The Impacts of Fiscal Decentralization on the Quality of Government in China: A Test of Market-Preserving Federalism at the Provincial Level

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The potential influence of fiscal decentralization on economic growth in China has been extensively studied. This paper examines whether fiscal decentralization has influenced marketization and regional disparity (intra-provincial expenditure inequality) and the tradeoff between them (quality of government, QoG). When local governments have sufficient fiscal autonomy, decentralizing fiscal power to sub-provincial governments is found to have a greater impact on increasing marketization, highlighting the important role of fiscal self-sufficiency in the effect of fiscal decentralization on market efficiency. Measuring the QoG from the marketization versus disparity perspective, we find a reversed U-shape relationship between revenue decentralization and QoG. Comparing the effect of fiscal decentralization on the QoG in different regions, intra-provincial revenue decentralization in the eastern area is above the optimal level, while the fiscal decentralization in the middle and western areas is near the optimal level. This paper combines the perspectives of fiscal decentralization and governance and conducts an empirical test of market-preserving federalism to explain differences among provinces.

Keywords: fiscal decentralization, marketization, disparity, quality of government

INTRODUCTION

China has succeeded in maintaining high economic growth over the past 40 years, which has been accompanied by government reform. Many scholars have tried to explain the reasons for this “growth miracle” by considering economic theories or political reforms. The question of whether fiscal decentralization has influenced economic growth in China has been extensively studied (F. Cai, Wang, & Du, 2002; Lin & Liu, 2000; Martinez-Vazquez & Rider, 2006; T. Zhang & Zou, 1998). As a complement to the existing literature, this paper examines whether fiscal decentralization has influenced marketization and regional disparity (intra-provincial expenditure inequality) and the tradeoff between them. We also tentatively measure the quality of government (QoG) from the marketization versus disparity perspective to investigate the impact of fiscal decentralization on QoG.

What is QoG? Does QoG matter? Scholars and institutions use different definitions and measurements to capture QoG. The most frequently used definition of QoG rests on the World Bank’s notion of governance (Kaufmann, Kraay, & Zoido-Lobatón, 1999, 2002). Daniel Kaufmann and Aart Kraay of the World Bank produced the Worldwide Governance Indicators (WGI), which compiles a wide range of governance data and measures different aspects of governance according to their definition. These six aspects include voice and accountability, political instability and violence, government effectiveness, regulatory quality, rule of law and control of corruption.1

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1 In this paper, we use equality (inequality) and equity (inequity) interchangeably after clarifying the key differences. For detailed information and to download the full dataset, refer to http://info.worldbank.org/governance/wgi/index.aspx#home.
With regard to China’s government quality, as a part of the research stream that explains China’s rapid development, this paper investigates the relationship between intra-provincial fiscal decentralization and QoG in China. Different from most of the literature, in this paper, we tentatively measure QoG from the marketization (efficiency) versus regional disparity (equality) perspective since an appropriate balance of efficiency and equity should be the goal of any society and a specific integration of the two can be used for government performance measurement. While there has long been heated debate regarding the principles of equity and efficiency, we construct an index of QoG, integrating the influences of both aspects on marketization and regional disparity.

Based on the relationship between efficiency and equality, this paper designs an integrated framework to measure QoG, with regard to the government’s intention to create an efficient market (marketization index) and necessary policy to ensure social equality (for instance, the Gini coefficient of public expenditure). The theory indicates that, in different stages of development and from two different perspectives, a good QoG should have different emphases. Based on the data from 1997 to 2009 in 31 provinces of China, this article analyzes how fiscal decentralization has contributed to the progress of China’s social-economic development, especially to QoG in terms of a balanced governance that can ensure both higher marketization and less regional disparity. By combining the perspectives of fiscal decentralization and government quality, this paper provides evidence that explains the post-1978 transition and prosperity of China and tests market-preserving federalism at the provincial level in China.

**LITERATURE REVIEW**

This section provides a brief literature review on fiscal decentralization, marketization, regional disparity, and QoG, mainly focusing on the impacts of fiscal decentralization and the measurement of government quality.

**Fiscal Decentralization and Marketization**

The impacts of fiscal decentralization on economic and fiscal variables, governance, and political outcomes have been substantially discussed by scholars (Martinez-Vazquez, 2015). Market-preserving federalism (the second generation of fiscal federalism) is an important stream of literature discussing the relationship between fiscal decentralization and marketization/economic growth (Jin, Qian, & Weingast, 2005; Montinola, Qian, & Weingast, 1995; Qian & Weingast, 1997; Weingast, 1995).

Some research investigates market-preserving federalism in different countries, including the United States (McKinnon, 1997; Weingast, 1995; Wibbels, 2005), Russia (Plehanov, 2007), India (Biju, 2007; Dua & Singh, 2003; Saez, Singh, & Dua, 2003), Australia (Braun, 2006), Argentina (Gordin, 2007) and Nigeria (Alo, 2012; Eme, Onyishi, & Ugwu, 2011). Weingast (2009, p. 281) further discusses five conditions that differentiate federal systems (a necessary condition for federalism).

For China, intergovernmental fiscal relations are such that the 1994 tax-sharing reform centralized tax revenues, and the expenditure responsibilities were kept local and even more decentralized (P. Zhang, Zhu, & Hou, 2016). According to Weingast’s (2009) framework, China’s fiscal decentralization does not necessarily conform to the five conditions: (F1) Hierarchy (fulfilled with limits), (F2) Subnational autonomy (compromised), (F3) Common market (compromised), (F4) Hard budget constraints (compromised), (F5) Institutionalized authority (absent). The World Bank described China’s intergovernmental fiscal relations as fiscal federalisms inside fiscal federalism (World Bank, 2002), and provinces have the discretion to

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2 Unless otherwise specified, fiscal decentralization in this paper refers to *intra-provincial* fiscal decentralization.

3 For instance, Hood (1991, p. 10) argued, “However, any simple dichotomy between ‘efficiency’ and ‘equity’ can be countered by NPM’s advocates on the grounds that ‘efficiency’ can be conceived in ways which do not fundamentally conflict with equity (Wilenski, 1986), and that equity values could perfectly well be programmed in to the target-setting and performance indication process, if there was strong enough political pressure to do so.”

4 World Bank (2002), China: Provincial Expenditure Inspection Report. Cited from Guang Zhang, 2009. A Primary Research on Fiscal Decentralization across Provinces in China since the 1994 Fiscal Reform, *Journal of Public Administration* (in Chinese), 2(1): 133-158.
decentralize fiscal power. Under this circumstance, how does fiscal decentralization affect marketization at the provincial level? This paper will investigate this question by testing marketing preserving federalism at the provincial level in China.

**Fiscal Decentralization and Regional Disparity**

Another stream of literature discusses the relationship between fiscal decentralization and regional disparity. From a theoretical point of view, it is ambiguous whether regional disparities increase or decrease and whether regions converge or diverge (Lessmann, 2009). Neoclassical growth theory (Solow, 1956), new growth theory (Romer, 1986, 1990), and the new economic geography (Krugman, 1993) are three important branches of the economic literature. On the other hand, empirical tests focus on the effects of fiscal decentralization in different countries including European Union countries, Colombia, Indonesia, Morocco, and China.

While much of the research indicates that fiscal decentralization increased regional disparity, in contrast some scholars find that a high degree of decentralization is connected to low regional disparities (Ezcurra & Pascual, 2008; Lessmann, 2009). Fiscal decentralization processes that attribute greater tax power to lower government tiers could also be effective in reducing intra-regional disparities in health outcomes in Italy, and the degree of economic development significantly affects the effectiveness, which highlights the importance of properly taking into account the specific features of the context (Novi, Piacenza, Robone, & Turati, 2015).

Bonet (2006) finds strong evidence that the fiscal decentralization process increased regional income disparities, which seems to be explained by the allocation of a major portion of new local resources to current spending (e.g., wages and salaries). Using spatial analysis to study the districts in Indonesia between 1994 and 2004, Arintenang (2014) finds that there is evidence of spatial autocorrelation and that the regional convergence rate is higher in the decentralization period. Fadli (2014) examines the direct and indirect effects of fiscal decentralization on the regional disparity in eastern and western Indonesia (2006-2012) through studying economic growth and find no direct effect. Using an econometric approach, Harouche and Bougantouche (2015) investigate the effects of fiscal decentralization and budget deconcentration on the regional disparities in Morocco between 2002 and 2011 and find that the impacts are related to budget deconcentration when it is combined with the fiscal decentralization.

Scholars also discuss China’s regional disparity and its causes. Shen (2004) argues that initially rich provinces were mainly located in inland areas, and the catching-up of the coastal region first brought about a convergence of the growth pattern across provinces in the 1980s. The subsequent divergence in the provincial growth rates increased the regional disparity in China in the 1990s. Wang (2010) investigates how decentralization in the 1980s and 1990s altered the foundation of underlying economic inequalities among China’s regions. West and Wong (1995) conclude that fiscal decentralization has contributed to very large and growing interregional inequalities in the provision of social services in China. These inequalities affect not only the welfare and living standard of the populace but also the investment in human resources.

Government quality can mediate the relationship between fiscal decentralization and regional disparities. The empirical evidence, based on a sample of 24 OECD countries over the period of 1984 to 2006, indicates that fiscal decentralization promotes regional convergence in high government quality settings. However, decentralization leads to wider regional disparities in countries with poor governance (Andreas P. Kyriacou, Muinelo-Gallo, & Roca-Sagalés, 2015), which highlights the importance of QoG.

**The Quality of Government**

Scholars and institutions use different definitions and measurements to capture QoG and thus to estimate the effects of QoG. Rothstein and Teorell (2008, p. 165) propose a coherent and specific definition of QoG: *the impartiality of institutions that exercise government authority*. Holmberg, Rothstein, and Nasiritousi (2009) review the conceptual discussion of what QoG
means; present the important concepts of QoG such as democracy, economic growth, corruption, and the rule of law; and investigate the effects of QoG on different aspects of society.5

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999) empirically investigate the determinants of QoG in a large cross-section of countries. They find that larger countries perform better, while countries that are poor, close to the equator, ethnolinguistically heterogeneous, use French socialist laws, or have high proportions of Catholics or Muslims exhibit inferior government performance. As one of the key elements of government quality, corruption has attracted the most attention from scholars. Mauro (1998) offers a list of possible causes and consequences of corruption since tentative evidence implicates that corruption may have considerable adverse effects on economic performance. Identifying the possible causes of corruption may suggest a number of ways to curb it. Tanzi and Davoodi (1998) further investigate the relationship between corruption, public investment, and growth, focusing on the problem of corruption instead of solutions. In addition to the channels in Mauro (1995, 1998), they found four additional arguments supporting that corruption can reduce growth. Fisman and Gatti (2002) study the relationship between fiscal decentralization and corruption at the cross-country level measured by a number of different indexes, and a very strong and consistent negative association was found between the two variables. Bardhan and Mookherjee (2006) conclude that the effects of decentralization on corruption and government accountability are complex and cannot be summarized by simple, unconditional statements.

With regard to the relationship between decentralization and QoG, there are two contradicting streams of effect (Bardhan, 2002; Bardhan & Mookherjee, 2006; Treisman, 2000). First, greater decentralization can promote inter-jurisdictional competition, thus reducing corruption and the undersupply of infrastructure support for private investors (Cebula & Ekstrom, 2009; Kong, 2011), leading governments to be more honest and efficient by bringing officials “closer to the people” (Treisman, 2000) and solidifying budget constraints to prevent governments from bailing out inefficient enterprises (Bardhan & Mookherjee, 2006). However, at the same time, decentralization might create coordination problems and obstacles to reform, while increasing incentives to eliminate and shirk on public good provision (Treisman, 2000). High-powered fiscal incentives can compound inter-jurisdictional externalities: local governments attract investors by colluding with them, promoting regional growth at the expense of other regions (Bardhan & Mookherjee, 2006). These contradicting effects highlight the importance of accompanying decentralization with institutional safeguards or the role of central government as a watchdog. This is to prevent the excessive capture of local governments by monitoring the performance of local governments and guaranteeing minimal service provision through targeted interventions in lagging areas (Bardhan & Mookherjee, 2006).

Huther and Shah (1998) develop an index for the quality of governance for a sample of 80 countries. They find a surprisingly strong positive relationship between fiscal decentralization and the quality of governance. However, Treisman (2000) argues that the strong relationship may be due to the reason that there were not any control variables. While Fisman and Gatti (2002) and De Mello and Barenstein (2001) both use the origin of countries’ legal systems as an instrument for fiscal decentralization, Treisman (2000) claims that it is not a good instrument since legal systems also directly influence the dependent variable, QoG (La Porta et al., 1999). Andreas P Kyriacou and Roca-Sagalès (2011a, 2011b) find that fiscal decentralization improves government quality, but this positive effect is mitigated by political decentralization such as regional elections and multi-level government. Based on Bolivia’s experience, Faguet (2004) finds that objective indicators of need are the most important determinants of sectoral changes in investment

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5 In 2004, Bo Rothstein and Sören Holmberg founded the QoG Institute at the University of Gothenburg. For details, refer to http://www.qog.pol.gu.se. The most recent data are from Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Felix Hartmann & Richard Svensson. 2015. The Quality of Government Standard Dataset, version Jan15. University of Gothenburg: The Quality of Government Institute, http://www.qog.pol.gu.se.
Table 1. The Rank of QoG for Different Provinces in 2009 (Efficiency vs. Equality)

| Code | Province        | Market Rank | Equality Rank | QoG Rank | QoG1 Rank |
|------|----------------|-------------|---------------|----------|-----------|
| 11   | Beijing        | 9.87 5      | 7.41 2        | 8.55 1   | 8.64 1    |
| 12   | Tianjin        | 9.43 6      | 3.80 18       | 5.99 7   | 6.62 5    |
| 13   | Hebei          | 7.27 17     | 4.31 12       | 5.60 15  | 5.79 16   |
| 14   | Shanxi         | 6.11 22     | 4.90 6        | 5.47 17  | 5.50 19   |
| 15   | Inner Mongolia | 6.27 20     | 2.67 29       | 4.09 27  | 4.47 26   |
| 21   | Liaoning       | 8.76 9      | 3.75 20       | 5.73 12  | 6.25 11   |
| 22   | Jilin          | 7.09 18     | 3.81 17       | 5.20 21  | 5.45 20   |
| 23   | Heilongjiang   | 6.11 22     | 3.17 25       | 4.40 23  | 4.64 25   |
| 31   | Shanghai       | 10.96 3     | 5.85 3        | 8.01 2   | 8.41 2    |
| 32   | Jiangsu        | 11.54 2     | 3.10 26       | 5.98 8   | 7.32 4    |
| 33   | Zhejiang       | 11.80 1     | 3.93 14       | 6.81 3   | 7.86 3    |
| 34   | Anhui          | 7.88 12     | 3.69 22       | 5.39 18  | 5.78 17   |
| 35   | Fujian         | 9.02 7      | 3.70 21       | 5.78 11  | 6.36 8    |
| 36   | Jiangxi        | 7.65 13     | 4.91 5        | 6.13 5   | 6.28 10   |
| 37   | Shandong       | 8.93 8      | 3.79 19       | 5.82 10  | 6.36 7    |
| 41   | Henan          | 8.04 11     | 4.63 7        | 6.10 6   | 6.34 9    |
| 42   | Hubei          | 7.65 13     | 4.24 13       | 5.69 13  | 5.94 15   |
| 43   | Hunan          | 7.39 16     | 4.60 8        | 5.83 9   | 6.00 13   |
| 44   | Guangdong      | 10.42 4     | 1.82 31       | 4.36 24  | 6.12 12   |
| 45   | Guangxi        | 6.17 21     | 4.49 9        | 5.26 20  | 5.33 22   |
| 46   | Hainan         | 6.40 19     | 4.40 11       | 5.31 19  | 5.40 21   |
| 50   | Chongqing      | 8.14 10     | 3.81 16       | 5.57 16  | 5.98 14   |
| 51   | Sichuan        | 7.56 15     | 2.41 30       | 4.27 26  | 4.99 24   |
| 52   | Guizhou        | 5.56 27     | 7.57 1        | 6.49 4   | 6.57 6    |
| 53   | Yunnan         | 6.06 24     | 5.21 4        | 5.62 14  | 5.64 18   |
| 54   | Xizang         | 0.38 31     | 3.88 15       | 1.21 31  | 2.13 31   |
| 61   | Shaanxi        | 5.65 26     | 3.25 24       | 4.28 25  | 4.45 27   |
| 62   | Gansu          | 4.98 29     | 3.08 27       | 3.92 29  | 4.03 29   |
| 63   | Qinghai        | 3.25 30     | 3.45 23       | 3.35 30  | 3.35 30   |
| 64   | Ningxia        | 5.94 25     | 4.48 10       | 5.16 22  | 5.21 23   |
| 65   | Xinjiang       | 5.12 28     | 3.07 28       | 3.96 28  | 4.09 28   |

Note: For the purpose of this comparison, QoG is based on a geometric average of marketization and equalization (inversed disparity), and QoG1 is based on an arithmetic average.

patterns, contradicting common claims that the local governments are too corrupt, institutionally weak, or prone to interest-group capture to improve upon the central government’s allocation of public resources. H. Cai and Treisman (2006) argue that neither political decentralization nor fiscal decentralization has contributed to China’s market reforms and the remarkable economic performance but rather growth-enhancing policies that emerged from competition between pro-market and conservative factions in Beijing has fostered China’s successes.

Much of the research on QoG is at the national level; the few exceptions include Knack (2002), who
analyzes the impact of various forms of “social capital” on QoG (measured by governmental performance) in the American states, and Rice (2001), who studied the relationship between social capital and government performance in Iowa communities. Both focused on government performance as one aspect of government quality. In contrast, this paper focuses on QoG at the provincial level in China. While we assume that QoG is politically centralized in China’s provincial context, this study is among the first to investigate the relationship between fiscal decentralization and QoG at the provincial level in China.

DATA AND MEASUREMENTS

In this paper, we measure QoG from the efficiency versus equity perspective. The efficiency measurement for different provinces is obtained from the marketization index compiled by Fan Gang and Wang Xiaolu (Fan & Wang, 2003; Fan, Wang, & Zhu, 2010). There are five main components in the index: (1) government-market relations, (2) non-governmental economic development, (3) the development of the product market, (4) the development of the factor market, and (5) the development of intermediary organizations and the legal system environment in the market. Each component includes several sub-categorical measurements. For the equity concern, we measure equity using the Gini coefficient of per capita government expenditures among different districts and counties (including county-level cities) within each province. We also use the coefficient of variation and the Theil index as equity measures for validity tests. Thus, to integrate the efficiency and equity indexes, we construct a measurement for the QoG: a geometric average of efficiency and equity.6

\[
Q = \sqrt{\text{efficiency} \times \text{equity}} = \sqrt{M \times \frac{1}{N}}
\]

where M is a marketization index and N is the Gini coefficient. Since a large Gini coefficient for local government expenditures indicates inferior government quality, we use the inversed version 1/N to measure equality (less disparity). Table 1 provides the rank of QoG for different provinces in 2009. To facilitate the explanation and comparison, marketization and equalization indexes are standardized with a mean of 1; thus, we can compare each index with 1.7 The results confirm our intuition quite well. Beijing ranks the first, and Shanghai ranks the second. Tibet and Qinghai are among the last two. The exception is Jiangxi province, which ranks third due to a good balance of efficiency and equity (both are approximately 6.7). Guangdong and Jiangsu’s ranks are quite low, considering their highly developed economies, due to the substantially low equity level. To allow for a comparison, we also provide the measurement based on the arithmetic average in the table below. Most of the literature measures fiscal decentralization using per capita provincial revenue/expenditure divided by per capita revenue/expenditure averaged at the national level. However, there is a possible issue: the share of a province’s per capita own-source revenue or own-source expenditure in the national average may indicate how fiscally important or large the province is but does not indicate whether it is more decentralized. There are different variations based on this measurement; however, this is a common problem for most decentralization measurements. In this paper, two different ratios (revenue decentralization and expenditure decentralization) are used to represent fiscal decentralization. Different from most of the literature, revenue decentralization for each province is measured by total on-budget own-source revenue for all sub-provincial governments as a share of total provincial revenue (provincial level plus all sub-provincial levels); similarly, outlay decentralization is total on-budget own-source expenditure as a share of total provincial expenditure.

The fiscal data were obtained from the Compendium of Fiscal Statistics for All Prefectures, Cities, and

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6 We use geometric average instead of arithmetic average based on the principle of diminishing marginal utility and the increasing marginal misery index of inequity, i.e., the benefit of marginally increased efficiency diminishes, while the cost of increased inequity increases. Note that since the average of M is larger than the average of 1/N, the geometric average assigns a greater penalty to inequity (high Gini coefficient).

7 The mathematical transformation is straightforward: standardized index = index value / the mean of all provinces.
Table 2. Summary Statistics for the Main Variables (30 Provinces, 1997-2009)

| Variable                          | Obs | Mean  | Std. Dev. | Min   | Max   |
|-----------------------------------|-----|-------|-----------|-------|-------|
| QoG                               | 390 | 4.52  | 1.25      | 2.04  | 8.72  |
| Marketization                     | 390 | 5.79  | 2.12      | 1.29  | 11.80 |
| Equity index                      | 390 | 3.75  | 1.36      | 1.10  | 7.65  |
| Revenue decentralization          | 388 | 0.76  | 0.12      | 0.36  | 0.97  |
| Expenditure decentralization      | 388 | 0.71  | 0.10      | 0.45  | 0.89  |
| Fiscal self-sufficiency           | 390 | 0.54  | 0.18      | 0.18  | 1.12  |
| Per capita GDP (in 10 thousand yuan) | 390 | 1.39  | 1.06      | 0.23  | 5.82  |
| Government size (expenditure/GDP) | 390 | 14.84 | 6.39      | 5.31  | 45.02 |
| Fiscal transfers/expenditures     | 390 | 50.68 | 16.26     | 4.47  | 93.00 |
| Urbanization rate                 | 390 | 33.41 | 15.80     | 14.04 | 88.16 |
| Number of county-level governments| 390 | 88.81 | 44.64     | 1.00  | 181.00|
| Urban-rural income gap            | 390 | 2.88  | 0.66      | 1.60  | 4.76  |
| Total population (in 10 thousands)| 390 | 4.25  | 2.62      | 0.50  | 10.13 |
| Population density                | 390 | 5.39  | 1.23      | 1.93  | 8.25  |
| Minority population ratio         | 390 | 9.67  | 15.32     | 0.00  | 61.80 |

Counties in the Country (1997-2009). Population data were obtained from the Demographic Data in Cities and Counties of China (1997-2010). Other control variables were obtained from the China Statistical Yearbook (1997-2010).8

**METHODOLOGY AND HYPOTHESES**

With a panel-data set of 30 provinces from 1997 to 2009, in alignment with the results of the Hausman test, we use fixed effects to estimate the effects of fiscal decentralization on QoG, on efficiency (marketization index), and on equity (the reverse of the Gini coefficient). The models are as follows.9

\[
Y_{it} = \alpha + \beta_1 FD_{it-1} + \beta_2 (FD \times Fiscal)_{it-1} + \beta_3 X + \mu_i + \delta_t + \varepsilon_{it}
\]

where \(Y\) stands for the dependent variables including the QoG, the marketization index, and the equity measurement. \(FD\) is fiscal decentralization, and \(Fiscal\) indicates the fiscal self-sufficiency rate, which is measured as own-source revenue divided by expenditure for each province. \(X\) is a vector of control variables including other social-economic statuses per capita GDP, government size (expenditure as a percentage of GDP), the urbanization rate, political competition (the number of county-level governments within each province), the urban-rural income gap (average urban income divided by rural income), the total population (in 10 thousands), population density, and the percentage of minority population. \(\mu_i\) and \(\delta_t\) indicate the province and year fixed effects, respectively, and \(\varepsilon_{it}\) is the error term. The interaction term \((FD \times Fiscal)\) is included since we believe that fiscal decentralization will have a greater effect when it is accompanied with higher fiscal self-sufficiency rates and enough fiscal autonomy. We note that here, fiscal decentralization measures the decentralized sub-provincial governments within each province, while self-sufficiency is a measurement for each province as a whole. The assumption is that decentralizing the fiscal power downward to sub-provincial governments

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8 Note that we use data from 1997 to 2009 because the key variable intra-provincial expenditure inequality is based on the expenditures of all districts, counties and county-level cities, which are available only until 2009, and the data on the marketization index have been available only since 1997.

9 While non-stationarity is an important issue, as mentioned in Ooi and Lee (2004), a linear combination of two non-stationary series may also be stationary. If such a stationary linear combination exists, the two non-stationary series are said to be cointegrated (Engle & Granger, 1987).
can have an effect only if there is enough fiscal autonomy for the local governments; otherwise, local governments still depend on other fiscal sources instead of own-source revenue even though the expenditure is very decentralized. To address this possible endogeneity issue, the fiscal decentralization measurements and the interaction terms are lagged one year in all regressions. Table 2 provides the summary statistics of the major variables.

Political and fiscal decentralization warrants local autonomy, which releases and promotes the ability to attain greater efficiency and has mainly been evidenced by marketization and private sector development in China over the past three decades. For instance, immediately after the reform and opening-up policy, with the decentralization of political and fiscal powers, we witnessed a rapidly rising trend of tilting to the private sector. Meanwhile, the decentralization-caused autonomy could further create large disparities among different aspects including GDP growth, the income gap, and fiscal power (revenue and expenditure). The large social-economic gaps that exist among the different regions of China have long been important issues to be addressed. Here arises the tradeoff between the effects of fiscal decentralization on efficiency and those on equity: fiscal decentralization may increase efficiency but simultaneously increase inequity. There should exist an optimal point where there is a balance of the two effects on efficiency and equity. Thus, we can expect a U-shaped relationship between fiscal decentralization and QoG measured using the marketization versus equality perspective. We propose the following hypotheses:

(1) Since fiscal decentralization promotes local autonomy, provinces with higher fiscal decentralization will have higher efficiency, as measured by the marketization index.
(2) Fiscal autonomy creates fiscal disparities, i.e., provinces with greater fiscal decentralization will have a higher Gini coefficient for local government expenditure.
(3) The effects of fiscal decentralization on the marketization index and government expenditure disparity are greater for provinces with higher fiscal self-sufficiency rates.
(4) There is a reversed U-shaped relationship between fiscal decentralization and QoG when it is measured as the integration of efficiency and equality.
RESULTS AND DISCUSSION

Based on Figure 1, we find that fiscal decentralization within the provinces from 1997 to 2009 has a quite stable trend. Approximately 70% to 80% of both revenue and expenditure were administered by sub-provincial governments. However, there is a slightly decreasing trend for fiscal self-sufficiency, especially from 1997 to 2002. The right panel of Figure 1 indicates that the Gini coefficient of local expenditure within each province also has a relatively stable trend with a slight drop in the platform in 2002 due to the further recentralization reform of income tax. The efficiency denoted by the marketization index increased steadily with the rapidly growing economy. Consistently, the constructed index of the QoG also increased steadily, particularly after 2002, which corresponds to the proposal of the scientific development view in 2003.

The regression results indicate that, on average, expenditure decentralization increases efficiency as measured by the marketization index, but revenue decentralization is not significant. After adding the interaction term of fiscal decentralization and self-sufficiency, the statistically significant coefficients provides some interesting results. For provinces with higher fiscal self-sufficiency, the effects of fiscal decentralization on market efficiency are much larger, even when fiscal decentralization is measured by revenue decentralization. These results corroborate the hypotheses quite well. The results indicate that when there is enough fiscal autonomy for the province, decentralizing fiscal power downward to sub-provincial governments increases efficiency to a greater degree, highlighting the importance of self-sufficiency for the effect of fiscal decentralization on market efficiency. For the effects of fiscal decentralization on the equity denoted by the inverse of the Gini coefficient of local expenditure, the results are not significant, which contradicts the hypotheses. A possible explanation is that local expenditure disparities have much more complicated determinants than just fiscal capacity. The complication also explains why Jiangsu and Guangdong provinces have a quite low equity index even though they have strong economies and the fiscal capacity to distribute equalizing transfers. This implication leaves an interesting direction for further research.

The regression table for the effects of fiscal decentralization on efficiency and equity is omitted due to space limitations and is available by request.
For the control variables, most of the results confirm our hypotheses. Provinces with higher per capita GDP are more likely to have high market efficiency. Political competition measured by the number of county-level governments promotes higher efficiency and better equity. Provinces with larger governments have lower expenditure equity, and higher population density tends to increase government equity. The two effects may be due to the fact that small provinces can better address intra-provincial disparity and richer provinces with larger population density have enough capacity to reduce the government expenditure gap.

The QoG measurement is constructed based on the geometric average of efficiency and equity. Since fiscal decentralization has a positive effect on market efficiency and a negative effect on expenditure equity, we expect that the effect of fiscal decentralization on QoG should be a reversed U-shape. The results are shown in Table 3. We do find a reversed U-shaped relationship between revenue decentralization and QoG. Based on the coefficients, we calculate the optimal level of revenue decentralization to be approximately 0.7 to 0.8; by coincidence, revenue decentralization stays quite stable from 0.7 to 0.8, with the mean at 0.76 in the sample period. The results indicate that revenue decentralization was in the optimal range during the past decade with respect to its effect on QoG. Expenditure decentralization is not significant; the signs indicate a possible reversed U-shaped relationship (negative coefficient of the square term and positive coefficient of the linear term). Consistently, government size decreases QoG. Both political competition and population density tend to increase QoG.

We divide the provinces into different regions: east, middle, and west. As shown in Figures 2, for fiscal decentralization in the eastern area, both revenue decentralization and expenditure decentralization are kept stable from 70% to 75%. Revenue decentralization in the middle area is always higher than that in the eastern area, while revenue decentralization in the western area was relatively high (close to the west) and gradually dropped below 75%. Revenue decentralization was even lower than that in the eastern area during recent years. For expenditure decentralization, during most years in

| Variables                      | (1) QoG | (2) QoG | (3) QoG | (4) QoG | (5) QoG | (6) QoG |
|--------------------------------|---------|---------|---------|---------|---------|---------|
| Rev decentralization (lag)     | 12.00*  | 9.498*  | 10.35*  |         |         |         |
|                                | (6.014) | (5.151) | (5.215) |         |         |         |
| Rev dec (square lag)           | -7.044  | -5.832  | -6.759* |         |         |         |
|                                | (4.389) | (3.809) | (3.884) |         |         |         |
| Exp decentralization (lag)     | 4.334   | 5.616   | 6.057   |         |         |         |
|                                | (8.938) | (8.651) | (8.248) |         |         |         |
| Exp dec (square lag)           | -0.773  | -2.265  | -3.071  |         |         |         |
|                                | (6.881) | (6.740) | (6.469) |         |         |         |
| Observations                   | 358     | 358     | 358     | 358     | 358     | 358     |
| R-squared                      | 0.759   | 0.758   | 0.796   | 0.797   | 0.798   | 0.799   |
| Number of id                   | 30      | 30      | 30      | 30      | 30      | 30      |

Note: Robust standard errors are clustered for each province and appear in parentheses (the results are similar for the standard test statistics), *** p<0.01, ** p<0.05, * p<0.1

Based on the regression function, -8.395X^2+13.74X, the optimal point is 13.74/8.395/2=0.818; based on the regression function with an interaction term, -7.533X^2+10.43X, the optimal point is 10.43/7.533/2=0.692.
the sample period, intra-provincial decentralization in the middle and western areas was lower than that in the eastern area. However, during the most recent few years, expenditure decentralization in the middle area increased to a level higher than that of the eastern area, which was approximately 80%. Even though expenditure decentralization in the western area is the lowest among the three regions, it has increased greatly during the past years, approaching a level similar to that of the other two regions.

We further regress the models for different regions. The results are shown in Table 4. Both the models with and without interaction terms are included. The results indicate that, with respect to effect on QoG, different regions have different optimal levels of fiscal decentralization. If we take the average of the results from the models with and without the interaction terms, the optimal levels in the regions are 62.3% (revenue), 79.0% (revenue), and 68.6% (expenditure) for the eastern, middle, and western areas, respectively. The optimal level in the eastern level is apparently lower than that of the other two areas. A possible explanation is that eastern developed provinces paid enough (or even too much) attention to efficiency; thus, less decentralization is needed. Moreover, if we compare the optimal levels with the actual ones, the optimal revenue decentralization in the eastern area is approximately 62.3%, while the actual value is 72.7%. This indicates that the eastern provinces could decrease within-provincial revenue decentralization to increase QoG. Intra-provincial centralization is needed to rebalance efficiency and equity with a better focus on the equity issue. In contrast, for provinces in both the middle and western areas, the actual values of fiscal decentralization are quite close to the optimal level. In the middle area, the optimal revenue decentralization is approximately 79.0%, and the average actual value is 79.4%; in the western area, the optimal expenditure decentralization is approximately 68.6%, and the average actual value is 67.8%.

CONCLUSION

This paper studies the effects of fiscal decentralization on QoG in China’s provinces. Different from most literature, this paper measures QoG from an efficiency versus equity perspective. The results indicate that when there is enough fiscal autonomy for the province, decentralizing the fiscal power downward to sub-provincial governments has a greater impact on increasing efficiency, highlighting the importance of self-sufficiency for the effect of fiscal decentralization on market efficiency. We also find a reversed U-shaped relationship between revenue decentralization and QoG. Our interviewees often considered their involvement in neighborhood affairs as part of their contribution to the country. They felt that their work in the neighborhood would promote the country’s development. The association seemed so natural that it was often mentioned without much supportive reasoning. We contended that this association might find its root in one strain of Confucianism: virtuous individuals should cultivate themselves, regulate their households, and then contribute to the good order of their states. Such an ethical idea imbued a special responsibility to the homeowners, motivating them to look beyond immediate personal interests.

As mentioned in the opening remarks, the provinces in less developed areas (middle and western areas) should focus more on the first stage of distribution/allocation (efficiency side), while the eastern area should pay more attention to redistribution (equity issue) given its highly developed economy. Therefore, the eastern area has a lower optimal level of fiscal decentralization in terms of equity, and the optimal level of fiscal decentralization in the middle and western areas is much higher, conforming to reality quite well. When we compare the optimal levels with the actual values, revenue decentralization in the eastern area is higher than the optimal level, indicating the need to decrease
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The results of this study differ from much the literature that proposes more decentralization and local autonomy. It is a reality that, in China, even local governments in the eastern area still face the problem of fiscal shortages with a heavy burden of fiscal responsibility. The findings here indicate that to increase QoG, intra-provincial revenue decentralization for the eastern provinces should be decreased. However, decreased intra-provincial decentralization does not always decrease local fiscal capacity. A decrease in intra-provincial decentralization can be accompanied with a downward shift in fiscal revenue power from the central government to provinces. An integration of the two policy directions will finally both increase local fiscal power and decrease intra-provincial decentralization, thus increasing QoG without hurting the fiscal capacity of local governments.

The results of this paper provide evidence that,

### Table 4. Effects of Fiscal Decentralization on QoG in Different Regions

| Variables                  | East          | Middle        | West          |
|----------------------------|---------------|---------------|---------------|
|                            | without interaction terms |               |               |
| FD_rev (lag)               | 11.84*        | 47.23**       | -19.24**      |
|                            | (6.300)       | (15.85)       | (6.428)       |
| FD_rev (square lag)        | -9.621*       | -30.42**      | 13.35**       |
|                            | (5.018)       | (10.96)       | (4.593)       |
| FD_exp (lag)               | -17.15        | -35.01        | 15.24         |
|                            | (16.10)       | (25.08)       | (10.99)       |
| FD_exp (square lag)        | 12.67         | 26.16         | -10.99        |
|                            | (12.03)       | (17.46)       | (8.626)       |
|                            | with interaction terms |               |               |
| FD_rev (lag)               | 15.52         | 43.61**       | -25.92**      |
|                            | (9.017)       | (14.73)       | (11.10)       |
| FD_rev (square lag)        | -15.11        | -24.43**      | 22.24**       |
|                            | (9.633)       | (9.194)       | (9.723)       |
| FD_rev*self-fiscal (lag)   | -3.357        | 8.758         | 22.67*        |
|                            | (8.573)       | (6.017)       | (10.59)       |
| FD_rev*self-fiscal (square lag) | 6.545        | -11.12        | -24.53        |
|                            | (10.59)       | (6.008)       | (14.21)       |
| FD_exp (lag)               | -28.81*       | -76.72*       | 33.61**       |
|                            | (15.73)       | (40.44)       | (13.53)       |
| FD_exp (square lag)        | 25.61         | 66.92         | -30.49**      |
|                            | (15.27)       | (38.44)       | (11.77)       |
| FD_exp*self-fiscal (square lag) | -16.99       | -44.72        | 25.19***      |
|                            | (17.17)       | (44.33)       | (7.732)       |
| Optimal (without interaction) | 61.5%        | -             | -             |
| Optimal (with interaction)  | 63.1%         | 80.4%         | -             |
| Actual value               | 72.7%         | 72.9%         | 79.4%         |

Note: The dependent variable is QoG. All control variables are included in the regressions but not shown in the table. Robust standard errors are clustered for each province and appear in parentheses, *** p<0.01, ** p<0.05, * p<0.1
given certain conditions, intra-provincial fiscal decentralization in China represents market-preserving federalism as “fiscal federalisms inside fiscal federalism.” However, this conclusion is applicable only to certain periods of China’s development and cannot be generalized to other countries or even other periods of China’s history. The fiscal incentives approach implies that the fiscal system directly influences whether governments choose market-fostering or market-distorting policies. Tiebout (1956) discusses the beneficial effects of the property tax for local government. Property taxes are an important component of local government fiscal structure. As a tax-benefit link, property taxation will lead local governments to focus on citizen welfare (Glaeser, 1996; Hoxby, 1999). How will the levy of a new property tax by local governments help China strengthen market-preserving fiscal federalism? This is a possible important direction deserving further research.

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