

FISCAL DECENTRALIZATION AND LOCAL GOVERNMENT SIZE IN CHINESE PREFECTURE-LEVEL CITIES: DOES FISCAL TRANSPARENCY MATTER?*

Cong LIU

Judhiana ABD GHANI

Wency BUI KHER THINNG

Cong LIU

PhD Candidate, Department of Economics,
School of Business and Economics,
Universiti Putra Malaysia, Serdang, Selangor, Malaysia

Judhiana ABD GHANI (corresponding author)

Senior Lecturer, Department of Economics,
School of Business and Economics,
Universiti Putra Malaysia, Serdang, Selangor, Malaysia
E-mail: judhiana@upm.edu.my

Wency BUI KHER THINNG

Senior Lecturer, Department of Economics,
School of Business and Economics,
Universiti Putra Malaysia, Serdang, Selangor, Malaysia

* **Acknowledgement.** Data availability statement: the data set is freely available for other researchers to use and is available upon request from the author.

Abstract

Fiscal transparency strengthens accountability mechanisms through mitigating information asymmetry, probably moderating the effect of fiscal decentralization on local government size. Using data from 283 Chinese prefecture-level cities, this study tests the hypothesis with the Generalized Method of Moments (GMM) estimator. We find that fiscal decentralization expands local government size under low transparency, but this positive effect weakens as transparency improves and becomes insignificant beyond a threshold. Vertical balance, reflecting reliance on own-source revenue, initially increases government size, but this effect diminishes with higher fiscal transparency and turns negative at higher transparency levels. These findings reveal that the common-pool hypothesis holds conditionally, suggesting that fiscal transparency is critical to ensure that fiscal decentralization promotes efficient public resource allocation.

Keywords: fiscal decentralization, local government size, fiscal transparency, vertical balance.

1. Introduction

In the 1970s, many countries implemented government reforms aimed at reducing the role of central governments while expanding the fiscal authority of subnational governments, which has continued to spread globally into the 21st century (Faguet, 2014). Fiscal decentralization has become a crucial component of the modern institutional system, promoting high-quality governance and coordinating regional development through optimizing resource allocation, enhancing local governments' autonomous capacity, and strengthening fiscal accountability (Rodden, 2003). This has led to extensive research in this field, particularly emphasizing the effects of fiscal decentralization on issues such as economic growth, government size, and corruption control (Martínez-Vázquez, Lago-Peñas and Sacchi, 2017). Among these issues, the relationship between fiscal decentralization and government size remains a frequently discussed topic, yet it continues to generate significant debate due to conflicting empirical findings (Choudhury and Sahu, 2023).

Since the 1980s, China has implemented fiscal reforms to advance fiscal decentralization. In 1994, the State Council (1993) enacted a historic reform that restructured the allocation of fiscal revenue and expenditure responsibilities across different government levels. Further, the State Council (2018) introduced the 'Reform plan for the division of fiscal powers and expenditure responsibilities between the central and local governments in basic public services'. These reforms have granted local governments greater budgetary autonomy while increasing their financial and administrative obligations. Over the past few decades, China has sustained a high level of provincial-local fiscal decentralization, at approximately 80% (National Bureau of Statistics, 2023). Within this framework, the size of local governments in Chinese prefecture-level cities has expanded considerably. The proportion of local government expenditure relative to GDP has risen from 13% in 2011 to 14.8% in 2022 (National Bureau of Statistics, 2023).

Numerous studies have investigated the relationship between fiscal decentralization and government size. Rodden (2003) argues that the use of government expenditure as a measure of government size may lead to biased results when testing the Leviathan hypothesis, as such expenditure includes intergovernmental transfers, supported by further findings. Ashworth, Galli and Padovano (2013) reveal that revenue decentralization shrinks government size, while transfers expand it in the short term but it adjusts over time. Jin and Zou (2002) investigate decentralization's effect on governments at different levels, finding that expenditure decentralization expands aggregate and subnational government size, while revenue decentralization reduces overall and central government size. Cassette and Paty (2010) show that tax decentralization increases subnational size but reduces that of central governments. Asngar, Nkoa and Younda (2024) confirm these patterns in sub-Saharan Africa, finding that tax decentralization enlarges central and local governments. Makreshanska-Mladenovska and Petrevski (2019) reveal that in developed countries, expenditure decentralization reduces government size, while revenue decentralization increases it; in contrast, in transition economies, revenue decentralization appears to constrain government size. In China, Zhang (2016) shows that fiscal

decentralization expands provincial size, while Zhang, Zhu and Hou (2016) find similar effects at the county level. More recently, scholarly attention has shifted to external moderating factors like governance and democracy, which significantly alter the decentralization-government size relationship (Choudhury and Sahu, 2023; Thanh and Canh, 2019; Qiao, Ding and Liu, 2019).

Fiscal transparency is an institutional factor that may influence the relationship between fiscal decentralization and government size. Defined as the public availability of information regarding government structures, functions, fiscal policy objectives, public sector accounts, and projections (Kopits and Craig, 1998), fiscal transparency represents a critical yet relatively recent component of modern governance systems. The International Monetary Fund (IMF, 2007) identifies fiscal opacity as a key contributor to the late 20th century financial crises and advocates for institutionalizing transparency. Today, fiscal transparency has become an integral element of fiscal governance frameworks. Substantial evidence confirms transparency's efficacy in curbing corruption by increasing the risks and costs associated with corrupt practices (de Abreu and Gomes, 2021; Montes and Luna, 2021). Fiscal transparency reduces information asymmetries and mitigates potential conflicts of interest between citizens and governments (Bastida, 2019). The constraining effect may moderate the impact of decentralization on government size.

Following global trends in fiscal reform, China has prioritized fiscal transparency and achieved remarkable progress over the past two decades. The State Council's (2007) Government Information Disclosure Regulations create clear guidelines for public access to government information. This framework was significantly strengthened when the National People's Congress (2014) amended the Budget Law of the People's Republic of China, mandating comprehensive and timely budget disclosure across all government levels. These institutional reforms have yielded substantial results: by 2022, local governments had dramatically improved their budget transparency practices. The Ministry of Finance (2024) reports that over 99% of local governments publicly release their fiscal budgets and final accounts. This progress is further corroborated by Tsinghua University research (2023), which documents significant improvements in budgetary openness across Chinese prefecture-level cities throughout the preceding decade.

China's implementation of fiscal decentralization through successive reforms has yielded significant outcomes. This devolution of fiscal authority accompanies the expansion of local government size. However, the precise relationship between fiscal decentralization and local government size remains ambiguous. Some scholars attribute these divergent results to variations in external environmental factors, such as democracy, while overlooking the potential role of fiscal transparency. Notably, Chinese local governments have improved fiscal transparency over the past two decades, enhancing accountability through reduced information asymmetry. While growing empirical research has focused on fiscal transparency's governance effects, its externalities remain understudied. Two questions arise: How does decentralization affect local government size in Chinese prefecture-level cities? How does fiscal transparency moderate this relationship?

The objective of this study is twofold: to examine the impact of fiscal decentralization on local government size; and to analyze the moderating role of transparency in their relationship. We propose a two-dimensional measure of fiscal decentralization, reflecting its magnitude and form via fiscal decentralization and vertical balance indicators, select a sample covering 283 prefecture-level cities from 2013 to 2022, and use the GMM approach. Marginal effects analysis reveals how decentralization's impact varies with fiscal transparency. Robustness checks apply alternative variable measures of government size, fiscal decentralization, and vertical balance. This study offers several contributions. Theoretically, it enriches decentralization literature by revealing the conditioning role of fiscal transparency as an external institutional factor. It also extends transparency research by highlighting its extended effect. Practically, findings inform policymakers on tailoring decentralization strategies and leveraging transparency to enhance fiscal governance.

2. Theoretical foundations and hypotheses

2.1. Fiscal decentralization and government size

Early theories on the relationship between fiscal decentralization and government size, rooted in Tiebout's (1956) model, highlight the efficiency of decentralized governance by emphasizing inter-jurisdictional competition and citizen mobility. Musgrave (1959) and Oates (1972) further argued that local governments, by their proximity to constituents, are better suited to provide public goods, potentially expanding government size due to increased demand from improved allocative efficiency. In contrast, Brennan and Buchanan (1980) abandon the assumption of a benevolent state, instead viewing governments as self-interested entities akin to Leviathan. Here, decentralization is seen as a mechanism to curb government expansion by fostering competition among local governments over mobile tax bases (Oates, 2005). Competitive pressures incentivize jurisdictions to reduce tax burdens and limit inefficiencies, restraining excessive government growth (Weingast, 2009).

As these theories focus on the overall size of government, the effect of decentralization on local governments needs some extension. The rationale for fiscal decentralization derives from Tiebout's (1956) model, which suggests that local governments' provision of public goods can achieve Pareto efficiency. Fiscal decentralization naturally increases local government size due to more fiscal autonomy. The size of local governments after this decentralization is the benchmark size, distinguishing from the original size. According to Oates' (1972) theory, local government size should be larger than the benchmark size due to stimulated public demands. In contrast, from Brennan and Buchanan's (1980) perspective, although competition constrains expansion, the resulting local government size should still be larger than the original size but smaller than the benchmark size without external intervention. Thus, we propose the hypothesis:

H1: Fiscal decentralization enlarges the size of local governments.

Scholars have emphasized that its form critically shapes its impact. The common-pool hypothesis (Weingast, Shepsle and Johnsen, 1981) argues that shared access to public resources leads to over-extraction and larger government size due to the externalization of fiscal costs. Brennan and Buchanan (1980) suggest that decentralization's constraining effect depends on the degree of collusion among local governments; greater collusion weakens interjurisdictional competition and undermines fiscal discipline. Rodden (2003) differentiates between types of decentralization, noting that own-source revenue decentralization tends to restrain government size, while transfer-dependent decentralization may fuel its expansion.

We define vertical balance to measure the decentralization form, reflecting reliance on own-source revenue. According to the collusion hypothesis (Brennan and Buchanan, 1980), intergovernmental collusion weakens the constraint effect of fiscal decentralization on government size. Therefore, if decentralization increases local governments' own-source revenue, the overall level of fiscal decentralization remaining constant, the constraint effect is strengthened, reducing local government size. Additionally, based on the common-pool hypothesis, increasing own-source revenue would lead to more supervision, limiting government expansion (Rodden, 2003). Thus, we propose the hypothesis:

H2: Vertical balance (reliance on own-source revenue) constrains the size of local governments.

2.2. Fiscal transparency as a moderator in the fiscal decentralization and government size nexus

Fiscal transparency derives its theoretical foundation from the principal-agent framework (Jensen and Meckling, 1976), which explains the inherent information asymmetry between citizens (principals) and governments (agents). This asymmetry persists despite electoral delegation of authority because citizens cannot monitor complex administrative processes. The resulting agency problem emerges when governmental actors prioritize bureaucratic self-interest (Niskanen, 2017), diverging from social welfare maximization as their informational advantage persists (Alt and Lassen, 2006). Fiscal transparency addresses this governance challenge by mitigating information asymmetries (Kaufmann and Bellver, 2005). This mechanism strengthens accountability (Hameed, 2005). Thus, fiscal transparency serves as an integrated governance mechanism that realigns bureaucratic incentives with public interest objectives.

Fiscal decentralization intensifies competition for the mobile tax base (Brennan and Buchanan, 1980). However, the effectiveness of this mechanism depends on information delivery. Under conditions of information opacity, decentralization may fail to enhance competition, as firms and citizens cannot perceive and respond to policy adjustments. As fiscal transparency improves, it reduces information asymmetry, enabling them to identify and compare fiscal policies. This promotes interjurisdictional competition, strengthening the constraining effect of decentralization on local government size. Moreover, from the perspective of Oates (1972), fiscal decentralization stimulates citizens' public demands.

Nevertheless, fiscal transparency encourages citizens to be more rational, limiting the expansionary effect. Accordingly, we propose the hypothesis:

H3: Fiscal transparency constrains the positive effect of fiscal decentralization on local government size.

The common-pool hypothesis argues that own-source revenue attracts more attention from citizens because they are directly levied on them (Rodden, 2003). This difference in attention results in larger local government size. However, this process is also influenced by transparency. With low transparency, decentralization through either own-source revenue or transfer payments may have a similar impact on the size. Due to information asymmetry, differences in attention are not effectively translated into accountability for government expansion. As fiscal transparency improves, the efficiency of this translation increases, strengthening the oversight effect driven by citizens' differential attention. Thus, we propose the hypothesis:

H4: Fiscal transparency amplifies the negative effect of vertical balance on local government size.

3. Research methodology

3.1. Sample selection and data sources

This study focuses on prefecture-level cities in China, the administrative level directly below provinces. Ten cities were excluded due to missing data, resulting in a final sample of 283 cities. The analysis covers the period from 2013 to 2022. Fiscal transparency data are obtained from Tsinghua University. Socioeconomic and fiscal variables are drawn from the China Economic Information Network (CEInet) Statistics Database, which compiles information from official statistical yearbooks and government reports.

3.2. Variable definitions and measurements

3.2.1. Dependent variable

Local government size (GS) is measured by the ratio of general public budget expenditures to GDP in a Chinese prefecture-level city. This expenditure-based measure is widely adopted in empirical research, as it more comprehensively reflects the scope of government activity (Qiao, Ding and Liu, 2019; Thanh and Canh, 2019). Some studies, however, use government revenue to capture fiscal capacity, suggesting it represents governments' real influence (Sirait, 2017). To ensure robustness, this study constructs an alternative measure (GS1), the ratio of total revenue, including general public budget revenue and transfer payments, to GDP. Following the literature (Makreshanska-Mladenovska and Petrevski, 2019), a positive coefficient is expected for its lagged term.

3.2.2. Explanatory variables

Fiscal decentralization (FD) is measured as the ratio of general public budget expenditure per capita in a prefecture-level city to that in its superior province. This expenditure-based approach aligns with most empirical studies, though some also examine revenue decentralization (Asngar, Nkoa and Younda, 2024). An alternative indicator (FD1) is constructed using total revenue. Following Zhang (2016), all measures are standardized on a per capita basis to account for inter-provincial differences in city numbers. Theoretically, fiscal decentralization is expected to positively affect local government size.

Vertical balance (VB) is defined as the ratio of general public budget revenue to budget expenditure in a prefecture-level city, indicating the extent to which delegated expenditure is financed by own-source revenue. While previous studies have used either fiscal autonomy (the share of own-source revenue in total revenue) or vertical imbalance (the share of transfer payments) to capture the form of decentralization (Ashworth, Galli and Padovano, 2013; Golem and Malešević Perović, 2014), these measures are based on total revenue, lacking systematization with the magnitude indicator. To ensure coherence, this study adopts an expenditure-based definition for vertical balance. Additionally, for robustness, we construct an alternative indicator (VB1), the share of own-source revenue in total revenue. Based on the theoretical framework, vertical balance is expected to negatively affect local government size.

3.2.3. Moderating variable

Fiscal transparency (FT) is measured using the index developed by Tsinghua University, which is based on the IMF's Manual on Fiscal Transparency (2007) and tailored to the Chinese context. Since 2013, Tsinghua has annually evaluated the fiscal transparency of prefecture-level cities and published the results, which have been widely used in empirical studies (Li and Yang, 2024; Sun and Andrews, 2020). The original scores are normalized to a 0–100 scale, with higher values indicating greater transparency. To address potential heteroscedasticity, the index is log-transformed. In line with the theoretical framework, fiscal transparency is hypothesized to exert a negative moderating effect on the relationships between fiscal decentralization and government size, and between vertical balance and government size.

3.2.4. Control variables

Population size (PS) is measured by the number of residents in a prefecture-level city, log-transformed. As the population increases, public demand tends to rise. However, this may generate economies of scale, lowering marginal costs and reducing government size. Empirical studies consistently report a negative relationship between population and government size (Makreshanska-Mladenovska and Petrevski, 2019; Choudhury and Sahu, 2023). Therefore, a negative coefficient is expected.

Real GDP per capita (RGP) is calculated using the GDP growth index with 2011 as the base year. According to Wagner's Law, the income elasticity of demand for public goods

is greater than one; as income rises, citizens demand relatively more public goods, leading to government expansion. While many studies support this view (Qiao, Ding and Liu, 2019; Makreshanska-Mladenovska and Petrevski, 2019), others find an inverse relationship (Prohl and Schneider, 2009; Choudhury and Sahu, 2023). Despite mixed evidence, this study expects a positive coefficient, in line with Wagner’s Law. Variable definitions and data sources are summarized in Table 1, and Table 2 provides descriptive statistics.

Table 1: Variable definitions and data sources

Variable	Definition	Source
Government Size, Primary, GS	The proportion of general public budget expenditures to GDP in a prefecture-level city (%).	China City Statistical Yearbooks
Government Size, Alternative, GS1	The proportion of total revenue to GDP in a prefecture-level city (%).	China City Statistical Yearbooks, City-level Statistical Authorities
Fiscal Decentralization, Primary, FD	The proportion of general public budget expenditure per capita in a prefecture-level city relative to that in its superior province (%).	China City Statistical Yearbooks, China Provincial Statistical Yearbooks
Fiscal Decentralization, Alternative, FD1	The proportion of total revenue per capita in a prefecture-level city relative to that in its superior province (%).	China City Statistical Yearbooks, China Provincial Statistical Yearbooks, City-level Statistical Authorities
Vertical Balance, Primary, VB	The proportion of general public budget revenue to expenditure in a prefecture-level city (%).	China City Statistical Yearbooks
Vertical Balance, Alternative, VB1	The proportion of general public budget revenue to total revenue in a prefecture-level city (%).	China City Statistical Yearbooks, City-level Statistical Authorities
Fiscal Transparency, FT	The fiscal transparency index of Chinese prefecture-level cities, measured on a scale from 0 to 100, where higher values indicate better fiscal transparency (log-transformed).	Tsinghua University https://www.sppm.tsinghua.edu.cn/xycbw/yjbg.htm
Population Size, PS	The number of residents in a prefecture-level city, in millions (log-transformed).	Statistical Yearbooks of prefecture-level cities
Real GDP Per Capita, RGP	Real GDP per capita in a prefecture-level city (2011 fixed prices), in thousands (log-transformed).	Statistical Yearbooks of prefecture-level cities

Note: All the yearbook data is collected from the CEInet Statistics Database, [Online] available at <https://ceidata.cei.cn/>

3.3. Econometric model specification

Following the theoretical framework, a dynamic panel model with two-way fixed effects is constructed to investigate the influence of fiscal decentralization on local government size, with a particular emphasis on the moderating role of fiscal transparency, as shown in Equation (1).

$$GS_{it} = \beta_1 GS_{it-1} + \beta_2 FD_{it} + \beta_3 VB_{it} + \beta_4 FT_{it} + \beta_5 (FD_{it} - \overline{FD}_i)(FT_{it} - \overline{FT}_i) + \beta_6 (VB_{it} - \overline{VB}_i)(FT_{it} - \overline{FT}_i) + \beta_0 + \theta X + \mu_i + \omega_t + \varepsilon_{it} \quad (1)$$

where *GS* denotes government size, *FD* represents fiscal decentralization, *VB* stands for vertical balance, *FT* refers to fiscal transparency, and *X* is a set of control variables, including population size (PS) and real GDP per capita (RGP). The overline indicates the group mean of the variable. The term μ_i refers to the individual fixed effect, ω_t denotes the time-period fixed effect, and ε_{it} is the error term.

The interaction terms are introduced to examine the moderating effects of fiscal transparency, and group mean centering is applied to the variables involved in the interaction terms. This technique isolates within-group variation and reduces potential multicollinearity between interaction terms and their components, as recommended by Balli and Sørensen (2013). Additionally, these coefficients alone do not reveal how fiscal transparency moderates the relationships in question. Following Qiao, Ding and Liu (2019), this study thus conducts a marginal effects analysis.

3.4. Estimation and model selection

The study adopts Difference and System GMM estimators (Arellano and Bover, 1995; Blundell and Bond, 1998) to address the potential endogeneity arising from the reverse causality between government size and economic development. The estimation uses orthogonal deviations, a two-step procedure, and error correction. Diagnostic tests include the Arellano-Bond test for autocorrelation and the Hansen J test for instrument validity. Additionally, Kiviet (2020) emphasizes that model selection is critical, especially when higher-order lags and additional covariates may improve estimation performance. Andrews and Lu (2001) introduced the Model and Moment Selection Criteria (MMSC) for GMM estimation. Accordingly, this study incorporates lagged terms and adopts these criteria to identify model specifications.

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Government Size, Primary	2,830	0.216	0.106	0.057	0.872
Government Size, Alternative	1,912	0.269	0.125	0.080	0.971
Fiscal Decentralization, Primary	2,830	0.854	0.238	0.376	2.494
Fiscal Decentralization, Alternative	1,912	0.859	0.263	0.346	2.499
Vertical balance, Primary	2,830	0.433	0.214	0.056	1.107
Vertical balance, Alternative	1,912	0.332	0.155	0.049	0.775
Fiscal Transparency	2,830	49.352	17.627	2.770	92.150
Population Size	2,830	4.303	2.920	0.256	21.268
Real GDP per capita	2,830	57.392	32.489	8.502	250.633

Source: The authors

4. Empirical results and discussion

4.1. Estimation results

The estimation results in Table 3 provide baseline evidence. The validity of the GMM estimations is supported by three key diagnostics: the Arellano-Bond tests confirm first-order autocorrelation and no second-order autocorrelation; the Hansen J tests consistently support instrument validity, indicating no over-identification issues; and joint significance tests of time dummies confirm the appropriateness of the two-way fixed effects specification.

Table 3 reveals the consistently significant positive coefficient of the lagged government size variable across all models, confirming the path-dependent nature of government expansion processes. Model 1 demonstrates statistically significant but temporal effects of fiscal decentralization: While the contemporaneous term exhibits a positive coefficient, the lagged term shows a countervailing negative effect. In contrast, the vertical balance displays a positive yet insignificant association. The independent analysis of fiscal transparency in Model 2 yields a positive but statistically insignificant coefficient. When incorporating them in Model 3, transparency achieves statistical significance but reverses to negative, while vertical balance becomes significant. Models 4 and 5 include the interaction of fiscal transparency with decentralization and vertical balance, respectively. Both interaction terms enter with statistically significant negative coefficients. Finally, Model 6, which includes both interaction terms, reveals a coherent pattern: contemporaneous fiscal decentralization and vertical balance show positive effects, while decentralization's first-order lag, fiscal transparency itself, and both interaction terms demonstrate statistically significant negative coefficients.

Model selection criteria yield results consistent with overall significance levels. First, Model 3 demonstrates superior explanatory power relative to Models 1 and 2, as evidenced by consistently lower values across all selection criteria. This confirms that simultaneously incorporating decentralization and transparency variables significantly enhances model performance. Second, Models 4 and 5, each featuring a distinct interaction term, show further improvement over Model 3 through systematically better criterion values, indicating that either interaction term enhances model fit. Third, Model 6, incorporating both interaction terms, achieves optimal performance with the lowest selection criteria values. These results demonstrate that the complete specification with dual interaction terms provides a better empirical fit.

Using the System GMM approach, Model 7 has similar results. Decentralization exhibits divergent temporal effects, positively influencing current local government size while negatively affecting subsequent period size. Vertical balance positively affects government size. Both effects are estimated conditional on fiscal transparency being at its within-group mean. Additionally, transparency negatively affects local government size when both decentralization and vertical balance are at their within-group means. The negative interaction terms confirm that transparency serves as an overall negative moderator of both

Table 3: Main empirical results

	Difference GMM					System GMM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Government Size, <i>it-1</i>	0.890*** (12.13)	0.979*** (5.67)	0.910*** (13.05)	0.875*** (12.90)	0.960*** (13.04)	0.882*** (12.97)	0.967*** (17.82)
Fiscal Decentralization, <i>it</i>	0.400*** (4.47)		0.393*** (4.99)	0.318*** (3.82)	0.342*** (3.12)	0.296*** (4.24)	0.243*** (2.70)
Fiscal Decentralization, <i>it-1</i>	-0.249*** (-3.73)		-0.280*** (-5.19)	-0.213*** (-3.25)	-0.283*** (-3.00)	-0.207*** (-3.78)	-0.220*** (-3.06)
Vertical Balance, <i>it</i>	0.194 (1.50)		0.225* (1.91)	0.126 (1.14)	0.239** (2.10)	0.199** (2.07)	0.104* (1.86)
Fiscal Transparency, <i>it</i>		0.003 (0.11)	-0.019* (-1.88)	-0.021** (-2.18)	-0.028** (-2.33)	-0.022** (-2.37)	-0.023** (-1.98)
Fiscal Decentralization* Fiscal Transparency, <i>it</i>				-0.446*** (-3.43)		-0.315*** (-2.68)	-0.295** (-2.49)
Vertical balance* Fiscal Transparency, <i>it</i>					-0.967** (-2.23)	-0.493* (-1.69)	-0.689*** (-3.39)
Population Size, <i>it</i>	0.111 (1.36)	0.062 (0.60)	0.104 (1.30)	-0.047 (-0.57)	0.022 (0.31)	-0.025 (-0.37)	-0.001 (-0.18)
Real GDP per capita, <i>it</i>	-0.529*** (-3.33)	-0.120 (-0.19)	-0.473*** (-3.60)	-0.604*** (-4.57)	-0.819*** (-3.37)	-0.660*** (-4.86)	-0.654*** (-5.20)
Real GDP per capita, <i>it-1</i>	0.325*** (2.70)	0.092 (0.18)	0.294*** (2.66)	0.349*** (3.14)	0.648*** (2.82)	0.414*** (3.41)	0.557*** (5.31)
Constant	0.437 (0.95)	0.023 (0.03)	0.435 (1.03)	0.978*** (2.64)	0.575 (1.20)	0.896** (2.29)	0.413*** (3.05)
AR(1) Test	-5.177 0.000	-4.436 0.000	-6.022 0.000	-5.859 0.000	-4.211 0.000	-6.015 0.000	-6.677 0.000
AR(2) Test	-0.085 0.932	-0.921 0.357	0.240 0.810	-0.630 0.529	-0.875 0.382	-0.918 0.358	-1.117 0.264
Hansen J Test	7.229 0.300	1.333 0.513	7.995 0.434	3.810 0.923	6.624 0.676	5.571 0.850	9.495 0.798
Chi-squared Test	173.66 0.000	178.79 0.000	201.51 0.000	154.79 0.000	109.92 0.000	136.84 0.000	130.43 0.000
MMSC-AIC	-4.771	-2.667	-8.005	-14.190	-11.376	-14.429	-18.506
MMSC-BIC	-26.643	-9.958	-37.169	-46.999	-44.185	-50.883	-69.542
MMSC-HQIC	-13.749	-5.659	-19.975	-27.657	-24.843	-29.392	-39.454
Number of Observations	2547	2547	2547	2547	2547	2547	2547

Note: t-statistics are presented in parentheses. Significance levels are indicated as follows: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The first rows of the tests show the test statistics, while the second rows display the corresponding p-values. The hypothesis for the Chi-squared test is that all time dummy variables are equal to zero. MMSC denotes the model and moment selection criteria. AIC, BIC, and HQIC refer to the Akaike, Bayesian, and Hannan-Quinn Information Criteria, respectively.

Source: The authors

relationships. Additionally, population size remains insignificant. Real GDP per capita shows significant negative contemporaneous effects but positive lagged effects. While contrasting with Wagner’s Law, it finds support in empirical work by Ashworth, Galli and Padovano (2013) and Makreshanska-Mladenovska and Petrevski (2019).

4.2. Marginal effects analysis

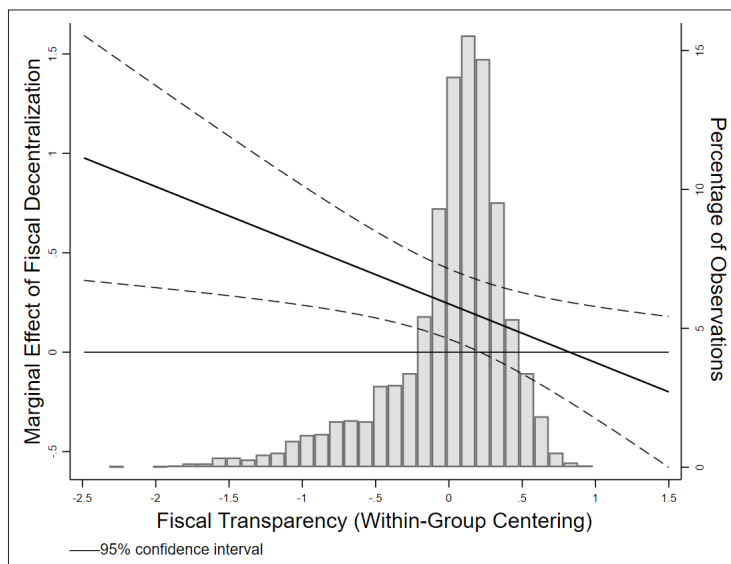


Figure 1: Marginal effects of fiscal decentralization on government size

Source: The authors

The estimation results do not indicate whether fiscal decentralization and vertical balance significantly impact government size when fiscal transparency deviates from its within-group mean. According to Model 7, Figure 1 presents the marginal effects of fiscal decentralization on government size, with the x-axis showing transparency and the left y-axis displaying the marginal effects. The figure incorporates a histogram of fiscal transparency using the right y-axis to indicate observation percentages. The downward-sloping solid line demonstrates how the marginal effects of decentralization decline as transparency increases, flanked by two dashed lines representing 95% confidence intervals, while another solid line parallel to the x-axis marks the zero marginal effects. The zero marginal effects line intersects the lower confidence bound at approximately 0.2 without intersecting the upper bound, indicating significantly positive effects when transparency falls below this threshold and statistically insignificant effects when transparency exceeds it. This pattern shows that decentralization exerts a significantly positive effect on local government size at low transparency levels, with this effect gradually diminishing as transparency improves and becoming statistically insignificant once transparency surpasses a threshold slightly above the within-group mean.

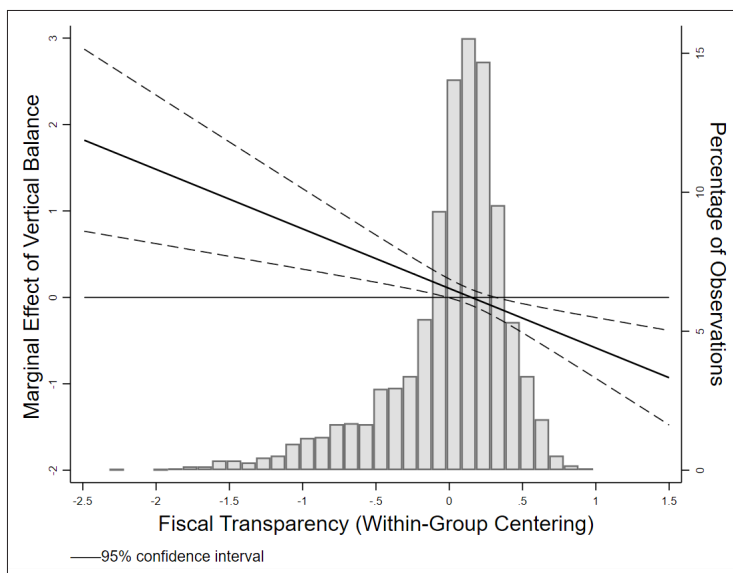


Figure 2: Marginal effects of vertical balance on government size

Source: The authors

Figure 2 illustrates how the marginal effect of vertical balance varies with transparency. The downward-sloping solid line indicates that the positive marginal effects of vertical balance on government size diminish as fiscal transparency increases. Furthermore, the 95% confidence intervals intersect the zero-effect line at approximately 0 and 0.3. Within this interval, we cannot reject that vertical balance has no statistically significant effect on local government size. Notably, when transparency falls below the lower bound of this interval, vertical balance exerts a significantly positive effect. Conversely, when transparency exceeds the upper bound, the effect becomes significantly negative. In summary, at low levels of transparency, an increase in vertical balance significantly expands local government size. However, as transparency improves, this positive effect gradually weakens. When it exceeds the within-group mean but remains below 0.3, variations in vertical balance exhibit no statistically discernible impact. Once transparency surpasses this threshold, further increases in vertical balance significantly reduce government size.

4.3. Discussions

The positive effect of fiscal decentralization on local government size supports Hypothesis 1. When local governments have more fiscal power, they tend to utilize it to provide more public goods, thereby naturally expanding their size. Although decentralization may enhance interjurisdictional competition, local governments may still engage in additional provision, resulting in a larger size. Moreover, the finding that improved fiscal transparency weakens the expansion effect of decentralization on local government size supports Hypothesis 3. On one hand, transparency reduces information asymmetry

between mobile tax bases and local governments, intensifying the competitive pressure from decentralization. On the other hand, transparency enhances citizen oversight by increasing the availability of fiscal information, making public demands more rational.

The positive effect of vertical balance and the moderating effect of fiscal transparency reject Hypothesis 2 and Hypothesis 4. According to the common-pool hypothesis, citizens pay more attention to how local governments allocate own-source revenue, which expands government size. However, our results challenge this view. In low-transparency environments, own-source revenue exerts a stimulative effect on local government size. One possible explanation is that, under low transparency, own-source revenue offers greater operational flexibility, enabling local governments to adopt opaque practices without facing accountability. However, this mechanism weakens as fiscal transparency improves. Enhanced transparency reduces information asymmetry, strengthens public oversight, and curbs questionable measures. Consequently, the positive effect of vertical balance diminishes. At higher levels of fiscal transparency, the impact of vertical balance reverts to significantly negative, as described by the common-pool hypothesis. This implies that the validity of the common-pool hypothesis depends on a prerequisite of high transparency.

The positive effect of fiscal decentralization on local government size aligns with most studies. For instance, Asngar, Nkoa and Younda (2024), using cross-country data, as well as Zhang (2016) and Zhang, Zhu and Hou (2016) on China, all find that fiscal decentralization tends to correlate with larger lower-level governments. Although some studies focus on subnational or provincial levels, the consensus suggests that decentralization is associated with government expansion at lower tiers. Furthermore, while the present study finds that the effect of decentralization on local government size becomes statistically insignificant at high levels of fiscal transparency, this result does not contradict the findings of prior studies, as extremely high levels of transparency remain relatively rare, and the threshold identified in our analysis is quite high.

The positive effect of vertical balance is in line with Ashworth, Galli and Padovano (2013). Unlike Rodden (2003), who identified a negative effect of own-source revenue on government size, Ashworth, Galli and Padovano found a positive effect of own-source revenue. However, both studies focus on general government size, limiting comparability. Moreover, our findings diverge from those of Cassette and Paty (2010) and Jin and Zou (2002), who also examined the impact of decentralization on subnational government size. However, the latter discussed the effects of decentralization magnitude and form separately. In contrast, the former employed a specification more like ours but found a positive effect of vertical imbalance on subnational government size. The difference may be attributed to their sample, which covers the EU-15 countries, known for their relatively high levels of fiscal transparency. This corresponds to the finding that vertical balance negatively influences local government size under high transparency.

Although the moderating effects identified in this study differ from those by Choudhury and Sahu (2023), Obeng (2021), and Qiao, Ding and Liu (2019), the results are not necessarily contradictory, as we focus on different levels of governments. Moreover,

while democracy and fiscal transparency function as institutions, our theoretical foundation depends on principal-agent theory rather than broader institutional theory. The study by Thanh and Canh (2019) is more comparable, as they focus on the moderating role of governance in Vietnam provinces. However, the opposite result may stem from their measurement approach, the share of total decentralized budgetary revenues to expenditures, diverging from more conventional indicators. Nonetheless, their study and ours converge on a central insight: institutional factors act as a critical moderating force that reshapes the relationship between decentralization and government size.

5. Robustness checks

This study conducts comprehensive sensitivity analyses using alternative measurement indicators, with the results presented in Table 4. The diagnostic tests consistently confirm the validity of all model specifications. As shown in the table, the alternative models yield estimation results largely consistent with the baseline model: the lagged government size, current fiscal decentralization, and vertical balance remain significantly positive, while both interaction terms are significantly negative. These checks collectively reinforce the validity of our core findings across different measurement approaches.

6. Conclusion and policy recommendations

While existing research has established that institutional context mediates the relationship between decentralization and government size, the predominant focus has been on democracy, overlooking other governance mechanisms, particularly fiscal transparency, which has emerged as a critical dimension of modern public administration. By reducing information asymmetry between citizens and governments, fiscal transparency strengthens accountability and constrains opportunistic behavior. This study addresses that gap by systematically examining how fiscal transparency moderates the impact of decentralization on local government size.

This study's analysis of 283 Chinese prefecture-level cities (2013–2022) yields four key findings. First, evidence confirms decentralization's expansionary effect on local government size, with provincial-level devolution consistently increasing local government size. Second, fiscal transparency emerges as a potent moderating factor, weakening the positive effect of decentralization until it becomes insignificant beyond identifiable threshold levels, demonstrating transparency's capacity to counteract expansionary pressures. Third, vertical balance fuels the growth of local government size, highlighting the decentralization form's distinct role in shaping the local public sector. Fourth, transparency also reduces the positive effect of vertical balance on local government size. At low transparency levels, vertical balance increases government size; when transparency exceeds the within-group mean, this positive effect loses statistical significance; only at high transparency levels does the relationship turn significantly negative. This progression reveals that the common-pool

Table 4: Robustness checks using alternative measures (2015-2022)

	FD1/VB1		GS1		FD1/VB1/GS1	
	Diff-GMM	Sys-GMM	Diff-GMM	Sys-GMM	Diff-GMM	Sys-GMM
	(1)	(2)	(3)	(4)	(5)	(6)
Government Size, it-1	0.534*** (3.63)	0.612*** (4.40)	0.268** (2.28)	0.260*** (2.64)	0.523*** (4.21)	0.552*** (5.48)
Fiscal Decentralization, it	0.216* (1.86)	0.270** (2.08)	0.308*** (4.31)	0.284*** (4.09)	0.266*** (6.19)	0.253*** (5.41)
Fiscal Decentralization, it					-0.123*** (-4.00)	-0.121*** (-4.13)
Vertical balance, it	0.361* (1.80)	0.465** (2.27)	0.279*** (2.86)	0.324*** (4.02)	0.225*** (2.86)	0.217*** (3.01)
Fiscal Transparency, it	-0.015 (-0.57)	-0.007 (-0.34)	-0.030* (-1.83)	-0.041** (-2.34)	-0.007 (-0.83)	-0.009 (-1.08)
Fiscal Decentralization*	-0.842** (-2.39)	-0.686* (-1.87)	-0.273* (-1.68)	-0.284* (-1.89)	-0.157* (-1.88)	-0.164* (-1.80)
Fiscal Transparency, it						
Vertical balance*	-1.229** (-2.01)	-1.710** (-2.41)	-0.704** (-2.43)	-0.816*** (-2.90)	-0.394** (-2.48)	-0.397** (-2.55)
Fiscal Transparency, it						
Population Size, it	-0.370 (-1.42)	0.045 (1.41)	0.148 (0.88)	0.019 (0.48)	0.001 (0.01)	0.027 (0.89)
Real GDP per capita, it	-0.908** (-2.47)	-0.555*** (-2.75)	-0.287 (-1.57)	-0.424*** (-5.86)	-0.253** (-2.24)	-0.199*** (-3.53)
Constant	3.782** (2.36)	1.792*** (2.94)	0.848 (0.94)	1.575*** (6.58)	0.936* (1.89)	0.707*** (4.18)
AR(1) Test	-3.539 0.000	-4.536 0.000	-3.480 0.001	-3.670 0.000	-3.861 0.000	-4.040 0.000
AR(2) Test	0.186 0.853	-0.170 0.865	0.404 0.686	-0.040 0.968	0.745 0.456	0.658 0.511
Hansen J Test	8.343 0.682	8.648 0.799	12.209 0.836	13.958 0.903	9.849 0.998	11.572 0.998
Chi-squared Test	128.04 0.000	178.15 0.000	60.32 0.001	83.1 0.000	133.79 0.000	178.17 0.000
MMSC-AIC	-13.657	-17.353	-23.791	-30.042	-42.151	-46.428
MMSC-BIC	-51.89	-62.54	-86.36	-106.52	-132.53	-147.24
MMSC-HQIC	-29.441	-36.007	-49.620	-61.611	-79.459	-88.041
Number of Observations	1673	1673	1673	1673	1673	1673

Source: The authors

hypothesis's validity is institutionally contingent rather than universal. Model selection criteria, the GMM estimators, and alternative measures collectively confirm the reliability of our conclusions.

The study proposes a comprehensive policy framework that synergizes decentralization benefits with transparency constraints. Fiscal decentralization should be maintained for its

efficiency gains in public goods provision, notwithstanding its expansionary effects, as the demonstrated Pareto improvements in resource allocation justify its continued implementation. Policymakers should strategically combine decentralization intensity with structural forms to achieve optimal government size control, using the former for macro-level calibration and the latter for micro-adjustments. Transparency mechanisms must be institutionalized as a precondition for further decentralization, given their proven capacity to mitigate moral hazard. Policy makers should implement tiered decentralization authorization where: low-transparency prefecture-level cities undergo mandatory transparency upgrades before receiving additional fiscal authority; high-transparency cities qualify for advanced decentralization instruments, having demonstrated institutional maturity. This graduated approach preserves decentralization's informational advantages while systematically internalizing its expansionary externalities.

Several limitations regarding measurement, scope, and generalizability should be acknowledged. First, reliance on the Tsinghua University fiscal transparency index, without alternative measures, raises concerns about measurement robustness. Second, the exclusive focus on prefecture-level governments limits generalizability, as dynamics may differ at the provincial or national level. These limitations suggest several avenues for future research: employing alternative transparency indicators to test robustness; conducting multi-level analyses to assess whether the findings generalize beyond prefecture-level governments. Together, these directions would validate and extend the contributions of this study.

References:

1. Alt, J.E. and Lassen, D.D., 'Transparency, Political Polarization, and Political Budget Cycles in OECD Countries', 2006, *American Journal of Political Science*, vol. 50, no. 3, pp. 530–550.
2. Andrews, D.W.K. and Lu, B., 'Consistent Model and Moment Selection Procedures for GMM Estimation with Application to Dynamic Panel Data Models', 2001, *Journal of Econometrics*, vol. 101, no. 1, pp. 123–164.
3. Arellano, M. and Bover, O., 'Another Look at the Instrumental Variable Estimation of Error-Components Models', 1995, *Journal of Econometrics*, vol. 68, no. 1, pp. 29–51.
4. Ashworth, J., Galli, E. and Padovano, F., 'Decentralization as a Constraint to Leviathan: A Panel Cointegration Analysis', 2013, *Public Choice*, vol. 156, no. 3-4, pp. 491–516.
5. Asngar, T.M., Nkoa, B.E.O. and Younda, D.U., 'Fiscal Decentralization and the Size of Government: An Empirical Test of the Leviathan Hypothesis', 2024, *Research Square*, DOI: 10.21203/rs.3.rs-4408576/v1.
6. Balli, H.O. and Sørensen, B.E., 'Interaction Effects in Econometrics', 2013, *Empirical Economics*, vol. 45, pp. 583–603.
7. Bastida, A.F., 'Transparency and Government Trust', 2019, *Public Sector Economics*, vol. 43, no. 1, pp. 15–19.
8. Blundell, R. and Bond, S., 'Initial Conditions and Moment Restrictions in Dynamic Panel Data Models', 1998, *Journal of Econometrics*, vol. 87, no. 1, pp. 115–143.
9. Brennan, G. and Buchanan, J.M., *The Power to Tax: Analytic Foundations of a Fiscal Constitution*, Cambridge University Press, 1980.

10. Cassette, A. and Paty, S., 'Fiscal Decentralization and the Size of Government: A European Country Empirical Analysis', 2010, *Public Choice*, vol. 143, pp. 173–189.
11. Choudhury, A. and Sahu, S., 'Reconciling the Mixed Evidence in the Fiscal Decentralization-Government Size Nexus Using Panel Quantile Regression', 2023, *Economic Modelling*, vol. 125, no. 4, DOI: 10.1016/j.econmod.2023.106347.
12. de Abreu, W.M. and Gomes, R.C., 'Fiscal Transparency Explains the Perception of Corruption, but Democracy Matters!', 2021, *Revista de Contabilidade e Organizações*, vol. 15, DOI: 10.11606/issn.1982-6486.rco.2021.182094.
13. Faguet, J.P., 'Decentralization and Governance', 2014, *World Development*, vol. 53, pp. 2–13.
14. Golem, S. and Malešević Perović, L., 'An Empirical Analysis of the Relationship Between Fiscal Decentralization and the Size of Government', 2014, *Finance a úvěr: Czech Journal of Economics and Finance*, vol. 64, no. 1, pp. 30–58.
15. Hameed, F., 'Fiscal Transparency and Economic Outcomes', 2005, *International Monetary Fund*, vol. 05/225, DOI: 10.5089/9781451862447.001.
16. International Monetary Fund (IMF), 'Manual on Fiscal Transparency', Washington, D.C.: International Monetary Fund, 2007, [Online] available at <https://www.imf.org/external/np/fad/trans/manual.htm>, accessed on June 10, 2025.
17. Jensen, M.C. and Meckling, W.H., 'Theory of the Firm. Managerial Behavior, Agency Costs and Ownership Structure', 1976, *Journal of Financial Economics*, vol. 3, no. 4, pp. 305–360.
18. Jin, J. and Zou, H.F., 'How Does Fiscal Decentralization Affect Aggregate, National, and Subnational Government Size?', 2002, *Journal of Urban Economics*, vol. 52, no. 2, pp. 270–293.
19. Kaufmann, D. and Bellver, A., 'Transparency Transparency: Initial Empirics and Policy Applications', 2005, *IMF Conference on Transparency and Integrity*, no. 8188, DOI: 10.2139/ssrn.808664.
20. Kiviet, J.F., 'Microeconomic Dynamic Panel Data Methods: Model Specification and Selection Issues', 2020, *Econometrics and Statistics*, vol. 13, pp. 16–45.
21. Kopits, M.G. and Craig, M.J., *Transparency in Government Operations*, Washington, D.C.: International Monetary Fund, 1998.
22. Li, M. and Yang, J., 'Can Digital Economy Mitigate Vertical Fiscal Imbalances in Chinese Local Government? The Role of Fiscal Transparency', 2024, *International Review of Financial Analysis*, vol. 96, DOI: 10.1016/j.irfa.2024.103713.
23. Makreshanska-Mladenovska, S. and Petrevski, G., 'Fiscal Decentralisation and Government Size: Evidence from a Panel of European Countries', 2019, *Review of Public Economics*, vol. 229, no. 2, pp. 33–58.
24. Martínez-Vázquez, J., Lago-Peñas, S. and Sacchi, A., 'The Impact of Fiscal Decentralization: A Survey', 2017, *Journal of Economic Surveys*, vol. 31, no. 4, pp. 1095–1129.
25. Ministry of Finance of the People's Republic of China, '2022 Local Budget and Final Accounts Disclosure Rankings', 2024, [Online] available at https://www.gov.cn/lianbo/bumen/202404/content_6943096.htm, accessed on May 11, 2025.
26. Montes, G.C. and Luna, P.H., 'Fiscal Transparency, Legal System and Perception of the Control on Corruption: Empirical Evidence from Panel Data', 2021, *Empirical Economics*, vol. 60, pp. 2005–2037.
27. Musgrave, R.A., *The Theory of Public Finance: A Study in Public Economy*, McGraw-Hill, 1959.

28. National Bureau of Statistics of the People's Republic of China, *China City Statistical Yearbooks*, China Statistics Press, 2023.
29. National People's Congress, 'Decision of the Standing Committee of the National People's Congress on Amending the Budget Law of the People's Republic of China (Presidential Order No. 12)', 2014, [Online] available at https://www.gov.cn/zhengce/2014-09/01/content_2743208.htm, accessed on May 11, 2025.
30. Niskanen, W.A. Jr., *Bureaucracy and Representative Government*, Routledge, 2017.
31. Oates, W.E., 'Toward a Second-Generation Theory of Fiscal Federalism', 2005, *International Tax and Public Finance*, vol. 12, pp. 349–373.
32. Oates, W.E., *Fiscal Federalism*, Edward Elgar Publishing, 1972.
33. Obeng, S.K., 'Fiscal Decentralization, Democracy and Government Size: Disentangling the Complexities', 2021, *Journal of International Development*, vol. 33, no. 6, pp. 975–1004.
34. Prohl, S. and Schneider, F.G., 'Does Decentralization Reduce Government Size? A Quantitative Study of the Decentralization Hypothesis', 2009, *Public Finance Review*, vol. 37, no. 6, pp. 639–664.
35. Qiao, M., Ding, S. and Liu, Y., 'Fiscal Decentralization and Government Size: The Role of Democracy', 2019, *European Journal of Political Economy*, vol. 59, no. 1, pp. 316–330.
36. Rodden, J., 'Reviving Leviathan: Fiscal Federalism and the Growth of Government', 2003, *International Organization*, vol. 57, no. 4, pp. 695–729.
37. Sirait, S., 'Fiscal Decentralization and Local Government Size: Evidence from Indonesia', 2017, *Public Policy and Administration Research*, vol. 7, no. 2, pp. 9–14.
38. State Council of the People's Republic of China, 'Decision of the State Council on Implementing the Tax-Sharing Fiscal Management System', 1993, [Online] available at https://www.guizhou.gov.cn/zwgk/zfgb/gzszfzb/199312/t19931215_70517751.html, accessed on April 9, 2025.
39. State Council of the People's Republic of China, 'Reform Plan for the Division of Fiscal Powers and Expenditure Responsibilities Between the Central and Local Governments in Basic Public Services', 2018, [Online] available at https://www.gov.cn/gongbao/content/2018/content_5268760.htm, accessed on April 9, 2025.
40. State Council of the People's Republic of China, 'Regulations of the People's Republic of China on Government Information Disclosure', 2007, [Online] available at https://www.gov.cn/zhengce/content/2008-03/28/content_1734.htm, accessed on April 9, 2025.
41. Sun, S. and Andrews, R., 'The Determinants of Fiscal Transparency in Chinese City-Level Governments', 2020, *Local Government Studies*, vol. 46, no. 1, pp. 44–67.
42. Thanh, S.D. and Canh, N.P., 'Local Governance: Impacts of Fiscal Decentralization on Government Size and Spending Composition in Vietnam', 2019, *Asian Economic Journal*, vol. 33, no. 4, pp. 311–340.
43. Tiebout, C.M., 'A Pure Theory of Local Expenditures', 1956, *Journal of Political Economy*, vol. 64, no. 5, pp. 416–424.
44. Tsinghua University, 'Chinese Prefecture-Level Fiscal Transparency Reports', 2023, [Online] available at <https://www.sppm.tsinghua.edu.cn/xycbw/yjbg.htm>, accessed on April 9, 2025.
45. Weingast, B.R., 'Second Generation Fiscal Federalism: The Implications of Fiscal Incentives', 2009, *Journal of Urban Economics*, vol. 65, no. 3, pp. 279–293.
46. Weingast, B.R., Shepsle, K.A. and Johnsen, C., 'The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics', 1981, *Journal of Political Economy*, vol. 89, no. 4, pp. 642–664.

47. Zhang, P., Zhu, C. and Hou, Y., 'Fiscal Decentralization, Flat Administrative Structure, and Local Government Size: Evidence and Lessons from China', 2016, *Public Administration and Development*, vol. 36, no. 3, pp. 198–214.
48. Zhang, S., 'Fiscal Decentralization, Budgetary Transparency, and Local Government Size in China', 2016, *Emerging Markets Finance and Trade*, vol. 52, no. 7, pp. 1679–1697.