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The Mechanism of Vertical Fiscal Imbalance Affecting High-Quality Economic Development: A 3SLS Estimation Based on Local Government Tax Effort and Expenditure Structure

Ke Wang[1,2*], Venus Khim-Sen Liew[2]

[1]School of Finance and Accounting, Anhui Finance & Trade Vocational College, Hefei, 230601, China, [2]Faculty of Economics and Business, Universiti Malaysia Sarawak, Kota Samarahan 94300, Malaysia

*Email: wangke@afc.edu.cn

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Abstract

Against the backdrop of China's transition toward high-quality economic development, it is imperative to explore the mechanisms through which the fiscal system influences development quality. This study employs panel data from 30 Chinese provinces spanning 2008 to 2022 and applies a Three-Stage Least Squares (3SLS) estimation to examine the impacts of vertical fiscal imbalance, local government tax effort, and expenditure structure on high-quality economic development. The results reveal that vertical fiscal imbalance not only directly constrains development quality but also exerts indirect effects by weakening tax effort and increasing the proportion of livelihood-related public expenditures. The decomposition of effects shows that the direct effect dominates in the tax effort pathway, whereas the indirect effect is more pronounced in the expenditure structure pathway. The findings suggest that region-specific policies and optimized fiscal decentralization are essential to promoting sustainable development.

Keywords: Vertical Fiscal Imbalance, Tax Effort, Expenditure Structure, High-quality Economic Development, Three-Stage Least Squares

Introduction

As China's principal social contradiction has shifted to that between the people's growing needs for a better life and unbalanced and inadequate development, the country's economic system is undergoing a triple transformation characterized by a shift in growth pace, structural optimization, and the transition of development drivers. The iterative trajectory of policies set out by the Central Economic Work Conference demonstrates that high-quality development has evolved from being a "fundamental requirement" into a dynamic governance framework emphasizing the coordination of quantity and quality. Its institutional core is embodied in a three-dimensional policy matrix comprising "deepening supply-side

structural reforms, upgrading demand-side management, and building a new development paradigm." As the quality of public demand continues to rise, addressing livelihood issues has become increasingly urgent (Jin, 2018; Liu & Zhang, 2022; Cai & Chen, 2023). In the report to the 20th National Congress of the Communist Party of China, General Secretary Xi Jinping stressed the acceleration of building a new development pattern and the vigorous promotion of high-quality development, highlighting that "comprehensive high-quality development is the essential requirement for building a modern socialist country."

However, in recent years, affected by the global economic downturn and the COVID-19 pandemic, China's economy has transitioned from a period of high-speed growth to one of medium-high-speed growth, with mounting downward pressures leading to a slowdown in fiscal revenue growth. Against the backdrop of rigid increases in fiscal expenditures, the imbalance between revenue and expenditure has become more pronounced. As demands for public spending on environmental governance and an aging population intensify, local governments face escalating fiscal pressures, with significant regional fiscal divergences emerging; some less-developed regions have even experienced negative fiscal revenue growth (Chu & Shao, 2018; Feng et al., 2023). Despite the central government maintaining a fiscal surplus, local governments are confronted with revenue-expenditure imbalances. The devolution of expenditure responsibilities is not always accompanied by corresponding transfers of tax revenue, resulting in a vertical fiscal imbalance (Wang & Liew, 2024). Local public finance is a crucial component of the modernization of national governance capacity and governance systems. Investigating the impact mechanisms of vertical fiscal imbalance on local governments' tax collection and administration helps to analyze their psychological and behavioral characteristics in tax enforcement (Wang et al., 2020; Liu et al., 2023).

China is currently at a critical juncture of economic transformation, and fiscal policy plays an increasingly prominent role in driving high-quality development. This study utilizes provincial panel data to analyze the impact mechanisms of vertical fiscal imbalance from the dual perspectives of tax effort and expenditure structure. The findings aim to offer policy recommendations for governments and policymakers in seeking optimal pathways to achieve sustainable economic development in China (Ren, 2018; Wei et al., 2021).

Literature Review

Economic development has long been viewed as a unity of quantity and quality. However, existing studies predominantly focus on the expansion of economic aggregates, while often neglecting development quality. This has led to increasingly prominent issues such as structural imbalances, income disparities, inefficient resource utilization, and environmental degradation (Tridico, 2011). Over time, scholars have begun to shift their attention to how to enhance the quality of economic development. Current research on vertical fiscal imbalance (VFI) primarily concentrates on economic growth rates, land financing, local government debt, transfer payments, and governance capacity (Liu et al., 2024). While these studies offer important insights, most operate in silos and lack a systematic analytical framework that organically integrates vertical fiscal imbalance, local government revenue-expenditure behavior, and economic development quality.

Regarding vertical fiscal imbalance (VFI), the concept was first introduced by Wagner in 1973, who noted that a VFI arises when the central government enjoys ample fiscal revenue while

local governments face substantial fiscal needs. Chu and Shao (2018) pointed out that with revenue concentrated at the central level and heavier expenditure responsibilities devolved to local governments, the adjustment of revenue distribution has not kept pace with the redistribution of expenditure responsibilities. Cai and Chen (2023) argued that the centralization of fiscal authority alongside the devolution of administrative responsibilities has resulted in a mismatch between revenues and expenditures, giving rise to vertical fiscal imbalance. This study measures VFI by drawing on the approach developed by Eyraud and Lusinyan (2013).

Regarding tax effort (Teffort), since the latter half of the 20th century, the IMF and the World Bank have introduced this concept in their research to encourage countries to formulate sustainable tax policies. Chu et al. (2019) estimated potential tax revenues using the "Buoyancy Method," and measured local governments' tax effort by calculating the ratio of actual to potential tax revenues.

Regarding local government expenditure structure (Gstructure), research on this topic dates back to the early 20th century and has gradually evolved alongside the development of modern public finance systems. Early studies focused on expenditure effects, the division of fiscal powers and responsibilities, and resource allocation (Barro, 1990; Easterly & Rebelo, 1993; Devarajan, 1996). The expenditure structure refers to how local governments allocate funds between investment expenditures and livelihood-related expenditures. Following the methodology of Chu and Fei (2021), this study uses the share of livelihood expenditures to measure the rationality of expenditure structure, with a higher proportion indicating that expenditures are more aligned with the "people-centered" development orientation.

Regarding economic development quality (Quality), Stiglitz et al. (2010) criticized GDP for overlooking development quality and social well-being, failing to capture issues such as distribution, equity, and sustainability, and advocated for more comprehensive indicator systems. In this context, General Secretary Xi Jinping put forward the "five major development concepts"—innovation, coordination, green development, openness, and sharing—at the Fifth Plenary Session of the 18th CPC Central Committee, which have become important criteria for assessing development quality in the new era. Drawing on the work of Chu et al. (2020), this study adopts a principal component analysis (PCA) approach to construct a composite indicator system based on these five major concepts, thereby providing a scientific assessment of economic development quality.

Hypotheses Development

Recently, the relationship between vertical fiscal imbalance (VFI) and high-quality economic development has attracted growing attention from researchers and policymakers, especially in the context of China (Wang & Liew, 2024). Theoretically, moderate vertical fiscal imbalance within the framework of fiscal federalism is believed to possess dual institutional efficacy (Bao et al., 2017). On one hand, it strengthens central fiscal authority through central-local collaborative governance mechanisms, thereby safeguarding macroeconomic stability and enhancing policy transmission efficiency (Sun et al., 2019). On the other hand, it optimizes local government incentive compatibility through transfer payment mechanisms (Wang et al., 2020). However, this also imposes substantial fiscal pressures on local governments, resulting in a fiscal mismatch between local and central governments (Wei et al., 2021). When

intergovernmental competition manifests through market segmentation, redundant construction, or distorted fiscal expenditures, it can suppress technological innovation and efficiency gains, ultimately leading to factor market misallocation and distortions (Song et al., 2021). Furthermore, due to the existence of central fiscal backstop policies, aggravated vertical fiscal imbalance may drive local governments to excessively rely on transfer payments, pushing them into an "incentive trap" characterized by reduced tax efforts and relaxed budget constraints. Against this backdrop, the following research hypothesis is proposed:
H1: The current level of vertical fiscal imbalance suppresses high-quality economic development in China.

Under vertical fiscal imbalance, local governments face the dual constraints of fiscal pressure and promotion competition, which weakens tax collection and administration (Von Hagen & Eichengreen, 1996). Asymmetric decentralization forces local governments to rely on land finance and debt expansion, which simultaneously undermines tax efforts (Rodden, 2002). Additionally, the GDP-oriented promotion tournament among local officials spurs inter-regional strategic competition, prompting local governments to adopt "elastic tax administration" strategies that effectively serve as implicit tax incentives (Li et al., 2021; Liu et al., 2024). These dual mechanisms together induce structural distortions in tax effort under vertical fiscal imbalance.
H2: Vertical fiscal imbalance suppresses tax effort.

Local governments frequently use tax incentives to attract investment, resulting in rapid expansion of investment scale and concentration in a few government-supported industries, thereby leading to inter-regional investment misallocation (Miyazawa et al., 2019). In the long run, this hampers high-quality local economic development. Over-provision of tax incentives triggers a compound "industrial agglomeration–tax base erosion" effect (Chu & Fei, 2021). On one hand, policy arbitrage opportunities drive capital to cluster excessively in subsidized industries, creating cross-regional "siphon effects" that distort investment structures away from comparative advantages. On the other hand, such distortive incentives induce a "sticky dissipation effect"—when the intensity of tax incentives exceeds the optimal threshold, their marginal benefits decline exponentially, ultimately hindering improvements in regional economic development quality (Tian & Wang, 2023).
H3: Tax effort has a suppressing effect on high-quality economic development.

Combining H2 and H3 leads to the following hypothesis:
H4: Vertical fiscal imbalance indirectly affects high-quality economic development by influencing tax effort.

In addition, under China's unique fiscal decentralization system, intensified vertical fiscal imbalance leads to local behavioral biases (Bardhan & Mookherjee, 2006). Firstly, widening fiscal gaps compel local governments to prioritize economic projects to expand the tax base, crowding out the provision of public goods and resulting in an "investment-heavy, livelihood-light" expenditure structure (Liu & Zhang, 2022). Secondly, vertical imbalance strengthens local dependence on central transfer payments, which induces a "common pool" effect that weakens expenditure incentives and exacerbates fiscal deficits (Li & Li, 2024). Thirdly, yardstick competition among regions forces lagging areas to raise tax burdens to catch up

with public service levels. The pressure of tax revenue losses has intensified reliance on transfer payments and expenditure imbalances. Coupled with local officials' GDP-oriented 'economic competition,' this has further deepened the path dependency of public spending toward production-oriented projects (Feng et al., 2023).
H5: Vertical fiscal imbalance suppresses expenditure structure optimization.

The influence of local expenditure structure on economic development quality can be analyzed from three perspectives. First, the central evaluation system's tilt toward livelihood and well-being compels local governments to optimize spending on education, healthcare, and other public services, enhancing soft environment quality and long-term growth potential (Odawara, 2011; Amusa & Oyinlola, 2019). Second, China's style of decentralization grants local governments autonomy over expenditures, allowing them to more precisely match local endowments and demands, thereby improving resource allocation efficiency and driving high-quality development (Liu et al., 2023). Third, breaking the GDP path dependence under the "promotion tournament," the marginal benefits of livelihood expenditures have surpassed those of production expenditures. By optimizing the expenditure structure, local governments can simultaneously meet public welfare demands and bolster officials' promotion prospects, mitigating the negative effects of excessive production spending and forming a dual impetus for enhancing economic development quality (Meričková et al., 2017).
H6: Expenditure structure promotes improvements in economic development quality.

Under China's decentralized system, local governments face a structural dilemma of "heavy expenditure responsibilities and weak revenue authority". At the same time, they are constrained by promotion incentives and the competitive pressure of the 'economic competition,' which leads to multiple conflicts between horizontal competition and the demands of public welfare (Yao et al., 2024). Moderate vertical fiscal imbalance may help optimize expenditure structure and promote high-quality economic development. However, when the imbalance becomes excessive, local governments often adopt growth-oriented spending patterns, biasing expenditure toward economic construction at the expense of high-quality development (Liu & Zhang, 2022). Vertical fiscal imbalance strengthens the impact of expenditure structure on economic development quality through three channels. First, local governments adjust their expenditure structures to alleviate fiscal pressures and seek promotion. Second, high-competitive pressures prompt them to favor short-term high-return areas, exacerbating structural imbalances. Third, regions with moderate to low levels of development blindly imitate the expenditure models of more developed provinces, deviating from reality and indirectly affecting economic development quality (Jia et al., 2016; Tian & Wang, 2023).
H7: Vertical fiscal imbalance indirectly affects high-quality economic development through expenditure structure.

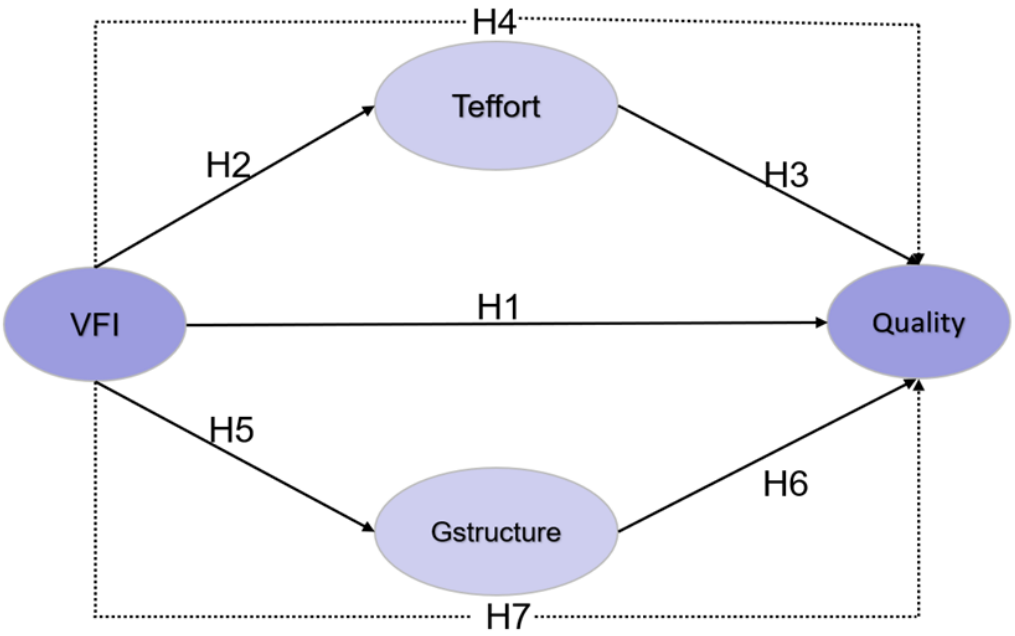

Figure 1. Conceptual Framework

Table 1
Variable Definition and Calculation Formula

Variable	Definition	Calculation Formula
Quality	Economic growth is not only quantitative expansion, but also includes quality, efficiency and sustainability	By performing principal component analysis on the five indicators of innovation, coordination, green development, openness, and shared prosperity
Tax Effort	Actual collection rate of local government taxes	Ratio of actual tax to potential tax
Expenditure Structure	Allocation of various expenditures in local government fiscal budgets	The proportion of public expenditure allocated to livelihood-related expenditure
VFI	Mismatch between central and local government revenue and expenditure	Refer to Table 2
Pgdp	Per capita GDP	The logarithm of GDP/ population
Ptax	Average tax burden per person	The logarithm of tax revenue / population
Open	Degree of Openness	Total exports /GDP
Ind	The proportion of tertiary industry	Value added of tertiary industry /GDP
Gscale	The amount of public expenditure	The ratio of general public budget expenditure / GDP
FSS	The portion of local government expenditure paid from its own revenue	Refer to Table 2
Density	Population density per unit area	Ratio of total population / land area
Transfer	Financial assistance provided by the government to individuals, families, businesses, or other organizations without charge	Percentage of general transfer payments out of total transfer payments

Urban	Urbanization level	Urban population/total population
Compete	Local governments engage in horizontal competition to achieve higher economic performance	Competitiveness of neighboring provinces in terms of Pgdp
Capital	Physical assets accumulated in the economic system and used in the production process	The ratio of actual fixed asset formation to actual GDP

Table 2
The Measurement Formula of VFI

Index Name	**Measurement Formula**
VFI	$\mathrm{VFI} = 1 - \frac{\mathrm{FD_R}}{\mathrm{FD_S}} \times (1 - \mathrm{FSS})$
$\mathrm{FD_R}$	$\mathrm{FD_R} = \frac{\frac{\mathrm{LP_R}}{\mathrm{LPOP}}}{\frac{\mathrm{LP_R}}{\mathrm{LPOP}} + \frac{\mathrm{CP_R}}{\mathrm{NPOP}}}$
$\mathrm{FD_S}$	$\mathrm{FD_S} = \frac{\frac{\mathrm{LP_S}}{\mathrm{LPOP}}}{\frac{\mathrm{LP_S}}{\mathrm{LPOP}} + \frac{\mathrm{CP_S}}{\mathrm{NPOP}}}$
FSS	$\mathrm{FSS} = \frac{\mathrm{LP_S} - \mathrm{LP_R}}{\mathrm{LP_S}}$
Variable Definitions	
$\mathrm{FD_R}$: Decentralization of Fiscal Revenue $\mathrm{FD_S}$: Decentralization of Fiscal Spending FSS: Local Financial Self-sufficiency Rate of Gap $\mathrm{LP_R}$: Local Public Revenue $\mathrm{LP_S}$: Local Public Spending $\mathrm{CP_R}$: Central Public Revenue $\mathrm{CP_S}$: Central Public Spending LPOP: Local Population NPOP: National Population	

Data and Methodology

Variables

In examining the impacts of vertical fiscal imbalance (VFI), local government tax effort (Teffort), and expenditure structure (Gstructure) on high-quality economic development (Quality), this study considers Quality as the dependent variable, while Teffort, Gstructure, and VFI serve as key independent variables. Control variables include the degree of openness (Open), industrial structure (Ind), expenditure scale (Gscale), local government competition (Compete), transfer payment structure (Transfer), urbanization (Urban), population density (Density), per capita tax revenue (Ptax), per capita GDP (Pgdp), material capital (Capital), and fiscal self-sufficiency (FSS). Detailed definitions and measurement methods for all variables are provided in Table 1.

Data Sources

The data for this study are compiled from official statistical yearbooks (including the China Statistical Yearbook, China Fiscal Yearbook, China Urban Construction Statistical

Yearbook, and China Land and Resources Statistical Yearbook), government debt audit reports, the Wind Database, as well as local government fiscal budgets.

Simultaneous Equation Model

To address endogeneity issues, this study employs a system of simultaneous equations estimated using Three-Stage Least Squares (3SLS). Compared to Two-Stage Least Squares (2SLS), which primarily corrects for endogenous bias, 3SLS combines instrumental variables with Generalized Least Squares (GLS), jointly optimizing the covariance matrix structure and effectively controlling for correlations among the error terms across equations, thereby significantly improving the validity of parameter estimation. Consequently, the 3SLS method is applied to estimate the joint system of equations.

$$Quality_{it} = \lambda_0 + \alpha_1 VFI_{it} + \alpha_2 Teffort_{it} + \alpha_3 Gstructure_{it} + \alpha_4 Open_{it} + \alpha_5 Ind_{it} + a_6 Gscale_{it} + \varepsilon_{1it} \quad (1)$$

$$Teffort_{it} = \rho_0 + \beta_1 VFI_{it} + \beta_2 Compete_{it} + \beta_3 Transfer_{it} + \beta_4 Urban_{it} + \beta_5 Density_{it} + \beta_6 Ptax_{it} + \beta_7 Pgdp_{it} + \varepsilon_{2it} \quad (2)$$

$$Gstructure_{it} = \tau_0 + \gamma_1 VFI_{it} + \gamma_2 Compete_{it} + \gamma_3 Transfer_{it} + \gamma_4 Density_{it} + \gamma_5 Urban_{it} + \gamma_6 Capital_{it} + \gamma_7 FSS_{it} + \gamma_8 Pgdp_{it} + \varepsilon_{3it} \quad (3)$$

Stationarity Tests

Given the extended period and large sample size of the panel data in this study, which increases the risk of spurious regression, both the LLC test and the Fisher-ADF test were employed to perform a stationarity test on the data to determine the presence of unit roots. The unit root test model is as follows:

$$y_{it} = \rho_i y_{i,t-1} + X'_{it}\beta_i + \mu_{it} \quad (4)$$

where i=1, 2, ... N, denotes cross-sectional individuals; t=1, 2, ...T, denotes observation period; and X'_{it} denotes exogenous variables. ρ_i is the autoregressive coefficient. If $|\rho_i|$ <1, it means that the sequence y_{it} is smooth, i.e. there is no unit root; if $|\rho_i|$ =1, it means that the sequence y_{it} is non-smooth, i. e. there is a unit root.

Results and Discussion

Descriptive Statistics

Table 3

Descriptive Statistics of Variables

Variables	Sample Size	Standard Errors	Minimum	Maximum	Average
Quality	30×15	1.2424	-1.7500	7.5800	-0.0000
Teffort	30×15	0.0878	0.7678	1.3027	1.0021
Gstructure	30×15	0.0471	0.4274	0.7108	0.6015
VFI	30×15	0.1909	0.1490	0.9383	0.6855
Ind	30×15	0.0932	0.2979	0.8373	0.4764
Transfer	30×15	0.1691	0.0319	0.7528	0.4810
Open	30×15	0.3263	0.0076	1.6701	0.2929
Compete	30×15	2.8549	0.4697	17.1979	3.6959
FSS	30×15	0.1936	0.1483	0.9509	0.5000
Urban	30×15	0.1343	0.2824	0.8960	0.5696
Gscale	30×15	0.1093	0.0969	0.7583	0.2472
Density	30×15	1.2838	2.0337	8.2753	5.4537
Ptax	30×15	0.8144	6.3235	10.4425	8.2508
Pgdp	30×15	2.2539	0.7840	13.9214	3.9460
Capital	30×15	1.1977	1.2962	8.9488	4.1312

Sources: Original data from China National Bureau of Statistics (2023), then calculated by the author using Stata 17.0.

Panel Unit Root Test Results

As shown in Table 4, all variables are significant at the 5% level, thereby rejecting the null hypothesis of the presence of unit roots. This indicates that all series pass the stationarity tests and are stable without the need for differencing, allowing for direct 3SLS estimation.

Table 4
Unit Root Test Results

Variables	LLC	Fisher-ADF				Conclusion
		P	Z	L*	Pm	
Quality	-1.4×10^{13}*** (0.0000)	90.8665*** (0.0062)	-1.8364** (0.0332)	-1.9276** (0.0279)	2.8177*** (0.0024)	I (0)
VFI	-1.5×10^{13}*** (0.0000)	133.9130*** (0.0000)	-6.2351*** (0.0000)	-6.1312*** (0.0000)	6.7473*** (0.0000)	I (0)
Ind	-2.5×10^{13}*** （0.0000）	141.2966*** (0.0000)	-5.7091*** (0.0000)	-5.9491*** (0.0000)	7.4213*** (0.0000)	I (0)
Transfer	-2.9×10^{14}*** (0.0000)	90.3639*** (0.0068)	-1.7811** (0.0374)	-1.6725** (0.0482)	2.7718*** (0.0028)	I (0)
Open	-1.5×10^{13}*** (0.0000)	162.4680*** (0.0000)	-7.4742*** (0.0000)	-7.6513*** (0.0000)	9.3540*** (0.0000)	I (0)
Compete	-4.9×10^{13}*** (0.0000)	355.7075*** （0.0000）	-14.3859*** （0.0000）	-17.9064*** （0.0000）	26.9943*** （0.0000）	I (0)
Teffort	-1.1×10^{14}*** (0.0000)	144.2382*** （0.0000）	-6.6799*** （0.0000）	-6.6238*** (0.0000)	7.6899*** (0.0000)	I (0)
Gstructure	-2.8×10^{13}*** (0.0000)	157.3603*** （0.0000）	-6.5666*** （0.0000）	-6.8503*** (0.0000)	8.8877*** (0.0000)	I (0)
Fss	-8.6×10^{12}*** (0.0000)	130.2150*** （0.0000）	-5.7899*** （0.0000）	-5.7842*** (0.0000)	6.4097*** (0.0000)	I (0)
Urban	-2.2×10^{13}*** (0.0000)	127.2231*** （0.0000）	-5.2875*** （0.0000）	-5.4035*** (0.0000)	6.1366*** (0.0000)	I (0)
Gscale	-2.3×10^{13}*** (0.0000)	143.8969*** （0.0000）	-6.5846*** （0.0000）	-6.6245*** (0.0000)	7.6587*** (0.0000)	I (0)
Density	-2.5×10^{12}*** (0.0000)	233.4761*** （0.0000）	-9.2920*** （0.0000）	-11.0776*** (0.0000)	15.8361*** (0.0000)	I (0)
Ptax	-1.6×10^{13}*** (0.0000)	153.9028*** （0.0000）	-7.1718*** （0.0000）	-7.2018*** (0.0000)	8.5721*** (0.0000)	I (0)
Pgdp	-1.6×10^{13}*** (0.0000)	175.8631*** （0.0000）	-8.2587*** （0.0000）	-8.4671*** (0.0000)	10.5768*** (0.0000)	I (0)
Capital	-3.3×10^{13}*** (0.0000)	155.5875*** （0.0000）	-6.3643*** （0.0000）	-6.5342*** (0.0000)	8.7259*** (0.0000)	I (0)

Note: ① LLC refers to the panel unit root test by Levin, Lin, and Chu (LLC, 2002); ② Numbers in parentheses are p-values; ③ ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively; ④ I(n) indicate that the series is stationary after nth-order differencing.

Results of the Simultaneous Equations

This study first applies 2SLS to address potential endogeneity and then implements 3SLS to estimate the system of equations. The results are presented in Table 5.

First, columns (2) and (5) of Table 5 indicate that the estimated coefficient of VFI is significantly negative, consistent with theoretical hypothesis H_1. Specifically, a one-unit increase in VFI leads to a 2.525-unit decline in economic development quality, suggesting that VFI suppresses high-quality development (Bao et al., 2017; Sun et al., 2019; Wei et al., 2021). Potential reasons include: (i) the positive effects of VFI tend to be long-term, while negative impacts such as expenditure expansion, investment inefficiency, and inflation are more immediate and pronounced; (ii) intensified inter-regional competition for resources exacerbates issues like redundant construction and market segmentation; (iii) under political centralization, local governments may sacrifice regulation and environmental protection to pursue short-term political achievements, undermining sustainable development momentum.

Second, VFI is significantly negatively correlated with tax effort, validating H2. Higher VFI weakens local tax incentives, increasing dependence on transfer payments (Li et al., 2021; Liu et al., 2024). Within China's fiscal decentralization framework, incentive distortions arising from the promotion tournament theory exacerbate the asymmetric allocation of revenue and expenditure responsibilities, intensifying VFI's negative impact on local tax effort.

Third, the coefficient of local tax effort is -0.870, confirming H3. Increased tax effort constrains enterprise vitality, shrinking the tax base and causing tax erosion. Moreover, the positive effects of tax cuts are offset by heightened enforcement, failing to significantly stimulate business development and consumer demand (Chu & Fei., 2021; Tian & Wang, 2023).

Fourth, columns (4) and (7) show that VFI is positively associated with expenditure structure, failing to support H5 (Liu & Zhang, 2022; Feng et al., 2023; Li & Li, 2024). Possible explanations are: (i) the central government uses transfer payments to compensate for the externalities of local public expenditures, incentivizing livelihood spending; (ii) under high VFI, reliance on central funds enhances standardized spending; (iii) a livelihood-prioritizing ideology drives local governments to increase livelihood expenditures and performance assessments.

Fifth, expenditure structure exerts a positive influence on economic development quality, validating H6. Each one-unit increase in livelihood spending raises development quality by 13.070 units (Liu et al., 2023). Reasons include: (i) livelihood spending encompasses multiple positive indicators directly enhancing development quality; (ii) central transfer payments guide local governments to increase livelihood investments; (iii) higher livelihood spending raises household income and improves the consumption environment, generating positive multiplier effects.

Sixth, regarding control variables, openness is significantly negatively associated with economic development quality, suggesting that increased openness may inhibit quality improvements, likely due to China's past reliance on export-driven growth. Future efforts should emphasize the quality of foreign investment and learn from advanced economies to better meet the people's aspirations for a better life. Optimizing industrial structure helps enhance economic quality, though the impact is not statistically significant. Developing the tertiary sector promotes employment and income, facilitating the transition from a manufacturing-dominated model to a service-oriented economy.

Local government competition is positively correlated with tax effort, significant at the 5% level, indicating that heightened competition fosters tax enforcement. With shifting development goals toward quality and ongoing budgetary reforms, local governments increasingly emphasize public service provision, thereby strengthening tax effort. The proportion of general transfer payments is negatively correlated with tax effort, suggesting that larger general transfers may weaken local tax initiative, reflecting institutional deficiencies in regulating local tax behavior, potentially even intensifying tax competition. Population density negatively affects tax effort, likely due to increased enforcement challenges. Per capita tax revenue is positively related to tax effort, implying that greater fiscal resources enhance local tax capacity and willingness. Per capita GDP is negatively related to tax effort, indicating stronger tax avoidance tendencies among high-income groups, prompting local governments to reduce tax stringency to attract investment.

Fiscal self-sufficiency is significantly positively correlated with expenditure structure: higher self-sufficiency leads to a greater share of livelihood spending, while lower self-sufficiency inclines spending toward economic construction to alleviate fiscal pressure. When finances are ample, governments prioritize public service provision and increase livelihood investments. Local competition is negatively related to expenditure structure, suggesting that competition drives officials to allocate funds to quick-return projects at the expense of long-cycle livelihood spending. The share of general transfers is positively correlated with expenditure structure, indicating that transfers promote livelihood spending by easing fiscal pressure and responding to the drawbacks of extensive development patterns, while high-quality development and shifting cadre evaluation standards also encourage more livelihood spending.

Table 5
Benchmark Regression Results

Dependent Variables（1）	**Two-SLS**			**Three-SLS**		
	Quality（2）	**Teffort（3）**	**Gstructure（4）**	**Quality（5）**	**Teffort（6）**	**Gstructure（7）**
VFI	-1.957**	-0.299***	VFI	-1.957**	-0.299***	VFI
	(-2.537)	(-3.235)		(-2.537)	(-3.235)	
Teffort	-0.472*		Teffort	-0.472*		Teffort
	(-1.451)			(-1.451)		
Gstructurre	15.088***		Gstructurre	15.088***		Gstructurre
	(6.638)			(6.638)		
Open	-1.327***		Open	-1.327***		Open
	(-5.965)			(-5.965)		
Ind	-4.960***		Ind	-4.960***		Ind
	(-4.377)			(-4.377)		
Gscale	7.935***			4.711***		
	(6.436)			(5.304)		
Compete		0.005**	-0.003**		0.005**	-0.001*
		(2.262)	(-2.311)		(2.300)	(-1.476)
Transfer		-0.101***	0.103***		-0.103***	0.132***
		(-3.014)	(5.622)		(-3.265)	(9.641)
Urban		0.857***	0.040		0.862***	-0.092*
		(6.501)	(0.565)		(6.945)	(-1.862)
Density		-0.730***	-0.074**		-0.724***	-0.066***
		(-12.144)	(-2.283)		(-12.786)	(-2.884)
Ptax		0.850***			0.841***	

		(29.240)			(30.830)	
Pgdp		-1.459***	0.020		-1.453***	0.051***
		(-32.560)	(1.035)		(-34.474)	(3.783)
Fss			0.181***			0.129***
			(5.740)			(5.447)
Capital			-0.004			-0.002
			(-1.182)			(-0.790)
Constant	-1.768	3.833***	0.964***	-3.246***	3.842***	0.898***
	(-1.285)	(9.032)	(4.154)	(-2.837)	(9.609)	(5.514)
Region	Y	Y	Y	Y	Y	Y
Time	Y	Y	Y	Y	Y	Y
R^2	0.9173	0.8005	0.8078	0.9224	0.8005	0.8015
Adjust R^2	0.9160	0.7969	0.8039	0.9212	0.7969	0.7974

Note: ① Numbers in brackets are t-values; ② ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively; ③ Y indicates that the variable is controlled for in the regression model.

Robustness Tests

To test the robustness of the above findings, this study re-estimates using an alternative measure of VFI defined as: $\mathrm{VFI\,II} = 1 - \frac{\mathrm{LP_R}}{\mathrm{LP_S}}$.

The 3SLS estimation results incorporating VFI Ⅱ are shown in Table 6. The core explanatory variables—VFI, tax effort, expenditure structure—and other key variables retain consistent directions, with only minor changes in some control coefficients, demonstrating the strong robustness of the estimates.

Table 6

Regression Results of Robustness Test

Dependent Variables（1）	**Two-SLS**			**Three-SLS**		
	Quality（2）	**Teffort（3）**	**Gstructure（4）**	**Quality（5）**	**Teffort（6）**	**Gstructure（7）**
VFI	-3.467***	-0.299***	0.382***	-4.021***	-0.309***	0.346***
	(-4.679)	(-3.235)	(6.599)	(-6.134)	(-3.549)	(7.075)
Teffort	-0.634**			-0.886***		
	(-2.308)			(-4.008)		
Gstructurre	11.025***			12.612***		
	(5.488)			(6.887)		
Open	-1.348***			-1.115***		
	(-6.991)			(-6.983)		
Ind	-2.799***			-0.760		
	(-3.171)			(-1.061)		
Gscale	2.976***			3.334***		
	(3.931)			(5.611)		
Compete		0.005**	-0.002*		0.005**	-0.001
		(2.262)	(-1.668)		(2.349)	(-1.355)
Transfer		-0.101***	0.025		-0.112***	0.086***
		(-3.014)	(1.640)		(-3.545)	(7.471)
Urban		0.857***	-0.155**		0.854***	-0.184***
		(6.501)	(-2.554)		(6.883)	(-3.904)
Density		-0.730***	-0.112***		-0.730***	-0.088***
		(-12.144)	(-4.065)		(-12.894)	(-3.879)

Ptax		0.850*** (29.240)			0.845*** (30.853)	
Pgdp		-1.459*** (-32.560)	-0.023 (-1.403)		-1.459*** (-34.555)	0.012 (0.960)
Fss			0.115*** (4.296)			0.088*** (3.963)
Capital			-0.007** (-2.570)			-0.004* (-1.947)
Constant	3.783*** (4.990)	3.833*** (9.032)	1.272*** (6.470)	1.813*** (2.874)	3.885*** (9.719)	0.977*** (5.921)
Region	Y	Y	Y	Y	Y	Y
Time	Y	Y	Y	Y	Y	Y
R^2	0.9403	0.8005	0.8290	0.9308	0.8004	0.8190
Adjust R^2	0.9394	0.7969	0.8255	0.9297	0.7968	0.8153

Note: ① Numbers in brackets are t-values; ② ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively; ③ Y indicates that the variable is controlled for in the regression model.

Standardized Regression Results

To distinguish the direct effects of VFI on economic quality from indirect effects via mediating variables, this study standardizes the relevant variables and re-estimates the models. As shown in Table 7, the significance levels remain largely consistent with the baseline results, further validating the robustness of the models.

Table 7

Results of Standardized Regressions on Quality, Teffort, Gstructure and VFI

Dependent Variables （1）	**Two-SLS**			**Three-SLS**		
	Quality （2）	**Teffort （3）**	**Gstructure （4）**	**Quality （5）**	**Teffort （6）**	**Gstructure （7）**
VFI	-0.225** (-2.337)	-0.057*** (-3.235)	0.087*** (6.635)	-0.268*** (-2.970)	-0.061*** (-3.657)	0.085*** (6.977)
Teffort	-0.038** (-2.319)			-0.045*** (-2.933)		
Gstructurre	0.110*** (3.899)			0.193*** (7.365)		
Open	-0.505*** (-10.566)			-0.483*** (-10.789)		
Ind	-0.101* (-1.726)			-0.082 (-1.511)		
Gscale	0.278*** (4.135)			0.316*** (5.040)		
Compete		0.014** (2.262)	-0.008** (-2.311)		0.014** (2.337)	-0.007** (-2.308)
Transfer		-0.017*** (-3.014)	0.017*** (5.622)		-0.019*** (-3.480)	0.022*** (7.534)
Urban		0.115*** (6.501)	0.005 (0.565)		0.116*** (6.937)	-0.000 (-0.005)
Density		-0.937*** (-12.144)	-0.095** (-2.283)		-0.923*** (-12.699)	-0.108*** (-2.790)
Ptax		0.692***			0.683***	

		(29.240)			(30.732)	
Pgdp		-0.840***	0.011		-0.836***	0.019*
		(-32.560)	(1.035)		(-34.438)	(1.887)
Fss			0.072***			0.070***
			(5.739)			(6.041)
Capital			-0.005			-0.003
			(-1.182)			(-0.955)
Constant	4.002***	1.700***	0.852***	3.767***	1.674***	0.883***
	(13.420)	(15.827)	(14.899)	(13.513)	(16.547)	(16.644)
Region	Y	Y	Y	Y	Y	Y
Time	Y	Y	Y	Y	Y	Y
R^2	0.9614	0.8005	0.8078	0.9604	0.8004	0.8063
Adjust R^2	0.9608	0.7969	0.8039	0.9598	0.7968	0.8023

Note: ① Numbers in brackets are t-values; ② ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively; ③ Y indicates that the variable is controlled for in the regression model.

Based on Table 7, this study calculates the direct, indirect, and total effects of VFI, tax effort, and expenditure structure on economic quality. Results in Table 8 show that the direct effect of VFI on economic quality is -2.525. Multiplying the effect of VFI on tax effort (-0.312) by that of tax effort on economic quality (-0.870) yields an indirect effect of 0.271, empirically supporting H4, i.e., VFI not only directly suppresses economic quality but also indirectly affects it by influencing local tax effort.

Similarly, using the effect of VFI on expenditure structure (0.348) and that of expenditure structure on economic quality (13.070), the indirect effect through expenditure structure is estimated at 4.548, supporting H7. This highlights that VFI can indirectly enhance economic quality by influencing local expenditure patterns. As China enters a stage of high-quality development, local governments are increasingly shifting from growth-centric objectives to enhancing people's well-being. Livelihood spending improves basic public services and infrastructure, attracts skilled talent and quality enterprises, and thus promotes long-term quality development.

In sum, the total effect of VFI on economic quality is estimated at 2.294, suggesting a nascent positive incentive effect under current conditions, though the pathways are complex and warrant deeper investigation in conjunction with local government behaviors and institutional arrangements.

Table 8
The Impact Pathways and Effects of VFI on Quality

Impact mechanism	Impact Path	Coefficient	Result	Total Effect
Direct Effect	VFI → Quality	α_1	-2.525	
Direct Effect	Teffort → Quality	α_2	-0.870	
Direct Effect	Gstructure → Quality	α_3	13.070	
Indirect Effect	VFI → Teffort	β_1	-0.312	2.294
	VFI → Teffort → Quality	$\beta_1 \times \alpha_2$	0.271	
Indirect Effect	VFI → Gstructure	γ_1	0.348	
	VFI → Gstructure → Quality	$\gamma_1 \times \alpha_3$	4.548	

Conclusion and Policy Recommendations

The results show that intensified VFI not only directly constrains high-quality development but also indirectly influences it through two key mechanisms: dampening local tax effort and promoting optimization of livelihood expenditure structures. Quantitative analysis of standardized panel data reveals that in the tax effort pathway, the direct effect of VFI outweighs the indirect effect, whereas in the expenditure structure pathway, the indirect effect surpasses the direct effect. Overall, at this stage, VFI may exert a positive influence on economic quality under certain conditions, primarily through its incentives for expenditure optimization and policy guidance.

Based on these findings, this study offers the following policy recommendations:

Recognize the pivotal role of VFI in either fostering or hindering high-quality development. Excessive VFI exacerbates local fiscal stress, undermining economic regulation and public service capacity. It is thus essential to gradually reduce VFI by improving the alignment of administrative powers and fiscal resources between central and local governments, enhancing the overall efficiency of fiscal resource allocation.

Formulate targeted regional fiscal policies reflecting local heterogeneity. Under central coordination, encourage regions to tailor fiscal strategies to their development stages and structural characteristics, simultaneously expanding fiscal expenditure and enhancing local fiscal autonomy. Strengthening tax administration, improving expenditure efficiency, and optimizing expenditure structures will enable fiscal resources to better support high-quality development goals.

Further refine the transfer payment system to enhance its role in promoting balanced regional development. Clarify the scope and spending responsibilities of transfer payments, improve sharing mechanisms between central and local governments, and boost institutional transparency and implementation efficiency. Greater transfers to economically weaker regions can help close fiscal gaps, improve public service provision, and achieve coordinated regional economic quality improvements.

Emphasize the critical role of livelihood public spending in adjusting VFI and advancing high-quality development. While reasonably controlling VFI, optimize expenditure structures to increase shares allocated to education, healthcare, and social security. Integrating fiscal policy with people's well-being not only improves living standards but also drives systematic quality improvements in economic development from the demand side.

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