

## Capital allocation effect of Local governments' Fiscal Expenditure Competition in China

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**Abstract.** Chinese fiscal decentralization reform inspired the local governments' enthusiasm of developing region's economy, which intensifies the competition between local governments. Using a large dataset at city level from 1985 to 2012, this paper analyzes the characteristics 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 imitations of social expenditure and administration expenses impede efficient allocation of capital. The different effects can be contributed to the essential characteristic of China's fiscal competition. Finally, it is propose that central government should perfect the official's achievement assessment system as soon as possible.

**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<sup>[1]</sup>. Under the current immature market economic system, Chinese local governments intervene much more on factor allocation especially on capital using fiscal measures.

This paper studies the influences of fiscal competition on capital allocation efficiency by employing a dynamic panel data model. 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 particularly after the 1994 tax-sharing reform. Secondly, although the fiscal competition between provincial governments in China has been well documented and studied, corresponding knowledge of the sub-provincial government 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 study sheds some new lights on the area.

## 2 The characteristics of fiscal expenditure competition in China

When a local government regulates economy utilizing fiscal policy, economic operation of other regions especially the neighboring jurisdictions would be affected through mechanism of resource allocation and yardstick effect<sup>[2,3]</sup>. Therefore, we use a spatial panel model to investigate the strategic interaction on fiscal expenditure:

$$\sum_{j=1}^n w_{ij} y_{jt} + \sum_{k=1}^n \beta_k x_{kit} + \epsilon_{it} = y_{it} \quad (1)$$

where  $y_{it}$  refers to the variables that depict local expenditure policy: 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  $j$ .  $\beta_k$  are coefficients to be estimated which stands for 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  $\epsilon_{it}$  is the vector of the coefficients of those control variables.  $\epsilon_{it}$  is an error term.

We use system GMM method suggested by Madariaga (2007) and Windmeijer (2005<sup>[4,5]</sup>). And 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

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 expenses over their local GDPs.

In addition to the lags of dependent variables, we control for 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 1 after 1994. Dummy variable Dum 2007 is introduced to remove the interferences caused by the change of statistics standard, which is valued as 0 for years before 2007 and 1 after 2007.

Within the framework of function (1), we establish panel data models to analyze

the interaction of cities fiscal expenditure policies of 21 provinces separately. From estimation results of typical provinces shown in Table 1, we can notice that most  $\rho$  and  $\rho$  are positive and significant. The results indicate imitative strategic interactions exist significantly. By comparison, it is shown that imitative strategic interactions on economic expenditure are much more obvious than on other kinds of expenditure. Another clear trend is that imitative strategic interactions between cities in developed province are much more weakened than others. This reveals that governments of less developed regions intervene economy more through fiscal means.

**Table 1.** Regression results of strategic interaction on local expenditure

Province	Interaction coefficient on TFE		Interaction coefficient on CE		Interaction coefficient on SE		Interaction coefficient on ME	
Jiangsu	0.063 (0.144)	0.061** (0.006)	0.233** (0.005)	0.397** (0.007)	0.062 (0.146)	0.034* (0.012)	0.014* (0.009)	0.028 (0.095)
Zhejiang	0.029* (0.010)	0.033** (0.004)	0.152* (0.014)	0.379** (0.007)	0.045* (0.011)	0.023** (0.005)	0.033 (0.076)	0.012* (0.009)
Guizhou	0.085** (0.002)	0.069** (0.007)	0.373** (0.009)	0.768** (0.012)	0.137* (0.014)	0.092** (0.003)	0.083** (0.006)	0.136** (0.012)
Yunnan	0.093* (0.008)	0.074** (0.005)	0.377** (0.006)	0.735* (0.019)	0.105** (0.005)	0.190** (0.006)	0.082* (0.013)	0.137** (0.007)

Notes: 1. Fiscal data of 231 Chinese cities in 21 provinces from 1985 to 2012 are used. Due to the distinct advantages on economics and administration municipality directly under the Central Government and vice-provincial cities are incomparable with ordinary cities and then not concluded in database. Province of Xizang, Gansu, Qinghai, Xinjiang, Ningxia, Inner Mongolia and Taiwan are uncollected because of fragmentary data. 2. Original data used in this study are collected from Chinese City Statistical Yearbook from 1985 to 2013, The New China 60 Years Statistical Data Assembly and Statistical Yearbook of provinces and cities concerned. 3. For the limitation of thesis, we only present results of typical provinces. 4. For regression of depended variable CE, sample data are from 1985 to 2006 because item of Infrastructure Expenditure was canceled from 2007. 5. Standard deviations are in parentheses. \*, \*\*, \*\*\* Denote the significance at 10%, 5%, 1% respectively.

### 3 Capital allocation effect of fiscal competition in China

Jeffrey Wurgler (2000) indicates that capital allocation efficiency can be measured by the sensitivity of capital to industries growth potential<sup>[6]</sup>. According to this theory, we establish models as function (2) to measure the capital allocation efficiency of 21 provinces based on city data from 1985 to 2012.

(2)

where  $I_{it}$  refers to the fixed asset balance of city  $i$  year  $t$ ;  $V_{it}$  refers to the sales revenues of industry of city  $i$  year  $t$ ;  $\epsilon_{it}$  is an error term. From estimation results shown in Table 2, we can notice that developed provinces such as Jiangsu, Zhejiang and Guangdong have relatively high capital allocation efficiency.

In order to examine the effects of local governments' fiscal expenditure on capital spatial allocation efficiency, we establish a linear regression model as function (3). The dependent variables are capital allocation efficiency of each province in table 2.  $C$  is the constant terms.  $F_k$  represents the fiscal competition vector of province  $k$  on fiscal expenditure items concerned. ITFE, ICE, ISE and IME present the strategy interaction degree on TFE, CE, SE and ME respectively, which are measured by the average of  $\rho$  and  $\rho$  examined in section 2.

(3)

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**Table 2.** Estimation results of capital allocation efficiency of provinces in China

Province			Province			Province		
Hebei	0.003** (0.001)	0.063*** (0.003)	Fujian	0.011 (0.238)	0.062* (0.010)	Shanxi2	0.003** (0.002)	0.039* (0.007)
Jilin	0.004*** (0.001)	0.030** (0.007)	Jiangxi	0.003** (0.002)	0.077*** (0.002)	Zhejiang	0.001*** (0.000)	0.162** (0.002)
Heilongj	0.002* (0.013)	0.026* (0.013)	Shandong	0.003*** (0.001)	0.086** (0.003)	Guangdong	0.001*** (0.001)	0.134*** (0.002)
Jiangsu	0.002** (0.001)	0.127** (0.004)	Henan	0.004* (0.003)	0.049** (0.003)	Guangxi	0.004** (0.002)	0.027* (0.005)
Anhui	0.003* (0.008)	0.062** (0.003)	Hubei	0.002** (0.002)	0.023* (0.004)	Hainan	0.001** (0.001)	0.076** (0.003)
Shanxi1	0.004** (0.003)	0.029* (0.009)	Hunan	0.003** (0.001)	0.038** (0.002)	Sichuan	0.003* (0.004)	0.043** (0.002)
Liaonin g	0.002*** (0.000)	0.088** (0.002)	Yunnan	0.006* (0.006)	0.021* (0.008)	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 2013, 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.

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 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.

**Table 3.** Regression results of capital allocation effects of fiscal competition

	Model 1	Model 2	Model 3	Model 4	Model 5
c	0.204*** (0.003)	0.093** (0.021)-	0.347 (1.291)	0.107** (0.018) -	0.138* (0.075) -
CB	0.047* (0.136)	0.005 (0.147)	0.007 (0.083)	0.004 (0.066)	0.002 (0.054)
CM	0.250 (0.530)	0.033 (0.104)	0.028 (0.268)	0.026 (0.175)	0.045 (0.217)
IS	0.023* (0.022) -	0.012* (0.015)	0.009* (0.009)	0.006** (0.013)	0.004* (0.012)
IIF	0.271* (0.094)				
E		0.266* (0.115)	0.626* (0.137) -	0.862** (0.081)	0.957** (0.071) -
ICE			2.190** (0.221)		1.839** (0.163) -
ISE				-3.441*** (0.024)	2.683** (0.245)
R <sup>2</sup> -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 2012 and Statistical Yearbook of provinces and cities concerned. 2. Standard deviations are in parentheses. \*, \*\*, \*\*\* Denote the significance at 10%, 5%, 1% respectively.

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

## 4 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 exhibit a significant imitative interaction, which means that in China local governments would implement similar policy when one of them adopts measures of expenditure cuts or spending increases. 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 a significant negative effect 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 impeded 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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