



# The Impact of Vertical Fiscal Imbalance and Local Government Expenditure Structure on the Quality of Economic Development in China: A Study Based on a Simultaneous Equations Model

Ke Wang<sup>1,2\*</sup>, Venus Khim-Sen Liew<sup>1</sup>

<sup>1</sup>Faculty of Economics and Business, Universiti Malaysia Sarawak, Kota Samarahan 94300, Malaysia, <sup>2</sup>School of Finance and Taxation, Anhui Economics and Management College, Hefei 230601, China. \*Email: [wangke@afc.edu.cn](mailto:wangke@afc.edu.cn)

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## ABSTRACT

The challenge of improving economic development quality and achieving sustainable growth has become a pressing issue for the Chinese government. This study explores the interaction between vertical fiscal imbalance, local government expenditure structure, and economic development quality. Using panel data from 30 Chinese provinces spanning 2008-2022, the study applies the three-stage least squares method to assess the dual impact of vertical fiscal imbalance on economic development quality. The results demonstrate that vertical fiscal imbalance not only has a direct negative impact on economic development quality but also indirectly impairs it by constraining the expenditure structure. Moreover, local government expenditure on public welfare projects plays a pivotal role in improving economic development quality. This study highlights the importance of addressing vertical fiscal imbalance in improving economic development quality. It recommends a rational division of fiscal powers and responsibilities between central and local governments, reforms to China's fiscal transfer payment system, and optimization of the expenditure structure to mitigate vertical fiscal imbalance and enhance China's economic development quality.

**Keywords:** Vertical Fiscal Imbalance, Expenditure Structure, Quality of Economic Development, Three-Stage Least Squares Method

**JEL Classifications:** E62, O23

## 1. INTRODUCTION

China is currently at a critical juncture in changing its growth model, optimizing the economic structure, and shifting to fresh drivers of economic development. Structural, institutional, and cyclical issues are interwoven, with a complex and challenging external economic environment and increasing domestic economic downward pressure, presenting new risks and challenges to economic development. As a structural policy, fiscal policy is being looked upon with greater expectation to stabilize economic growth (Jin, 2018; Liu and Zhang, 2022; Cai and Chen, 2023).

How to objectively assess the current state of local fiscal revenues and expenditures, and how local governments convert

fiscal pressure into development momentum to promote high-quality economic development, has become a matter of public concern (Chu and Shao, 2018; Feng et al., 2023). Within China's fiscal decentralization system, on one hand, local governments can adopt public policy measures such as subsidies and tax reductions to alleviate fiscal pressure. These measures create a favorable environment for the full release of market vitality, which in turn helps enterprises improve production efficiency and fosters sustainable economic development at the micro level. On the other hand, the political promotion incentives under China's decentralized system provide an internal mechanism for local economic development. Local officials are motivated by prospects of upward promotion and the horizontal economic competition among peer local governments. Additionally, the

relatively autonomous decision-making power in economic and administrative affairs, granted to local leaders by Chinese-style fiscal decentralization, further incentivizes them. This combination drives officials to direct increased fiscal revenues towards the provision of economic public goods that enhance their jurisdiction's GDP competitive advantage, thereby generating substantial short-term economic growth (Wang et al., 2020; Liu et al., 2023).

China's economy experienced rapid growth for an extended period, driven by both objective conditions and internal mechanisms. However, as it transitions to a new phase of development, the misalignment between the pace of growth and the quality of that growth has become increasingly apparent, revealing various issues that hinder the pursuit of high-quality development. The traditional extensive development model no longer satisfies current economic demands, and the development in social, economic, and cultural aspects is uncoordinated, with national soft power and social happiness index needing improvement (Ren, 2018; Wei et al., 2021).

Amidst a critical phase of economic transformation, the role of fiscal policy as a key macroeconomic tool in driving high-quality economic development is unmistakable. Building on existing research, this study investigates the relationship between vertical fiscal imbalance and the quality of economic development. By conducting an empirical analysis using provincial panel data, the study assesses both the impact and underlying mechanisms of vertical fiscal imbalance on economic development quality, with a focus on the local government expenditure structure. The aim is to provide theoretical and empirical insights into these issues, offering a deeper understanding of how vertical fiscal imbalance influences economic development quality. Ultimately, the study identifies potential strategies for optimizing local government expenditure structure, improving economic development quality, and fostering sustainable economic growth in China.

## 2. LITERATURE REVIEW

Wagner first proposed the concept of vertical fiscal imbalance (VFI) in 1973. Hettich and Winer (1986) later formalized the theory, defining VFI as the situation where the central government enjoys a surplus of revenue while local governments face increasing funding demands. Hunter (1977) highlighted that VFI occurs when the central government controls a disproportionate share of revenue compared to local governments. Dahlby and Wilson (1994) further explained that VFI is evident when the marginal cost of raising revenue is uniform across all government levels, yet there is a mismatch between the revenue collected and the expenditures required at different government tiers (Breton, 1989). The difference between local governments' required spending and the fiscal revenue they get was highlighted by Bird and Tarasov (2004). Tremblay and Boadway (2006) also pointed out that the needs for regional expenditures cannot be met by the budgetary transfers that the central government makes to local governments.

Chu and Shao (2018) pointed out that while the central government concentrates a large portion of fiscal revenue, local governments shoulder the majority of expenditure responsibilities, with the

distribution of government expenditure responsibilities not aligned with the intergovernmental revenue-sharing system (Li and Zhang, 2019). According to Cai and Chen (2023), there is a substantial imbalance between regional government spending and revenues as a result of the centralization of fiscal authority and the decentralization of expenditure duties, which exacerbates the vertical fiscal imbalance. The framework created by Eyraud and Lusinyan (2013) is used in this study to calculate VFI.

Regarding local government expenditure structure (Gstructure), it can be traced back to the early 20<sup>th</sup> century, gradually forming alongside the establishment of modern state governance and public finance systems. Early public finance scholars focused on the economic effects and social impacts of government spending (Barro, 1990), particularly the allocation of fiscal responsibilities among different levels of government (Easterly and Rebelo, 1993), as well as the distribution and utilization of fiscal resources (Devarajan, 1996). The expenditure structure of local governments refers to the allocation and configuration of various expenditure items by local governments when executing their fiscal budgets, including both investment-oriented and welfare-oriented expenditures. This study, drawing on the research by Chu and Fei (2021), measures the bias in public expenditure structure using the proportion of welfare-oriented expenditure in total government spending. A higher proportion of welfare-oriented expenditure indicates a smaller deviation from the value goal of being people-centered and governance for the people, and also reflects a more rational expenditure structure.

Regarding the quality of economic development (Quality), Stiglitz and Fitoussi (2010) were the first to criticize the appropriateness of Gross Domestic Product (GDP) as a measure of Quality and social welfare. GDP focuses solely on quantity rather than quality, neglects negative externalities, disregards wealth distribution inequalities, and overlooks the contributions of non-market activities, while also failing to reflect sustainability issues (Tridico, 2011; Mlachila et al., 2017). Therefore, they advocated for a broader set of measures to more precisely evaluate the true quality of economic development and social welfare. During the Fifth Plenary Session of the 18<sup>th</sup> Central Committee of the Communist Party of China, President Xi Jinping introduced and systematically elaborated on the Five Major Development Concepts: Innovation, coordination, green development, openness, and sharing. These ideas cover a wide range of aspects of China's economic growth and provide a critical framework for evaluating Quality in a scientific manner. They also serve as the foundation for developing an economic development quality indicator system tailored to the new era (Jin, 2018; Ren, 2018; Han et al., 2019; Wang and Zhang, 2021; Zhou et al., 2022). Building on the research of Chu and Shao (2018), this study constructs a comprehensive indicator system based on these five development concepts, employing principal component analysis (PCA) to quantify quality precisely.

## 3. RESEARCH HYPOTHESES DEVELOPMENT

The impact of VFI on Quality: Bao et al. (2017) argues that due to horizontal competition, local governments excessively rely on

investment-driven economic growth, which is detrimental to the improvement of Quality. Sun et al. (2019) suggest that excessive local government spending leads to inefficient resource allocation due to issues such as redundant construction and overcapacity. Moreover, VFI hinders China's Quality by suppressing marketization, obstructing technological progress, reducing consumer welfare, and worsening environmental quality (Wang et al., 2020). Song et al. (2021) argues that the deepening of VFI in a region inhibits the enhancement of Quality. VFI exerts a negative indirect effect on Quality through expenditure structure (Wei et al., 2021). Thus, the subsequent study hypothesis is proposed.

H<sub>1</sub>: The current level of VFI hinders Quality in China.

The Impact of VFI on Gstructure: First, under China's fiscal decentralization system, the fiscal revenue-expenditure gap widens as VFI intensifies, making it optimal for local governments to prioritize economic development projects to expand the tax base and increase tax effort to ensure regional normalcy (Oates, 1993). Consequently, local governments tend to prioritize investment in productive projects within the region, thereby reducing the level of public goods provision (Bardhan and Mookherjee, 2006). This neglects residents' demand for public goods, distorting the public expenditure structure and exhibiting a clear investment-heavy, and welfare-light characteristic.

Second, the intensification of VFI tends to cause local governments to become overly reliant on central government transfers, leading to a reduction in the share of public expenditure (Ferrario and Zanardi, 2011). Local governments must inevitably use transfer payments and non-tax revenues to fill fiscal gaps as VFI intensifies, with central transfer payments often being more rapid and effective in compensating for local fiscal shortfalls (Jia et al., 2014). Generally, local governments have limited capacity to develop tax sources for greater fiscal revenue, leading to dependence on central transfer payments, which are long-term allocated to local public expenditure projects (Fisher, 1982). Excessive reliance on central transfer payments further exacerbates local fiscal deficits, while the common pool effect of fiscal resources weakens the incentive effect of transfer payments on public expenditure.

Third, interregional yardstick competition further drives local governments' Gstructures to become biased. Due to differences in resource distribution among regions, governments in less-developed areas need to exert greater fiscal effort, such as raising tax rates or expanding the tax base, to match the public expenditure levels of more developed areas (Wang, 2016). However, increasing the tax burden may accelerate the outflow of resources from the jurisdiction. Less developed local governments are likely to rely more on central transfer payments in order to avoid losing their tax bases and to gain an advantage in the competition for public services. This will increase the volatility of public finances and eventually cause a deviation from the ideal Gstructure, which is usually marked by high public spending and low public service spending (Keen and Marchand, 1997).

Furthermore, under the top-down administrative evaluation system, local government officials engage in economic tournaments

for career advancement, creating another layer of yardstick competition among local governments. To gain an advantageous position in the economic tournament, local governments often focus on developing the local economy to drive GDP and tax revenue growth, leading to a bias toward productive expenditure projects in public spending decisions (Liu and Zhang, 2022).

H<sub>2</sub>: VFI inhibits the Gstructure of local governments.

The impact of Gstructure on quality: First, with the increasing demand for a better life among the people, the central government has gradually incorporated welfare projects into the performance evaluation system for local government officials (Fu and Zhang, 2007; Gong and Lu, 2009). Local governments are expected to adapt to this policy shift by proactively optimizing Gstructure. They should focus on enhancing the quality of the regional economic environment through key areas such as education, healthcare, and employment. This approach aims to improve the region's attractiveness to capital and talent, leading to a long-term enhancement in Quality (Liu et al., 2023).

Second, although local governments have limited power over revenue, they possess greater autonomy in expenditure. This autonomy allows them to leverage their informational advantage to identify the strengths of local resources and the most pressing needs of residents, thereby precisely directing the optimization of the public expenditure structure. This not only enhances the character of local economic development in the long term but also improves resource allocation efficiency (Qian and Weingast, 1997).

Third, under the incentive of political promotion tournaments, local governments have long prioritized rapid growth in productive expenditure due to the GDP-hero performance evaluation system, resulting in diminishing marginal returns on productive expenditure. The marginal returns from increasing welfare-oriented expenditure by local governments are expected to significantly exceed those from productive expenditure (Amusa and Oyinlola, 2019).

Therefore, optimizing Gstructure not only meets people's increasing demand for a better life and helps local officials succeed in the political promotion tournaments but also mitigates the negative effects of past rapid growth in productive expenditure. This optimization significantly enhances Quality within their jurisdictions.

H<sub>3</sub>: The Gstructure of local governments improves Quality in China.

The Impact of VFI and Gstructure on Quality: Under China's decentralized system, local governments face the dilemma of bearing relatively high expenditure responsibilities with limited revenue authority. At the same time, they are directly influenced by top-down administrative evaluations, which provide promotion incentives and economic competition incentives. Local governments are inevitably caught between horizontal yardstick competition among regions and the multifaceted



institutional constraints of local residents' aspirations for a better life with limited income levels (Liu and Zhang, 2022). Within a moderate level of VFI, local government Gstructure can maintain a reasonable level, positively contributing to Quality. However, when local governments fall into the trap of excessive VFI, the pursuit of economic growth performance becomes the sole development focus, leading to an expansion in expenditure scale and a bias toward economic construction expenditure, which significantly hinders the improvement Quality (Feng et al., 2023).

Therefore, VFI will continuously intensify the impact of Gstructure on Quality in the following three ways. First, to alleviate the fiscal pressure under the asymmetric decentralization system while maximizing promotion opportunities, local government officials will continuously adjust local expenditure structures, thereby influencing Quality. Second, under the high competitive pressure caused by VFI, local governments will proactively shift toward industries with short cycles and high returns, further exacerbating the negative effects of structural imbalance on Quality. Third, local governments at different levels of economic development, in their pursuit of catching up with more developed provinces and cities, may overlook the actual economic conditions of their regions. Consequently, they may blindly imitate the expenditure behavior of their competitors, which can indirectly impact Quality through Gstructure of local governments.

H<sub>4</sub>: VFI indirectly affects quality through Gstructure of local governments.

Based on previous research, this study proposes the research model as shown in Figure 1.

## 4. DATA AND METHODOLOGY

### 4.1. Variables

The dependent variable is Quality, with VFI and GStructure serving as the key explanatory variables. Control variables include Pgd, Open, Gscale, Fss, Compete, Density, and Transfer. Detailed definitions and measurement methods for all variables are provided in Table 1.

### 4.2. Data Sources

The raw data for the variables in this study are sourced from several key publications, including the China Statistical Yearbook, China Financial Yearbook, China City Statistical Yearbook, National

Government Debt Audit Report, China Land and Resources Almanac, Wind Database, China Economic Net Statistical Database, as well as fiscal budget reports and statistical yearbooks from various provinces and cities.

Considering the implementation of a new classification standard and statistical methodology for government revenue and expenditure in China in 2007, as well as the unavailability of statistical data for Tibet, this study focuses on the period from 2008 to 2022. The sample consists of 30 provinces, municipalities, and autonomous regions, excluding Tibet, Hong Kong, Macau, and Taiwan.

### 4.3. Simultaneous Equation Model

To investigate the impact and mechanism of VFI on quality, this study employs three-stage least squares (3SLS) to conduct a benchmark regression for 30 Chinese provinces, identifying the direction and magnitude of the variable impacts. Subsequently, the calculation method for Gstructure is altered, and 3SLS regression is conducted again to discuss the robustness of the benchmark regression results. Finally, the independent variables are standardized to analyze their pathways and transmission mechanisms, testing the presence and magnitude of indirect effects.

To validate the research hypotheses, this section constructs a panel simultaneous equation model for empirical analysis as follows:

$$Quality_{it} = \lambda_1 + \alpha_1 VFI_{it} + \alpha_2 Gstructure_{it} + \alpha_3 Pgd_{it} + \alpha_4 Open_{it} + \alpha_5 Gscale_{it} + \varepsilon_{1it} \quad (1)$$

$$Gstructure_{it} = \lambda_2 + \beta_1 VFI_{it} + \beta_2 Fss_{it} + \beta_3 Compete_{it} + \beta_4 Density_{it} + \beta_5 Transfer_{-it} + \varepsilon_{3it} \quad (2)$$

Where:

Quality = Quality of economic development

Gstructure = Local government expenditure structure

VFI = Vertical fiscal imbalance

Pgd = Per capita GDP

Open = Degree of openness to the outside world

Gscale = Scale of local government spending

Fss = Financial self-sufficiency

Compete = Local government competition

Density = Population density

Transfer = Transfer payment structure.

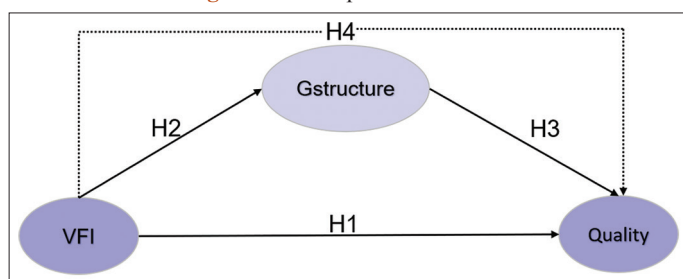
### 4.4. Stability Test

To prevent spurious regression and ensure the reliability of the regression results, this study performs stationarity tests on the data prior to conducting the regression analysis. Specifically, the LLC test and Fisher-ADF test are utilized, with Stata 17.0 software employed for unit root testing of the variables.

The model for the unit root test is structured as follows:

$$y_{it} = \rho_i y_{i,t-1} + X'_{it} \beta_i + \mu_{it} \quad (3)$$

Figure 1: Conceptual framework.



Please refer to Table 1 for the definitions and operationalization of the relevant concepts

**Table 1: Definition and Calculation of Variables**

Variable	Definition	Calculation
Quality	Economic growth is not solely about quantitative expansion but also involves enhancing quality, improving efficiency, and ensuring long-term sustainability	The calculation is based on principal component analysis, incorporating five key indicators: innovation, coordination, green development, openness, and shared development
Gstructure	The allocation of various expenditures within local governments' fiscal budget	Share of livelihood-related expenditure in total public expenditure
VFI	Imbalance between fiscal revenues and expenditures between the central and local governments	$VFI = 1 - \frac{FD_R}{FD_E} \times (1 - LFSR)$ $FD_R = \frac{\frac{LP_R}{LPOP}}{\frac{LP_R}{LPOP} + \frac{CP_R}{NPOP}}$ $FD_E = \frac{\frac{LP_E}{LPOP}}{\frac{LP_E}{LPOP} + \frac{CP_E}{NPOP}}$
Pgdp	The economic value generated per person in the region	The natural logarithm of the GDP-to-population ratio
Open	The degree of a region's openness to the external economy	The share of total exports and imports as a percentage of GDP
Gscale	Amount of local payment of public expenditure	The proportion of general public budget expenditure relative to the provincial GDP
FSS	Portion of local government expenditures covered by its own revenues	$FSS = \frac{LP_E - LP_R}{LP_E}$
Density	The population density measured as the number of individuals per unit of land area	The population density measured as the ratio of the total population to the land area at the end of the year
Transfer	Non-reimbursable financial aid provided by local governments to individuals, households, businesses, or other organizations	The proportion of general transfers relative to total gross transfers
Compete	Competition among local governments aimed at enhancing economic performance and securing greater promotion opportunities for officials	Competitiveness of neighboring provinces in terms of GDP per capita

**Variable Definitions**

- $FD_R$ : Decentralization of Fiscal Revenue
- $FD_E$ : Decentralization of Fiscal Expenditure
- $LP_R$ : Local Public Revenue
- $LP_E$ : Local Public Expenditure
- $CP_R$ : Central Public Revenue
- $CP_E$ : Central Public Expenditure
- $LPOP$ : Local Population
- $NPOP$ : National Population

where  $i$  denotes the cross-sectional units, while  $t$  represents the time periods observed.  $X'_{it}$  signifies the exogenous variables in the model, and  $\rho_i$  is the autoregressive coefficient. If  $|\rho_i| < 1$ , the sequence  $y_{it}$  is deemed stationary, implying the absence of a unit root. Conversely, if  $|\rho_i| = 1$ , the sequence  $y_{it}$  is non-stationary, indicating the presence of a unit root.

**5. RESULTS AND DISCUSSION**

**5.1. Descriptive Statistics**

The dataset includes years 2008 through 2022. Table 3 provides specific descriptive data for the variables.

**5.2. Panel Unit Root Test Results**

Table 3 demonstrates that every variable is significant at the 5% level, which results in the rejection of the unit root null hypothesis. This confirms that all variables have passed the stationarity test

and are stationary without the need for differencing (Keshab, 2019; Zhang and Wang, 2020). Consequently, the 3SLS estimation can be conducted.

**5.3. Model Selection and Testing Results**

The system of simultaneous equations was subjected to various tests, including the Breusch-Pagan LM Test, Robust Hausman Test, Multicollinearity Test, Heteroskedasticity Test, Serial Correlation Test, and Durbin-Wu-Hausman Test. The results are presented in Tables 4 and 5.

The results of the multicollinearity test show that none of the variables in either equation exhibit multicollinearity. However, the heteroskedasticity and serial correlation tests reveal the presence of both heteroskedasticity and serial correlation in equations (1) and (2), indicating that the traditional Hausman test may not be valid. To ensure robustness in light of these issues, the model was adjusted using the Robust Hausman Test

(Sargan-Hansen test). The adjusted results demonstrate that fixed effects are preferred over random effects for both equations. Additionally, the Breusch-Pagan LM test indicates that random effects outperform pooled OLS regression. As a result, fixed effects regression was applied to both equations within the system of simultaneous equations.

Additionally, the Durbin-Wu-Hausman Test indicates the presence of endogeneity in equations (1) and (2), and 3SLS can address the

endogeneity issues arising from bidirectional causality. Given that both equations exhibit heteroskedasticity and serial correlation, clustered robust standard errors were used in the subsequent 3SLS regression to mitigate the effects of these issues.

### 5.4. Results of Simultaneous Equations Regression

This study utilizes Two-Stage Least Squares (2SLS), Three-Stage Least Squares (3SLS), and iterative 3SLS to estimate the model. The detailed results are shown in Table 6.

**Table 2: The measurement formula of vertical fiscal imbalance**

Index name	Measure formula
VFI	$VFI = 1 - \frac{FD_R}{FD_S} \times (1 - LFSR)$
FD <sub>R</sub>	$FD_R = \frac{LP_R}{\frac{LPOP}{\frac{LP_R}{LPOP} + \frac{CP_R}{NPOP}}}$
FD <sub>E</sub>	$FD_E = \frac{LP_E}{\frac{LPOP}{\frac{LP_E}{LPOP} + \frac{CP_E}{NPOP}}}$
FS <sub>S</sub>	$FSS = \frac{LP_E - LP_R}{LP_E}$

**Variable definitions**

FD<sub>R</sub>: Decentralization of fiscal revenue, FD<sub>E</sub>: Decentralization of fiscal expenditure, FSS: Local financial self-sufficiency rate of gap, LP<sub>R</sub>: Local public revenue, LP<sub>E</sub>: Local public expenditure, CP<sub>R</sub>: Central public revenue, CP<sub>E</sub>: Central public expenditure, LPOP: Local population, NPOP: National population

First, the estimates in columns 2, 4, and 6 of the models reveal that the VFI coefficient is negative, supporting Hypothesis 1. This implies that the suppressive effect of VFI outweighs its promotive impact. Specifically, Quality declines by 1.480 units for every unit rise in VFI, indicating that VFI obstructs Quality advances (Bao et al., 2017; Wang et al., 2020; Song et al., 2021; Wei et al., 2021). Several potential reasons for this are proposed: (i) The positive influence of VFI on quality primarily manifests in the establishment of a stable institutional environment, the function of transfer payments in factor allocation optimization, and the promotion of regional learning and competition at the macro level. However, these effects are often long-term and gradual. (ii) In contrast, the negative impact of VFI on quality tends to be more immediate and direct. Excessive dependence on transfer payments and national government bailouts has resulted in an unsustainable expansion of fiscal expenditures, causing inefficient investment and inflation, both of which significantly harm quality. Additionally, intense competition among local governments for scarce resources and production factors has led to unfavorable actions including market fragmentation, local protectionism, and superfluous construction, all of which

**Table 3: Descriptive statistics of variables**

Variable	Observation (N×T)	Standard errors	Minimum	Maximum	Average
Quality	30×15	1.2424	-1.7500	7.5800	-0.0000
VFI	30×15	0.1909	0.1490	0.9383	0.6855
Gstructure	30×15	0.0471	0.4274	0.7108	0.6015
Pgdp	30×15	2.2539	0.7840	13.9214	3.9460
Open	30×15	0.3263	0.0076	1.6701	0.2929
Gscale	30×15	0.1093	0.0969	0.7583	0.2472
Fss	30×15	0.1936	0.1483	0.9509	0.5000
Compete	30×15	2.8549	0.4697	17.1979	3.6959
Density	30×15	1.2838	2.0337	8.2753	5.4537
Transfer	30×15	0.1691	0.0319	0.7528	0.4810

**Table 4: Panel Unit Root Test Results**

Variables	LLC	Fisher-ADF				Conclusion
		P	Z	L*	Pm	
Quality	-1.4e×10 <sup>13</sup> *** (0.0000)	90.8665*** (0.0062)	-1.8364** (0.0332)	-1.9276** (0.0279)	2.8177*** (0.0024)	I (0)
VFI	-1.5e×10 <sup>13</sup> *** (0.0000)	133.9130*** (0.0000)	-6.2351*** (0.0000)	-6.1312*** (0.0000)	6.7473*** (0.0000)	I (0)
Gstructure	-2.8×10 <sup>13</sup> *** (0.0000)	157.3603*** (0.0000)	-6.5666*** (0.0000)	-6.8503*** (0.0000)	8.8877*** (0.0000)	I (0)
Pgdp	-1.6×10 <sup>13</sup> *** (0.0000)	175.8631*** (0.0000)	-8.2587*** (0.0000)	-8.4671*** (0.0000)	10.5768*** (0.0000)	I (0)
Open	-1.5×10 <sup>13</sup> *** (0.0000)	162.4680*** (0.0000)	-7.4742*** (0.0000)	-7.6513*** (0.0000)	9.3540*** (0.0000)	I (0)
Gscale	-2.3×10 <sup>13</sup> *** (0.0000)	143.8969*** (0.0000)	-6.5846*** (0.0000)	-6.6245*** (0.0000)	7.6587*** (0.0000)	I (0)
Fss	-8.6×10 <sup>12</sup> *** (0.0000)	130.2150*** (0.0000)	-5.7899*** (0.0000)	-5.7842*** (0.0000)	6.4097*** (0.0000)	I (0)
Compete	-4.9×10 <sup>13</sup> *** (0.0000)	355.7075*** (0.0000)	-14.3859*** (0.0000)	-17.9064*** (0.0000)	26.9943*** (0.0000)	I (0)
Density	-2.5×10 <sup>12</sup> *** (0.0000)	233.4761*** (0.0000)	-9.2920*** (0.0000)	-11.0776*** (0.0000)	15.8361*** (0.0000)	I (0)
Transfer	-2.9×10 <sup>14</sup> *** (0.0000)	90.3639*** (0.0068)	-1.7811** (0.0374)	-1.6725** (0.0482)	2.7718*** (0.0028)	I (0)

① LLC refers to the Levin et al. (2002) panel unit root test, while P, Z, L\*, and Pm in the Fisher ADF test correspond to the inverse Chi-squared (χ<sup>2</sup>), inverse standard normal, inverse logit, and modified inverse χ<sup>2</sup> statistics, respectively. ② Values in parentheses represent P-values. ③ \*\*\*, \*\*, and \* indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively. I (n) denote that the series becomes stationary after nth-order differencing. ④ The data presented in this table were computed using Stata 17.0

hinder effective resource allocation and the division of labor. (iii) In China, political centralization has coexisted with economic decentralization, local officials often engage in short-term behaviors aimed at stimulating growth, such as relaxing regulations on enterprises and damaging the environment for economic gain. These actions undermine the endogenous drivers of sustainable economic development.

**Table 5: Test results of panel data analysis dependent variable: Quality-Eq (1)**

Variables	Quality		
	Pooled OLS	Random effect	Fixed effect
Breusch-Pagan	895.19 (0.0000) ***		—
LM Test			
Robust Hausman Test	—	32.96 (0.0000) ***	
Observations	450	450	450
Multicollinearity (vif)			4.55
Heteroskedasticity ( $\chi^2$ -stat)	—	—	3729.84 (0.0000)***
Serial correlation (F-stat)	—	—	74.21 (0.0000)***
Durbin-Wu-Hausman test		103.42 (0.0000)***	

① Values in parentheses represent P-values. ② \*\*\* denotes statistical significance at the 1% level. Standard errors for the estimated coefficients are provided in parentheses next to each variable

**Table 6: Test results of panel data analysis dependent variable: Gstructure-Eq (2)**

Variable	Gstructure		
	Pooled OLS	Random effect	Fixed effect
Breusch-Pagan LM test	738.15 (0.0000) ***		—
Robust Hausman test	—	41.27 (0.0000)***	
Observations	450	450	450
Multicollinearity (vif)	—	—	5.11
Heteroskedasticity ( $\chi^2$ -stat)	—	—	786.53 (0.0000)***
Serial correlation (F-stat)	—	—	81.85 (0.0000)***
Durbin-Wu-Hausman test		5.78 (0.0162)***	

① Values in parentheses represent P-values. ② \*\*\*denotes statistical significance at the 1% level. Standard errors for the estimated coefficients are provided in parentheses next to each variable

**Table 7: Benchmark regression results for VFI, local Gstructure, and quality**

Dependent variables	Two_sl		Three_sl		Three_sl_~r	
	Quality	Gstructure	Quality	Gstructure	Quality	Gstructure
VFI	-1.733*** (-3.07)	-0.939*** (-7.48)	-1.460*** (-2.79)	-0.695*** (-7.22)	-1.480*** (-3.08)	-0.680*** (-6.98)
Gstructure	11.840*** (6.11)		9.521*** (5.47)		9.756*** (6.10)	
Pgdp	0.298*** (7.39)		0.308*** (11.59)		0.306*** (12.44)	
Open	-0.570** (-2.86)		-0.380 (-2.83)		-0.394 (-3.18)	
Gscale	5.778*** (6.41)		2.625*** (4.01)		2.919*** (4.83)	
Fss		0.852*** (6.87)		0.608*** (6.50)		0.593*** (6.26)
Compete		-0.0041*** (-3.94)		-0.0040*** (-5.47)		-0.0040*** (-5.39)
Density		-0.022 (-0.74)		-0.006 (-0.29)		-0.003 (-0.16)
Transfer		0.119*** (7.27)		0.144*** (10.41)		0.145*** (10.41)
Constant	-6.690*** (-5.01)	-0.202 (-0.82)	-5.166*** (-4.47)	-0.043 (-0.25)	-5.317*** (-5.01)	-0.044 (-0.26)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.9406	0.8088	0.9506	0.8059	0.9499	0.8054

① Values in parentheses represent t-values. ② \*\*\*, and \*\* indicate rejection of the null hypothesis at the 1% and 5% significance levels, respectively. ③ The data presented in this table were computed using Stata 17.0

Second, there is a negative relationship between VFI and Gstructure, as indicated by the data in columns 3, 5, and 7 (Jia et al., 2014; Wang, 2016; Liu and Zhang, 2022). Specifically, the percentage of livelihood-related expenses falls by an average of 0.680 units for every unit increase in VFI, effectively supporting Hypothesis 2. This can be attributed to two main reasons: (i) The generally high level of VFI in China creates a significant fiscal gap between local government revenues and expenditure responsibilities, further driving local governments to engage in protectionist competition. This competition leads local governments to prioritize economic construction expenditures over livelihood expenditures, reflecting a focus on economic development at the expense of public welfare. (ii) The presence of an official promotion mechanism and an economic assessment system incentivizes local government officials to engage in an economic tournament, which distorts the supply of public goods as they seek to secure promotion capital. As a result, the high level of VFI in China exacerbates the bias of local government expenditures toward economic construction, thereby worsening Gstructure of local governments.

Third, the results in columns 2, 4, and 6 indicate that the estimated coefficient of Gstructure on quality is positive, validating hypothesis 3. This implies that a public expenditure structure biased towards livelihood expenditures enhances quality (Liu and Zhang, 2022; Feng et al., 2023). Specifically, quality rises by 9.756 units for every unit increase in Gstructure. The possible reasons for this are as follows: (i) Livelihood expenditures include nine categories such as general public services, public safety, social security and employment, medical security, science and technology, education, culture, sports and media, healthcare, and environmental protection, all of which are positively related to Quality. Therefore, a public expenditure structure biased towards livelihood expenditures inevitably improves quality indicators. (ii) Theoretically, an appropriate fiscal gap at the local government level facilitates the central government’s macroeconomic regulation through transfer payments, guiding local governments to increase investment in livelihood projects by optimizing the structure of transfer payments. (iii) An increase in livelihood expenditures can affect residents’ disposable income and consumption environment,



thereby producing both a crowding-out effect and a multiplier effect on consumption, thereby promoting the enhancement of Quality.

Fourth, regarding control variables, the increase in Pgdg has a positive impact on Quality. Higher GDP corresponds to greater fiscal capacity for local governments, facilitating comprehensive economic development planning. The relationship between open and quality is negative but not significant, indicating that the impact of increased openness on suppressing quality has not yet materialized. Gscale shows a significant positive correlation with quality, consistent with theoretical expectations. This result suggests that raising local governments' fiscal spending levels encourages greater standards of public service and guides social capital participation in regional economic development, thereby positively influencing Quality. Fss shows a significant positive correlation with Gstructure, indicating that as Fss increases, the degree of Gstructure also increases. Specifically, for each unit increase in Fss, the proportion of livelihood-related expenditures increases by an average of 0.544 units. Conversely, for each unit decrease in Fss, the proportion of economic construction expenditures increases by an average of 0.544 units. When Fss is low, local governments are compelled to seek revenue sources and funding to alleviate fiscal pressure, leading to a preference for investing fiscal resources in construction expenditures that yield direct economic benefits while relatively neglecting livelihood expenditures. When Fss is high, local governments do not face significant pressure to promote economic growth. As the demand for public goods and services in their jurisdictions increases, local governments are incentivized to increase the proportion of livelihood-related expenditures, thereby tilting the public expenditure structure towards livelihood expenditures.

Compete shows a significant negative correlation with Gstructure, indicating that horizontal competition among local governments significantly hinders the optimization of the expenditure structure. In China's system of economic decentralization and political centralization, local government officials, in pursuit of promotion benefits, tend to allocate more fiscal expenditures to industries with short cycles and high returns, generally paying less attention

to long-term livelihood expenditures. This is detrimental to the optimization of Gstructure.

The correlation between Density and Gstructure is not significant, indicating that the direct impact of density on Gstructure has not yet emerged. This could be due to the fact that the increase in public product expenditures brought about by higher population density outweighs the reduction in the cost of public product sharing, leading local governments to prefer construction expenditures to meet spending demands. Moreover, as population agglomeration brings about economies of scale, it also increases pressure on employment and infrastructure, prompting local governments to squeeze livelihood expenditures to finance construction expenditures, thereby biasing the public expenditure structure towards construction expenditures.

Transfer shows a significant positive correlation with Gstructure, indicating that an increase in the proportion of equalizing transfer payments significantly raises the share of livelihood-related expenditures within local public spending. First, equalizing transfer payments effectively alleviate the fiscal gap faced by local governments by increasing their disposable income, significantly boosting livelihood expenditures that were previously constrained by limited revenues. Second, under the traditional development model focused on economic growth rates, local governments have competed to increase the proportion of productive expenditures to quickly raise local economic levels. However, the negative issues associated with this development model, such as redundant construction, overcapacity, and industrial imbalances, have increasingly hindered current economic development. Therefore, the benefits of increasing revenue through equalizing transfer payments and investing in livelihood areas are now greater than those of investing in productive sectors. Lastly, the shift in the central government's macroeconomic goals towards high-quality development, along with changes in local officials' performance evaluation criteria, has become an important external factor motivating local governments to increase livelihood expenditures.

### 5.5. Robustness Results

Gstructure is measured by the proportion of livelihood expenditures within the general public budget expenditure. Since livelihood

**Table 8: Regression results of robustness tests**

Dependent variables	Two_sls		Three_sls		Three_sls_~r	
	Quality	Gstructure	Quality	Gstructure	Quality	Gstructure
VFI	-2.537*** (-4.08)	-0.828*** (-7.64)	-2.669*** (-4.62)	-0.723*** (-7.52)	-2.676*** (-4.52)	-0.713*** (-7.41)
Gstructure	8.307*** (4.22)		8.812*** (4.84)		8.917*** (4.79)	
Pgdg	0.301*** (8.42)		0.320*** (11.50)		0.320*** (11.98)	
Open	-0.567** (-3.32)		-0.541*** (-4.08)		-0.528*** (-4.16)	
Gscale	2.000*** (3.87)		2.496*** (6.32)		2.574*** (6.83)	
Fss		0.627*** (5.85)		0.516*** (5.43)		0.506*** (5.31)
Compete		-0.0004 (-0.45)		-0.0019*** (-2.84)		-0.0021*** (-3.29)
Density		-0.092*** (-3.52)		-0.058*** (-2.71)		-0.053*** (-2.56)
Transfer		0.060*** (4.24)		0.103*** (9.12)		0.108*** (9.91)
Constant	-1.235* (-1.88)	0.210 (0.98)	-1.600*** (-2.83)	0.096 (0.57)	-1.660*** (-2.94)	0.072 (0.45)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.9569	0.8227	0.9548	0.8168	0.9544	0.8153

① Values in parentheses represent t-values. ② \*\*\*, \*\*, and \* indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively. ③ The data presented in this table were computed using Stata 17.0



**Table 9: Standardized regression results of VFI, Gstructure, and quality**

Dependent variables	Two_sls		Three_sls		Three_sls_r	
	Quality	Gstructure	Quality	Gstructure	Quality	Gstructure
VFI	-0.331*** (-3.07)	-0.179*** (-7.48)	-0.279*** (-2.79)	-0.133*** (-7.22)	-0.283*** (-3.08)	-0.130*** (-6.98)
Gstructure	11.840*** (6.11)		9.521*** (5.47)		9.757*** (6.10)	
Pgdp	0.672*** (7.39)		0.693*** (11.59)		0.689*** (12.44)	
Open	-0.186*** (-2.86)		-0.124*** (-2.83)		-0.129*** (-3.18)	
Gscale	0.632*** (6.41)		0.287*** (4.01)		0.319*** (4.83)	
Fss		0.165*** (6.87)		0.118*** (6.50)		0.115*** (6.26)
Compete		-0.0117*** (-3.94)		-0.0114*** (-5.47)		-0.0114*** (-5.39)
Density		-0.029 (-0.74)		-0.008 (-0.29)		-0.042 (-0.16)
Transfer		0.020*** (7.27)		0.024*** (10.41)		0.025*** (10.41)
Constant	-5.440*** (-4.34)	0.788*** (15.08)	-4.415*** (-3.88)	0.760*** (20.26)	-4.520*** (-4.32)	0.756*** (19.88)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.9406	0.8088	0.9506	0.8059	0.9499	0.8054

① Values in parentheses represent t-values. ② \*\*\*, and \*\* indicate rejection of the null hypothesis at the 1% and 5% significance levels, respectively. ③ The data presented in this table were computed using Stata 17.0

**Table 10: Paths and transmission of VFI on Gstructure and quality**

Mechanisms	Paths and transmission	Effect	Result	total effect
Direct effect	VFI→Quality	$\alpha_1$	-1.460	-1.460
Direct effect	Gstructure→Quality	$\alpha_2$	9.521	9.521
Indirect effect	VFI→Gstructure	$\beta_1$	-0.695	-6.617
	VFI→Gstructure →Quality	$\alpha_2 \times \beta_1$	-6.617	

expenditures are composed of various detailed expenditure categories, this study conducts a robustness test by altering the measurement method of Gstructure. Specifically, this study uses protection-related expenditures within livelihood expenditures for the robustness test. Protection-related expenditures include four main categories: general public services, general public safety, social security and employment, and housing security. The public expenditure structure is represented by the proportion of protection-related expenditures within the general public budget expenditure, and the 3SLS regression is re-estimated. The specific results are reported in Table 7.

First, the coefficients of the explanatory variables, the dependent variables, and the control variables remain significant, and the signs of the main variables have not changed, indicating the stability of the empirical results. Among the control variables, the population density, which was previously insignificant, becomes significant, with one coefficient being positive and the other negative. This suggests that the increase in population density causes the public expenditure structure to lean towards livelihood expenditures.

### 5.6. Standardized Regression Results

The results of the benchmark regression and the theoretical mechanism analysis show that there are two ways in which VFI influences the Gstructure of local governments. To isolate the direct impact of VFI on Gstructure from its indirect transmission effects, this study standardizes all variables and re-estimates using the 3SLS method. The regression results are reported in Table 8, and the significance of all variables is still in line with the findings of the benchmark regression. VFI inhibits the improvement of quality while significantly enhancing Gstructure. Meanwhile, Gstructure

significantly improves Quality.

This study estimates the direct, indirect, and total effects of VFI and Gstructure on quality using the standardized regression results from Table 8 (Liu and Zhang, 2022; Feng et al., 2023). Table 9’s calculations demonstrate that there is a -1.460 direct influence of VFI on Quality. Multiplying the effect of VFI on Gstructure (-0.695) by the effect of Gstructure on quality (9.521) yields an indirect effect of 6.617, which represents the indirect effect of VFI on quality that is mediated through Gstructure. This finding effectively validates hypothesis 4, which posits that VFI can indirectly influence quality through the local government Gstructure. The rationale behind this result lies in the fact that as economic development transitions into a new phase of high-quality growth, the development goals and policy orientations of regional governments simultaneously shift towards enhancing residents’ quality of life and well-being. On the one hand, the new development stage requires local authorities to offer sufficient basic services and infrastructure to meet the daily needs of local residents. On the other hand, by increasing the level of livelihood expenditures, local authorities can enhance their attractiveness to high-quality talent and enterprises, thereby promoting the sustained improvement of Quality over the long term.

## 6. CONCLUSION

Firstly, VFI not only hinders the improvement of quality but also restricts local governments from allocating expenditures to livelihood-related projects. Secondly, Gstructure significantly contributes to the enhancement of quality. Thirdly, VFI indirectly suppresses the improvement of quality by influencing Gstructure of local governments. Finally, Pgdp and Gscale have significant positive effects on quality, while open negatively impacts it. Additionally, Fss and transfer tend to increase local government spending on livelihood-related projects, whereas compete encourages more spending on productive projects. The impact of density on Gstructure is not significant.

Based on the above conclusions, this study suggests three key policy implications.

First, recognize the significant impact of VFI on quality. Since VFI can have a detrimental effect on quality, it is important to manage and progressively reduce high levels of VFI. Achieving this requires a rational division of fiscal authority and responsibilities between national and regional governments, strengthening the national government's fiscal oversight of regional governments, and alleviating the fiscal pressures faced by regional governments.

Second, China's fiscal transfer payment system should be further improved. The scope of transfer payment funds needs to be clearly defined, and a shared responsibility system between central and local governments should be established and refined. This will enhance the efficiency of resource allocation and promote improvements in quality through the transfer payment mechanism. The proportion of transfer payments to economically underdeveloped regions should be gradually increased, based on regional and economic development levels, to better address fiscal disparities and support sustainable, stable economic growth.

Third, recognize the significance of public spending on livelihoods in relation to VFI and quality. While reducing VFI, it is important to appropriately increase livelihood-related expenditures, aligning fiscal policies with public welfare. This approach will enhance the living standards and welfare of residents, thereby promoting overall economic development.

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## REFERENCES

- Amusa, K., Oyinlola, M.A. (2019), The effectiveness of government expenditure on economic growth in Botswana. *African Journal of Economic and Management Studies*, 10(3), 368-384.
- Bao, Q., Tang, S., Liu, B. (2017), Local competition, homogeneity of leading industries and domestic overcapacity. *Journal of World Economy*, 40(10), 144-169.
- Bardhan, P., Mookherjee, D. (2006), Decentralization and accountability in infrastructure delivery in developing countries. *Economic Journal*, 116(508), 101-127.
- Barro, R.J. (1990), Government spending in a simple model of endogenous growth. *Journal of Political Economy*, 98(5), 103-125.
- Bird, R.M., Tarasov, A.V. (2004), Closing the gap: Fiscal imbalances and intergovernmental transfers in developed federations. *Environment and Planning C: Government and Policy*, 22(1), 77-102.
- Breton, A. (1989), The growth of competitive governments. *The Canadian Journal of Economics*, 22(4), 717-750.
- Cai, Q.F., Chen, Y.H. (2023), Vertical fiscal imbalances, local incentive alienation and business investment. *Journal of Management World*, 39(5), 25-40.
- Chu, D.Y., Fei, M.S. (2021), Vertical fiscal imbalances, tax effort and local economic growth. *Contemporary Finance and Economics*, 10, 30-42.
- Chu, D.Y., Fei, M.S., Huang, X. (2020), Local government competition, tax efforts and high-quality economic development. *Public Finance Research*, 8, 55-69.
- Chu, D.Y., Shao, J. (2018), Vertical fiscal imbalances, public expenditure structure and economic growth. *Economic Theory and Business Management*, 10, 30-43.
- Dahlby, B., Wilson, L.S. (1994), Fiscal capacity, tax effort, and optimal equalization grants. *The Canadian Journal of Economics*, 27(3), 657-672.
- Devarajan, S. (1996), The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(2), 313-344.
- Easterly, W., Rebelo, S. (1993), Fiscal policy and economic growth. *Journal of Monetary Economics*, 32(3), 417-458.
- Eyraud, L., Lusinyan, L. (2013), Vertical fiscal imbalances and fiscal performance in advanced economies. *Journal of Monetary Economics*, 60(5), 571-587.
- Feng, T., Liu, M., Li, C. (2023), How do vertical fiscal imbalances affect energy efficiency? The role of government spending on science and technology. *Environmental Science and Pollution Research*, 30(14), 58-71.
- Ferrario, C., Zanardi, A. (2011), Fiscal decentralization in the Italian NHS: What happens to interregional redistribution? *Health Policy*, 100(1), 71-80.
- Fisher, R.C. (1982), Income and grant effects on local expenditure: The flypaper effect and other difficulties. *Journal of Urban Economics*, 12(3), 324-345.
- Fu, Y., Zhang, Y. (2007), Chinese decentralization and fiscal expenditure structural bias: The costs of competing for growth. *Journal of Management World*, 3, 4-12+22.
- Gong, F., Lu, H.Y. (2009), Public expenditure structure, preference matching and fiscal decentralization. *Journal of Management World*, 1, 10-21.
- Han, J., Sun, Y.W., Chen, C.F., Lan, Q.X. (2019), Is industrial upgrading driving green growth in China's cities? *Journal of Beijing Normal University*, 3, 139-151.
- Hettich, W., Winer, S. (1986), Vertical imbalance in the fiscal systems of federal states. *Canadian Journal of Economics*, 19(4), 746-765.
- Hunter, J. S. (1977), Federalism and fiscal balance: A comparative study. *Fiscal Federalism: Vertical Balance*. Australia: Australian National University Press, pp. 38-112.
- Jia, J., Guo, Q., Zhang, J. (2014), Fiscal decentralization and local expenditure policy in China. *China Economic Review*, 28, 107-122.
- Jin, B. (2018), Economics of quality development. *China Industrial Economics*, 4, 5-18.
- Keen, M., Marchand, M. (1997), Fiscal competition and the pattern of public spending. *Journal of Public Economics*, 66(1), 33-53.
- Keshab B. (2019), Application of panel data models for empirical economic analysis. *Panel Data Econometrics*, 68(4), 665-708.
- Levin, A., Lin, C.F., Chu, C.S.J. (2002), Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1-24.
- Li, Y.Y., Zhang, F. (2019), Mechanisms and incentive effects in the formation of vertical fiscal imbalances. *Journal of Management World*, 35(7), 43-59.
- Liu, L., Zhang, W. (2022), Vertical fiscal imbalance and government spending on science and technology in China. *Economic Change and Restructuring*, 55(3), 125-136.
- Liu, Z., Tong, Z., Zhang, Z. (2023), Government expenditure structure, technological progress and economic growth. *International Journal of Emerging Markets*, 36(5), 158-174.
- Mlachila, M., Tapsoba, R., Tapsoba, S.J.A. (2017), A quality of growth index for developing countries: A proposal. *Social Indicators Research*, 134(2), 675-710.

- Oates, W.E. (1993), Fiscal decentralization and economic-development. *National Tax Journal*, 46(2), 237-243.
- Qian, Y., Weingast, B.R. (1997), Federalism as a commitment to preserving market incentives. *Journal of Economic Perspectives*, 11(4), 83-92.
- Ren, B.P. (2018), Research on China's high-quality economic development. *Journal of Shanxi Normal University*, 47(3), 104-118.
- Song, M.Z., Ye, C., Chen, J., Liu, X.Q. (2021), Impact of vertical fiscal imbalances on high-quality economic development. *Journal of Hunan University of Finance and Economics*, 37(5), 47-54.
- Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2010), *Mismeasuring our lives: Why GDP doesn't add up*. Sustainable Development and Environment. New York: The New Press (pp. 11-41).
- Sun, Z., Chen, X.D., Su, X.Y. (2019), Local competition, overcapacity and fiscal sustainability. *Industrial Economics Research*, 1, 75-86.
- Tremblay, J.F., & Boadway, R. (2006), A theory of fiscal imbalance. *European Journal of Public Finance*, 62(1),1-27.
- Tridico, P. (2011), *Institutions, Human Development and Economic Growth in Transition Economies*. UK: Palgrave Macmillan. p115-128.
- Wang, J.R. (2016), Decentralization, local debt and modern fiscal reform - an effect analysis based on different perspectives of fiscal decentralization. *Modern Economic Science*, 38(6), 82-92+125.
- Wang, L.P., Liu, Y., Wu, W.T. (2020), Impact of fiscal system imbalances on high-quality economic development. *Journal of Industrial Technological Economics*, 7, 22-30.
- Wang, Q., Zhang, F. (2021), The effects of trade openness on decoupling carbon emissions from economic growth - evidence from 182 countries. *Journal of Cleaner Production*, 27(9), 123-138.
- Wei, D.M., Gu, N.H., Wei, J.H. (2021), Vertical fiscal imbalances, public expenditure bias and high-quality economic development. *Economic Review*, 2, 23-43.
- Zhang, L., Wang, Q. (2020), A comprehensive study on panel unit root tests: evidence from LLC, Fisher, and other tests. *Economic Modelling*, 90, 470-482.
- Zhou, C., Li, X., Lin, X., Cheng, M. (2022), Influencing factors of the high-quality economic development in China based on LASSO model. *Energy Reports*, 8, 1055-1065.