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## **Abstract:**

Fiscal incentive is closely related with the extra-budgetary revenues. Based on our definition of “fiscal incentive”, we explore the impacts of fiscal incentives under decentralization on responsiveness of public good provision to real local needs. There are also some problems in fiscal decentralization in China: first, with a huge basis of extra-budgetary revenue, the size of local government would be expanded, resulting in a heavier burden on the shoulder of local citizens and peasants; second, there exist some decreasing return to scale in local extra-budgetary expenditure; thirdly, “urbanization” (measured as the ratio of rural population to the total population) is negatively correlated with the local extra-budgetary expenditure on urban maintenance, indicating that in China, the process of industrialization and urban construction are not consistent.

**Key Words: Fiscal Decentralization, Local Public Good Provision, Fiscal Incentives**

**JEL Classification: H61, H71, H72.**

## 1.Introduction

Over the past two decades, fiscal decentralization is one of the most important issues in China economic reform and economic development. There has been extensive previous research on this topic. Contribution to this literature (Qian and Weingast , 1996, 1997) argue that the Chinese fiscal reform of the earlier 1980s until 1994 gave local governments incentives to pursue local economic growth and possibly created a basis for China remarkable economic performance. Recently, Berkowitz and Li (2000) pointed out that, with decentralization, Chinese local governments have gained more clearly defined tax rights than their Russian counterparts, this helps explain observed differences in economic performance in the two countries. Shleifer (1997) and Zhuravaskaya (2000) believed that the existence of fiscal incentive for the local governments in China is the key for Chinese economic prosperity. Despite there are large literature about fiscal decentralization and fiscal incentive for local governments in China, few studies have quantitatively examined the effects of fiscal decentralization on the responsiveness of local public provision to the local public needs. Recently, Zhang et (2004) contribute an case study, showing that with democratic elections in rural China, the level of local public good provision in rural China would be increased. Empirical studies about the effect of fiscal incentive after the 1994 tax reform on the level and composition of local public provision are still scant.

Economically, a key argument used by the proponents is that decentralization should match bundles of public goods to local residents' demands more accurately (Oates, 1972). However, as pointed out by Keen and Marchand (1997), fiscal competition under decentralization might cause some "bias" in public spending patterns, thus there might exist systematic distortions of public spending. Faguet (2004) contribute an econometric approach to measure whether decentralization makes government more or less responsive to its citizens. Based on a panel data set about the local governments' budgetary and extra-budgetary revenue and their expenditures, in this paper, we apply the method of Faguet (2004) with some extensions, and examine the "bias" in public expenditure generated by fiscal incentives as well as the improvements in the responsiveness of local public good provision to the local needs, resulted from fiscal decentralization after 1994 tax reform.

The plan of the paper is as follows. Section 2 describe the institutional changes after the 1994 tax reform, to introduce three mechanisms of fiscal incentives supporting continuing fiscal decentralization in the last decade. Section 3 compares the different spending patterns of local governments' budges and their extra-budgets. Following by the methodology of Faguet (2004), in Section 4, we tests empirically whether the fiscal incentive changed the patterns of local public provisions, and then examine the determinants of this change. And, finally, section 5 concludes the paper.

## **2. Fiscal Decentralization Trend after the Tax-Sharing System**

### **Reform in 1994**

By conventional measure, there are five tiers in China fiscal system: The Central government, 31 provincial governments, 331 prefecture governments, 2109 county governments, and 44741 township-level units. Usually all lower tier governments except the Central are called “local governments”. During the last two decades, fiscal decentralization has been a critical component of economic reform in China. The decentralization includes a series of fiscal arrangements which permit local governments, especially the provincial governments, a large authority or residual control rights over fiscal revenue, these arrangements actually confer substantial fiscal incentives for the local governments to promote economic reform and economic development. However, fiscal incentive for the local governments under decentralization actually away the central government’s tax base, which in turn resulted in a declining of the central government’s share in total fiscal revenue ( from 35 percent in 1978 to 12 percent in 1992), therefore, in 1994, a new tax reform was introduced, which fundamentally changed the way the Central and Provincial governments share revenues.

According with the Tax Sharing System, which is the core of the 1994 tax reform, tax revenue is divided into three parts: central revenue, local revenue and share revenue, and taxes are collected separately by the Central taxation bureau and the local taxation bureaus. As a result, the proportion of local governments’ taxation in the total revenue is reduced, and at the same time, the power of local governments to cut or exempt taxes of local enterprises is also weakened. However, the expenditure assignments for the local governments, which were basically inhered form the planning economy, have not been adjusted correspondently with the change of tax sharing after 1994. The local governments have still been responsible for providing the fundamental public goods: education, health and medical care, social security system, infrastructure construction and urban maintenance, and agriculture support and so on. Beside, as market oriented reforms go on, the local governments have been being faced a huge pressure to provide social security system for the so called lay-out SOEs workers and larger number of unemployment. As C. Wong and D. Bhattasali (2002) pointed out that, the sub-provincial levels (prefecture, county, and township) of governments in China have very heavy expenditure responsibilities that are out of the line with international practice. Consequently, in order to keep a balance between the local fiscal revenue and the expenditure, fiscal decentralization has to be kept in reality after the 1994 tax reform.

There are three mechanisms for the continuing fiscal decentralization since 1994:

***(1) Revenue transfer from the Central government to the local governments.*** Before the 1994 tax reform, the central government promised that, the actual revenue of the local governments in 1993 was regarded as a base, and the Central government would return a lump-sum grant to the local government to make sure that the local revenue would at least be as large as that in 1993. The central government

committed to making a transfer to each of provinces of:

$$\text{TRANSFER} = \text{PRE} - \text{LT} - 0.25 \cdot \text{VAT}$$

where PRE is the province's base retained revenue and LT is the province's local tax revenue in 1993. In other word, if the sum of the local tax revenue (here, "local tax" is defined by the 1994 tax system.) and local shared Value Added Tax revenue ( according with the 1994 tax system, the local governments are eligible to share with 25% of Valued Added Tax.) is less than that of base revenue in 1993, then the local governments could be compensated by the Central government up to this difference.

(2) *Tax sharing rule.* The above equation of revenue transfer is only for keeping the local fiscal expenditure level at 1993. There is also a tax sharing rule for solving growth problem of the local budgetary expenditure, this rule specifies that if the value added tax and consumption tax exceed the level of these taxes in 1993, then the local governments could share with

$$\text{TAX SHARE RATE} = 0.3 \cdot [0.75 \cdot \text{VAT increase} + \text{CT increase}] + 0.25 \cdot \text{VAT}$$

were CT is consumption tax.

With the transfer and tax sharing rule, the Central government has transferred larger and larger amount of revenue to the local governments. Consequently, after transfer with tax sharing, though the proportion of the local revenue in total revenue is dropped from 70 percent in 1993 to 45 percent recently, after transfer with tax sharing, the proportion of the local budgetary expenditure in total national budgetary expenditure is still about 70 percent, almost as the same as that in 1993.

(3) *Local governments' extra-budgetary revenue.* From figure 1, it could be found out that, since 1978, both the extra-budgetary revenue and the extra-budgetary expenditure has been sharply increasing. Originally, in the 1980's, extra-budget was a result of economic reform. When more and more State-Owned-Enterprises retained profit, and a large part of this remained profit became main source of local governments extra-budget, since in China most SOEs were owed by local governments at that time. In the period between 1978 and 1993, local governments was really like an "agent", playing as protector or supporter for local SOEs. It is mutually benefited between the local governments and the local SOEs, the local governments could keep SOEs remained profit within the extra-budget to provide public service for the local SOEs, and the local SOEs could get in return from the former some tax exemption and special protections. It is exactly the implementation of the 1994 tax reform that demanded the local SOEs remained profit to be moved out of the local governments' extra-budget, and the SOEs budget has become a independent budget directly controlled by the Minister of Finance. This is why there is first drop in the curves of both the local extra-budgetary revenue and the extra-budgetary expenditure in Figure 1

The second declining in the curves of ER (extra-budgetary revenue) and EE (extra-budgetary expenditure) occurred in 1997 since the Central government determined to move 13 items of special fund out of the local extra-budget, however, this changed did not affect the control right of the local governments, because the process

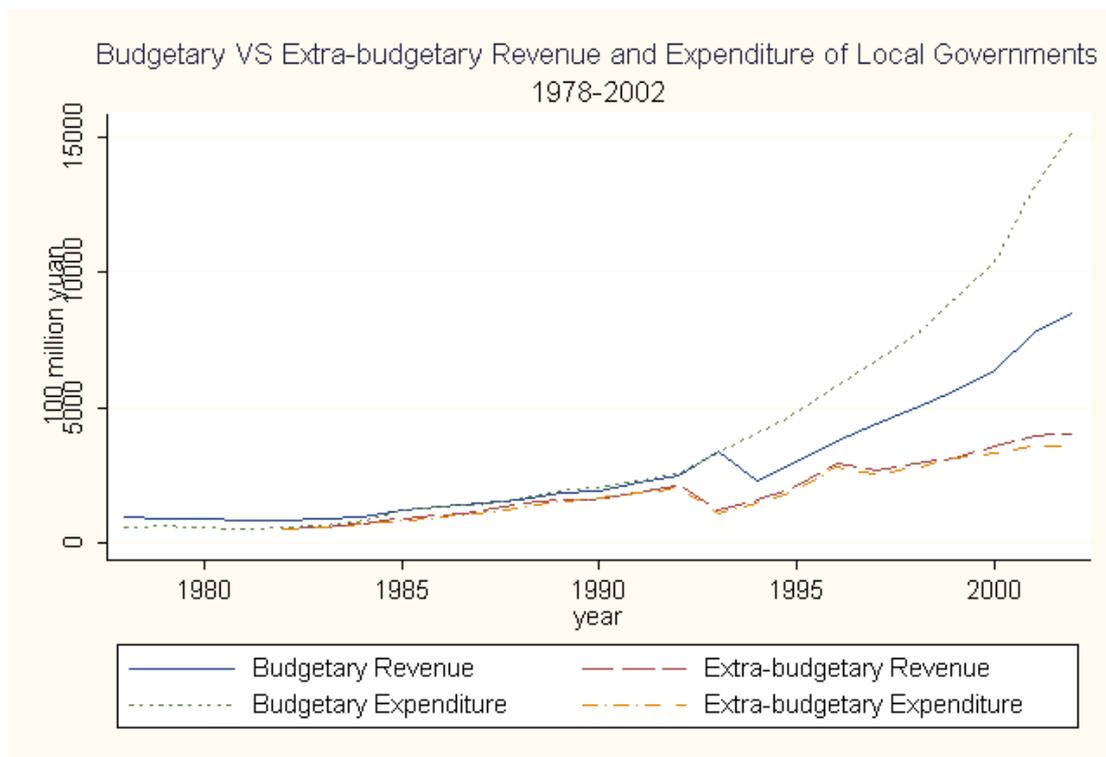


Figure 1: the trends of local governments' budgetary and extra-budgetary (1978-2002).

Sources: Fiscal Yearbooks(1992-2004), The minister of Finance of China.

of fund rising and fund using is still controlled by the local governments.

Although there are these two drops in ER and in EE, the size of extra-budget of the local governments is consistently increasing since 1997. However, now, in the uprising of local extra-budget, there is different meaning from the uprising trend before 1994: the previous increasing of local extra-budget implied some collusion between the local governments and the local SOEs, since the 1994 tax reform separated the relation between them, the incentive for local governments to protect the local SOEs is weakened, instead, the local governments have a stronger incentive to sell out the SOEs, this is one of key causes behind the China privatization.. The recent uprising of the extra-budget, after separating with the SOEs' remained profit, is financed by some new foundation: land selling, fee collection, and the revenues from sub-agents belonged directly or indirectly to the local governments. It is the current uprising of the local extra-budget that makes the local government to be transformed as a market preserving role.

Since the extra-budget is the main source of the fiscal incentive for the local governments, from the next section on, we start to analyze the function of this, and

compare extra-budgetary expenditure with that of budgetary expenditure, to explore how the fiscal incentives under new period of decentralization affect the responsiveness of local public good provision to local needs.

### **3. Different Patterns of Budget v.s. Extra-budget Spending of Local Governments**

Between 1999 and 2002, according to the data set, in China, the patterns of public spending of local government budget is quite different from that of local government extra-budget. As Keen and Marchand (1997) pointed out, the regional fiscal competition would affect both the overall level of public spending and its composition. Usually, the local public spending on recreational facilities or social services would be reduced by fiscal decentralization with regional fiscal competition, whereas the local public spending on infrastructure such as roads would be increased. Since the constraints the budget process of local governments is faced with is more strictly than that the extra-budget process is subject to, in particular, the local politicians have much more authority to determine the extra-budget spending, it is expected that the spending compositions might be different between local governments' budget and the local governments' extra-budget.

From Table 1 to table 4, based on estimations with a panel data set (31 provinces, 4 years, in total 124 observations), we summarize different patterns of public spending in China local budget v.s. local extra-budget on four main areas: education, agricultural support, infrastructural (road) spending, and government administrative spending. In each area, both the local (provincial) budget spending and the local (provincial) extra-budget spending are regressed on the same vector of independent variables. The signs and values of different estimated coefficients from fixed effect and random effect models are presented in each table, where the performance of the extra-budget spending is compared with that of budget spending.

#### **3.1. Education**

Per capita public spending on education rises when per capita GDP growth, this means that economic development would improve the public investment on education. And, as Table 1 shows, this effect is same in both local government budget and extra-budget. However, the effect of illiterate rate on the per capita budget spending on education is positive in the random effect model, whereas this effect is negative, although insignificant, on the per capita extra-budget education spending. It seems that, where the illiterate rate is higher, and thus where need is greater, then local governments would increase the public spending within the budget process. In contrast to this, extra-budget of local governments either ignore (in the fixed effect model) or negatively responds to this need (in the random effect model). This implies that, in the education area, local government budget spending is more sensitive to

local need than local governments' extra-budget spending is. There are other differences also. It could be found out in Table 1 that, within the budget, public spending on education is somewhat “scale determined”: where the “teacher-student ratio” and “per capita school” ( it is defined as how many primary schools in 10000 persons) are higher, spending on education within the local budget would increase significantly, implying that the responsibilities for the construction of school building and the improvement of teacher team are mainly born on the shoulder of local governments' budget. On the other side, it is obviously from Table 1 that, the reactions of the extra-budget of local governments to these two variables are either significantly negative (in the random effect model), or insignificantly ( in both fixed effect model and random effect model), meaning that the extra-budget spending is not invested on school building and teacher team.

Table 1: Performance of Budgetary VS Extra-budgetary Expenditure of Local Government--- Education

Dependent variables	Budgetary Expenditure per capita for Education		Extra-budgetary Expenditure per capita for Education	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
GDP per capita	2624.5*** (6.45)	2085.8*** (11.21)	41.173** (2.57)	-4.3799 (-0.94)
Teacher-student ratio in Primary school	-2068.6 (-0.20)	11798** (2.00)	-439.74 (-1.00)	-267.38* (-1.73)
Illiteracy rate	-10.155 (-0.83)	27.474*** (3.52)	0.7497 (1.09)	-0.1743 (-0.51)
The number of primary school owned by every 10000 persons	136.88* (1.73)	104.68** (2.56)	4.2635 (1.35)	-0.0054 (-0.00)
Constant	-516.50 (-0.90)		-33.897 (-1.37)	
Observations	124	124	114	114
Number of region	31	31	30	30
R-squared within	0.8422	0.8140	0.4088	0.2724
R-squared between	0.6966	0.8567	0.2402	0.3735
R-squared overall	0.7109	0.8505	0.0420	0.3298
Hausman test: $\chi^2(k)$		16.05		6.26
Hausman test: $Pr > \chi^2$		0.0246		0.5102

Note: (1) T-statistics in Parentheses;

(2) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

(3) Each regression includes a full set of year dummies.

### 3.2. Agricultural Support.

The behaviors of public spending by local budget and extra-budget on agriculture support are presented in Table 2. It is clear that, this spending is increasing as per capita DGP growth within local government budget as well as extra-budget. Also, the sign of the effect of rural population ratio (“urbanization”, by the definition, this is the ratio of rural population to the total population) on the public spending on agriculture is positive but insignificant in both of local budget (fixed effect and random effect model) and the extra-budget process (fixed effect model). However, our estimate results show that, there exist “scale economy” in local government budget spending on agricultural investment, since this spending tends to be lower, with the village size become larger, the coefficient of “village scale” is significantly

Table 2: Performance of Budgetary VS Extra-budgetary Expenditure of Local Government-- Agriculture

Dependent variables	Budgetary Expenditure per rural person for Agriculture		Extra-budgetary Expenditure per rural person for Agriculture	
	Fixed	Random	Fixed	Random
	Effect	Effect	Effect	Effect
GDP per capita	216.95*** (10.19)	148.77*** (8.65)	24.667*** (4.06)	21.657*** (3.95)
Urbanization	0.7537 (0.61)	0.9391 (1.35)	0.2776 (0.79)	-0.0559 (-0.22)
Village scale	-7.5847 (-1.48)	-10.638** (-2.19)	1.2481 (0.85)	1.0444 (0.74)
Percentage of disaster area to cultivated area	-23.168** (-2.29)	-23.384** (-2.17)	2.960 (1.03)	2.68945 (0.94)
Constant	-185.15** (-2.02)		-32.453 (-1.24)	-6.0185 (-0.29)
Observations	120	120	120	120
Number of region	30	30	30	30
R-squared within	0.6213	0.5926	0.3793	0.3716
R-squared between	0.6435	0.6478	0.1373	0.2170
R-squared overall	0.6318	0.6383	0.1432	0.2207
Hausman test: $\chi^2(k)$		27.11		13.58
Hausman test: Pr > $\chi^2$		0.0003		0.0347

Note: (1) T-statistics in Parentheses;

(2) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

(3) Each regression includes a full set of year dummies.

negative in the random effect model. It is contrast that this “scale economy” effect does not occur in the extra-budget spending, the estimated coefficients of “village

scale” are positive (insignificant) in both fixed effect and random model. It is worthy of notice that the reaction to natural disasters is quite different between local budget process and the extra-budget process. While the reaction of the extra-budget agricultural spending to “natural disaster rate” is insignificantly positive, the response of local governments’ budget spending to this variable is not only negative, but also significant! Most likely, this sharp difference reflect the fact that the budget spending is “ex ante” determined, and it is impossible for budget process to ex ante respond to some randomly happened disasters, whereas as somewhat ex-post reaction, local governments’ extra-budget spending could positively react to public need when natural disasters occur, resulting in some positive correlation between “disaster rate” and public spending on agriculture, though it is insignificant in our estimation.

### **3.3. Infrastructure construction**

Next, we turn to an interesting comparison between local governments’ budget and the extra-budget spending on local infrastructure construction. Concerning about the extra-budget process, it is obviously from Table 3 that, (according to the fixed effect model), the per capita governments’ spending for infrastructure is significantly increasing following the growth of per capita GDP and the increase of FDI ( it is defined by the value of FDI divided by the value of industrial production) , and the density of highway ( it is defined by the length of highway divided by the area of correspondent province). In contrast, it is clear that the impacts of GDP growth, FDI increase on budget spending for infrastructure construction are either insignificant ( the coefficients of GDP and FDI), or even significantly negative (the coefficient of “GDP per capita” )! These differences reflect genuine differences between the functions of local budget spending and the functions of local governments’ extra-budget spending: in China, since the end of last century, the local extra-budget is mainly spent on the infrastructure construction, and it is considerably sensitive to DGP growth, and it is invested for attracting more FDI; on the other hand, the local governments’ budgetary expenditure for these economic activities might be limited, it is rather mainly spent out for public consumptions such as education and public administration. For this reason, the extra-budget is called as “economic development budget” or “construction budget”, while the formal budget process of local governments is regarded as “public consumption budget” or “lunch budget”. The negative sign of “length of highways per land area” in both of “Budgetary and Extra-budgetary expenditure” indicates that, the lower the density of high way, thus the more the public need for this kind of infrastructure, then the more the budgetary as well as the extra-budgetary expenditure would be invested on capital construction and urban maintenance, meaning the local public good provision might be closely matched with local public preference. It is surprising that the process of “urbanization” (measured as the ratio of rural population to the total population) is negatively correlated with the local extra-budgetary expenditure on capital construction and urban maintenance, indicating that in China, the process of industrialization and urban construction are not accompanied with the transformation

of rural residents into urban residents, and there exists some inconsistency between industrialization and urbanization.

Table 3: Performance of Budgetary VS Extra-budgetary Expenditure of Local Government  
---Capital Construction and Urban Maintenance

Dependent variables	Budgetary Expenditure for Capital Construction and Urban Maintenance per IOV		Extra-budgetary Expenditure for Capital Construction and Urban Maintenance per IOV	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
GDP per capita	-258.37 (-1.23)	-164.13 (-1.29)	82.106* (1.77)	18.358 (0.72)
Length of highways per land area	-662.14** (-2.13)	-591.83*** (-2.57)	-152.17** (-2.22)	-64.024 (-1.36)
FDI per Industrial Output Value (IOV)	0.5497 (0.45)	1.0682 (1.39)	0.6535** (2.45)	0.3785** (2.43)
Urbanization	-17.208 (-1.39)	5.2496 (1.27)	-1.2297 (-0.45)	-1.3616* (-1.66)
Constant	1171.5*** (3.03)		101.43 (1.19)	
Observations	118	118	119	119
Number of region	30	30	30	30
R-squared within	0.3426	0.3068	0.5185	0.4982
R-squared between	0.1154	0.2791	0.0012	0.1484
R-squared overall	0.1117	0.2731	0.0700	0.2834
Hausman test: $\chi^2(k)$		-8.55		-43.80
Hausman test: $Pr > \chi^2$		N/A		N/A

Note: (1) T-statistics in Parentheses;

(2) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

(3) Each regression includes a full set of year dummies.

### 3.4. Government Administration Spending

As table 4 indicates, per capita GDP growth would push local governments to expand administration expenditure in both of budget and extra-budget, and it seems that the local extra-budgetary administration expenditure is expanding faster than the local budgetary one when local economy is growing, meaning that some informal local government agents hire more persons to manage and regulate local market activities. The trend of local informal government agent expanding is also reflected in the estimated effect of “urbanization” on the extra-budgetary administration

expenditure: it could be found out that the process of “urbanization” has substantially increase the extra-budgetary administration spending ( in both of fixed and random effect models), and at the same time, “urbanization”( the reduction of the ratio of rural population) significantly results in a reduction of local budgetary administration expenditure ( in random effect model). This finding is consistent with the argument by C.Wong and D. Bhattasali (2002) that the recent expanding of local governments is mainly supported by the local extra-budget. It is important to notice that, on the administration area, the extra-budgetary expenditure is clearly less efficient than that of budgetary expenditure: at first, the large the “village scale”, the less the budgetary expending on administration, but the more the extra-budgetary administrative spending (though insignificantly), thus there is “scale economy” in budgetary spending on administration, while this scale economy does not occur in extra-budgetary administrative expenditure; secondly, the more the rural residents become urban residents, the less the budgetary administrative expenditure is, but the more the extra-budgetary one is. Our estimation shows, however, that there are negative correlation between the extra-budgetary administrative spending and the forfeit revenue per capita, therefore, the expanding of extra-budgetary administrative spending might not be attributed to the growth of forfeit revenue and fees.

Therefore, it could be inferred from table 4 that, there are three reasons for the relative uprising trend of local extra-budgetary administrative expenditure compared to the budgetary counterpart: (1) the economic development result in a faster growth of local extra-budget administrative size than that of local budget; (2) the process of “urbanization” has mainly caused the informal government agents to be enlarged, and has made the formal government administration activities faced with more strictly constraints and relatively shrunk; (3). The inefficiency of extra-budgetary activities would also increase spending on them. It is somewhat confirmed by our regression that, currently in China, there exist some shift from budgetary administrative expenditure to extra-budgetary administrative expenditure, since the former is more strictly constrained by the later one.

In summary, the composition and functions of public spending in local governments’ budget are clearly different from those of extra-budget. In China, the bias on the composition in local public spending suggested by Keen & Marchand (1997) is most likely happed in the form of parallel but distinctive functions of budgetary and extra-budgetary expenditures. The budgetary expenditures are mainly responsible for some basic public good provision such as education, agricultural support, and other public consumptions, while the extra-budgetary expenditures are more sensitive to the public need for infrastructure investments and some randomly happened rescuing requirements in the situations of natural disasters, and more sensitive for attracting FDI. On the aspect of public administration, the local extra-budget is growing much faster than that of formal budgetary size when DGP is growing, meaning that there are larger and larger public resources allocated into less constrained extra-budgetary administrative agents, which in turn would result in some fiscal burden on local residents, in particular, on peasants. Generally speaking, the

budgetary expenditure are some *ex ante* determined or approved by local peoples' congress and superior governments, while the extra-budgetary expenditure is usually *ex-post* examined by the public, thus the local governments have disposal power to allocate extra-budgetary resources *ex ante*. This is why the extra-budget is the main source of the fiscal incentive for the local governments in China.

Table 4: Performance of Budgetary VS Extra-budgetary Expenditure of Local Government--- Government Administration

Dependent variables	Budgetary Expenditure per capita for Government Administration		Extra-budgetary Expenditure per capita for Government Administration	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
	GDP per capita	117.23 (1.65)	101.42*** (2.73)	161.53** (1.99)
Village scale	-19.185* (-1.92)	-32.011*** (-3.80)	1.1940 (0.10)	2.1750 (0.22)
Urbanization	-4.3455* (-1.83)	-3.0702*** (-2.56)	5.1249* (1.74)	3.1171** (2.31)
Forfeit revenue per capita	-0.0038 (-0.01)	0.0137 (0.05)	-0.9419** (-2.25)	-0.6689** (-2.19)
Constant	156.78** (2.14)		-50.768 (-0.52)	
Observations	123	123	124	124
Number of region	31	31	31	31
R-squared within	0.5840	0.5726	0.3746	0.3675
R-squared between	0.1294	0.3224	0.6599	0.6699
R-squared overall	0.1974	0.3514	0.6392	0.6498
Hausman test: $\chi^2(k)$		-14.77		7.18
Hausman test: $Pr > \chi^2$		N/A		0.4107

Note: (1) T-statistics in Parentheses;

(2) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

(3) Each regression includes a full set of year dummies.

#### 4. Empirical Tests: Decentralization, Fiscal Incentive and the Responsiveness of Public Investment to Local Needs.

My objective is to test whether decentralization and fiscal incentive for local government made public investment more responsible to local needs in China. In

section 3, it is reported that with more extra-budgetary resources allocated to the local governments, and thus with more fiscal decentralization, the pattern of local public investment has been changed at large. In this section, we explore the effects of fiscal incentives under decentralization on the responsiveness of public investment to local needs.

#### 4.1. Methodology

We first give out the measurement of fiscal incentive under decentralization. The literature on public finance and China fiscal decentralization is characterized by numerous theoretical analyses about the distortions in fiscal incentive under decentralization. Briefly speaking, there are two opposite extremes of these distortions: one is pointed out by Shleifer (1997) and Zhuravskaya (2000) that in Russian, poor economic performance might be explained to some extent by the lack of the incentives for local governments to encourage business formation. According to Zhuravskaya, if an increase of the local tax base result in a nearly equal increase in local budgetary revenues, then the fiscal incentive is strong. However, in Russian most part of the increase of local tax base was captured by the central government. The other distortion is discussed by S. Wong (2002) that in China, since the local extra-budgetary revenue is fully controlled by local governments, while the local budgetary revenue should be constrained to the local people's congress and be supervised by the public, thus, there are some incompatibility between the local budgetary and the extra-budgetary incentives, and the budgetary resource might be shifted implicitly into the local extra-budget. In order to avoid these two distortions, we define a dummy variable to measurement of fiscal incentive for local governments under decentralization as follow: if the budgetary revenue varies in the same direction with the extra-budgetary revenue, then we define "incentive" equal to 1; otherwise, the "incentive" equals to zero.

Instead of choosing government expenditures as dependent variables in section 3, here we choose public goods as dependent variables, in order to explore the impacts of fiscal incentives on the responsiveness of public investments to local needs. Ideally public goods would be measured in quality-adjusted units of output, separated by type. But such information is unavailable for China, instead I separately choose 5 sectors: education, health and medical care, highway construction, urban maintenance, and administration. In each of these sectors, several variables are selected out to measure the level of local public goods.

We collect data about China local public good provision from "Statistical information of China local fiscal statistical information". This data set covers 30 regions (all provinces except for Chongqing since it was established in 1995), 10 years (from 1994-2003). Thus, the size of observation is 300. By an extension of the method of Faguet (2004), for public good, I estimate the model

$$Y_{it} = a_1 region + a_2 region^* + a_3 pgdp_{it} + a_4 pgdp_{it}^* + a_5 pbe_{it} + a_6 pbe_{it}^* + a_7 pee_{it} + a_8 pee_{it}^* + a_9 \delta_t + \varepsilon_{it}$$

where  $Y_{it}$  is the level of specific public good such as per capita health institution, highway density, per capita primary school, the ratio of teachers to students and so on, the variable “region” represents province dummy which captures all of the characteristics of a state fixed in time; and  $\delta_t$  is time dummy which captures year shocks and time-specific characteristics. And also, per capita GDP level (pgdp) is included as a independent variable to control the impact of economic development on public good provision. Besides, capita budgetary expenditure level (pbe), and per capita extra-budgetary expenditure level (pee) are included into the vector of dependent variables to examine the responsiveness of public spending to the local public need. The variable with star is the product of that variable and the fiscal incentive dummy variable which takes the value zero if in the specific region (province) and in the specific year, the local budgetary revenue does not vary in the same direction with its extra-budgetary revenue, and 1 if they changes in the dame direction. All the four independent variables with star capture incentive-specific or fiscal decentralization specific characteristics during the period between 1994 and 2003, thus the estimated coefficients like  $\alpha_2, \alpha_4, \alpha_6, \alpha_8$  will capture the effects of fiscal incentive under decentralization.

Then we perform three tests:

1.  $\alpha_1 = \alpha_2; \alpha_3 = \alpha_4; \alpha_5 = \alpha_6; \alpha_7 = \alpha_8$ .

These tests are means tests. This is s simply t-test to determine whether the means of the coefficients of independent variables without stars are significantly different from those of the counterparts without stars. Significance indicates that fiscal incentives under decentralization changed the responsiveness through the effects and actions of local governments.

2.  $\alpha_{1i} = \alpha_{2i}$ . This test is controlled by all other 7 independent variables. This is an individual test. This F-test checks municipality by whether the fiscal incentives affected state coefficients are different from the simples state coefficients for public expenditures in a given sector. A significant F-test constitutes evidence that fiscal incentives under decentralization caused some changes in the responsiveness of local governments’ spending to the local public needs. Significance in many regions (provinces) constitutes stronger evidence that decentralization with fiscal incentives have some influences on the efficiency of the local public good provision.

3. Lastly, I place that the *differences* in the state dummy coefficients on the left side and estimates the model

$$\alpha_{2i} - \alpha_{1i} = \xi s_i + \eta Z_i + \varepsilon_i \quad (1)$$

for each of 5 sectors, where S is a variable representing for the existing stock of

public good or public service in 1998, and  $Z$  is a vector of institutional and civic variables, both indexed by region (province)  $i$ . This approach isolates those changes in the responsiveness of local public expenditures to the local public needs resulting from the fiscal incentive under decentralization, and then examines the determinants behind.

The variables included in the  $Z$  vector are “privatization” (the ratio of non-state-owned industrial output to the total industrial output), FID (the value of FDI divided by total value of industrial output), “urbanization”, and “the ratio of extra-budgetary expenditure to budgetary expenditure”. In order to combine very specific  $Z$ -type variables into indicators that are useful, I characterized them according with the approach of Faguet (2004) to construct principal component variables (PCVs) for each. Thus, the equation (1) could be written as

$$\alpha_{2i} - \alpha_{1i} = \xi s_i + \eta_1 Z_{i1} + \eta_2 Z_{i2} + \dots + \eta_4 Z_{i4} + \varepsilon_i \quad (2)$$

where the subscripts 1 to 4 denote above four principal components variable for institutional changes.

#### 4.2 Hypothesis

For each of 5 sectors (education, health and medical care, road construction, capital construction and urban maintenance, and finally, public administration), the main coefficient of interests is  $\xi$ , which I interpret as an indicator of the degree to which the local public good provision is based on need. This is because of the law of decreasing marginal utility of a public service as the level of local public good provision rises. In the following 5 sectors, two types of indicators are included into  $S$ : (1) the stock of local public service at some initial stage. We choose the year 1998 as initial year since we only have the detailed information about local extra-budgetary expenditures in 1999-2002. For example, in the education model, the dependent variable is “ratio of teacher to student in high schools”, and the stock of education service level in an initial stage is represented by “illiterate rate” in 1998; in the health and medical care model, the independent variable is “medical institution beds owned by every 10000 persons”, then the level of this variable in 1998 is chosen as a measurement of the initial stock; in the road construction model, the independent variable is “length of the first-class highway per area”, the level of that variable in 1998 is regarded as the initial stock; in capital construction and urban maintenance model, the independent variable is “public investment level” on this field, thus the corresponding level in 1998 is as the initial stock; and in the government administration model, the independent variable is “the level of government expenditure per capita”, so the level of this variable in 1998 is used as the initial sock. (2). Indicators which measure the degree of backwardness or emergency, reflecting

the degree of public need. For example, in the education model, the dependent variable is “ratio of teacher to student in high schools”, and the degree of backward is represented by “illiterate rate” in 1998; in the capital construction and urban maintenance model, the “percentage of disaster area to cultivated area” is selected to represent the degree of emergency, thus the degree of public need for capital construction.

Based on the law of decreasing marginal utility, it is expected that the higher the “initial stock” is, the lower the local public expenditure is. Also, if the fiscal incentive under decentralization makes local government more responsive to local needs by “tailoring level of consumption to the preferences of smaller, more homogeneous group” (Wallis and Oates, 1988; Besley and Coate, 1999), then it is expected that the more backward is the condition of public good provision, or the more emergency is in living or production condition, the higher is the local government provision for public good. Therefore, two types of hypothesis are present as the following:

**(i). If the fiscal incentive under decentralization is increase the responsiveness of local public good provision to the public need, we then expect the signs of the coefficients of the initial stock to be negative.**

**(ii). On the other hand, if the indicators of S in model of (2) are the measurements of the degree of backwardness or emergency, and if the fiscal incentives under decentralization really improved the responsiveness of the public good provision to the preference of local citizen and peasants, we then expect the sign of the estimated coefficients of these measurements to be positive.**

#### **4.3. Results for the means tests ( test 1).**

Table 5 shows the results from the means tests  $\alpha_1 = \alpha_2; \alpha_3 = \alpha_4; \alpha_5 = \alpha_6; \alpha_7 = \alpha_8$ . It could be found out that , in the education model, the mean values of  $\alpha_3$  is significantly different from that of  $\alpha_4$  at the 10% level, and the mean value of  $\alpha_5$  is significant different from that of  $\alpha_6$  at the 0.1% level; in the heath and medical care model,  $\alpha_1$  and  $\alpha_7$  are different from  $\alpha_2$  and  $\alpha_8$  respectively , and significantly at the 10% level, while the mean of  $\alpha_5$  differs from  $\alpha_6$  significantly at the level of 5%; in the road (highway) construction model, the values of  $\alpha_3$  and  $\alpha_7$  are different from those of  $\alpha_4$  and  $\alpha_8$  significantly at the 0.01% level respectively; And in the model of capital and urban maintenance model, the means of  $\alpha_3$  and  $\alpha_5$  are

different from those of  $\alpha_4$  and  $\alpha_6$  significantly at the level of 3% and of 0.04% respectively, however, the value of  $\alpha_1$  is significantly different from that of  $\alpha_2$  at only the 15% level; in the model of public administration model, the means of  $\alpha_3$  and  $\alpha_5$  are different significantly from those of  $\alpha_4$  and  $\alpha_6$  at the level of 0.01%, while the value of  $\alpha_1$  is significantly different from that of  $\alpha_2$  at only the level of 16%. All of these differences supply some evidences that fiscal incentives under decentralization changed the patten of local public good provision in China.

Examination of the difference values of  $\alpha$  s in the education model indicates that the effect fiscal incentive and fiscal decentralization are likely to reduce the level of public service on local education. Although the impact of per capita GDP would on education could be increased by introduction of fiscal incentive, the values of  $\alpha_2, \alpha_6, \alpha_8$  show that, by introducing fiscal incentives, the local public good on education, in particular, the support impact of local budgetary expenditure on education, would be reduced, meaning even the budgetary support for local education might be weakened under fiscal decentralization.

The impact of fiscal incentive on health and medical care is at the most likely positive. It could be seen that although the effect of budgetary expenditure (pbe) support on medical sector would be weakened, the extra-budgetary expenditure (pee) support for this service would be increased, and in general the introduction of fiscal incentive would significantly increase the public good provision in this sector (see the value of  $\alpha_2$ ). And it is unclear about the changes of impact of economic development (pgdp) after introducing the fiscal incentives.

In the road (highway) construction, the introducing of fiscal incentive would increase the provision level of the public good. It could be seen that the effect of the state variable (region) on highway length is positive (though insignificantly), and the effect of local extra-budgetary expenditure is also significantly increased. On the other hand, the fiscal incentive might slightly weaken the impact of the GDP growth (pdgp) on the road construction ( compare the value of  $\alpha_3$  and  $\alpha_4$ ), probably, this might be resulted from lower effect of local budgetary expenditure on highway when extra-budge is expanding.

In the sector of capital construction and urban maintenance, all of the value of  $\alpha_2, \alpha_4, \alpha_8$  are negative, indicating that the public good provision in this sector would be reduced after introducing the fiscal incentive with the higher extra-budgetary expenditure level, meaning as local governments have more residual rights over the extra-budgetary resource, they gradually throw the burden of capital investment to

**Table 5: The Results of the Means Test**

Sector	Variables		Coef.	Std. Err	t-statistic	P Value
Education	<i>region</i>	$a_1$	-.00023	.000135	0.92	0.3371
	<i>region</i> *	$a_2$	-1.69e-06	.0001263		
	<i>pgdp<sub>it</sub></i>	$a_3$	-.01125	.00526	2.64	0.1056
	<i>pgdp<sub>it</sub></i> *	$a_4$	.00661	.00628		
	<i>pbe<sub>it</sub></i>	$a_5$	.00001	2.09e-06	18.55	0.0000
	<i>pbe<sub>it</sub></i> *	$a_6$	-4.41e-06	2.49e-06		
	<i>pee<sub>it</sub></i>	$a_7$	.000015	.000014	0.37	0.5418
	<i>pee<sub>it</sub></i> *	$a_8$	-2.24e-06	.000016		
Medical Care	<i>region</i>	$a_1$	-.24358	.08282	2.79	0.0959
	<i>region</i> *	$a_2$	.00812	.07760		
	<i>pgdp<sub>it</sub></i>	$a_3$	1.7844	3.2558	0.43	0.5129
	<i>pgdp<sub>it</sub></i> *	$a_4$	-2.6734	3.8801		
	<i>pbe<sub>it</sub></i>	$a_5$	.00483	.00129	3.60	0.0588
	<i>pbe<sub>it</sub></i> *	$a_6$	-.00030	.00153		
	<i>pee<sub>it</sub></i>	$a_7$	.00925	.00849	0.00	0.9957
	<i>pee<sub>it</sub></i> *	$a_8$	.00934	.00988		
Highway	<i>region</i>	$a_1$	.92646	.68199	0.16	0.6867
	<i>region</i> *	$a_2$	.43044	.63633		
	<i>pgdp<sub>it</sub></i>	$a_3$	300.70	26.512	30.65	0.0000
	<i>pgdp<sub>it</sub></i> *	$a_4$	-6.1020	31.670		
	<i>pbe<sub>it</sub></i>	$a_5$	-.01041	.01052	0.05	0.8273

	$pbe_{it}^*$	$a_6$	-.00559	.01253		
	$pee_{it}$	$a_7$	-.31187	.06918	10.59	0.0013
	$pee_{it}^*$	$a_8$	.15743	.08061		
Capital Construction and Urban Maintenance	$region$	$a_1$	7.2132	21.120	2.06	0.1524
	$region^*$	$a_2$	-47.917	19.789		
	$pgdp_{it}$	$a_3$	-4235.4	830.27	4.60	0.0329
	$pgdp_{it}^*$	$a_4$	-515.77	989.47		
	$pbe_{it}$	$a_5$	3.0602	.32974	8.38	0.0041
	$pbe_{it}^*$	$a_6$	1.0580	.39155		
	$pee_{it}$	$a_7$	-2.0096	2.16740	0.16	0.6912
	$pee_{it}^*$	$a_8$	-.21411	2.5214		
Government Administration	$region$	$a_1$	.59086	.45315	1.97	0.1615
	$region^*$	$a_2$	-.56606	.42458		
	$pgdp_{it}$	$a_3$	-102.84	17.813	8.67	0.0035
	$pgdp_{it}^*$	$a_4$	6.7505	21.229		
	$pbe_{it}$	$a_5$	.10231	.00707	42.14	0.0000
	$pbe_{it}^*$	$a_6$	.00598	.00840		
	$pee_{it}$	$a_7$	-.01411	.04650	0.03	0.8622
	$pee_{it}^*$	$a_8$	.00272	.05409		

the private enterprises. Except, the impact of budgetary expenditure on the level of capital construction is significantly increased, thus, if is required for the local governments to provide public good n in capital construction, it would be, at the most likely, some budgetary activity which is perhaps controlled by supervision of higher

tier of officials.

And finally in the sector of public administration, the introducing of fiscal incentives would generally increase the level of public spending on this field ( see the values of  $\alpha_4, \alpha_6, \alpha_8$ ), meaning that fiscal decentralization with growing scale of extra-budgetary expenditure would push some inflation of local government size. And the change of the effect of state dummy (region) on this field is unclear.

So, briefly, the introducing of fiscal incentive under decentralization would increase public good provision in the sectors of highway, administration, and slight in health and medical care; however, it would reduce the level of public services in education and capital construction, indicating that there are some bias in the patterns or composition of public good provision. These finding are consistent with the results in section 3.

#### 4.4. The results for the F-test (test 2)

Table 6 shows the number of regions (provinces) where we can reject the hypothesis  $\alpha_{1i} = \alpha_{2i}$ , that is, the number of provinces where fiscal incentive under decentralization did change the patterns of local public good provision in China. The test is significant in the all of the provinces for education, and is significant in about 93.3% of provinces for highway, in 56.7% of provinces for health and medical care, and only in 20% and 16.7% of provinces for government administration and capital construction. This suggests that the patterns of the local public good provision changed significantly in education, road (highway) construction, and somewhat in health and medical care, did not changed the pattern of local public good provision in capital construction and administration. Taking into account the results of from test 1, we conclude that the pattern of public good provision in education and in highway construction did changed significantly after introducing fiscal incentive under decentralization, the pattern of public good provision in health and administration changed modestly by fiscal decentralization, and for capital construction and urban maintenance, it may have but the evidences is

**Table 6: the result for the F-test**

sector	No. significant	% significant
Education	30	100%
Medical Care	17	56.7%
Highway	28	93.3%
Capital Construction and Urban Maintenance	5	16.7%
Government Administration	6	20%

inconclusive about the pattern of public good provision. From this point, our analysis for the results of Test 3 focused on the four sectors: education, road (highway) construction, health and medical care, and government administration.

#### 4.5. The Results for Test 3.

Test 4 investigates the determinants of the difference in regional (provincial) dummy variables,  $\alpha_{2i} - \alpha_{1i}$ , where both of  $\alpha_{2i}$  and  $\alpha_{1i}$  are generated by Test 2. The purpose of this regression is to explore for the reasons for the increase of local public good provision due to fiscal incentives and fiscal decentralization. Since the available detailed information about the structure of the local extra-budgetary expenditure is only for the period 1999-2002, so the length of our data set for this investigation is 4 year. And, consequently, we choose the levels of specific public goods as the measurements of the initial stocks of the correspondent public services. By constructing the principal component value (PCV), all the information about institutional changes such as privatization, FDI increase, urbanization and the growth of the local extra-budgetary size during these four years, is included in the correspondent four time-independent PCVs. Then Test 4 simply becomes a OLS regression.

The results are presented in Table 7 to table 10, sector by sector.

Table 7: Regression with Eigenvalues---Education

Dependent variables	a_teh_ratio
Illiteracy rate	0.0010* (1.95)
PV1	-0.00009 (-1.16)
PV2	0.00006 (0.08)
PV3	0.05091 (0.96)
PV4	-0.0097 (-0.75)
Constant	0.0140 (1.57)
R-squared	0.3101
Prob > F	0.0911

Note: (1) OLS regression reported with robust standard errors;

(2) T-statistics in Parentheses;

(3) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

##### 4.5.1. Education

From table 7, it is clear that the level of public good provision in education would rise significantly at the 10% level with fiscal incentives under decentralization, where the illiterate rate is higher, and thus where need is greater. This implies that local governments are more sensitive to local need than central government. Although the total level of public good provision in local education would be reduced with fiscal incentives as shown in section 2 and in Test 1, here, it is found out that the marginal propensity for local public good provision in education might be increase when the degree of backward is severer. This finding is more likely because, usually, extra-budgetary expenditure of local governments for education is not scale determined, and local governments with more residual rights would eagerly change the backward situation at first.

The positive signs of estimated coefficients of PCVs are only weak evidences, directly indicating that, the responsiveness of local public good provision to need is improving with some institutional changes.

#### 4.5.2. *Health and Medical Care*

The level of public service in health and medical care ( here it is measured by “bed owned by 10000 persons) would be decreased significantly at the level of 1% with the initial stock of that variable, meaning the higher the initial stock is, the lower is the

Table 8: Regression with Eigenvalues---Medical Care

Dependent variables	a_pbed
Medical institution beds owned by every 10000 persons (1998)	-0.80545*** (-16.72)
PV1	0.02996* (1.98)
PV2	-0.0507 (-0.36)
PV3	4.5281 (0.79)
PV4	-0.5958 (-0.20)
Constant	30.768*** (21.18)
R-squared	0.8975
Prob > F	0.0000

Note: (1) OLS regression reported with robust standard errors;

(2) T-statistics in Parentheses;

(3) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

public service provision now. This is a right sign according with the law of diminishing marginal utility. Economically, this is most likely that, with fiscal decentralization and more resources controlled by local government, the fiscal

expenditure would more and more input into some backward areas. It is worthy of noticing that the estimated coefficient of PCV1 (indirectly characteristic for “privatization” ) is positive at the level of 10%, weakly indicating that with the process of privatization, local government’s marginal propensity for public service provision in health sector would be increased, therefore, the local government in China is going on the way to reform its function in right direction.

#### 4.5.3. Road(highway) Construction

Currently in China, road (highway)is constructed mainly by enterprises, however, local government has much power to influence banking loan to support this construction. And, as shown in section 3, there is significant correlation between highway density and extra-budgetary expenditure. Table 9 shows that, the lower level of the initial stock of highway was in 1998, the higher the highway density with the fiscal incentives under decentralization, implying that the marginal propensity for providing government spending would be higher where is initial condition of road is poorer. Thus, the sign of estimated coefficient here is also right. Although the effects of all the four eigenvalues are insignificant in this regression, however, their sighs are consistent with economic sense: with the process of privatization, with more and more FDI, and with higher ratio of the extra-budgetary resource to the budgetary one, marginal propensity for public spending on road construction would be increased, while this marginal propensity would be lower where the urbanization level is relatively higher, indicating that the law of diminishing marginal utility works in determining public spending on road construction.

Table 9: Regression with Eigenvalues---Highway

Dependent variables	a_phw2
Length of first-class highway per area (1998)	-0.44169** (-2.51)
PV1	0.8515 (1.41)
PV2	3.9683 (0.88)
PV3	-316.07 (-1.24)
PV4	78.626 (1.07)
Constant	162.23*** (5.20)
R-squared	0.4306
Prob > F	0.0166

Note: (1) OLS regression reported with robust standard errors;

(2) T-statistics in Parentheses;

(3) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

#### 4.5.4. Government Administration

The positive sign of the estimated coefficient of the initial stock (Government administration expenditure per capita in 1998) is opposite to the hypothesis listed on the end of the sub-section 4.2., although this is insignificantly. However, there is deep economic background for this “wrong” sign: it is more likely that the higher is the government administration expenditure in 1998, the higher is this expenditure level currently, indicating that local governments in China are inflating their size recently under fiscal decentralization!

Table 10: Regression with Eigenvalues----- Government Administration

Dependent variables	a_pbadm
Government Administration expenditure per capita (1998)	2.7674 (0.91)
Forfeit revenue per capita (1998)	-0.5001 (-0.20)
PV1	0.4177 (0.40)
PV2	7.1773 (0.81)
PV3	-237.76 (-0.50)
PV4	-97.635 (-1.01)
Constant	-397.12*** (-3.42)
R-squared	0.1379
Prob > F	0.6262

Note: (1) OLS regression reported with robust standard errors;

(2) T-statistics in Parentheses;

(3) Asterisks indicate variables whose coefficients are significant at the 10%(\*), 5%(\*\*), and 1%(\*\*\*)levels;

## 5. Conclusions

China’s 1994 fiscal reform, i.e. the new tax-sharing system dramatically changed the national revenue sharing system, and changed the balance of revenue availability between the central government and local government. However, no commensurate changes in expenditure assignment were made. Local governments, with more control over the administration of locally assigned taxes, have expanded their residual rights over fiscal resource allocation again. Thus, the fiscal decentralization trend which started from the very beginning of economic reform in the 1980’s is not derailed by the fiscal reform in 1994. Basically, there are three fiscal mechanisms of the fiscal incentives for local governments in the regime of this continuing

decentralization: transfer from central government to local governments; tax-sharing system between the low level of government, and a huge base of extra-budgetary revenue for local government, and even self-raised funds for off-budget revenue.

Decentralization with fiscal incentives not only significantly changed the patterns of public good provision, but also the composition of government budgetary expenditure as well as of extra-budgetary expenditure. Throughout the last decade, with more and more extra-budgetary revenue, the local governments in China unambiguously increase public expenditures in road construction, in particular, highway construction, in order to attract more FDI; and also, local extra-budgetary expenditures modestly increase the per capita public services in health and medical care; at the same time, the local extra-budgetary expenditure is more sensitive to random happened natural disasters. It is very important to note that the local extra-budgetary administration expenditure is expanding faster than the local budgetary one when local economy is growing, meaning that some informal local government agents hire more persons to manage and regulate local market activities. Local budgetary expenditure is mainly responsible for the fundamental public good provision such as education, urban maintenance, agriculture support, and in the education area, local government budget spending is more sensitive to local need than local governments' extra-budget spending is. Therefore, there are so called "bias" (Keen & Marchand 1997) in the pattern of public spending with fiscal incentives and fiscal decentralization, however, these bias appear not only within local budgetary expenditure and within local extra-budgetary spending, but also in the different expenditure structures between the local budgetary and the extra-budgetary spending. Our findings in this research support the argument (Qian and Weingast, 1997, 1999) that the local governments in China play the role like "agent" for economic development, but this role of "agent" is mainly played by local extra-budgetary expenditure.

Fiscal incentive is closely related with the extra-budgetary revenues. Based on our definition of "fiscal incentive", we explore the impacts of fiscal incentives under decentralization on responsiveness of public good provision to real local needs. In education, health and medical care, road (highway) construction, fiscal incentives are positively related to real local need. Although the per capita extra-budgetary expenditure for education is declining when per capita GDP is growing, the increase of extra-budgetary revenue with the same direction in the increase of budgetary revenue would improve the responsiveness of public services in education to the real need, meaning that fiscal incentives would guide marginal propensity for public good provision more closely to local citizens' preferences. The right signs of the estimated coefficients in Test 3 in section 4 (regression with eigen-value) imply that, decentralization with fiscal incentives improved the sensitivity of local public good provision to local needs, and these results are consistent with the economic law of diminishing marginal utility.

Apart from the bias mentioned above, there are the main problems in fiscal decentralization in China: first, with a huge basis of extra-budgetary revenue, the local government would expand government size, and then the government administration

expenditure would be increased at the rate faster than that of economic growth, resulting in a heavier burden on the shoulder of local citizens and peasants; There exist some decreasing return to scale in local extra-budgetary expenditure, implying that some inefficiency occurs in the allocation of extra-budgetary resources, and therefore, it is necessary for the public and peoples congress to check and balance the extra-budgetary expenditure process; and lastly, as our research found out that, process of “urbanization” (measured as the ratio of rural population to the total population) is negatively correlated with the local extra-budgetary expenditure on capital construction and urban maintenance, indicating that in China, the process of industrialization and urban construction are not consistent. Therefore, hold down the size the local governments, put more constraints on the extra-budgetary expenditures, and improve the efficiency of resource allocation within budgetary process are the tasks for further fiscal reform in China.

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