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THE IMPACT OF GOVERNMENT SIZE ON ECONOMIC GROWTH IN CHINESE PREFECTURE-LEVEL CITIES: DOES FISCAL TRANSPARENCY MATTER?

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ABSTRACT

Recent studies have examined how institutions influence the relationship between government size and economic growth. However, they have largely overlooked the significance of fiscal transparency, which can help bridge the information gap between governments and citizens. Furthermore, these studies typically concentrate on national or state levels, neglecting local governments that are primarily responsible for delivering public goods. This study investigates the impact of local government size on economic growth in Chinese prefecture-level cities, emphasizing the moderating role of fiscal transparency. We employ a dynamic panel model with two-way fixed effects and the Generalized Method of Moments (GMM) for estimation. The data encompasses 283 cities from 2013 to 2022. The main findings are as follows: In the absence of fiscal transparency, local government size positively influences economic growth; however, fiscal transparency negatively moderates this relationship. Moreover, as fiscal transparency increases, the positive effect diminishes and becomes statistically insignificant once it exceeds a certain threshold. Robustness checks using alternative measures and estimation techniques validate the results. The primary originality of this study lies in quantifying the moderating role of fiscal transparency in the relationship between government size and growth. These findings challenge the New Institutional Theory, which asserts that institutions directly drive growth, and provide a novel perspective on the interplay between government size and economic performance, offering valuable insights for policymakers aiming to balance government size and transparency for sustainable development.

Keywords: Economic growth, fiscal transparency, government size, Chinese prefecture-level cities

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1. INTRODUCTION

The United Nations Sustainable Development Goals (SDGs) provide a global framework for addressing urgent challenges by 2030 (United Nations, 2015). Goal 8 emphasizes inclusive and sustainable economic growth, while Goal 16 promotes accountable and transparent institutions. These goals are closely related to the ongoing debate regarding the role of government in economic development, particularly concerning the relationship between government size and economic growth. Early theorists such as Adam Smith (1937) questioned the extent of government intervention in markets, while Keynesian economists, including John Maynard Keynes (1937) and Paul Samuelson (1948), advocated for a more active government role during economic downturns. Scholars like Barro (1990) and Armey (1995) further examined the intricate connections between government size and economic growth, reflecting the evolving nature of this debate and its significance for economic policymaking.

Empirical studies examining the relationship between government size and economic growth yield mixed results. Some research suggests that a larger government size may hinder growth, while others argue that it could stimulate growth (Bajrami, Gashi, Ukshini, & Rexha, 2022; Chen, 2020; Colombier, 2024; Sibt-e-Ali, Shah, Mazhar, Khan, & Parveen, 2021; Tkacova, Gavurova, & Maslisova, 2023). Investigations into nonlinear dynamics further complicate the issue (Akram & Rath, 2020; Goh & Aznan, 2023; Hajamini & Falahi, 2018). These discrepancies may arise from institutional differences, as North (1990) posited that variations in economic growth among countries with similar resources can be attributed to differences in their institutions. Nirola and Sahu (2019) found that institutional quality can mitigate the negative impact of government size on growth. Furthermore, Macek and Janků (2015) emphasized that fiscal transparency, which enhances accountability by reducing information asymmetry, influences the relationship between government size and economic growth, although they did not quantify this effect.

China's government operates within a multi-tiered system, with the central government establishing macroeconomic policies and providing fiscal support to provinces through transfer payments and tax-sharing arrangements. Provincial governments are responsible for implementing these policies and coordinating local economic and fiscal activities. At the local level, particularly in prefecture-level cities, governments manage economic development, infrastructure, and public services within the frameworks (National People's Congress, 2018). Fiscal decentralization policies, such as the 1994 tax-sharing reform, significantly reshaped the fiscal relationship between central and local governments by decentralizing revenue collection and establishing a clearer division of tax responsibilities (State Council, 1993). In 2012, the central government introduced the "Measures for Central-to-Local Equalization Transfer Payments" to mitigate regional fiscal disparities (Ministry of Finance, 2012). Consequently, the size of local governments, measured by the proportion of expenditure to GDP, increased from 13% in 2011 to 14.8% in 2022 (National Bureau of Statistics, 2023). This expansion has facilitated investments in public services; however, local government debt has also surged, reaching 44.74 trillion yuan by September 2024 (Ministry of Finance, 2024a).

Fiscal transparency has become a crucial element of administrative modernization in China's ongoing fiscal reforms. The 2008 Government Information Disclosure Regulation established fundamental requirements for disclosing fiscal information (State Council, 2007). In 2016, the

"Opinions on Fully Promoting Government Transparency" further underscored the importance of public access to government information (State Council, 2016). By 2022, over 99% of local government departments had published their final accounts and budgets, marking a significant improvement (Ministry of Finance, 2024b). However, fiscal transparency still varies considerably among prefecture-level cities. Developed cities like Guangzhou and Hangzhou have established robust fiscal disclosure mechanisms, while less-developed cities continue to face challenges in achieving transparency (Tsinghua University, 2023). These disparities impact local government effectiveness, as enhanced transparency contributes to reducing corruption.

China's fiscal reforms have significantly transformed the size and responsibilities of local governments, impacting public service provision and economic management in prefecture-level cities. Larger local governments are often perceived as more capable of driving economic growth through enhanced public services; however, concerns regarding inefficiency and fiscal burdens persist. The effect of local government size on economic growth remains ambiguous. Concurrently, reforms aimed at improving fiscal transparency have been implemented to bolster accountability. Although fiscal transparency has improved markedly, its influence on the relationship between local government size and economic growth is still uncertain. Existing studies indicate that institutional factors can moderate this relationship, yet fiscal transparency has received limited attention in this context. Furthermore, while some research suggests that the relationship between government size and economic growth varies across countries with differing levels of fiscal transparency, the moderating effect of fiscal transparency itself has not been quantitatively assessed. This leads to two critical questions: (1) How does local government size affect economic growth in Chinese prefecture-level cities? (2) How does fiscal transparency influence the relationship between local government size and economic growth in these cities?

This study investigates the dynamics between local government size, fiscal transparency, and economic growth in Chinese prefecture-level cities. The first objective is to analyse how local government size impacts economic growth, while the second explores the moderating role of fiscal transparency in this relationship. The sample consists of data from 283 cities spanning the years 2013 to 2022. A dynamic panel model with two-way fixed effects is employed, estimated using the GMM approach. A systematic model selection process ensures robustness, with alternative indicators and estimators being considered. This study is novel in three ways. First, it focuses on prefecture-level cities, providing a more detailed perspective on the influence of government size on economic growth. Second, it examines the underexplored role of fiscal transparency in moderating the relationship between government size and economic growth. Lastly, the study's systematic model selection process mitigates potential model specification errors, thereby enhancing reliability. In terms of significance, the study introduces a framework that integrates fiscal transparency, government size, and economic growth, illuminating the relationship between government size and economic growth while deepening the understanding of the role of fiscal transparency in fostering economic growth. This research contributes to the SDG of promoting sustainable economic growth and accountable institutions.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Government Size and Economic Growth

The relationship between government size and economic growth is a central tenet of the Endogenous Growth Theory. Romer (1990) emphasizes the government's role in promoting growth through investments in research and development (R&D) and education, which enhance human capital and technological advancement. His model suggests that government intervention in market regulation fosters innovation, thereby spurring long-term growth. Barro (1990) illustrates a nonlinear relationship between government spending and economic growth: initially, increased spending boosts growth by providing essential public goods and services. However, as the size of government expands, the positive effects begin to diminish, leading to higher taxes that ultimately hinder growth. Armey (1995) proposes the Armey Curve, arguing that while lower taxes can increase revenue, excessively high taxes can dampen economic activity, resulting in reduced revenue and growth. This underscores the importance of balancing taxation and spending to avoid stifling economic progress.

Empirical studies have produced a range of findings regarding the relationship between government size and economic growth. Bajrami et al. (2022) identified a positive impact in seven Western Balkan countries, while Sibt-e-Ali et al. (2021) observed a similar correlation in China and India. Colombier (2024), in a study of 17 developed countries from 1880 to 2016, noted a positive but modest effect. In contrast, Tkacova et al. (2023) reported a negative effect in 27 EU countries. Similarly, Jabeen and Malik (2021) found a negative relationship in Pakistan using time-series data from 1973 to 2018. Exploring nonlinear dynamics, Chekouri, Chibi, and Benbouziane (2022) identified a threshold effect in Algeria, where initial increases in government size promote growth, but beyond a certain point, they inhibit it. In contrast, Aznan, Goh, and Koong (2022) discovered a U-shaped relationship between government investment expenditure and growth in Malaysia, and Goh and Aznan (2023) observed a similar pattern in Korea. Further supporting nonlinear interpretations, Asimakopoulos and Karavias (2016) validated an inverted U-shape, indicating that modest government spending promotes growth, while excessive spending hinders it. However, Christie (2014) found that the negative impact of government spending becomes significant only beyond a certain threshold, suggesting a more complex dynamic.

Regional studies reveal variations that are not as evident at the national level. Schaltegger and Torgler (2006), for instance, investigated this relationship within Swiss cantons using data from 26 cantons between 1981 and 2001. Their fixed-effects model analysis indicated that, at the cantonal level, economic growth is negatively impacted by larger governments, although investment expenditure had no discernible effect. However, Chen (2020), utilizing panel data from 29 Chinese provinces from 2007 to 2017, found a positive impact of government size on economic growth. Similarly, Awolaja, Onakoya, Ojutiku, and Aroyewun-Khostly (2021), examining the relationship at the federal, state, and local levels, observed that the expansion of both state and local governments contributes to economic growth. Additionally, Akram and Rath (2020) discovered two distinct thresholds in their analysis conducted in India, suggesting that the benefits of larger governments only materialize over the medium term. This implies that the connection between government size and economic growth may change over time and depend on specific economic conditions.

In this study, we examine the role of local government size in promoting economic growth, drawing on Romer's growth theory. Romer emphasizes that government investments in knowledge, technology, and human capital are essential drivers of long-term economic growth. For local governments, a larger size facilitates more substantial investments in public goods, such as infrastructure, all of which enhance productivity and innovation. These investments contribute to the development of technological advancement, which is central to economic growth. While Barro's model also suggests a connection between government size and economic growth, it is less effective in understanding the dynamics of local governments operating within a decentralized fiscal system. Barro's theory posits that government size is primarily financed through taxation to support government expenditures, with growth driven by initial investments that enhance productivity. However, Barro's model does not account for the specific conditions of decentralized systems. In this context, the expansion of local government size primarily results from fiscal decentralization, which involves a reallocation of fiscal revenue. This structure mitigates the negative impact of tax burdens emphasized in Barro's model. Instead, the positive effects of increased investment in local infrastructure, driven by enhanced fiscal authority, may prevail. Consequently, we hypothesize the following:

H1. The size of local governments is positively associated with economic growth in Chinese prefecture-level cities.

2.2. Government Size, Economic Growth, and the Moderating Role of Fiscal Transparency

Fiscal transparency refers to the openness and accessibility of government fiscal information, which enables citizens to effectively monitor and understand public financial activities (Craig & Kopits, 1998). It is closely related to the Principal-Agent Theory (Jensen & Meckling, 2019). Due to a lack of capacity to manage public affairs, citizens entrust politicians with the responsibility of managing public resources through electoral systems, thereby establishing a typical principal-agent relationship (Moe, 1984). The Bureaucratic Behaviour Theory (Niskanen, 2017) highlights that governments often prioritize maximizing revenue and extending their influence, while citizens typically seek to maximize social welfare. This divergence leads to the issue of agency costs. Furthermore, compared to citizens, governments possess a significant informational advantage, which they may exploit to make public decisions that align with their interests (Eisenhardt, 1989). Enhancing fiscal transparency is a practical solution to reduce agency costs by mitigating information asymmetry (Heald, 2006). It strengthens accountability mechanisms, compelling governments to align their activities with the preferences of citizens.

The theoretical foundation of this study is grounded in the New Institutional Theory (North, 1990), which emphasizes the role of institutions in shaping economic outcomes. The Endogenous Growth Theory posits that economic growth arises from internal mechanisms. However, it does not adequately explain why some countries can effectively harness these growth incentives while others cannot. North (1990) argues that institutional disparities are the fundamental source of variations in economic growth across countries. The efficiency with which a country utilizes growth factors is significantly influenced by its institutions. Fiscal transparency, as an institutional arrangement, demonstrates several positive economic impacts, including the reduction of corruption (Cifuentes‐Faura, 2024). Yao (2024) and Gavazza and Lizzeri (2009) emphasize that fiscal transparency fosters more disciplined fiscal policies and enhances debt management. Overall,

fiscal transparency can enable local governments to engage in production activities more efficiently by reinforcing accountability mechanisms, thereby moderating the relationship between local government size and economic growth.

Some empirical studies explore the relationship between fiscal transparency, government size, and economic growth. Williams (2011), utilizing data from 105 nations spanning 1960 to 2004, found that greater transparency and a smaller government size are associated with higher per capita GDP growth. Macek and Janků (2015) categorized 34 OECD countries based on their levels of fiscal transparency and discovered that in countries with lower transparency, more favourable economic growth correlates with a larger government. Conversely, in countries with higher transparency, a larger government size is associated with slower growth. This highlights the crucial role of fiscal transparency in shaping the impact of government size on economic performance, although the effect was not quantified. Nirola and Sahu (2019) investigated institutional quality as a mediator in the relationship between government size and growth. Analysing data from 23 Indian states between 2005 and 2014, they found that the negative relationship between government size and growth is intensified by higher institutional quality, suggesting that effective governance is vital in mitigating the adverse effects of government size. Accordingly, we propose the following:

H2. Fiscal transparency has a positive moderating effect on the relationship between local government size and economic growth in Chinese prefecture-level cities.

3. METHODOLOGY

3.1. Empirical Model

This study investigates the impact of government size on economic growth, emphasizing the significance of fiscal transparency. The initial panel model is developed following this theoretical framework and the specifications outlined by Williams (2011).

$$g_{it} = \beta_0 + \beta_1 k_{it} + \beta_2 p_{it} + \beta_3 \mathrm{GS}_{it} + \beta_4 \mathrm{FT}_{it} + \mu_i + \omega_t + \varepsilon_{it} \quad [1]$$

where g is economic growth, k is physical capital growth, p is population growth, GS is government size, and FT is fiscal transparency. In addition, μ_i, ω_t, and ε_{it} represent the individual effects, time-fixed effects, and the error term, respectively.

Macek and Janků (2015) argued that the influence of government size on economic growth varies among countries with different levels of fiscal transparency. Consequently, the study introduces an interaction term to examine the moderating effect of fiscal transparency on the relationship between government size and growth. Equation (1) is reformulated as Equation (2).

$$g_{it} = \beta_0 + \beta_1 k_{it} + \beta_2 p_{it} + \beta_3 GS_{it} + \beta_4 FT_{it} + \beta_5 (GS_{it} \times FT_{it}) + \mu_i + \omega_t + \varepsilon_{it} \quad [2]$$

Then, group-mean centring is applied to the variables in the interaction term, centring both variables at the individual level. This method involves subtracting the group mean from each observation, thereby emphasizing within-group variation and controlling for group-specific effects (Balli & Sørensen, 2013). A significant concern with the interaction model is the potential

endogeneity associated with government size (Nirola & Sahu, 2019). To address this issue, we extended the model to a dynamic framework by incorporating a lagged term of economic growth, as suggested by Hajamini and Falahi (2018). This adjustment reduces endogeneity and provides a more accurate representation of the evolution of economic growth over time.

$$g_{it} = \beta_6 g_{it-1} + \beta_0 + \beta_1 k_{it} + \beta_2 p_{it} + \beta_3 \mathrm{GS}_{it} + \beta_4 \mathrm{FT}_{it} + \beta_5 (\mathrm{GS}_{it} - \overline{\mathrm{GS}_i})(\mathrm{FT}_{it} - \overline{\mathrm{FT}_i}) + \mu_i + \omega_t + \varepsilon_{it} \quad [3]$$

Under average transparency, the influence of government size on growth is represented by the coefficient β_3 in Equation (3). Like this, at the average level of government size, the coefficient β_4 shows how transparency affects growth. The partial derivative of growth to the size of government is used to determine the overall impact of government size in this context.

3.2. Variable and Data Source

Economic Growth (g): This research utilizes the growth rates of real GDP in Chinese prefecture-level cities to measure economic growth. The growth rate is calculated using the cities' GDP index, with the previous year serving as the baseline. Empirical studies examining the influence of government size on growth rarely employ absolute GDP indicators; instead, they typically use growth rate indicators. Initially, these studies primarily relied on the nominal GDP growth rate as the main indicator of economic growth. However, this has gradually been supplanted by the real GDP growth rate (Aznan et al., 2022; Akram & Rath, 2020). Real GDP accounts for price fluctuations, thereby facilitating a clearer understanding of the underlying relationship.

Government Size (GS): This study presents two metrics for assessing government size, defined as the ratio of general public budget expenditure and revenue to GDP in Chinese prefecture-level cities. Empirical studies have predominantly utilized government expenditure to construct the indicator of government size (Aznan et al., 2022; El Husseiny, 2019). However, some researchers argue that government revenue, excluding transfer payments, more accurately reflects the true size of governments and uses it to develop the indicator (Akram & Rath, 2020). This study employs the latter approach as an alternative to a robustness check.

Fiscal Transparency (FT): To mitigate heteroscedasticity, this study utilizes the log-transformed values of the fiscal transparency index published by Tsinghua University. Tsinghua University has developed a comprehensive indicator system to evaluate fiscal transparency at the prefecture level in China and publishes relevant reports annually, which are widely utilized in public economics research (Li & Yang, 2024; Sun & Andrews, 2020). This system is grounded in international standards while being tailored to the specific context of China. To ensure comparability across years despite variations in scoring criteria, the index scores are normalized to a scale of 0 to 100, where 0 represents the lowest level of transparency and 100 signifies the highest.

Physical Capital Growth (k): The ratio of fixed asset investment to GDP in Chinese prefecture-level cities serves as a proxy for physical capital growth. Ram (1986) theoretically developed a model that illustrates the relationship between government size and economic growth, where the proportion of investment to output acts as the explanatory variable. This indicator has been widely adopted to measure physical capital growth, as demonstrated in the study by Hajamini and Falahi (2018), which found a positive effect of physical capital growth on economic growth.

Population Growth (p): Population growth is quantified as the growth rate of the resident population in prefecture-level cities. Controlling population growth is a common and essential practice in economic growth research. Empirical studies conducted by Akram and Rath (2020) and Aydin and Esen (2020) both utilized this indicator. While most economic theories suggest a positive effect of population growth, both studies identified a negative relationship between population growth and economic growth.

Table 1: Variables and Data Sources

Type	Variable	Measurement	Source
Dependent Variable	Economic Growth, *g*	The real GDP change % for Chinese prefecture-level cities, computed as the GDP index change percentage over the same time last year, %	CEI database
Independent Variable	Government Size, GS	The size of government in prefecture-level cities, calculated as the general public budget expenditure to the city's GDP ratio, %	CEI database
	Government Size (alternative), GS1	The size of government in prefecture-level cities, calculated as the general public budget revenue to the city's GDP ratio, %	CEI database
Moderator	Fiscal Transparency, FT	An indicator for fiscal transparency at the prefecture level, evaluated on a scale of 0 to 100, where higher numbers correspond to more transparency, log	Tsinghua University, https://www.sppm.tsinghua.edu.cn/xycbw/yjbg.htm
Control Variable	Physical Capital Growth, *k*	The proportion of fixed asset investment to GDP in Chinese prefecture-level cities, %	CEI database
	Population Growth, *p*	The growth rate of the resident population in Chinese prefecture-level cities, %	CEI database

Notes: The CEI database refers to the China Economic Information Network statistical database.

This study compiles a panel dataset that includes 283 prefecture-level cities in China from 2013 to 2022. The data encompass the GDP index, general public budget expenditure and revenue, fixed asset investment, and resident population, which were gathered from the statistical yearbooks of prefecture-level cities as well as the Chinese City Statistical Yearbooks. Access to this data was facilitated through the China Economic Information Network Statistical Database (CEI). The fiscal transparency index data were obtained from Tsinghua University, which has been publishing an annual fiscal transparency index for Chinese prefecture-level cities since 2012. However, due to changes in the statistical metrics after 2012, the data utilized in this study began in 2013. The definitions of the variables and their respective data sources are listed in Table 1, while Table 2 presents the descriptive statistics.

3.3. Estimation and Model Selection

This study employs both the Difference and System GMM estimators to address the issue of endogeneity (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998), which arises from the potential inverse relationship between government size and economic growth. This methodology is widely recognized for effectively resolving endogeneity concerns (Hajamini & Falahi, 2018; Nirola & Sahu, 2019). Both methods utilize a two-step estimation process. To mitigate the potential underestimation of standard errors, we employ corrected standard errors. During data processing, we apply an orthogonal transformation to minimize the loss of variability. For model diagnostics, we assess first- and second-order autocorrelation and conduct the Hansen J test.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
Economic Growth, *g*	0.066	0.033	-0.210	0.182
Fiscal Transparency, FT	49.35	17.63	2.770	92.15
Government Size, GS	0.216	0.106	0.057	0.872
Government Size, GS1	0.077	0.025	0.023	0.202
Physical Capital Growth, *k*	0.836	0.358	0.162	2.992
Population Growth, *p*	0.000	0.025	-0.341	0.219

Note: The number of observations is 2,830.

Kiviet (2020) noted that a specification search may be necessary, as higher-order lags can help mitigate the serial correlation of erroneous terms and provide a structured framework to address related issues. Kripfganz (2019) integrated this framework with the Model and Moment Selection Criteria (MMSC) for GMM estimation, which was proposed by Andrews and Lu (2001). This framework is employed in this study to identify the most suitable model. Lags of variables are incorporated into Equation (3.3) to evaluate whether their inclusion improves model fit, based on MMSC values and significance tests. The same procedure is applied to models with various combinations of variables, and their MMSC values are compared to assess whether the removal of certain variables enhances model fit. Ultimately, the most appropriate model for each estimation approach is determined by identifying the one with the lowest MMSC values. Additionally, a joint significance test of time dummy variables is conducted to ascertain whether a two-way fixed effects model is more appropriate.

4. RESULTS AND DISCUSSION

Table 3 presents the primary results obtained using the Difference and System GMM estimators. The validity of these estimators is confirmed through diagnostic tests. Both the first- and second-order serial correlation tests satisfy the necessary conditions for accurate GMM estimation. Additionally, the Hansen J test supports the validity of the instruments employed. Chi-square tests indicate that time-fixed effects should be incorporated into the model. The Difference GMM results consistently underscore the significant positive impact of past economic growth on future performance. The first lagged term of economic growth exhibits a significant coefficient of approximately 0.3, suggesting that prior growth strongly influences future economic performance. Although the second lag is smaller, it still contributes positively with a significant coefficient,

indicating a lasting effect from growth two periods prior. In Model 1, which considers only government size, a significantly positive relationship is identified, suggesting that government size positively affects economic growth. Model 2, which examines fiscal transparency independently, demonstrates a clear positive impact on growth. In Model 3, where both variables are included, their significance is reinforced, with both coefficients remaining statistically significant. Notably, the coefficient for fiscal transparency increases, indicating its enhanced role in promoting growth, while the coefficient for government size remains stable. Model 4 introduces an interaction term between fiscal transparency and government size. In this model, the coefficient for government size rises, while the coefficient for fiscal transparency experiences a slight decrease. The interaction term is statistically significant and negative, highlighting fiscal transparency negatively moderates the impact of government size on economic growth.

Models 5 to 8 present the System GMM estimates. The lagged terms of economic growth in these models continue to exhibit significantly positive and approximately estimated coefficients. Compared to Model 1, the coefficient for government size in Model 5 increases slightly to 0.156. Meanwhile, the fiscal transparency coefficient remains stable at 0.020 in Model 6. In Model 7, which includes both government size and fiscal transparency, the coefficient for government size decreases to 0.131, closely aligning with the 0.121 observed in Model 3, while the coefficient for fiscal transparency rises to 0.029. Model 8's coefficients for transparency, government size, and their interaction term are statistically significant. The government size coefficient is 0.174, which is larger than in Model 7 but still indicates a less significant increase compared to the change from Model 3 to Model 4 in terms of economic growth. The coefficient for the interaction term is -0.258, reflecting a negative moderating effect of fiscal transparency on the relationship between government size and economic growth. Additionally, across all models, the results consistently indicate that increases in both population and fixed capital positively influence current economic growth. The growth in fixed capital from the previous two periods significantly affects economic growth.

Table 3 presents the three information criteria statistics for each model, which are essential for evaluating the model structure. In the Difference GMM estimation results, the absolute value of criteria statistics for Model 3 are higher than those for Models 1 and 2, but lower than those for Model 4, which includes their interaction term. This implies that Model 4 stands out as the most effective among the Difference GMM models. The three information criteria statistics are consistently lower in the System GMM models with similar variable combinations when compared with the Difference GMM, suggesting the System GMM estimation is better suited for these variables. Model 8, which includes the interaction term, shows the highest absolute values of information criteria statistics within the System GMM models, followed by the model that includes both government size and fiscal transparency without the interaction term. The latter are greater than those of the single-variable models, leading to the conclusion that Model 8, which incorporates the interaction term, is superior.

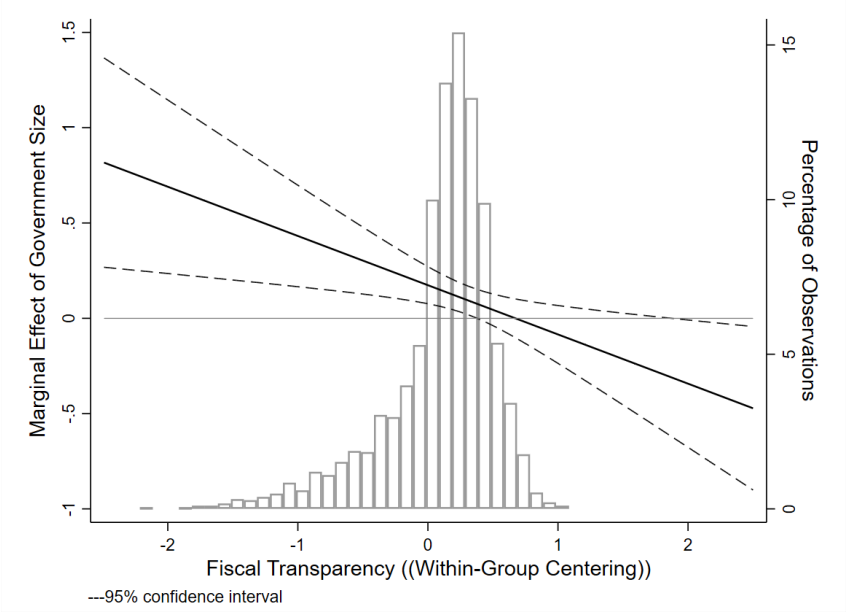
Table 3: Main Empirical Results

	Difference GMM				System GMM			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
g_{it-1}	0.352***	0.320***	0.364***	0.280***	0.322***	0.274***	0.343***	0.311***
	(6.42)	(5.70)	(6.91)	(4.95)	(6.06)	(5.80)	(7.49)	(6.08)
g_{it-2}		0.057*		0.063**		0.086***		0.065**
		(1.91)		(2.07)		(2.95)		(2.13)
GS_{it}	0.120*		0.121**	0.268***	0.156***		0.131***	0.174***
	(1.81)		(2.42)	(3.54)	(3.14)		(3.32)	(3.50)
FT_{it}		0.019**	0.026***	0.022**		0.020**	0.029***	0.021***
		(2.24)	(3.28)	(2.53)		(2.43)	(3.82)	(2.97)
$GS_{it}\times FT_{it}$				-0.422***				-0.258***
				(-2.61)				(-2.61)
p_{it}	0.438***	0.201**	0.292***	0.242***	0.421***	0.235***	0.256***	0.244***
	(3.23)	(2.27)	(2.92)	(2.95)	(3.66)	(2.65)	(3.02)	(3.38)
k_{it}	0.074**	0.116***	0.085**	0.099***	0.079***	0.104***	0.082***	0.091***
	(2.08)	(2.90)	(2.50)	(3.06)	(2.60)	(3.09)	(3.28)	(4.04)
k_{it-1}	-0.070**	-0.097***	-0.082***	-0.108***	-0.074**	-0.098***	-0.080***	-0.095***
	(-2.35)	(-3.06)	(-3.01)	(-3.76)	(-2.43)	(-3.13)	(-3.17)	(-3.80)
k_{it-2}				0.011				0.012**
				(1.92)				(2.05)
AR(1) Test	-7.854	-7.979	-7.957	-7.836	-7.750	-7.919	-8.056	-8.120
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) Test	1.002	0.809	1.238	0.155	0.773	0.034	1.166	0.779
	0.317	0.418	0.216	0.877	0.440	0.973	0.244	0.436
Hansen J Test	19.40	23.71	25.35	35.305	24.33	25.64	28.41	44.398
	0.496	0.593	0.555	0.639	0.443	0.645	0.649	0.497
$\chi 2$ Test	1132.02	888.87	1235.61	890.17	1119.85	1025.40	1268.67	986.56
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MMSC-AIC	-20.601	-28.290	-28.655	-42.695	-23.672	-32.363	-35.590	-45.602
MMSC-BIC	-93.510	-123.071	-127.082	-184.868	-111.163	-138.081	-152.244	-209.647
MMSC-HQIC	-50.527	-67.194	-69.055	-101.051	-59.584	-75.756	-83.472	-112.936

Notes: ***p<0.01, *p<0.05, and p<0.1. Interaction terms are group-centred. Both time and individual effects are fixed. The null hypothesis of the chi-square test posits that the coefficients for the time dummies are equal to zero. MMSC refers to the model and moment selection criteria. AIC, BIC, and HQIC denote the Akaike, Bayesian, and Hannan-Quinn Information Criterion, respectively.

These results do not clarify whether the size of government significantly influences economic growth when transparency deviates from its within-mean level. Figure 1, based on the results of Model 8, illustrates how the marginal influence of government size varies. The solid line represents the marginal influence on growth as fiscal transparency changes, while the two dotted lines indicate the 95% confidence interval and the conditions under which government size affects growth in a statistically significant manner. The x-axis corresponds to fiscal transparency, which has been naturally logarithmically transformed and centred within groups. A confidence interval is considered statistically significant when both of its bounds lie entirely above or below zero. Figure 1 reveals that when the x-axis value is below 0.4 (the point at which the lower bound intersects the horizontal line), government size has a significantly positive marginal influence. Specifically, in cities where fiscal transparency is below this level, an increase in government size positively impacts economic growth. However, this positive influence diminishes as fiscal transparency increases, and once fiscal transparency exceeds this threshold, it becomes statistically insignificant.

Figure 1: Marginal Effects of Government Size on Economic Growth



The estimation results indicate that, in the absence of fiscal transparency, the size of local government has a significantly positive effect on economic growth. However, fiscal transparency negatively moderates this relationship. Additionally, both physical capital growth and population growth are found to positively contribute to economic growth. Further analysis of marginal effects reveals that while government size initially exerts a positive influence on economic growth, this effect diminishes as fiscal transparency increases and eventually becomes statistically insignificant once fiscal transparency exceeds a certain threshold. Therefore, our results support Hypothesis 1, while Hypothesis 2 is not supported. These findings align with the predictions of the Endogenous Growth Theory, confirming that increases in local government size promote economic growth. However, contrary to expectations, fiscal transparency does not exhibit the anticipated positive

moderating effect on the relationship between local government size and economic growth. Instead, the study confirms a moderating effect of fiscal transparency, but it's negative. This finding challenges the New Institutional Theory, which posits that institutions are immediate drivers of growth.

Compared with the study by Awolaja et al. (2021), although our study also finds a positive effect of local government size on economic growth, this effect is conditional: it exists only when fiscal transparency is low. This provides additional insights into the relationship between government size and economic growth. Furthermore, our results extend the findings of Macek and Janků (2015). While we similarly observe a positive relationship between local government size and economic growth under conditions of low fiscal transparency, we do not identify any negative effects at higher levels of transparency. Instead, we reveal that the effect diminishes and becomes insignificant as transparency increases, thereby innovatively quantifying the moderating role of fiscal transparency in this relationship. Although our findings differ from those of Nirola and Sahu (2019), we argue that fiscal transparency plays a distinct role in this context. Unlike their study, which focuses on state-level governments in India, our research examines local governments in China. Additionally, fiscal transparency is just one aspect of institutional quality, and greater transparency does not always equate to improved institutional quality.

The inconsistency between the results and theoretical expectations may stem from the assumption that enhanced government efficiency necessarily leads to economic growth. While it is widely acknowledged that fiscal transparency improves government efficiency, it remains uncertain whether these efficiency gains translate into economic growth. One potential oversight is the alteration in the composition of public expenditures that local governments may undertake under the pressure of increased fiscal transparency. According to the Bureaucratic Behaviour Theory, local governments might prioritize productive expenditures that directly boost fiscal revenues. However, as fiscal transparency improves, local governments may redirect resources toward non-productive expenditures, such as healthcare and social security, which align with citizens' preferences for social welfare. Although improved government efficiency can yield greater output from the same level of productive expenditure, this potential reallocation of resources may diminish the proportion of productive expenditures. Consequently, this shift in expenditure composition may negate the positive effects of increased efficiency on economic growth. In this scenario, the negative impact of changing expenditure composition outweighs the positive impact of enhanced efficiency.

5. ROBUSTNESS CHECKS

We conduct sensitivity tests using alternative indicators of government size and various estimation methods. Table 4 presents the results from two models that utilize a different indicator of government size: the public budget revenue-to-GDP ratio. Both models meet the validity requirements for GMM estimation. The joint significance test of the time dummy variables supports the use of two-way fixed effects models. In Model 1, the Difference GMM results indicate that fiscal transparency and government size are not statistically significant. However, the System GMM model demonstrates a better overall fit, with all variables being statistically significant. Although there are some changes in the coefficients, the coefficients for government size and fiscal transparency remain positive, while the coefficient for the interaction term remains negative,

consistent with the results presented in Table 3. Overall, substituting the government size measure does not alter the conclusion.

Table 4: Robustness Checks with Alternative Measures of Government Size

	Dependent Variable: g_{it}	
	DIF GMM	SYS GMM
	(1)	(2)
g_{it-1}	0.245***	0.296***
	(3.65)	(5.94)
g_{it-2}	0.052	0.057**
	(1.59)	(2.06)
$GS1_{it}$	0.129	0.219**
	(0.72)	(2.10)
FT_{it}	0.014	0.019***
	(1.58)	(2.93)
$GS1_{it} \times FT_{it}$	-0.732***	-0.804***
	(-3.35)	(-4.12)
p_{it}	0.107	0.170**
	(1.06)	(2.44)
k_{it}	0.172***	0.105***
	(3.63)	(4.59)
k_{it-1}	-0.143***	-0.103***
	(-4.04)	(-4.60)
AR(1) Test	-7.310	-7.516
	0.000	0.000
AR(2) Test	-0.950	0.522
	0.342	0.602
Hansen J Test	29.491	36.829
	0.643	0.569
$\chi 2$ Test	311.01	392.35
	0.000	0.000
MMSC-AIC	-10.733	-18.730
MMSC-BIC	-54.479	-84.348
MMSC-HQIC	-28.689	-45.6635

Table 5 presents the results from alternative estimators. Model 2 illustrates the fixed effects model, where the joint F-test is significant, indicating that all fixed effects are not equal to zero, thereby improving upon Model 1 (pooled OLS). The Hausman test rejects the random effects model (Model 3) in favour of the fixed effects model. The Wald test in Model 4 supports the inclusion of time-fixed effects. Model 5 employs robust two-stage least squares (2SLS) estimation. The endogeneity test reveals a correlation between government size, the interaction term, and the error term, suggesting potential bias in Models 1–4. Consequently, an instrumental variable estimator is utilized. The KP-LM test confirms no under-identification, while the KP-Wald statistic exceeds the 10% threshold, ruling out weak instruments. The Hansen J test validates the instruments. Compared to Model 4, the coefficients for government size, fiscal transparency, and the interaction term in Model 5 become significant and larger, consistent with the GMM estimates in Table 3, where government size and fiscal transparency are positively correlated, and the interaction term is negatively correlated.

Table 5: Robustness Checks Using Alternative Estimators

	Dependent Variable: g_{it}				
	Pooled OLS	FE	RE	Two-Way FE	Robust 2SLS
	(1)	(2)	(3)	(4)	(5)
GS_{it}	-0.034***	-0.079***	-0.038***	0.017	0.469***
	(-5.49)	(-4.29)	(-5.35)	(1.14)	(3.31)
FT_{it}	-0.008***	-0.013***	-0.010***	0.001	0.005*
	(-6.93)	(-9.78)	(-7.92)	(0.85)	(1.78)
$GS_{it}\times FT_{it}$	-0.075**	0.116***	-0.031	-0.037	-0.615***
	(-2.05)	(2.81)	(-0.84)	(-1.16)	(-3.36)
p_{it}	0.268***	0.159***	0.242***	0.015	0.049
	(10.63)	(5.60)	(9.44)	(0.72)	(1.45)
k_{it}	0.017***	0.008**	0.016***	0.007***	0.009*
	(9.73)	(2.46)	(8.25)	(3.03)	(1.86)
City FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes
Observations	2830	2830	2830	2830	1981
Joint F Test		2.02***			
Hausman Test			128.84***		
Wald Test				232.77***	
Endogeneity Test					24.526***
KP LM Test					35.452***
KP Wald Test					15.77*
Hansen J Test					0.715
					(0.397)

Notes: The Wald test checks if time dummies are zero; the Kleibergen-Paap (KP) LM test for under-identification; the Kleibergen-Paap (KP) Wald test evaluates instrument strength; The Hansen J test checks for overidentification.

6. CONCLUSION

Most studies examining the relationship between government size and economic growth have primarily focused on national or state levels, with comparatively less attention given to local governments, which are responsible for a significant portion of public goods and services. Previous research has emphasized the role of institutions in moderating the impact of government size on economic growth, while the importance of fiscal transparency has been largely overlooked. Fiscal transparency reduces information asymmetry and enhances accountability, thereby curbing self-interested behaviours by local governments. Although Macek and Janků (2015) investigated the impact of fiscal transparency on the relationship between government size and economic growth, they did not quantify this effect. Given the expansion of local government size and the rapid improvement in fiscal transparency in Chinese prefecture-level cities, this study aims to explore the impact of local government size on economic growth and to examine the moderating role of fiscal transparency in this relationship.

Using data from 283 prefecture-level cities in China from 2013 to 2022, we construct a dynamic panel model with two-way fixed effects and estimate the coefficients using the GMM approach. Through a systematic model selection process, our findings reveal several key insights: First, in the absence of considerations for fiscal transparency, the size of local government has a significantly positive effect on economic growth in Chinese prefecture-level cities. Second, fiscal

transparency negatively moderates this relationship. Third, as fiscal transparency increases, the positive effect of government size on economic growth diminishes and becomes statistically insignificant once fiscal transparency exceeds a certain threshold. However, even at high levels of transparency, the effect does not become significantly negative. These results remain robust across various measures and estimation methods.

The efficiency of public resource allocation relies on effective coordination among governments at various levels. This study contributes to the existing literature by confirming the positive impact of local government size on economic growth in Chinese prefecture-level cities, thereby enhancing our understanding of the role local governments play in promoting economic development. Furthermore, our findings underscore the importance of fiscal transparency in moderating the positive relationship between government size and economic growth, challenging the New Institutional Theory, which typically emphasizes institutions as the primary drivers of growth. We argue that fiscal transparency is more likely influenced by citizens' expectations for improved government oversight rather than by economic growth itself. Lastly, our findings provide a more nuanced perspective on the SDGs, which advocate for sustained, inclusive growth and emphasize the need for transparent and accountable institutions. Our study suggests that high levels of fiscal transparency may constrain the growth-enhancing effects of government size.

We propose several policy recommendations. First, China should continue its series of fiscal reforms aimed at improving fiscal decentralization. This shift in fiscal authority has expanded the capacity of local governments, enabling them to leverage their informational advantages to provide public goods, thereby enhancing the efficiency of public resource allocation. Given the negative moderating effect of fiscal transparency, policies promoting further transparency should be reevaluated, and an effective supervisory mechanism should be established to ensure that fiscal transparency remains within a reasonable range. While fiscal transparency is essential for enhancing efficiency, excessive transparency could hinder the government's ability to stimulate economic growth. Therefore, we recommend a balanced approach that maintains fiscal transparency at an optimal level, allowing local governments to promote economic growth while ensuring efficiency.

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