

Research Article

The Role of Fiscal Transparency in Stabilizing Investment in China

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Abstract

Against the backdrop of China's "stabilizing investment" policy, this paper examines the impact of fiscal transparency on investment efficiency and its underlying mechanisms. In the current context of tightening fiscal constraints and challenges to the sustainability of traditional expansionary fiscal policies, it is of significant theoretical and practical importance to explore how to enhance investment efficiency by improving fiscal management effectiveness rather than merely expanding fiscal revenues and expenditures. Using panel data from 31 Chinese provinces from 2009 to 2016, with the incremental capital-output ratio (ICOR) measuring investment efficiency, this study employs dynamic panel system GMM, threshold effect, and mediation effect models for empirical analysis. The findings reveal that: First, investment efficiency in most provinces remains relatively low and shows a declining trend, while fiscal transparency exerts a significantly positive effect on investment efficiency. Second, the impact of fiscal transparency on investment efficiency exhibits a threshold effect, with notable heterogeneity between coastal and non-coastal regions. When fiscal transparency is below a certain threshold, its enhancement plays a particularly significant role in promoting investment efficiency. Third, fiscal transparency indirectly improves investment efficiency by advancing marketization, with marketization serving as a significant mediating channel. This paper not only provides empirical evidence for understanding the relationship between fiscal transparency and investment efficiency, but also offers new insights for local governments to implement the "stabilizing investment" policy under fiscal constraints. It suggests that greater emphasis should be placed on the disclosure of fiscal information, optimizing the communication of policy details, and reducing undue government intervention. By enhancing governance transparency and marketization, investment effectiveness can be strengthened, contributing to high-quality investment growth.

Keywords

Stabilizing Investment, Fiscal Transparency, Investment Efficiency, Marketization

1. Introduction

Investment is one of the "troika" that drives economic growth and plays a crucial role in optimizing resource allocation, improving people's livelihoods, and promoting employment [36]. Given the impact of the COVID-19 pandemic

(Coronavirus Disease 2019) and the current uncertain international economic situation, "stabilizing investment" as one policy of the "six stabilities," plays an even more important role than ever before [49]. The "six stabilities" policy is intended

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to stabilize six economic indicators: employment, finance, foreign trade, foreign investment, domestic investment, and expectation. The Chinese central government first proposed the “six stabilities” policy in July 2018, when trade friction between China and the United States intensified. In early 2020, the sudden outbreak of the pandemic severely affected China’s economy. Thus, the “six stabilities” continue to be implemented [16] to stabilize and drive Chinese macroeconomics.

Fiscal policies have been an important tool to stimulate investment in China since 1998 [49], comprising numerous policies including fiscal expenditure, preferential tax, debt financing, and so on [23]. These fiscal policies generally focus on the scale of fiscal revenue and expenditure while paying limited attention to fiscal management, leading to the following two problems. First, can these fiscal policies be sustainable since the Chinese fiscal balance has been tighter than ever before? Second, are these policies effective? Researchers find that preferential tax, extra-budgetary revenue, and general transfer payments promote the scale of investment. However, they have no positive effect on investment efficiency [43]. These two problems urge China to develop new fiscal policies to stimulate investments that do not merely focus on fiscal revenue or expenditure. This study investigated the empirical impact of fiscal transparency on investment efficiency. Since fiscal transparency involves no direct fiscal revenue or expenditure, it may help solve these two problems.

Fiscal transparency is broadly interpreted as indicating the public’s improved ability to understand the true motivations behind policy actions and to assess the chances of meeting policy objectives [3], and is widely recognized as a pillar of good governance [25, 32]. When budgets and other fiscal documents are transparent and accessible, citizens and legislators can better monitor how their government raises revenue, allocates limited resources, and manages public finances [6].

The Chinese government began to emphasize fiscal transparency in the 2000s. For instance, the Chinese Budget Law was revised in 2018, and one of the most important revisions was the legal disclosure of budget drafts and reports, which were state secrets, as per the 1995 version of the Chinese Budget Law [40]. Currently, the Chinese government is pursuing more comprehensive, specific, and accessible disclosure of fiscal information. Several cities initiated their own experiments. For example, Guangzhou City has asked all of its 114 governmental agencies to make their agency budgets available to the public, and the public has been able to obtain fiscal information through application software such as WeChat since 2020 [34].

Despite governmental emphasis on fiscal transparency, empirical analyses of whether and how fiscal transparency affects governance and policy remain scarce [6]. This study empirically investigates the impact of fiscal transparency on investment efficiency by employing the dynamic panel system generalized method of moments (GMM), mediation effect, and threshold effect models based on 31 Chinese provincial-level

data from 2009 to 2016.

The contributions of this study to the literature are as follows: First, we investigate the empirical impact of fiscal transparency on investment. It is difficult to explain the endogeneity between the two variables. Additionally, investment efficiency is based mainly on previous years. Therefore, to avoid endogeneity and to consider the impact of previous years, this study adopts the dynamic panel system GMM model as the main model. We find that the empirical level of investment efficiency is still quite low by calculating the incremental capital–output ratio (ICOR); fiscal transparency affects investment efficiency positively; fiscal transparency affects investment efficiency by improving marketization, and the threshold effect exists. Second, this study suggests practical measures for China, such as emphasizing fiscal transparency, rather than merely expanding the fiscal scale of expenditure or revenue to improve investment efficiency. Previous research has primarily focused on fiscal revenue and expenditures, such as fiscal investment, tax and fee reductions, fiscal subsidies, and debt financing [22, 28]. In contrast, this study focuses on an important aspect of fiscal management, fiscal transparency, and expands the research on the role of fiscal policies.

2. Literature Review

2.1. Measurement and Influencing Factors of Investment Efficiency

Although no unified method for measuring investment efficiency currently exists, ICOR has been approved by numerous scholars. Scholars have measured China’s ICOR value and found that its overall value is extremely low or even ineffective [15, 21]. Furthermore, capital–output ratio has also been used to characterize investment efficiency [18]. We use ICOR to measure investment efficiency as a basic explained variable and the capital–output ratio as a substitutable explained variable.

Regarding the factors influencing investment efficiency, Shen and Sun (2004) explore the correlation between financial development and investment efficiency [39]. Guo (2005) finds that investment efficiency can be improved by increasing quality and promoting the flow of human capital [17]. Yuan (2013) states that technological progress can improve investment efficiency [50]. Economic policy uncertainty and incomplete information significantly inhibit investment [44].

2.2. Fiscal Transparency and Marketization

Research on the impact of fiscal transparency on investment currently focuses on normative analysis, while quantitative research is extremely scarce. Few studies have been conducted on the impact of fiscal transparency on marketization. Fiscal trans-

parency prevents the government from intervening in the market by easing the information asymmetry between the government and public, thereby promoting marketization [9]. Moreover, it can expose the government's improper intervention and rent-seeking behavior, and the public can truly play a supervisory role in the government. The cost of the intervening market for the government and its officials will increase, thereby reducing government opportunism [6]. Fiscal transparency can also help the government better understand the preferences of residents, offer public goods in order of priority with limited financial resources, and avoid inappropriate and excessive intervention, thereby creating conditions for the market mechanism to function effectively [1, 19].

2.3. Investment Efficiency and Marketization

Research on China's investment needs considers the institutional background of the transitional economy, the most obvious of which is government intervention or marketization [53]. Chinese scholars agree that government intervention is an important reason for loss of investment efficiency [11, 13, 14]. In the context of frequent administrative intervention and lack of effective supervision in China, investors may adjust their investment trajectories to meet the government's preferences, which may lead to overinvestment, underinvestment or investment deviation [27, 45]. However, some scholars have suggested that marketization may reduce investment efficiency, as the government can overcome market failures through fiscal and monetary policies. For example, investing in large-scale infrastructure through expansionary fiscal policies can significantly boost infrastructure industries and, thus, improve investment efficiency in related industries [4].

The aforementioned literature has important implications for this study; nevertheless, it has two shortcomings. First, empirical research on the impact of fiscal transparency on investment efficiency has not been conducted. Scholars' analysis of policy uncertainty and incomplete information can only offer limited insights, and the experimental impact is still questionable. Second, research on "fiscal transparency–marketization–investment efficiency" has not yet been conducted. Most scholars believe that fiscal transparency can promote marketization, which has an impact on investment efficiency, but can fiscal transparency affect investment efficiency through marketization? Is its impact positive or negative? This study investigates these two points and enriches the existing literature.

3. Theoretical Analysis and Research Hypotheses

3.1. Fiscal Transparency Affects Investment Efficiency Positively

Uncertainty of economic policy is one of the main reasons

for low investment efficiency, and this impact is the most direct and obvious [5] because uncertainty in economic policies can engender lack of information or confusion, which leads to investors' avoidance of ambiguity and results in "cash is king" attitudes or investment "tide" [26]. In other words, investors cannot have accurate or rational expectations, which makes it difficult to make scientific investment decisions [22].

Shannon, the founder of information theory, proposed that eliminating uncertainty requires the release of effective information and the promotion of communication between the government and the public [7], which is exactly the meaning of fiscal transparency. Critically, fiscal transparency is considered a pivotal dimension of governmental transparency [24] as public policies are usually funded by taxpayers' money [40]. Therefore, information included in public budgets is important for monitoring the provision of public services, and access to meaningful information is a powerful incentive for investors [10].

Fiscal transparency promotes information disclosure and communication with the public. Since public participation is an integral part of fiscal transparency, it not only means openness, but also offers approaches for the government to communicate with the public, including investors [30]. Wenling City in China has successfully implemented democratic dialogue on budgeting since 2005, and many enterprises have actively participated in the dialogue actively [8].

In other words, to reduce economic policy uncertainty, investors must obtain complete, accurate, accessible, and timely information from the government. As a concentrated reflection of macroeconomic policies, the degree of fiscal information disclosure—fiscal transparency—is directly and highly related to the certainty of macroeconomic policies. As the certainty of macroeconomic policy positively affects investment efficiency, fiscal transparency can positively affect investment efficiency. Thus, this study proposes the following hypotheses:

Hypothesis 1 (H1): Fiscal transparency affects investment efficiency positively.

3.2. Threshold Effect of Fiscal Transparency on Investment Efficiency Exists

Many important fiscal transparency indices identify the quantity and quality of disclosed fiscal information (stakeholder engagement) as the main dimensions of fiscal transparency [2, 12]. However, not all information is important for investors. Some information may not be important once investors obtain the necessary information to make investment-related decisions. Therefore, the degree of its impact on investment efficiency may vary with improved fiscal transparency.

First, from the perspective of information disclosure, macroeconomic policies have the greatest impact on investors, including government subsidies, industrial investment funds, and tax incentives. If this information is transparent, it pro-

vides the necessary conditions for investors to make reasonable expectations. Although the disclosure of some budget information, such as personnel and office expenses, can improve the overall fiscal transparency score, the impact of the disclosure may not be critical because of the weak correlation between these rigid expenditures and investment decisions. Second, from the perspective of information disclosure, if investors are unable to conveniently and quickly obtain relevant information for scientific investment decisions, improving the information disclosure methods is necessary to increase transparency. However, if investors have already obtained necessary information in current ways, then the expansion of disclosure methods cannot play an important role as before. For instance, if investors can conveniently obtain the necessary information through the government's official websites, then obtaining this information via TV is not very important for investors, although it can improve the scoring of fiscal transparency. Therefore, once fiscal transparency exceeds a certain degree, its impact on investment efficiency remains positive but may be weaker than before. Accordingly, this study proposes a second hypothesis.

Hypothesis 2 (H2): The impact of fiscal transparency on investment efficiency may differ at different fiscal transparency stages and regions.

3.3. Fiscal Transparency Affects Investment Efficiency by Promoting Marketization

Marketization can improve investment efficiency. The low degree of marketization is the main reason for investment inefficiency because investment is largely distorted by government intervention [2]. For example, corruption does exist in key investment industries, such as engineering construction and land leasing. Corruption accounts for one-third or more than half of the investment. Investment has been the hardest hit by corruption in China [52]. For state-owned enterprises, the impact of administrative intervention is even more significant than that of other enterprises, and investment distortions are extremely severe. Therefore, restraining government intervention and letting the market mechanism play its role is critical to improving investment efficiency in China [33, 37].

Marketization can reduce investment efficiency. An important condition for the normal operation of market mechanisms is perfect competition, which is difficult to achieve in reality [35]. The occurrence of market failures, such as excessive competition, price distortion, and information asymmetry, inevitably leads to low investment efficiency [20]. Chinese governments have encouraged and launched various large-scale and necessary public infrastructure investment projects, which have unobservable positive external effects on improving macro-investment efficiency [20].

Fiscal transparency improves marketization because it can restrict and supervise the government, thus clarifying the boundary between the government and the market and allowing the market mechanism to fully play its role. In provinces

with low transparency, marketization is correspondingly low. In contrast, in provinces with high transparency, marketization is high. Low fiscal transparency may encourage the government to intervene arbitrarily and excessively in market investment and even breed corruption [42], which may decrease investment efficiency. However, low fiscal transparency may also encourage the government's macro control, thereby assisting in reducing market failure and increasing investment efficiency. Thus, fiscal transparency can promote marketization, which may increase or decrease investment efficiency. We propose the third hypothesis as follows:

Hypothesis 3a (H3a): Fiscal transparency improves investment efficiency by promoting marketization.

Hypothesis 3b (H3b): Fiscal transparency reduces investment efficiency by promoting marketization.

3.4. The Chinese Institutional Context and Its Implications

China's institutional environment exhibits several distinctive features that shape the relationship between fiscal transparency and investment efficiency.

First, the Chinese economy operates under a strong state-led development model, where local governments play a pivotal role in mobilizing resources, guiding industrial policy, and implementing investment projects. This contrasts with many market-economy contexts where investment decisions are predominantly driven by private actors. In China, fiscal transparency not only informs investors but also signals government priorities and commitment to policy stability, which can reduce uncertainty in a system where administrative guidance remains influential.

Second, China's fiscal and governance systems are characterized by pronounced regional heterogeneity. Coastal provinces generally benefit from higher levels of marketization, better institutional quality, and greater integration with global markets, whereas inland regions often rely more heavily on government-led investment and transfer payments. This divergence implies that the effect of fiscal transparency may be conditioned by local institutional maturity—a point corroborated by our threshold analysis.

Third, China's ongoing transition from a planned to a market economy means that institutional norms are still evolving. Fiscal transparency reforms are embedded in a broader agenda of modernizing fiscal governance and enhancing government accountability. However, these reforms coexist with legacy practices such as soft-budget constraints, off-budget financing, and informal government–business ties. These factors may moderate the effectiveness of transparency in curbing investment distortions.

While these contextual features enrich our understanding of how transparency operates in a major transitional economy, they also pose limitations on the generalizability of the find-

ings. The strong role of the state and the unique intergovernmental fiscal relations in China may mean that the estimated effects of fiscal transparency are not directly transferable to settings with different political–economic structures. Nonetheless, this study offers insights for other emerging economies that are pursuing transparency reforms amid strong state involvement in economic activity. It also highlights the importance of considering institutional boundaries when extrapolating governance-related findings across countries.

4. Variables, Data, and Models

4.1. Calculation of ICOR

Scholars typically use ICOR to describe investment efficiency [31]. The smaller the ICOR value, the higher is the investment efficiency, and vice versa. We calculated the provincial ICOR from 2009 to 2016, referring to Zhang et al. (2004) [51] and Wen & Wang (2017) [47]. Missing data were filled in using interpolation. A detailed calculation of ICOR can be obtained on request. The lowest value of ICOR was 3.4 in Guangdong Province in 2009, and the highest was 23.5 in Shanxi province in 2015. The average provincial ICOR value were 8.01. The overall ICOR continues to increase, indicating that investment efficiency is generally reduced. Among them, Ningxia, which has the worst investment efficiency, increased from 10.9 to 22.6, whereas Guangdong, which has the best

investment efficiency, increased from 4.2 to 6.1.

4.2. Variables

The explained variable—ICOR—is the value calculated in this study. The explanatory variable, fiscal transparency, is obtained from provincial fiscal transparency scores published by several scholars [38]. The mediation variable (marketization) was obtained from the marketization index compiled by Wang et al. (2018). This index includes the relationship between the government and the market, development of the non-state-owned economy, degree of development of the product market, degree of development of the factor market, development of market mediation organizations, and the institutional environment [46]. The control variables include total social consumption, total local fiscal expenditure, per capita GDP, and urbanization level [29, 41, 48]. Table 1 presents the descriptive statistics for these variables. To avoid problems such as increasing dimensional gaps and nonstationary sequences, the dependent, independent, and control variables were standardized. The data were collected from the China Statistical Yearbook. The substitutable variable—the capital–output ratio—is the amount of capital required for an economic system to obtain one unit of output. The lower the value, the higher the investment efficiency and vice versa. We calculate the provincial capital–output ratio and use it as a replacement variable for robustness testing.

Table 1. Descriptive statistics of the variables.

	Variable	Abbreviation	Number of observations	Mean	SD	Minimum value	Maximum value	Median
Explained variable	investment efficiency	ICOR	248	7.54	3.42	3.38	23.45	6.59
Explanatory variables	fiscal transparency	TRS	248	29.30	12.56	11.52	77.70	24.16
Mediating variable	marketization index	MRT	248	5.83	1.98	-0.23	10.00	5.82
Control variables	total social consumption	CON	248	7415.19	6515.22	156.60	34739.10	5761.80
	total fiscal expenditure	EXE	248	360.53	209.20	46.97	1147.35	307.61
	urbanization level	CITY	248	53.79	13.94	22.30	89.61	51.90
	GDP per capita	GDP	248	44047.08	22372.35	10971.00	118198.00	38568.00
Robustness check variables	capital–output ratio	AST	248	4.57	1.34	2.44	11.07	4.20

4.3. Models

To the best of our knowledge, the empirical relationship between fiscal transparency and investment efficiency has not been investigated. Thus, it is difficult to explain the endogeneity

between the two variables. Additionally, investment efficiency is based mainly on previous years. Therefore, to avoid endogeneity and consider the impact of previous years, this study uses the dynamic panel system GMM model to explore the impact of fiscal transparency on the ICOR, as depicted in equation (1).

$$ICOR_{it} = \beta_0 + \gamma_1 ICOR_{it-1} + \beta_1 TRS_{it} + \alpha_1 X_{it} + e_{it} \quad (1)$$

In equation (1) $ICOR_{it}$ represents the investment efficiency of province i in period t , TRS_{it} represents the fiscal transparency of province i in period t , and X_{it} represents the control variables of province i in period t , including the urbanization level (CITY), household consumption level (CON), per capita

GDP (GDP), and fiscal total expenses (EXE).

To test whether there is a mediating effect, dynamic panel models (2) and (3) were established with fiscal transparency (TRS), marketization (MRT), and ICOR as the explanatory, mediating, and explained variables.

$$MRT_{it} = \alpha TRS_{it} + \gamma_1 MRT_{it-1} + \alpha_1 X_{it} + e_{1it} \quad (2)$$

$$ICOR_{it} = \gamma_1 ICOR_{it-1} + \alpha' TRS_{it} + \rho MRT_{it} + \alpha_2 X_{it} + e_{2it} \quad (3)$$

Equation (2) depicts the impact of fiscal transparency on marketization and Equation (3) depicts the impact of fiscal transparency on ICOR through marketization. The mediation effect can be tested by combining Equation (1). If the coefficient

of Equations (2) and (3) (α and ρ) are significant, marketization is a mediating variable with a mediating effect.

This study uses a panel threshold effect model to explore the impact of fiscal transparency as a threshold variable on the ICOR, as shown in Equation (4).

$$ICOR_{it} = u_i + \alpha_1 I(TRS_{it} < \varphi_1) TRS_{it} + \alpha_2 I(TRS_{it} > \varphi_1) TRS_{it} + \beta_1 X_{it} + \gamma_{it} \quad (4)$$

In Equation (4), $I(\cdot)$ is the threshold indicator function; the threshold variable in brackets is fiscal transparency (TRS), φ_1 , which is the threshold value to be calculated, and the control variables are summarized as X_{it} .

4.4. Results and Discussions

4.4.1. Stationarity and Cointegration Tests

To prevent non-stationary data from affecting the validity of the regression, it is necessary to test the stationarity of the panel data before conducting a regression analysis. The HT test method was used in this study. We find that the variables ICOR, TRS, and MRT are stationary at the 1% significance level, whereas the remaining variables are non-stationary series, requiring further cointegration tests. Based on the unit root tests, both the Pedroni and Westerlund tests were conducted for the cointegration analysis. The test statistics for both hypotheses are significant, rejecting the null hypothesis of no cointegration relationship. This indicates the existence of at least one long-term equilibrium relationship among the variables, making them suitable for regression modeling.

4.4.2. Positive Impacts of Fiscal Transparency on Investment Efficiency-Results of the Dynamic System Panel GMM Regression

To verify the impact of fiscal transparency on ICOR, the dynamic panel system GMM model is employed to conduct a

baseline regression using Equation (1). To eliminate the endogeneity problem of the variables that cause the bias of the coefficients, We use the lagged dependent variable as instrumental variable. The results are presented in Table 2. Models 1–6 show the regression results after gradually increasing the number of control variables: The coefficients of fiscal transparency has a negative effect on ICOR, and the coefficients are -0.0347, -0.0255, -0.0128, -0.0178, -0.0090, -0.1650 and -0.01941 in Models 1-6, which indicates that for every unit increase in fiscal transparency, ICOR decreases by approximately 0.01-0.16 units, the coefficients are significant at 1% level in Models 2, 5, 6, 7; at 5% level in Models 1 and 3, and 10% level in Model 4. that is, investment efficiency improves by 0.028 units. This finding implies that fiscal transparency positively affects investment efficiency, which supports H1. We also see that the urbanization rate (CITY) has a negative sign, it might be that as urbanization rises, cities tend to be well developed, it also enables shared infrastructure and better institutions to reduce transaction costs and improve project allocation, thus leading the decrease of ICOR.

The diagnostic tests suggest that the GMM specification is broadly well-constructed based on the P-value of AR (1) and AR (2). In particular, Models 1-5 exhibits no evidence of second-order serial correlation in the differenced residuals (p-values of AR (2) are greater than 0.05 for all 5 models), satisfying the key requirement for the moment conditions of GMM estimation, additionally, the p-values of AR (1) in Models 1-4 are significant at 10% level, which supports the validity of the underlying moment conditions and the use of lagged variables as

internal instruments. At the same time, the relatively large Sargan statistics observed across Models 1 – 5 can be explained by the inclusion of lagged ICOR as one of the regressors, which expands and alters the internal instrument matrix and may increase

the sensitivity of the overidentifying-restrictions test. Although Model 1 reports a comparatively small Sargan statistic, this result might be interpreted as a more parsimonious model with fewer covariates, therefore, it is less able to capture the characteristic of the dependent variables to the current-period ICOR.

Table 2. Results of GMM model and robustness check.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
ICOR _{it-1}	0.9511*** (54.48)	0.9722*** (120.91)	0.9431*** (90.04)	0.9505*** (82.33)		1.2087*** (4.88)	0.8278*** (141.72)
TRS	-0.0347** (-2.03)	-0.0255*** (-2.70)	-0.0128** (-2.08)	-0.0178* (-1.72)	-0.0090*** (-3.86)	-0.1650*** (-3.40)	-0.0194*** (-3.07)
EXE			-0.1984*** (-4.50)	0.4128*** (18.91)			
CON				-0.5821*** (-16.81)			
CITY					-0.0982*** (-3.81)		
GDP		0.0952*** (5.83)	0.1773*** (5.45)	0.4386*** (6.90)	0.0293** (2.06)	0.5875* (1.91)	0.2809*** (13.39)
AST _{it-1}					1.0989*** (123.27)		
Constant	0.1489*** (11.00)	0.1429*** (20.99)	0.1545*** (8.21)	0.1322*** (5.11)	0.2209*** (21.44)	0.1465** (2.15)	0.1059*** (38.10)
Obs	217	217	217	217	217	70	147
AR(1)	0.0563	0.0513	0.0649	0.0323	0.1415		
AR(2)	0.231	0.2288	0.2373	0.2394	0.1108		
Sargan	21.94 [0.02]	29.75 [0.16]	28.93 [0.18]	23.01 [0.46]	19.43 [0.05]		

Model 5 is the robust test result by replacing the dependent variable, that is, replacing the dependent variable (ICOR) with capital–output ratio. The impact coefficient of fiscal transparency on investment efficiency is -0.009 at the 1% significance level, implying that for every unit increase in fiscal transparency, investment efficiency increases by 0.009 units. Model 6 passes the test at a significant level, indicating that the baseline model is robust.

To explore the regional impacts of transparency on ICOR, we employed the GMM regression based on data divided to coastal and non-coastal provinces. In Table 2, Models 6 and 7 show the results for the coastal and non-coastal provinces. The coefficients for the coastal and non-coastal provinces were $-$

-0.1650 , and -0.0194 respectively. Both the coefficients are significant at the 1% level. Overall, the regional robustness checks support the robustness of the baseline model while also reflecting the heterogeneous characteristics of different regions.

4.4.3. Threshold and Mediation Effect

To test whether fiscal transparency has a threshold effect on investment efficiency, we use Equation (4) as the base model and fiscal transparency as the threshold variable. Based on the heterogeneous characteristics of different regions in China, this study conducted threshold effect tests by dividing coastal

and non-coastal regions. Table 3 shows the significance of single- or double-threshold models for total, coastal, and non-coastal samples after repeated sampling 100 times using the self-sampling method. Table 3 indicates that for the total and non-coastal samples, the single-threshold model is preferred, whereas for the coastal sample, the double threshold model is preferred. For coastal samples, the first and second thresholds were 40.39 and 39.00, respectively. The second threshold is less than the first, and the estimation results show that there are five sets of observations in the overlapping region. Table 4 shows that fiscal transparency, in general, has a negative effect on the ICOR, and the effects vary in different regions. The coefficients are significant at the 5% level when fiscal transparency is below TRS_0 for the overall, coastal, and non-

coastal region models. For the coastal sample, when fiscal transparency falls between 40.39 and 39.00, the coefficient is positive and significant at the 1% level, which conflicts with the assumptions above. However, because there are only five out of 217 observations, as mentioned before, this result can be neglected. The coefficient of TRS_2 is significant at the 10% level for the coastal model, and this significance diminishes with an increase in fiscal transparency. We conclude that with the improvement in fiscal transparency, the positive effect of fiscal transparency on ICOR still exists but may not be as significant as the lower fiscal transparency scenario, which supports H2. In other words, the impact of fiscal transparency on ICOR is more significant in provinces with low transparency than in those with high transparency.

Table 3. Threshold significance test and threshold estimates.

threshold variable	Sample	Threshold number	F value	Threshold estimate	95% confidence interval
TRS	Total	Single threshold	13.94*	20.27	[20.10, 20.28]
		Double threshold	5.78		
	Coastal	Single threshold	4.76	TH21=40.39	TH21: [39.98, 40.64]
		Double threshold	53.74***	TH22=39.00	TH22: [38.68, 39.98]
	Non-Coastal	Single threshold	10.41*	20.27	[19.97, 20.28]
		Double threshold	4.80		

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, and the t-values are in parentheses.

Table 4. Threshold effect using fiscal transparency as the threshold variable.

Variable	Total sample	Coastal sample	Non-Coastal sample
TRS_0	-0.058**	-0.0333**	-0.0655**
TRS_1	-0.002	0.0607***	-0.001
TRS_2		-0.0184*	
R-squared	0.703	0.889	0.697
Obs	217	70	147
Province	31	10	21

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively, and the t-values are in parentheses.

To verify the reliability of marketization as a mediating variable, this study conducted a mediating path test based on Equation (2). Table 5 presents the results. The coefficient of the impact of fiscal transparency on marketization in Model 9 is -0.0466, which passes the test at the 5% significance level, suggesting that fiscal transparency has a significantly positive impact on marketization and can be used as a mediation vari-

able. Model 10 is based on Equation (3). The impact coefficient of marketization on investment efficiency is -0.216, which passes the test at the 1% significance level, indicating that marketization has a significantly positive impact on investment efficiency. According to the testing process of the mediating effect, the coefficients α and ρ were significant, confirming the existence of a mediating effect. In Model 10,

the impact coefficient of fiscal transparency on investment efficiency is -0.0673, significant at the 10% level. This finding indicates that fiscal transparency increases investment efficiency by promoting marketization, supporting H3a.

The diagnostic tests suggest that the GMM specification is appropriately constructed. The AR(2) tests yield p-values

greater than 0.1 for Models 9–11, indicating that there is no statistically significant second-order serial correlation in the differenced residuals and thus supporting the underlying moment conditions when using lagged variables as internal instruments.

Table 5. Results of mediating effect.

VARIABLES	Model 9 mediating path test	Model 10 Mediation effect test	Model 11—Robustness test with the replaced dependent variable
ICOR _{it-1}		0.9680*** (35.84)	
MRT		-0.2160*** (-4.59)	-0.0283*** (-3.51)
TRS	-0.0466** (-2.12)	-0.0673*** (-2.91)	-0.0099*** (-3.68)
GDP	-0.3140*** (-4.05)	0.7064*** (5.96)	
CITY	1.1006*** (6.46)	-0.4319*** (-3.19)	
MRT _{it-1}	0.5220*** (13.18)		
AST _{it-1}			1.1138*** (161.72)
Constant	0.1239 (1.64)	0.1271*** (4.42)	0.2222*** (35.07)
Obs	217	217	217
province	31	31	31
AR(1)	0.0054	0.0403	0.1824
AR(2)	0.6898	0.2928	0.2564
Sargan	14.93 [0.19]	13.14 [0.28]	19.70186 [0.05]

To ensure that the results are robust and reliable, we conduct a robustness test by replacing the dependent variable. After replacing ICOR with capital–output ratio in Model 11, the coefficient of fiscal transparency on capital–output ratio is -0.028, indicating that for every unit increase in fiscal transparency, investment efficiency increases by 0.028 units by promoting marketization, which is significant at the 1% level. Therefore, Model 10 was robust.

5. Conclusions

This study investigates the critical yet underexplored relationship between fiscal transparency and investment efficiency within the distinctive institutional context of China. By employing a dynamic panel system GMM model, alongside threshold and mediation analyses on provincial data from

2009 to 2016, we provide robust empirical evidence that enhancing fiscal transparency serves as a viable and sustainable mechanism for improving investment efficiency, thereby supporting the national “stabilizing investment” policy.

Our key findings are threefold. First, fiscal transparency exerts a significant positive impact on investment efficiency, as measured by the incremental capital-output ratio (ICOR). This underscores that beyond traditional fiscal instruments (e.g., expenditure expansion or tax cuts), improvements in governance and information disclosure can effectively reduce policy uncertainty and foster a more predictable environment for investors. Second, this impact is non-linear and exhibits a threshold effect. The positive effect is most pronounced when transparency levels are below a certain threshold, which varies notably between coastal and non-coastal regions. This heterogeneity highlights the importance of tailored, region-specific transparency reforms rather than a one-size-fits-all approach. Third, the pathway of this influence is partially mediated by the degree of marketization. Fiscal transparency helps curb arbitrary government intervention, clarifies the government-market boundary, and allows market mechanisms to function more effectively, which in turn enhances the allocation efficiency of investment.

This research contributes to the literature by extending the analysis of fiscal governance beyond revenue and expenditure to the realm of information and accountability. It demonstrates that in a transitional economy like China, where government intervention has historically been substantial, enhancing fiscal transparency can be a potent tool for mitigating investment distortions and improving macroeconomic efficiency. For policymakers, particularly at the local government level, our findings offer clear guidance: 1. Shift from Scale to Efficiency: The “stabilizing investment” policy should be reoriented from a singular focus on investment scale toward improving investment efficiency. Local governments should establish and monitor efficiency metrics like ICOR alongside traditional growth targets 2. Prioritize Transparency as a Sustainable Tool: Under increasing fiscal constraints, expanding traditional fiscal stimulus is unsustainable. Improving fiscal transparency—especially in non-coastal regions and jurisdictions with currently low scores—provides a high-return, low-cost avenue for stimulating efficient investment. Efforts should prioritize disclosing information most relevant to investor decision-making, such as details on industrial funds, subsidies, and medium-term fiscal frameworks 3. Leverage Transparency to Promote Marketization: Fiscal transparency should not be an end in itself but a means to restrain government overreach and foster a market-conducive environment. Reforms should be designed with the explicit goal of reducing information asymmetry and enabling public and market supervision of government actions related to investment.

Abbreviations

ICOR	Incremental Capital-output Ratio
COVID-19	Coronavirus Disease 2019
GMM	Generalized Method of Moments

Author Contributions

Shujie Wang: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing.

Yan Ge: Data curation, Investigation, Methodology, Resources, Software, Validation, Writing – original draft.

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Conflicts of Interest

The authors declare that they have no affiliations with or involvement in any organization or entity with any financial interest in the subject matter or materials discussed in this manuscript.

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