Business tax
and enterprise income tax was set to be 100% in all provinces. Secondly, local
governments no longer enjoy the authority to collect taxes themselves. Instead,
State Tax Bureau and Local Tax Bureau were established, acting as collect-
ing agents for central government and local governments separately. State Tax
Bureau is in charge of collecting central exclusive tax and shared tax revenue,
while Local Tax Bureau is in charge of collecting local exclusive tax. Because
of these institutional changes, the share of central government revenue in total
revenue increased to around 55% in 1994 (National statistical Bureau 2004).

The following graphs (figure 3a, 3b, 3c) provide profiles for local marginal
sharing rate of Value Added Tax, marginal sharing rate of Business Tax and

Between 1985 and 1993, there are cross-province variations. 14 provinces\(^8\),
have average marginal sharing rates less than 100%; the other 15 provinces\(^9\),
all had 100% marginal sharing rates. In the 1994 reform, for value added tax, Those
fourteen provinces had smaller drop in marginal sharing rate compared to other
fifteen provinces, who had decreased from 100% pre 1994 to 25% afterwards

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\(^8\)Anhui, Beijing, Hebei, Henan, Hubei, Hunan, Jiangsu, Liaoning, Shandong, Shanghai,
Shanxi, Sichuan, Tianjin, Zhejiang

\(^9\)Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Heilongjiang, Inner Mongolia,
Jiangxi, Jilin, Ningxia, Qinghai, Shaanxi, Xinjiang, Yunnan
(Figure 4a). For business tax and enterprise income tax, these 14 provinces had larger increase in marginal sharing rate, compared to 15 provinces which already enjoyed 100% sharing rate pre 1994 (Figure 4b, 4c).

3 Fiscal Incentive and Effort: A Theoretical Model

The relationship between Chinese central government and local governments could be modelled as a classical principal-agent model. Local governments are offered certain share of their output (fiscal revenue in this case). Such a performance related pay aligns the agent (local government)'s interests with the principal (central government)'s. China’s local governments have higher incentives to collect more if they were offered more, as they could spend more in local expenditures. The more they spent, especially in capital constructions like infrastructure investment, the more growth they could inspire, the better political career the provincial leaders could enjoy.

Suppose local government has two collection tasks, also assume the local government is maximizing the following objective function.

$$\max \sum_{i=1}^{2} R_i(e_i) - C_1(e_1,e_2) - C_2(e_1,e_2) + T$$

where $S_i$ is the local marginal sharing rate on task $i$, $i = 1, 2$; $e_1$ and $e_2$ are local efforts on task 1 and 2; $R_1(e_1)$ and $R_2(e_2)$ are fiscal revenue from task 1 and 2; $C_1(e_1,e_2)$ and $C_2(e_1,e_2)$ are cost functions for task 1 and 2; $T$ is net lump sum transfer from the central government.

For simplicity, further assume that

$$R_1(e_1) = e_1$$
$$R_2(e_2) = e_2$$

$$C_1(e_1,e_2) = \frac{1}{2}e_1^2 + \frac{1}{2}\gamma e_1 e_2$$
$$C_2(e_1,e_2) = \frac{1}{2}e_2^2 + \frac{1}{2}\gamma e_1 e_2$$

where $\gamma$ describes the relationship between task 1 and task 2, $0 < \gamma < 1$ being substitutes.

Optimal efforts could be found by FOC:

$$e_1^* = \frac{s_1 - \gamma s_2}{1 - \gamma^2}; \quad e_2^* = \frac{s_2 - \gamma s_1}{1 - \gamma^2}$$
**Proposition 1** If task 1 and 2 are substitutes \((0 < \gamma < 1)\), given \(s_2\) constant, when marginal sharing rate of task 1, \(s_1\), increases, the agent’s effort on task 1, \(e_1\) will increase, while the effort on task 2, \(e_2\) will decrease; when marginal sharing rate of task 1, \(s_1\), decreases, the agent’s effort on task 1, \(e_1\) will decrease, while the effort on task 2, \(e_2\) will increase.

Therefore, regarding China’s 1994 tax separating reform, I have the following predictions:

- Provinces whose pre-1994 marginal sharing rate of budgetary revenue (mainly composed of tax revenue such as value-added tax, business tax and enterprise income tax) will have larger increase in the sharing rate, and thus will have relatively bigger increase in budgetary revenue collection, compared to provinces whose budgetary sharing rates are already 100% pre reform; Also, they will have relatively larger decrease in extra-budgetary revenue collection.

- Provinces whose pre-1994 marginal sharing rate of budgetary revenue (mainly composed of tax revenue such as value-added tax, business tax and enterprise income tax) were already 100% will have larger decrease in the sharing rate, and thus will have relatively bigger decrease in budgetary revenue collection, compared to provinces whose budgetary sharing rates are less than 100% pre reform; Also, they will have relatively larger increase in extra-budgetary revenue collection.

## 4 Data and Identification Strategy

### 4.1 Data sets

In this paper, I use panel data for 29 provinces from 1980 to 2005. Tibet is dropped from the dataset due to the poor quality of its fiscal data\(^{10}\). Chongqing, a newly established municipal city since 1997 is not included in the dataset, as it did not go through the 1994 tax separating reform.

In China’s fiscal reform literature, there are mainly two kinds of fiscal incentive indices. One is marginal sharing rate, by Lin and Liu (2000), Jin and Qian (2005), which describes local reward for their efforts at the margin, while the other is the ratio of local expenditure/central expenditure in a province, by Zhang and Zou (1998), Gong and Zhang (2005). They argued this ratio, commonly used in the literature on fiscal federalism, captured well the magnitude of fiscal decentralization, thus was an appropriate index for fiscal incentive.

\(^{10}\)In some years, the tax revenue is negative. In some years, data are missing.
However, China’s statistical data does not provide central expenditure at the provincial level. Instead, what they have is only central expenditure in the national level. Then, for the same year, given same denominator, the higher is local expenditure, the higher is the ratio, and therefore the higher is the fiscal incentive in a province. The ratio is very likely to be endogenous, as local expenditure is highly correlated with other local characteristics, such as GDP, population, etc. Provinces like Beijing, Jiangsu, Zhejiang have much higher expenditure than provinces like Ningxia, Xinjiang. But on margins, they are only allowed to keep part of local revenue for their tax effort, while the latter ones could keep 100%. Therefore, in my paper, I followed Lin and Liu, Jin and Qian, using marginal sharing rate as the index for fiscal incentive.

Variables that would be used in the regression are classified as follows:

I. Local tax revenue indices

1. TVAT (value added-tax)
2. TBT (business tax)
3. TEIT (enterprise income tax)

II. Local extra-budgetary revenue index.

III. Local budgetary expenditure and extra-budgetary expenditure

IV. Local fiscal incentive indices:

1. Marginal sharing rate of value-added tax
2. Marginal sharing rate of business tax
3. Marginal sharing rate of enterprise income tax

V. Local economic control variables

1. GDP, Gross Domestic Product
2. POP, population.

4.2 Identification strategy

The first factor for identifying the impact of the 1994 tax separating reform is that different provinces have distinct pre1994 sharing rates. All 29 provinces experienced this reform. Using the marginal sharing rates at the provincial level in a regression yields the following estimates:

\footnote{The original statistics of value-added tax revenue since 1994 and enterprise income tax revenue since 2002 do not take into account the part handing over to the central government. For my use, I have transformed them into total tax revenue generated in every province. I discuss data processing procedure in more detail in Appendix C.}
\[ Y_{it} = 1 \times pre1994 \text{ sharing rate}_{it} - 25\% \]
\[ Z_{it} = -1 \times pre1994 \text{ sharing rate}_{it} + 100\% \]

where \( Y_{it} \) is the decrease in the marginal sharing rate of value-added tax; \( Z_{it} \) is the increase in the marginal sharing rate of business tax and enterprise income tax.

Broadly, this means that the provinces with low (pre-existing) sharing rates were in a position to benefit more from the newly established fiscal regime, whereas areas with high prevalence were not. This heterogeneity allows for a treatment-control strategy.

Secondly, the initiation of the 1994 reform was largely a function of factors external to the province unit. It imposes homogenous marginal sharing rates for all sub-national governments, as well as establishes State Tax bureau and Local Tax Bureau in all provinces. This contrasts with explanations that might have troublesome endogeneity problems, such as capture by special province interests.

These factors combine to form the central variable in the present study:

\[(Pre \text{ reform marginal sharing rate})_i \times (\text{indicator for post reform})_t\]

Most compactly, I call this variable \((sharing \text{ rate}^{pre}_i \times post_t)_i\), where \(i\) indicates the province. The variable denotes the average level of marginal sharing rate in province \(i\) before the reform. \(Post94\) is a dummy variable indicating whether year \(t\) is later than the 1994 tax separating reform.

I compare the evolution of outcomes (tax revenue per capita) across provinces with distinct pre reform marginal sharing rates, in order to assess the effect of the reform to the remarkable changes.

5 Results

5.1 Budgetary revenue

5.1.1 Difference in Difference Analysis

Without taking into account heterogeneous starting levels of provinces whose average \(pre1994\) marginal sharing rate was smaller than 100\%, I first conduct a simple difference in difference analysis.

I split 29 provinces in the sample into two groups according to their \(pre1994\) marginal sharing rate. Group A (\(Pre1994\) sharing rate <100\%) contains 14 provinces. Group B (\(Pre1994\) sharing rate =100\%) contains 15 provinces. I also divided the time series from 1985-2004\(^{12}\) into two parts, one is from 1985 to1993; the other is from 1994 to 2004, using 1994 as a threshold.

\(^{12}\)For budgetary tax revenue, well kept data starts from 1985.
From Table 1, 2 and 3, we can see Group A, which has larger increase in the sharing rates of business tax and enterprise income tax, and smaller decrease in the sharing rates of value-added tax, indeed exhibits larger increase in tax revenue. It’s consistent with section 3’s predictions. From the graph (Figure 5a, 5b, 5c; Figure 6a, 6b, 6c), similar results hold. In general, group A shows more increase than group B. Of course, without taking into account other provincial specific control variables, the analysis is rough. However, it does provide us some preliminary idea about the different effect of 1994 reform on different groups.

5.1.2 Econometric regression

Regression Model

In order to capture the effect of distinct pre existing marginal sharing rates on tax effort after 1994 reform, I used the following specifications¹³.

\[ Tax_{it} = \alpha_i + \beta_i + \gamma (\text{sharing rate}^{pre}_{i} \times \text{post94}) + \delta X_{it} + \varepsilon_{it} \]  

Where \( Tax_{it} \) are various tax revenue indices in province \( i \) at time \( t \).

There are three tax indices I used
1) per capita value added tax;
2) per capita business tax;
3) per capita enterprise income tax.

\( \alpha_i \) is province fixed effect, which control for the influence of unobserved time-invariant province characteristics (e.g. location, natural endowment) on tax revenue; \( \text{post94} \) is year dummy which denotes the 1994 reform. It switches from 0 to 1 for all provinces since 1994. \( \beta_i \) will capture the effects of national events which affect all provinces in a similar manner; It’s the strongest specification in terms of time variable, however, it does not allow to identify 1994’s level effect clearly; \( \text{sharing rate}^{pre}_{i} \) is weighted average of the sharing rates prevailing pre1994 in province \( i \). \( X_{it} \) contains control variable, i.e. per capita GDP, which captures the fiscal capacity in province \( i \) at year \( t \). \( \varepsilon_{it} \) is the province level error term which is assumed not to be correlated with other regressors.

The coefficient of the interaction term, \( \gamma \), will capture the effect of the pre reform sharing rate level on the after reform tax collection;

\[ Tax_{it} = \alpha_i + \theta \times \text{post94} + \gamma (\text{sharing rate}^{pre}_{i} \times \text{post94}) + \beta \times (t - 1984) + \delta X_{it} + \varepsilon_{it} \]  

¹³My regression was inspired by Bleakley, H.(2006) “Disease and Development: Evidence from Hookworm Eradication in the American South”, as well as Edmonds E.V., Pavcnik, N. and Topalova, P.(2007) “Trade Adjustment and Human Capital Investments: Evidence from Indian Tariff Reform”. I did not put \( \text{sharing rate}^{pre}_{i} \) as an indicator in regression as it may be highly correlated with province fixed effect.
Compared with equation (1), the difference in specification mainly comes from the time variable.

In equation 2, I specified \((t - 1984)\) as the time trend starting from 1985. In this setting, the coefficient of reform dummy, \(\theta\), will capture the level effect of 1994 reform over and above the existing trend. The coefficient of the interaction term, \(\gamma\), will capture the effect of the pre reform sharing rate level on the after reform tax collection. The coefficient of the time, \(\beta\), will capture the trend since 1985 if there is any.

\[
\text{Tax}_{it} = \alpha_i + \theta \times \text{post94} + \gamma (\text{sharing rate}_{i}^{\text{pre}} \times \text{post94}) + \beta \times (t - 1984) + \phi [\text{post94} \times (t - 1984)] + \delta X_{it} + \varepsilon_{it}
\]  

(3)

This specification is almost same as equation (2) except for the new interaction term, \(\text{post94} \times (t - 1984)\).

The coefficient of the interaction term between reform dummy variable and time variable, \(\phi\), will capture the effect of 94 reform in the change of the trend if there is any.

One concern about my model is the non-random pre-reform marginal sharing rates. It’s true that the particularistic contracted sharing rates before 1994 across provinces are not exogenous. Generally, richer costal provinces were offered lower marginal sharing rates. In the regression, I control per capita GDP to take care of the possibility that provinces with lower pre-reform marginal sharing rates collect more revenue after the reform just because they are richer. This control variable prevents my result from being driven by economic growth rather than better tax enforcement. More importantly, I am also allowing a break in the trend from 1994, as there is no obvious reason to justify why richer provinces increase more in the collecting trend from 1994 except the different change in marginal sharing rates.

The second concern is that poorer provinces tend to get more equalization grants from central governments, which might discourage their collection efforts. Province fixed effect prevents my result from being driven by grant seeking induced tax enforcement effort rather than marginal sharing rates induced tax enforcement effort.

The third concern is that in addition to tax sharing rate change, the collecting system also changed. Here, post94 dummy will capture the common shock to all provinces, including the tax collecting bureau establishment which is same across all provinces in 1994. As a result, the coefficient of the interaction term will provide us with clean effect of the 1994 rate change depending on different pre1994 marginal sharing rate level. The coefficient of post94 reform will give us the level effect.

Regression results with respect to budgetary tax revenue

Table 4, column 1, 2 and 3, report the estimates of provincial per capita
value-added tax regression, equation (1), (2) and (3) respectively. In three specifications, the interaction term, $sharing\ rate_{i}^{\text{pre}} \times \text{post}94$, always has significant and negative coefficient, which supports my hypothesis that provinces with lower starting level experienced lower decline in marginal sharing rate, and thus exhibit higher tax effort on value-added tax after the 1994 reform; the coefficients for local control variable, per capita GDP, are positive and highly significant, showing that provinces with higher fiscal capacity generate more tax revenue. Also, the interaction term of reform dummy and the trend, $\text{post}94 \times (t - 1984)$, is positive and significant, suggesting that the reform changed the trend of value added tax collection. The channel is likely to be through the establishment of State Tax bureau, which is in charge of collecting value added tax since 1994.

Table 5, column 1, 2 and 3, report the estimates of provincial per capita business tax regression, equation (1), (2) and (3) respectively. In three specifications, the interaction term, $sharing\ rate_{i}^{\text{pre}} \times \text{post}94$, always has significant and negative coefficient, which supports my hypothesis that provinces that had lower starting level exhibit higher tax effort on business tax after the 1994 reform; the coefficients for local control variable, per capita GDP, are positive and highly significant, showing that provinces with higher fiscal capacity generate more tax revenue.

Table 6, column 1, 2 and 3, report the estimates of provincial per capita enterprise income tax regression, equation (1), (2) and (3) respectively. In three specifications, the interaction term, $sharing\ rate_{i}^{\text{pre}} \times \text{post}94$, always has significant and negative coefficient, which suggests that provinces that had lower starting level exhibit higher tax effort on enterprise income tax after the 1994 reform. The coefficients for local control variable, per capita GDP, are positive and highly significant, showing that provinces with higher fiscal capacity generate more tax revenue. Also, the interaction term of reform dummy and the trend, $\text{post}94 \times (t - 1984)$, is positive and significant, suggesting that the reform changed the trend of enterprise income tax collection.

Robustness Check

It is argued that the official classification of local revenue (thus, local marginal sharing rate) and central revenue might not matter too much de-facto in China, given the complicated inter-governmental transfer system. For example, in Alwyn Young (2000), figure 1 shows the ratio of central expenditure to local expenditure is relatively stable before and after the 1994 reform, although the 1994 tax separating reform dramatically changes the ratio of central revenue to local revenue. It seems that the link between local revenue and local expenditure is not very tight in China. Therefore, the change in the local marginal sharing rates of tax revenue in the 1994 reform might just be a nominal event, which does not influence local behavior at all, as potentially local governments know what’s called local revenue is not strictly adhered to when it came into expenditure. Then, it might be a counter fact to the incentive story I addressed in the paper that says local marginal sharing rate does matter. As a result, I
run the following regression on local budgetary expenditure. The main idea in the robustness check is if local governments collect more when they were offered higher share, it must be because they could spend more.

From table 7, in column 1, 2 and 3, the interaction term, $sharing\ rate_{pre} \times \ post94$, always has significant and negative coefficient, which suggests that provinces with lower starting level experienced larger increase in local expenditure after the 1994 reform; the coefficients for local control variable, per capita GDP, are positive and highly significant, showing that provinces with higher fiscal capacity get to spend more expenditure. Local expenditure does differ for two groups after the 1994 reform, suggesting that the local marginal sharing rates are credible, i.e. provinces did face different incentives through the 1994 reform. If the 1994 reform induced local marginal sharing rate change is null, we should not observe significant difference in local expenditure.

5.2 Extra-budgetary Revenue

In the former sections, I have analyzed the 1994 tax separating reform’s incentive effects on different provinces in terms of their enforcement efforts in budgetary taxes. However, for local governments, in addition to budgetary revenue, there is extra-budgetary revenue that they were allowed to set aside since early 1980s. Because extra budgetary revenue is largely outside of MOF (the Ministry of Finance) purview, it conferred very significant real autonomy to local governments (implicitly 100% local sharing rate), and provides a local revenue base. Most importantly, it was widely accepted as a legitimate source for “topping up” local public expenditures. Due to the increasing size in extra budgetary revenue which is outside the central regulation, in 1993, the central government cut the items listed as extra-budgetary revenue. Reform of extra-budgetary funds again had begun in 1996 and intensified in 1998 and 1999. Since 1998, the MOF has continued a policy of converting fees into taxes with the objective of reducing the importance of extra-budgetary funds at the local level. In 1999, the MOF began to formulate organizational budgets that show all budgetary, extra-budgetary and other resources and spending for each ministry. In 2000, Minister of Finance, Xiang Huaicheng, announced plans for treasury reform to improve financial management of public funds, and introduction of new standards for government procurement (Figure 7 for detail).

In the following part, I will conduct analysis on the 1994 tax separating reform’s incentive effects on different provinces in terms of their effort in extra-

\footnote{Fees represent the main source for extra-budgetary revenue at the local level. The list of fees includes surcharges on household utility bills, hospitals and school charges, road maintenance, advertisement, vehicle purchases and so on. Some of the fees are levied by individual departments of the local administration and kept for the departments’ use without passing through the local general budget.}

\footnote{Initially, State owned enterprise funds were set aside as extra-budgetary funds. In 1980s, however, as SOEs gained more autonomy in the enterprise reform, these funds were severed from local government control. From 1993 onwards, enterprise funds were no longer counted as "extra-budgetary". Instead, it was taken into budgetary administration.}
budgetary revenue, as well as their trade-off between extra-budgetary revenue and budgetary revenue, using the heterogeneity in pre-existing local marginal sharing rates of budgetary revenue. The prediction should be, before 1993, provinces with lower marginal sharing rates in budgetary revenue should devote more efforts to extra-budgetary revenue, compared to those provinces with 100% marginal sharing rates in budgetary revenue. After 1993 (given the presence of nation wide uniform extra-budgetary reforms in 1993 and 1998), provinces with lower pre-existing marginal sharing rates in budgetary revenue will devote less efforts to extra-budgetary revenue, compared to those with pre 100% marginal sharing rates in budgetary revenue, as they have benefited more from the 1994 tax separating reform in the budgetary category.

I use the following specifications.

\[ \text{PER}_{it} = \alpha_i + \beta_t + \gamma_1(t-1979) + \gamma_2 \text{dum}93 \times (t-1979) + \gamma_3 \text{dum}98 \times (t-1979) + \gamma_4 \text{PGDP}_{it} + \varepsilon_{it} \]  

\[ \text{PER}_{it} = \alpha_i + \beta_t + \gamma_1(t-1979) + \gamma_2 \text{dum}93 \times (t-1979) + \gamma_3 \text{dum}98 \times (t-1979) \]

\[ + \gamma_4 \text{pre93rate}_i \times (t-1979) + \gamma_5 \text{dum}93 \times \text{pre93rate}_i \times (t-1979) \]

\[ + \gamma_6 \text{dum}98 \times \text{pre93rate}_i \times (t-1979) + \gamma_7 \text{PGDP}_{it} + \varepsilon_{it} \]

It is a trend break model without considering heterogeneity in pre1993 marginal sharing rates. \( \alpha_i \) is province fixed effect, which control for the influence of unobserved time-invariant province characteristics. \( \beta_t \) is year fixed effect and will capture the effects of national events which affect all provinces in a similar manner. \( \text{dum}93 = 1 \) if \( 1993 \leq \text{year} \leq 1998 \). \( \text{dum}98 = 1 \) if \( \text{year} \geq 1998 \). \( \gamma_1 \) captures the trend starting from 1980 when I have my first sample. \( \gamma_2 \) captures the change in trend from 1993 relative to the trend starting from 1980. \( \gamma_3 \) captures the change in trend from 1998 relative to the trend starting from 1980.

It is a trend break model considering the heterogeneity in pre93 marginal sharing rates. \( \text{pre93rate}_i \) are the average marginal sharing rates pre1993 in province \( i \). \( \gamma_4 \) captures the different trend starting from 1980 of provinces with high pre93 marginal sharing rate in budgetary revenue compared to those with low marginal sharing rate. \( \gamma_5 \) captures the different change in trend from 1993 of provinces with higher pre93 marginal sharing rate compared to those with lower marginal sharing rate. \( \gamma_6 \) captures the different change in trend from 1998 of provinces with higher pre93 marginal sharing rates compared to those with lower marginal sharing rates.

In table 8, column 1 and 2, the coefficients for \( \text{dum}93 \times (t-1979) \) and \( \text{dum}98 \times (t-1979) \) are negative, suggesting that after central government cut local government in extra-budgetary revenue in 1993 and 1998, the trend of extra-budgetary revenue collection decreased. For the interaction term, \( \text{pre93rate}_i \times (t-1979) \),
the coefficient is negative and significant, suggesting that provinces with 100% pre93 marginal sharing rates in budgetary revenue put less efforts in extra-budgetary revenue relative to provinces with lower marginal sharing rates in the budgetary revenue. For interaction term, $dum_{93} \times \frac{pre93rate_i}{(t - 1979)}$ and $dum_{98} \times \frac{pre93rate_i}{(t - 1979)}$, the coefficients are positive and significant, suggesting that provinces with higher pre93 marginal sharing rates in budgetary revenue devoted more efforts to extra-budgetary revenue after the cuts in extra-budgetary revenue. It's consistent with the results I found in the previous regression that the provinces with higher pre 1994 marginal sharing rates had less to gain in the sharing rates of budgetary tax revenue through the 1994 tax separating reform, compared to provinces with lower pre1994 marginal sharing rates.

Robustness Check

Similar logic should hold for the extra-budgetary category that if local governments collect more extra-budgetary revenue, it has to be due to the fact that they could spend more in extra-budgetary expenditure. Therefore, I run the similar regressions with respect to local extra-budgetary expenditure.

In table 9, column 1 and 2, the coefficients for $dum_{93} \times (t - 1979)$ and $dum_{98} \times (t - 1979)$ are negative, suggesting that after central government cut local government in extra-budgetary revenue in 1993 and 1998, the trend of extra-budgetary expenditure decreased. For the interaction term, $\frac{pre93rate_i}{(t - 1979)}$, the coefficient is negative and significant, suggesting that provinces with 100% pre93 marginal sharing rates in budgetary revenue spend less extra-budgetary expenditure relative to provinces with lower marginal sharing rates in the budgetary revenue. For interaction term, $dum_{93} \times \frac{pre93rate_i}{(t - 1979)}$ and $dum_{98} \times \frac{pre93rate_i}{(t - 1979)}$, the coefficients are positive and significant, suggesting that provinces with higher pre93 marginal sharing rates in budgetary revenue spent more extra-budgetary expenditure after the 1994 tax separating reform.

6 Conclusions

The question of how agencies react to incentive is one of the holy grails in contract theory. Empirical studies have been emerging rapidly in the last few decades on this issue. However, the way government institutions react to incentive is not widely explored.

This paper investigates whether the effect of 1994 tax separating reform—whereby marginal sharing rate for value-added tax decreased to 25% in all provinces, and for business tax and enterprise income tax increased to 100% in all provinces—vary across Chinese provinces with different pre reform marginal sharing rates. The results indicate that budgetary tax has risen more in
provinces with lower pre-reform sharing rate compared to those with higher pre-reform sharing rate, while extra-budgetary revenue has increased less in provinces with lower pre-reform sharing rate. My analysis suggests that local governments do respond to fiscal incentives in a way contract theory predicts, at least in China’s case. Higher share of the output (fiscal revenue) does motivate bureaucrats. It then sheds some light on the utility function of the government organizations. Moreover, the results in this paper indicate that high marginal sharing rate is beneficial in the sense that it enhances tax enforcement and alleviate local pursuit in extra-budgetary revenue. Therefore, in order to achieve efficiency, the better way for China’s central government seems to give local governments higher marginal sharing rates in budgetary taxes.

This study concentrated on estimating sub-national government’s fiscal effort with respect to fiscal incentive. The sharp change in marginal sharing rate of the taxes, however, may have had a broader impact on the Chinese economy, including the potential effect of enhancing the local incentive in promoting local growth. How did the local government adjust to such a shock in addition to fiscal revenue collection? Studying these additional effects will be the direction of my future work.
## Appendix A Tax Revenue Assignments

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<tbody>
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<tr>
<td>fixed</td>
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<td></td>
<td></td>
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<tr>
<td>Profits from centrally owned SOEs</td>
<td>Income and adjustment tax from centrally owned SOEs(^{16})</td>
<td>Income tax of all centrally owned SOEs</td>
<td></td>
</tr>
<tr>
<td>Custom duties and income and commercial tax collected by customs</td>
<td>Custom duties and all ‘VAT and product taxes’ collected at customs</td>
<td>All customs duty, VAT and excise taxes on imports; Exercise/Consumption Tax (^{17})</td>
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</tr>
<tr>
<td><strong>Local</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed</td>
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<td></td>
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</tr>
<tr>
<td>Profits from locally owned SOEs</td>
<td>Income and adjustment tax of locally owned SOEs</td>
<td>Income tax and adjustment tax of locally owned state enterprises, collectives, and private enterprises(^{18})</td>
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</tr>
<tr>
<td>locally owned SOEs</td>
<td>Income tax from collectively owned enterprises</td>
<td>Business tax falling on sectors not covered by VAT</td>
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<tr>
<td><strong>Shared/adjustable</strong></td>
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<td></td>
</tr>
<tr>
<td>Industrial and commercial tax except those described above in central fixed revenue.</td>
<td>All sales taxes (VAT, business tax, and product tax) (^{19}) revenues from all enterprises</td>
<td>Value-added tax (75 percent central, 25 percent provincial)(^{20})</td>
<td></td>
</tr>
</tbody>
</table>

Source: world bank1992, 2002; Wong1995

### Appendix B Sharing Rule between Central government and Local governments

1. 1985-1987, in the table of tax categories, there are local, central and shared ones.

\(^{16}\) ‘Tax for profit reform’ was introduced in 1984, when the original profit remittance from SOEs was replaced by income and adjustment tax from SOEs.

\(^{17}\) It’s a new tax created in the 1994 tax separating reform.

\(^{18}\) In 2002, it became a shared tax with a ratio of 50%: 50%. In 2003 and 2004, the ratio was changed to be 40% for the local governments

\(^{19}\) In 1984, the original industrial and commercial tax was replaced by Product tax, VAT and business tax

\(^{20}\) Product Tax was gradually abolished. VAT became the most important tax source, which accounted for about 60% of the total tax revenue
The sharing rule during 1985-1987 was: Province revenue = 0 × central fixed income + $S \times (\text{local fixed income}^{21} + \text{adjustable income})$

2. 1988-1993, Province revenue = 0 × central fixed income + $S \times (\text{local fixed income + shared income})$.

3. 1994-2004 Tax separating system: Province revenue = 0 × central exclusively tax + 1× local exclusively tax + $\sum S_i \times \text{shared tax}_i$

**Appendix C Data Source and processing procedure**

Data Source
I. Local budgetary tax indices.
   1. TVAT (value added-tax)
   2. TBT (business tax)
   3. TEIT (enterprise income tax)

   The earliest comparable data on Tax is from 1985.

II. Local extra-budgetary revenue index.
   Extra-budgetary revenue 1980-2005 is from Qian (2005) and China 55 years’ statistics.

III. Local budgetary expenditure and extra-budgetary expenditure.
   Expenditure series 1980-2005 is from Qian (2005) and China 55 years’ statistics.

IV. Local fiscal incentive indices:
   1. MS (marginal sharing rate of VAT),
   2. MSB (marginal sharing rate of Business Tax)
   3. MSI (marginal sharing rate of enterprise income tax)


V. Local economic control variables

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21In China, local fixed income was, in principle, assigned fully to the local government. However, the actual practice of revenue sharing in China has not matched this scheme. Both "local fixed" and "shared" taxes have been subject to sharing, apparently because adherence to these categories caused a revenue shortfall to the central government.
1. GDP, Gross Domestic Product
2. POP, population.

Economic control indicators between 1985 and 2004 are from China statistical yearbooks and China 55 years statistics.

Data processing procedure

1. TVAT: total value added tax; before 1985, China implemented a major tax called ICT (industrial and commercial tax). From 1985 to 1993, ICT was replaced by three important specific taxes, i.e. Value added tax, Product tax and business tax. Gradually, the tax base of product tax was replaced by value added tax. In 1994, product tax was abolished in all provinces and value added tax took over completely. For the data to be comparable with post 1994 value-added tax, I summed up value added tax and product tax before 1994. Since 1994, the provincial statistics just take into account the 25% shared part of value-added tax revenue. I divided the original statistics by 25% to get the total value-added tax revenue generated in every province.

2. TEIT: total enterprise income tax; from 1985 to 1994, there are separate enterprise income tax categories, including state-owned enterprise income tax, state-owned enterprise adjustment tax, Income tax from collectively owned enterprises and income tax from private enterprises. Since 1994, the above were replaced by a single tax category named enterprise income tax. I summed up the state-owned enterprise income tax, state-owned enterprise adjustment tax, Income tax from collectively owned enterprises and income tax from private enterprises before 1994 in order to be comparable with the post 1994 statistics. In 2002, the statistics just takes into account the 50% shared part of local governments. From 2003 to 2004, the statistics takes into account the 40% shared part of local governments. I divided the original statistics by the respective sharing rate to get comparable data.

References


Figure 1 Government Organization Structure in China, 2005

Central government
(Pop: 1.31 billion)

22 provinces & 5 autonomous regions
(Average pop: 45.7 million)

4 Provincial-level municipalities:
Beijing, Shanghai, Tianjin, Chongqing
(Average pop: 17.9 million)

Lower level governments

Figure 2 geographical distributions of provinces with distinct pre-existing marginal sharing rate

Yellow areas are provinces with pre1994 sharing rates=100%.
Pink areas are provinces with pre1994 sharing rates<100%.
Figure 3a Marginal sharing rates of value added tax by province

- **Anhui**
- **Beijing**
- **Fujian**
- **Gansu**
- **Guangdong**
- **Guangxi**
- **Guizhou**
- **Hainan**
- **Hebei**
- **Heilongjiang**
- **Henan**
- **Hubei**
- **Hunan**
- **Inner Mongolia**
- **Jiangsu**
- **Jiangxi**
- **Jilin**
- **Liaoning**
- **Ningxia**
- **Qinghai**
- **Shaanxi**
- **Shandong**
- **Shanghai**
- **Shanxi**
- **Sichuan**
- **Tianjin**
- **Xinjiang**
- **Yunnan**
- **Zhejiang**

**Legend:**
- × pre1994 sharing rate < 100%
- ○ marginal sharing rate = 100%

**Note:** Marginal sharing rate of value added tax.
Figure 3b Marginal sharing rates of business tax by province

- **Anhui**
- **Beijing**
- **Fujian**
- **Gansu**
- **Guangdong**
- **Guangxi**
- **Guizhou**
- **Hainan**
- **Hebei**
- **Heilongjiang**
- **Henan**
- **Hubei**
- **Hunan**
- **Inner Mongolia**
- **Jiangsu**
- **Jiangxi**
- **Jilin**
- **Liaoning**
- **Ningxia**
- **Qinghai**
- **Shaanxi**
- **Shandong**
- **Shanghai**
- **Shanxi**
- **Sichuan**
- **Tianjin**
- **Xinjiang**
- **Yunnan**
- **Zhejiang**

**Marginal sharing rate of business tax**

- **Year**
- **1985**
- **1990**
- **1995**
- **2000**
- **2005**

- **pre1994 sharing rate<100%**
- **pre1994 sharing rate=100%**
Figure 3c Marginal sharing rates of enterprise income tax by province
For group A and B, marginal sharing rates before 1994 and after 1994 are all calculated in mean terms.
For group A and B, marginal sharing rates before 1994 and after 1994 are all calculated in mean terms.
Figure 4c Marginal sharing rates comparison of enterprise income tax by group

For group A and B, marginal sharing rates before 1994 and after 1994 are all calculated in mean terms.
For group A and B, per capita value-added tax before 1994 and after 1994 is all calculated in mean terms.
For group A and B, per capita business tax before 1994 and after 1994 is all calculated in mean terms.

Figure 5b Per capita business tax by group
For group A and B, per capita enterprise income tax before 1994 and after 1994 is all calculated in mean terms.
Figure 6a Per capita value-added tax by province

- Anhui
- Beijing
- Fujian
- Gansu
- Guangdong
- Guangxi
- Guizhou
- Hainan
- Hebei
- Heilongjiang
- Henan
- Hubei
- Hunan
- Inner Mongolia
- Jiangsu
- Jiangxi
- Jilin
- Liaoning
- Ningxia
- Qinghai
- Shaanxi
- Shandong
- Shanghai
- Shanxi
- Sichuan
- Tianjin
- Xinjiang
- Yunnan
- Zhejiang

Key:
- ✗ pre1994 sharing rate < 100%
- ○ pre1994 sharing rate = 100%
Figure 6b Per capita business tax by province

- pre1994 sharing rates < 100%
- pre1994 sharing rates = 100%
Figure 6c Per capita enterprise income tax by province

- Anhui
- Beijing
- Fujian
- Gansu
- Guangdong
- Guizhou
- Hainan
- Hebei
- Heilongjiang
- Henan
- Hubei
- Hunan
- Inner Mongolia
- Jiangsu
- Jiangxi
- Jilin
- Liaoning
- Ningxia
- Qinghai
- Shaanxi
- Shandong
- Shanghai
- Shanxi
- Sichuan
- Tianjin
- Xinjiang
- Yunnan
- Zhejiang

× pre94 sharing rates < 100%
○ pre94 sharing rates = 100%
Figure 7 Per capita extra-budgetary revenue

× pre94 sharing rate < 100%  ○ pre94 sharing rate = 100%
### Table 1 per capita value added tax (10000 RMB)

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<th></th>
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<th>after 1994</th>
<th>difference</th>
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<td>pre1994&lt;100%</td>
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<td>(0.0003)</td>
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<td>(0.0064)</td>
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### Table 2 per capita business tax (10000 RMB)

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<td>(0.0039)</td>
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### Table 3 per capita enterprise income tax (10000 RMB)

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Table 4 Regression result for value-added tax

Dependant variable: provincial Per capita value-added tax

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Control variable

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*** 1% significant; ** 5% significant; * 10% significant
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Control variable

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<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
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<tbody>
<tr>
<td>Per capita GDP</td>
<td>0.0150***</td>
<td>0.0152***</td>
<td>0.0150***</td>
</tr>
<tr>
<td></td>
<td>(0.0014)</td>
<td>(0.0014)</td>
<td>(0.0014)</td>
</tr>
<tr>
<td>Province fixed effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effect</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
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<p>| | | | |</p>
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<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>R square</td>
<td>0.5098</td>
<td>0.5058</td>
<td>0.5053</td>
</tr>
<tr>
<td>Number of observations</td>
<td>549</td>
<td>549</td>
<td>549</td>
</tr>
</tbody>
</table>

*** 1% significant; ** 5% significant; * 10% significant
Table 6 Regression result for enterprise income tax

<table>
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<tr>
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<tbody>
<tr>
<td>post94</td>
<td>No</td>
<td>0.0075</td>
<td>-0.0133</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0082)</td>
<td>(0.0094)</td>
</tr>
<tr>
<td>sharingrate_{i}^{pre} × post94</td>
<td>-0.0238***</td>
<td>-0.0216**</td>
<td>-0.0232***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0086)</td>
<td>(0.0088)</td>
</tr>
<tr>
<td>(t – 1984)</td>
<td>No</td>
<td>0.0010***</td>
<td>-0.0009*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0003)</td>
<td>(0.0005)</td>
</tr>
<tr>
<td>post94×(t – 1984)</td>
<td>No</td>
<td>No</td>
<td>0.0027***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0006)</td>
</tr>
</tbody>
</table>

Control variable

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
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<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per capita GDP</td>
<td>0.0153***</td>
<td>0.0168***</td>
<td>0.0156****</td>
</tr>
<tr>
<td></td>
<td>(0.0017)</td>
<td>(0.0016)</td>
<td>(0.0016)</td>
</tr>
<tr>
<td>Province fixed effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effect</td>
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<td>No</td>
<td>No</td>
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<td>R square</td>
<td>0.4738</td>
<td>0.4570</td>
<td>0.4629</td>
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<td>544</td>
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</tbody>
</table>

*** 1% significant; ** 5% significant; * 10% significant
Table 7 Regression result for per capita local budgetary expenditure

Dependant variable: provincial Per capita budgetary expenditure

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>post94</td>
<td>No</td>
<td>0.0581***</td>
<td>-0.0286</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0208)</td>
<td>(0.0226)</td>
</tr>
<tr>
<td>sharingrate_{pre} × post94</td>
<td>-0.1104***</td>
<td>-0.1002***</td>
<td>-0.1102***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0210)</td>
<td>(0.0221)</td>
</tr>
<tr>
<td>(t − 1984)</td>
<td>No</td>
<td>0.0079***</td>
<td>0.0011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0008)</td>
<td>(0.0011)</td>
</tr>
<tr>
<td>post94 × (t − 1984)</td>
<td>No</td>
<td>No</td>
<td>0.0112***</td>
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<td></td>
<td></td>
<td>(0.0014)</td>
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Control variable

<table>
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<tr>
<th></th>
<th>(1)</th>
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<th>(3)</th>
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<tbody>
<tr>
<td>Per capita GDP</td>
<td>0.0455***</td>
<td>0.0518***</td>
<td>0.0458***</td>
</tr>
<tr>
<td></td>
<td>(0.0041)</td>
<td>(0.0042)</td>
<td>(0.0040)</td>
</tr>
<tr>
<td>Province fixed effect</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year fixed effect</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>R square</td>
<td>0.6334</td>
<td>0.6123</td>
<td>0.6276</td>
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<tr>
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</tbody>
</table>

*** 1% significant; ** 5% significant; * 10% significant
<table>
<thead>
<tr>
<th>Dependant variable: per capita extra budgetary revenue</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>((t - 1979))</td>
<td>0.0012***</td>
<td>0.0038***</td>
</tr>
<tr>
<td></td>
<td>(0.0003)</td>
<td>(0.0005)</td>
</tr>
<tr>
<td>(dum93 \times (t - 1979))</td>
<td>-0.0002</td>
<td>-0.0022***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0005)</td>
</tr>
<tr>
<td>(dum98 \times (t - 1979))</td>
<td>-0.0006***</td>
<td>-0.0021***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0004)</td>
</tr>
<tr>
<td>(\text{mspre}_{93} \times (t - 1979))</td>
<td>No</td>
<td>-0.0031***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0006)</td>
</tr>
<tr>
<td>(dum93 \times \text{mspre}_{93} \times (t - 1979))</td>
<td>No</td>
<td>0.0024***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0004)</td>
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<tr>
<td>(dum98 \times \text{mspre}_{93} \times (t - 1979))</td>
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<td>0.0019***</td>
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<tr>
<td>Per capita GDP</td>
<td>0.0110***</td>
<td>0.0100***</td>
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<tr>
<td></td>
<td>(0.0008)</td>
<td>(0.0010)</td>
</tr>
<tr>
<td>Province fixed effect</td>
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<td>Yes</td>
</tr>
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<td>Yes</td>
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<tr>
<td>R square</td>
<td>0.5633</td>
<td>0.6861</td>
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<tr>
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</table>

*** 1% significant; ** 5% significant; * 10% significant
Table 9 Regression on the per capita extra-budgetary expenditure

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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<tbody>
<tr>
<td>(t - 1979)</td>
<td>0.0012***</td>
<td>0.0043***</td>
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<td></td>
<td>(0.0003)</td>
<td>(0.0006)</td>
</tr>
<tr>
<td>(dum93 \times (t - 1979))</td>
<td>-0.0001</td>
<td>-0.0022***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>(dum98 \times (t - 1979))</td>
<td>-0.0005***</td>
<td>-0.0024***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0004)</td>
</tr>
<tr>
<td>(mspre93 \times (t - 1979))</td>
<td>No</td>
<td>-0.0036***</td>
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<tr>
<td></td>
<td></td>
<td>(0.0006)</td>
</tr>
<tr>
<td>(dum93 \times mspre93 \times (t - 1979))</td>
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<td>0.0025***</td>
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<tr>
<td></td>
<td></td>
<td>(0.0004)</td>
</tr>
<tr>
<td>(dum98 \times mspre93 \times (t - 1979))</td>
<td>No</td>
<td>0.0023***</td>
</tr>
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<td>0.0100***</td>
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<td>(0.0010)</td>
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</table>

*** 1% significant; ** 5% significant; * 10% significant