

Fiscal Expenditure Competition of China's Local Governments: The Characteristics and Its Effects on Capital Allocation

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Abstract

Chinese fiscal decentralization reform inspires the local governments' enthusiasm of developing region's economy and intensifies the competition between local governments. Using a large dataset at city level from 1985 to 2012, this paper analyzes the characteristic and regional difference of fiscal expenditure competition, and studies the effects of expenditure competition on capital allocation. The estimation results show that imitative interaction of productive expenditure has positive effect on capital allocation efficiency, while the strategic imitation of social expenditure and administration expenses impede efficient allocation of capital. The different effects can be contributed to the essential characteristic of fiscal competition in China. Finally, it is propose that the official's achievement assessment system based on economic growth rate should be reformed. A more perfect performance assessment system should conclude not only local GDP but also the productivity of the public services and recourses allocation efficiency.

Keywords: *fiscal expenditure competition, local government, capital allocation, imitative interaction, panel data, spatial econometric model*

1. Introduction

The ultimate object of China's economic Reform is to achieve maximum accelerated economic development by introducing market mechanism into socialist system. The central government implements reform in phases in different region to ensure the stable development of the economy. At the same time, financial system reform and political institution adjustments provides economic and political incentives for local governments. Economic incentive, which comes from the fiscal decentralization reform, allows local governments spend fiscal earnings independently and then strives local governments for region economic development. Political incentive, which caused by official appointment system and government performance examination mainly based on local GDP, ties official promotion and local development together^[1]. Under the current immature market economic system, therefore, Chinese local governments intervene much more on resource allocation than those in western countries. Since labor supply is almost inexhaustible in China, local governments compete fiercely for capital using fiscal measures.

This paper studies the influences of fiscal competition on capital allocation efficiency by employing a dynamic panel data model and fiscal data of 231 Chinese cities. The contribution of this study lies in the following several aspects. Firstly, being different from the joint fiscal and political decentralization in most western democratic countries, the coexistence of fiscal decentralization and political centralization in China makes local

governments' competition more complicated ^[2, 3]. Particularly, since the tax-sharing reform in 1994, this specific governance structure with a significant vertical fiscal imbalance provides us with an interesting context to examine the relevance of the current theories of fiscal competition. Secondly, although the fiscal competitions between provincial governments in China have been well documented and studied ^[4, 5], corresponding knowledge of the sub-provincial governments remains sparse. Our paper studied the fiscal competition among sub-provincial governments by using the most comprehensive fiscal data of 231 Chinese cities from 1985 to 2012, which better avoids omitted variable bias caused by macro- or provincial-level unobservable aggregate shocks. Thirdly, the existing empirical evidence on capital allocation efficiency is confined to financial market and the effect of fiscal competition on capital allocation is ignored. Our paper studies the influences of fiscal competition on capital allocation efficiency and sheds some new lights on the area of capital allocation efficiency.

The rest of this paper is organized as follows. Section 2 analyses the characteristics and regional differences of fiscal expenditure competition between local governments in China. Section 3 estimates regional capital allocation efficiency. Section 3 analyses the effect of fiscal competition on capital allocation, and the final section concludes.

2. The Characteristics and Regional Differences of Fiscal Expenditure Competition between China's Local Governments

2.1. Estimation Strategy

When a local government regulates economy utilizing fiscal policy, economic operation of other regions especially the neighboring jurisdictions would be affected though mechanism of resource allocation and yardstick effect ^[6, 7]. Therefore, we use a special panel model to investigate the strategic interaction on fiscal expenditure of China's local governments:

$$y_{it} = \varphi y_{i,t-1} + \rho_1 \sum_{j \neq i} \omega_{ij} y_{jt} + \rho_2 \sum_{j \neq i} \omega_{ij} y_{j,t-1} + \theta P_{it} + X'_{it} \beta + u_{it}$$

$$u_{it} = \rho_3 \sum_{j \neq i} \omega_{ij} u_{jt} + \varepsilon_{it}$$

$$\varepsilon_{it} = \mu_i + v_{it}$$

(1)

where y_{it} refers to the variables that depict local expenditure policy: $y_{i,t}$ is the government expenditure size or the share of each expenditure category of city i in year t . $y_{i,t-1}$ is the 1 lag of dependent variable accounting for the persistence of government expenditures. w_{ij} is impact weights of city i on city j . ρ_1 , ρ_2 are coefficients to be estimated which stand for the pattern and extent of cities strategic interaction on fiscal expenditure. P_{it} refers to expenditure policy of the province which city i belongs to. X'_{it} represents a set of control variables that shape local government expenditures. And β is the vector of the coefficients of those control variables. u_{it} is an error term.

The ordinary Least-Square method (OLS) is biased and neither consistent nor efficient in estimation of model involving spatially lagged variables. To deal with this problem, Madariaga (2007) and Windmeijer (2005) propose the system GMM estimation that combines regressions both in differences and in levels into one system ^[8, 9]. For system GMM method, the differenced lags of the dependent variable are instrumented by the further lags as the difference GMM. According to this suggestion, we use system GMM method in this paper.

2.2 Variables and Database

We investigate policy imitation from the aspects of expenditure on the city level. Every other city in the same province is regarded as competitor of the given city. Assignment on these weights are based on distance principle where $w_{ij}^D = d_{ij}^{-1} / \sum d_{ij}^{-1}$ and d_{ij} is the distance between the city i and city j .

Four kinds of variables are used to describe the size and composition of local governments' fiscal expenditure policy. Total Fiscal Expenditure (TFE) is measured by a ratio of the city governments expenditures over their local GDPs. Construction Expenditure (CE) is measured by a ratio of infrastructure expenditure over their local GDPs. Social Expenditure (SE) is measured by a ratio of summation of operation expenses for science, education, health care and culture, sports, broadcast and television over their local GDPs. Maintenance Expenditure (ME) is measured by a ratio of administrative expenditure over their local GDPs.

In addition to the lags of dependent variables, we control other factors that could possibly affect local expenditure policy in the regressions. Real GDP per capita (GDP) is deflated by the provincial-level consumer prices in 1978. Population density (PD) is accounts for possible scale effects in the provision of public services. GDP's and PD's log values is used in the regressions. Openness degree (OD) is measured by a ratio of total volume of foreign trade over their local GDPs. Urbanization level (UL) is measured by a ratio of urban population over their total population. Dummy variable, Dum 1994, is introduced to remove the interferences caused by financial system reform in 1994, which is valued as 0 for years before 1994 and as 1 after 1994. Dummy variable, Dum 2007, is introduced to remove the interferences caused by is the change of statistics standard from 2007, which is valued as 0 for years before 2007 and as 1 after 2007.

Fiscal data of 231 Chinese cities in 21 provinces from 1985 to 2012 are used. Municipality directly under the Central Government and vice-provincial cities are not concluded in database because they are incomparable with ordinary cities due to their distinct advantages on economics and administration. Provinces of Xizang, Gansu, Qinghai, Xinjiang, Ningxia, Inner Mongolia and Taiwan are unconcluded because of fragmentary data.

2.3 Results and Discussion

Within the framework of function (1), we establish fixed effects panel data models to analyze the interaction of cities fiscal expenditure policies of 21 provinces separately. From estimation results shown in Table 1 and 2 we can notice that most ρ_1 and ρ_2 are positive and significant, which indicates imitative strategic interactions exist significantly on the total fiscal expenditure, economic expenditure, social expenditure and maintenance expenditure. By comparison, it is shown that imitative strategic interactions on economic expenditure are much more obvious than on other kinds of expenditure. This finding provides reasonable interpretation of imitation on public expenditure focusing on infrastructure in context of fiscal competition for limited economy resources and "zero-sum game" in officials' promotion in China^[10].

Another clear trend is that imitative strategic interactions between cities in developed province such as Guangdong and Jiangsu are much more weaken than others. This reveals that governments of less developed regions intervene economy more through fiscal means to stimulate economic growth in short terms.

Table 1. Regression Results of Strategic Interaction on Local Expenditure (1)

Province	Interaction coefficient on TFE(Interaction coefficient on CE	
	ρ_1	ρ_2	ρ_1	ρ_2
Hebei	0.122* (0.015)	0.074** (0.005)	0.285** (0.007)	0.429** (0.010)
Jilin	0.046* (0.004)	0.153* (0.017)	0.470** (0.009)	0.604* (0.011)
Heilongjiang	0.139* (0.014)	0.050*** (0.001)	0.656* (0.026)	0.542*** (0.009)
Jiangsu	0.063 (0.144)	0.061** (0.006)	0.233** (0.005)	0.397** (0.007)
Anhui	0.044** (0.002)	0.092* (0.013)	0.520* (0.024)	0.574** (0.008)
Shanxi1	0.072*** (0.003)	0.039** (0.002)	0.623** (0.012)	0.446* (0.004)
Liaoning	0.084* (0.013)	0.058** (0.002)	0.496** (0.011)	0.378** (0.006)
Fujian	0.037 (0.109)	0.077* (0.003)	0.307* (0.016)	0.366** (0.007)
Jiangxi	0.028* (0.007)	0.105* (0.016)	0.421* (0.015)	0.463** (0.009)
Shandong	0.084* (0.009)	0.063** (0.005)	0.430*** (0.007)	0.550** (0.009)
Henan	0.106 (0.009)	0.052** (0.004)	0.543* (0.020)	0.473** (0.011)
Hubei	0.032* (0.007)	0.070* (0.012)	0.458** (0.008)	0.508* (0.004)
Hunan	0.045 (0.083)	0.082** (0.004)	0.397* (0.019)	0.617** (0.014)
Yunnan	0.093* (0.008)	0.074** (0.005)	0.377** (0.006)	0.735* (0.019)
Shanxi2	0.059** (0.002)	0.048* (0.013)	0.425** (0.011)	0.517*** (0.009)
Zhejiang	0.029* (0.010)	0.033** (0.004)	0.152* (0.014)	0.379** (0.007)
Guangdong	0.026 (0.135)	0.017* (0.010)	0.240* (0.013)	0.249*** (0.001)
Guangxi	0.054* (0.009)	0.072* (0.013)	0.471* (0.017)	0.530** (0.008)
Hainan	0.089* (0.012)	0.076 (0.095)	0.618* (0.017)	0.292** (0.007)
Sichuan	0.052* (0.010)	0.081** (0.007)	0.444** (0.010)	0.503** (0.009)
Guizhou	0.085** (0.002)	0.069** (0.007)	0.373** (0.009)	0.768** (0.012)

Notes: 1.All original data used in this study are collected from Chinese City Statistical Yearbook from 1985 to 2012, The New China 60 Years Statistical Data Assembly and Statistical Yearbook of provinces and cities concerned. 2. Standard deviations are in parentheses. *, **, *** Denote the significance at 10%, 5%, 1% respectively.

Table 2. Regression Results of Strategic Interaction on Local Expenditure (2)

Province	Interaction coefficient on SE		Interaction coefficient on ME	
	ρ_1	ρ_2	ρ_1	ρ_2
Hebei	0.015* (0.009)	0.024 (0.092)	0.029* (0.008)	0.037* (0.009)
Jilin	0.143* (0.013)	0.061** (0.004)	0.077* (0.014)	0.037* (0.012)
Heilongj	0.078** (0.004)	0.125*** (0.001)	0.049* (0.011)	0.030** (0.004)
Jiangsu	0.062 (0.146)	0.034* (0.012)	0.014* (0.009)	0.028 (0.095)
Anhui	0.069* (0.011)	0.053 (0.137)	0.082* (0.010)	0.085* (0.019)
Shanxi1	0.144 (0.208)	0.035* (0.009)	0.080* (0.012)	0.057** (0.006)
Liaoning	0.038* (0.010)	0.041** (0.003)	0.046** (0.003)	0.021* (0.017)
Fujian	0.040** (0.003)	0.025* (0.010)	0.031* (0.009)	0.024* (0.012)
Jiangxi	0.046* (0.012)	0.037** (0.005)	0.029* (0.010)	0.034 (0.111)
Shandong	0.062** (0.003)	0.077* (0.013)	0.020* (0.009)	0.039** (0.006)
Henan	0.112* (0.014)	0.028** (0.003)	0.067** (0.004)	0.053* (0.005)
Hubei	0.046* (0.009)	0.054** (0.003)	0.022** (0.005)	0.047** (0.005)
Hunan	0.051** (0.003)	0.025* (0.010)	0.036** (0.003)	0.027* (0.012)
Yunnan	0.105** (0.005)	0.190** (0.006)	0.082* (0.013)	0.137** (0.007)
Shanxi2	0.062** (0.004)	0.039* (0.009)	0.041** (0.005)	0.027* (0.010)
Zhejiang	0.045* (0.011)	0.023** (0.005)	0.033 (0.076)	0.012* (0.009)
Guang-dong	0.029* (0.009)	0.017 (0.083)	0.014* (0.009)	0.008 (0.064)
Guangxi	0.062* (0.012)	0.037* (0.009)	0.057** (0.004)	0.088* (0.013)
Hainan	0.035 (0.133)	0.049** (0.004)	0.056** (0.006)	0.038* (0.009)
Sichuan	0.034** (0.004)	0.047* (0.008)	0.025* (0.008)	0.039** (0.005)
Guizhou	0.137* (0.014)	0.092** (0.003)	0.083** (0.006)	0.136** (0.012)

Notes: 1.All original data used in this study are collected from Chinese City Statistical Yearbook from 1985 to 2012, The New China 60 Years Statistical Data Assembly and Statistical Yearbook of provinces and cities concerned. 2. Standard deviations are in parentheses. *, **, *** Denote the significance at 10%, 5%, 1% respectively.

3. Capital Spatial Allocation Efficiency in China

Jeffrey Wurgler (2000) indicates that capital allocation efficiency can be measured by the sensitivity of capital to industries growth potentiall ^[11]. According to this theory, we establish models as function (2) to measure the capital allocation efficiency

$$\ln \frac{I_{it}}{I_{i,t-1}} = \alpha + \eta \ln \frac{V_{it}}{V_{i,t-1}} + \varepsilon_{i,t}$$

(2)

where I_{it} refers to the fixed asset balance of city i year t ; V_{it} refers to the industry sales revenues of city i year t ; ε is an error term.

Capital allocation efficiencies of 21 provinces are measured based on their data from 1985 to 2012. Municipality directly under the Central Government and vice-provincial cities are not concluded in database .Provinces of Xizang, Gansu, Qinghai, Xinjiang, Ningxia, Inner Mongolia and Taiwan are unconcluded because of fragmentary data. From estimation results shown in Table 3, we can notice that developed provinces such as Jiangsu, Zhejiang and Guangdong have relatively high capital allocation efficiency.

Table 3. Estimation Results of Capital Allocation Efficiency of Provinces in China

Province	α	η	Province	α	η
Hebei	0.003** (0.001)	0.063*** (0.003)	Fujian	0.011 (0.238)	0.062* (0.010)
Jilin	0.004*** (0.001)	0.030** (0.007)	Jiangxi	0.003** (0.002)	0.077*** (0.002)
Heilongj	0.002* (0.013)	0.026* (0.013)	Shandong	0.003*** (0.001)	0.086** (0.003)
Jiangsu	0.002** (0.001)	0.127** (0.004)	Henan	0.004* (0.003)	0.049** (0.003)
Anhui	0.003* (0.008)	0.062** (0.003)	Hubei	0.002** (0.002)	0.023* (0.004)
Shanxi1	0.004** (0.003)	0.029* (0.009)	Hunan	0.003** (0.001)	0.038** (0.002)
Liaoning	0.002*** (0.000)	0.088** (0.002)	Yunnan	0.006* (0.006)	0.021* (0.008)
Guangxi	0.004** (0.002)	0.027* (0.005)	Shanxi2	0.003** (0.002)	0.039* (0.007)
Hainan	0.001** (0.001)	0.076** (0.003)	Zhejiang	0.001*** (0.000)	0.162** (0.002)
Sichuan	0.003* (0.004)	0.043** (0.002)	Guangdong	0.001*** (0.001)	0.134*** (0.002)
Guizhou	0.005** (0.002)	0.017* (0.009)			

Notes: 1. All original data used in this study are collected from Chinese City Statistical Yearbook from 1985 to 2012. 2. Standard deviations are in parentheses. *, **, *** Denote the significance at 10%, 5%, 1% respectively.

4. Capital Allocation Effect of Fiscal Expenditure Competition in China

4.1 Estimation Strategy and Variables

In order to examine the effects of local governments' fiscal expenditure on capital spatial allocation, we establish a linear regression model. The dependent variables of η_k are capital allocation efficiency of each province examined in section 3. C is the constant terms. F_k represents the fiscal competition vector of province k on fiscal

expenditure items concerned. ITE presents the strategy interaction degree on Total Fiscal Expenditure, ICE presents the strategy interaction degree on Construction Expenditure, ISE presents the strategy interaction degree on Social Expenditure, IME presents the strategy interaction degree on Maintenance Expenditure. ITE, ICE, ISE and IME are measured by the average of ρ_1 and ρ_2 in Table 1. γ is the coefficients to be estimated which stands for the effects of fiscal expenditure competition on capital allocation.

$$\eta_k = c + F_k \gamma + C_k \vartheta + \varepsilon_k \quad (3)$$

In addition to the variables of fiscal competition, we control for other factors, presented by vector C_k , that could possibly affect capital spatial allocation efficiency in the regressions. Capital allocation function of commercial bank (CB) of each province is measured by an average ratio of increased bank loan over their local GDPs from 1985 to 2012. Capital allocation function of capital market (CM) of each province is measured by an average ratio of the number of listed companies over the total company's number from 1985 to 2012. Considering that industrialization would affect capital allocation efficiency of manufacturing, variable of Industry Structure (IS), measured by a ratio of the secondary industry's GDP over total GDP, is introduced into the regression function. ϑ is the coefficients to be estimated.

4.2 Results and Discussion

Within the framework of function 3, five regressions including different kind of independent variables are estimated and the results are organized and presented in Table 4.

Table 4 Regression Results of Capital Allocation Effects of Fiscal Competition

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>c</i>	0.204*** (0.003)	0.093** (0.021)	0.347 (1.291)	0.107** (0.018)	0.138* (0.075)
<i>CB</i>	0.047* (0.136)	-0.005 (0.147)	0.007 (0.083)	-0.004 (0.066)	-0.002 (0.054)
<i>CM</i>	0.250 (0.530)	0.033 (0.104)	0.028 (0.268)	0.026 (0.175)	0.045 (0.217)
<i>IS</i>	0.023* (0.022)	0.012* (0.015)	0.009* (0.009)	0.006** (0.013)	0.004* (0.012)
<i>ITFE</i>	-0.271* (0.094)				
<i>ICE</i>		0.266* (0.115)	0.626* (0.137)	0.862** (0.081)	0.957** (0.071)
<i>ISE</i>			-2.190** (0.221)		-1.839** (0.163)
<i>IME</i>				-3.441*** (0.024)	-2.683** (0.245)
R ² -adj.	0.529	0.474	0.571	0.604	0.645
F test	5.627	4.561	5.042	5.288	5.379

Notes: 1. All original data used in this study are collected from Chinese Statistical Yearbook from 1985 to 2013 and Statistical Yearbook of provinces and cities concerned. 2. Standard deviations are in parentheses. *, **, *** Denote the significance at 10%, 5%, 1% respectively.

The negative effect of ITE on capital allocation in model 1 indicates that fiscal expenditure of local governments is not tailored well to need of market and local economic development, and then impedes the efficiency of macro-distribution of capital. Economic expenditure, such as infrastructure construction, can benefit the cost decrease

of transactions and production. Therefore, the coefficients of ICE are positive and significant. The significant and strong negative effects of IEC on capital allocation in model 3 and model 5 indicate that imitative interaction on public expenditure of science, education and administration has negative effects on capital allocation. The reason is that governments' ignoring of essential demand of local economic developments and deliberate imitation is not conducive to capital allocation. Last but not least, the negative coefficients of IME prove that the growth of government scale and unproductive expenditure are unfavorable to capital allocation efficiency.

For other independent variables in control, the coefficients of CB and CM are almost all insignificant. This is primarily due to the intervention of local governments which hinders commercial bank function efficiently on capital allocation. The coefficient of IS is small and significant on 10% level, which means that the development of industrial economy helps capital allocation to some extent. It conforms to the economic laws that industry development will improve productivity and economic efficiency.

5. Conclusion

In the fiscal decentralization system, local governments should both cooperate and compete for market and resource for their own economy development. Utilizing a spatial econometric model and liner regression, this paper analyzes characteristics and regional difference of fiscal expenditure competition between municipal governments. The results and conclusions are as follows:

The investigation results of the municipal level data indicate that fiscal expenditure policy of local governments exhibits a significant imitative interaction, which means that Chinese local governments would implement similar policy when one of them adopts measures of expenditure cuts or spending increases. This imitation on expenditure item is the results of a marked vertical fiscal imbalance at the local level leading by expenditure decentralization and revenue centralization simultaneously in fiscal regime. Meanwhile, fiscal competition characterized by imitative interaction influence capital allocation significantly. From the regression results, we can find that productive expenditure, such as infrastructure construction expenditure, has significant positive effect on capital allocation efficiency by decreasing transactions and production cost. However, the results show significant negative effects of social public expenditure and administration expenses. With the political incentive coming from official appointment system and government performance examination mainly based on local GDP, local officials strive for personal promotion by a relatively better performance on local economic developments. Therefore, ignoring real demand of local economic developments and deliberate imitation on expenditure policy inevitably impedes the efficiency of macro-distribution of capital.

To combat this distorted expenditure tendency, institutional adjustments should be introduced properly. One proposal would be to establish a more perfect performance assessment system which concludes not only local GDP but also the productivity of the public services and recourse allocation efficiency.

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