

Study on the Impact of Tax Competition on Urban Innovation: Based on the Mediating Effect of Fiscal Science and Technology Expenditure

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Abstract

Under the Chinese-style fiscal decentralization system, local government tax competition is an important factor affecting urban innovation. This study selects 293 prefecture-level cities in China from 2000 to 2024 and establishes a two-way fixed effects model to systematically examine the effect of tax competition on urban innovation, and conducts robustness tests and heterogeneity analysis. At the same time, this study further includes the intensity of local fiscal science and technology expenditure as a mediating variable in the analytical framework to explore the influence path. The results show that local tax competition improves the level of urban innovation, passes a series of robustness tests, and has heterogeneous effects, with the strongest effect in central China and the weakest effect in eastern China. Fiscal science and technology expenditure plays a mediating role. Based on the research conclusions, this study proposes suggestions such as improving top-level design, implementing regionalized fiscal and tax policies, and improving the fiscal science and technology investment support system.

Keywords

tax competition, innovation, fiscal science and technology expenditure, two-way fixed effects model, mediating effect

1. Introduction

Innovation is the primary driving force leading development and a strategic support for building a modern economic system. As China's economy enters the new normal, the driving force of economic development has shifted from traditional factor-driven development to innovation-driven development [1]. As the core carrier for the agglomeration of innovation factors and regional economic growth, the continuous improvement of urban innovation capacity is closely related to the enhancement of national overall innovation competitiveness and the fundamental transformation of the mode of economic development. However, under the dual incentives of the fiscal decentralization system and the political promotion tournament, local governments have launched fierce interregional tax competition to compete for mobile capital, high-quality enterprises, and scarce talent. Tax competition is usually manifested as local governments attracting production factors to flow into their regions by reducing effective tax rates, implementing tax reductions and exemptions, and providing tax rebates. In the short term, this competitive behavior is certainly helpful for reducing the tax burden of enterprises, promoting factor agglomeration, and stimulating economic growth. In the long term, however, excessive tax

competition may lead to the loss of local fiscal revenue, thereby compressing public expenditures on science and technology, education, and other fields, and producing a profound inhibitory effect on urban innovation capacity. The contradiction between the long-term nature of improving urban innovation capacity and the short-term nature of tax competition behavior has become increasingly prominent and has become a practical issue that urgently needs in-depth study. Existing studies have accumulated relatively rich results on the relationship between tax competition and innovation, but no consistent conclusion has yet been formed.

Some scholars believe that tax competition promotes innovation. Zhang [2] constructed a theoretical analytical framework covering industrial agglomeration, tax competition, and technological innovation, and used panel data from 2000 to 2018 to analyze mediating effects and threshold effects. The study found that industrial agglomeration promoted technological innovation by weakening the level of tax competition. Based on prefecture-level city data, Yao, Yan, and Chen [3] incorporated resource mismatch into the analytical framework of tax competition and green innovation efficiency and constructed a random effects Tobit model for empirical testing. The results show that China's tax competition effectively improves regional green innovation efficiency and presents a form of competition toward improvement. The mechanism is that tax competition can promote the improvement of green innovation efficiency by correcting resource mismatch. Other studies reveal the inhibitory effect of tax competition. An empirical study based on panel data from 41 cities in China's Yangtze River Delta from 2012 to 2022 found that the tax competition behavior of local governments in China hinders the improvement of regional technological innovation [4]. From the enterprise level, Cao and Lin [5] took high-tech enterprise income tax incentives and the additional deduction policy for R&D expenses as evaluation objects and used data from A-share listed companies for analysis. They found that the existence of international tax competition and the implementation of the patent box system in host countries weaken the enterprise innovation effect of China's tax incentive policies. Shi and Shen [6] used data on Chinese industrial enterprises from 2011 to 2018 to empirically test the effect of tax competition on the innovation efficiency of industrial enterprises and its mechanism. The study shows that excessive tax competition hinders the improvement of the innovation efficiency of industrial enterprises, in which capital flow plays a partial mediating role. Based on panel data from 30 Chinese provinces from 2007 to 2021, Chen [7] empirically analyzed the effect of tax competition on the transformation of innovation achievements in high-tech industries.

It is worth noting that an increasing number of studies have found that the relationship between tax competition and innovation is not a simple linear relationship but shows nonlinear characteristics. Some scholars constructed a threshold regression model based on sample data from 31 Chinese provinces from 2006 to 2015 and found that there is an optimal interval for the promoting effect of local government tax competition intensity on technological innovation. The study by Meng, Yang, and Zheng [8] also confirms that there is an inverted U-shaped relationship between local government tax competition and industrial transformation and upgrading. Huang and Xiao [9] used a spatial Durbin model to analyze panel data from Chinese prefecture-level and above cities from 2005 to 2021, revealing an inverted U-shaped relationship between tax competition and urban economic resilience. Tax competition shapes urban economic resilience by affecting regional industrial structure and innovation level. Based on Chinese provincial panel data from 2001 to 2017, Deng, You, and Wang [10] combined a dynamic spatial Durbin model with a threshold panel model to analyze the nonlinear effects of income tax competition and environmental tax competition on green technology innovation, and found that tax competition has an inverted U-shaped effect on green technology innovation. These findings indicate that the effect of tax competition on innovation has complex threshold effects and stage transition characteristics [11].

Overall, although the existing literature has laid an important theoretical foundation and provided methodological reference for this study, there is still room for expansion in the following aspects. First, in terms of research scale, most studies use the provincial level or enterprise level as the unit of analysis. Studies that directly take prefecture-level cities as the object and systematically examine the impact of tax competition on urban innovation capacity remain relatively insufficient, whereas prefecture-level cities are precisely the key level for implementing tax competition policies and carrying innovation activities. Second, in terms of mechanism analysis, although some literature involves channels such as fiscal expenditure, enterprise R&D, and human capital separately, few studies have incorporated the three into a unified analytical framework for comparative research on mediating effects. Third, in terms of time span, existing studies mostly focus on

specific year intervals, and the depiction of changes in the tax competition pattern and urban innovation dynamics in recent years needs to be further enriched.

Based on the above analysis, this study takes 293 prefecture-level cities in China from 2000 to 2024 as the research objects, selects the degree of tax competition as the core explanatory variable and urban innovation capacity as the explained variable, and systematically examines the impact of tax competition on urban innovation under the condition of controlling for multiple factors, including economic development level, industrial structure, fiscal science and technology input, human capital level, infrastructure level, financial development level, degree of opening to the outside world, and degree of government intervention. At the same time, this study further includes the intensity of local fiscal science and technology expenditure as a mediating variable in the analytical framework, attempting to reveal the action path and transmission mechanism through which tax competition affects urban innovation. This study aims to provide a theoretical basis and decision-making reference for local governments to optimize tax competition strategies and improve the level of urban innovation, and to offer suggestions for promoting high-quality regional economic development.

2. Theoretical Analysis and Research Hypotheses

Tax competition among local governments profoundly affects the allocation of regional innovation resources. Under the Chinese-style fiscal decentralization system, local governments use strategic means such as tax preferences and reductions in the effective tax burden to attract capital, technology, talent, and other innovation factors to flow into their jurisdictions, forming a tax depression effect and an industrial agglomeration trend, and thereby promoting the improvement of regional innovation capacity [12]. Bian and Bai [13] pointed out that the competitive goal of local governments is shifting from competing for growth to competing for innovation. A reasonable tax competition strategy can enrich local general public budget revenue, provide a financial basis for local governments to expand public inputs in education, science and technology, and industrial supporting facilities, improve innovation infrastructure and the industrial support environment, and ultimately empower the growth of urban innovation output. Based on this, this study proposes the following hypothesis:

H1: Local tax competition has a significant positive promoting effect on urban innovation.

Furthermore, the empowerment of urban innovation by tax competition does not occur directly but operates through specific transmission channels. From the fiscal capacity side, the fiscal increment obtained by local governments through a moderate increase in the tax burden can effectively expand the allocation space of the general public budget and encourage local governments to increase the proportion of science and technology funds in fiscal expenditure [14]. The increase in fiscal science and technology expenditure can not only directly subsidize research institutes, high-tech enterprises, and the construction of innovation platforms and share the R&D risks of micro entities, but also optimize the regional innovation ecosystem from the public supply side and continuously increase the supply of regional innovation public goods. In this way, it opens the complete transmission chain from tax burden increase and fiscal capacity expansion to increased fiscal science and technology expenditure and growth in innovation output [15]. Based on this, this study proposes the following hypothesis:

H2: Fiscal science and technology expenditure is an important transmission channel through which local tax competition empowers urban innovation.

3. Research Design

3.1 Model Setting

According to the above analysis, in order to clarify the relationship between local tax competition and urban innovation and to test the transmission and mediating effect of fiscal science and technology expenditure between the two, this study uses a time-city two-way fixed effects model for empirical testing. The specific model is set as follows:

First, a benchmark regression model is constructed to test the main effect of local tax competition on urban innovation and to verify research hypothesis H1:

$$\ln_patent_{it} = \alpha_0 + \alpha_1 \ln_tax_burden_{it} + \alpha' X_{it} + \delta_t + \mu_i + \varepsilon_{it} \quad (1)$$

Model (1) is the benchmark regression for the impact of tax competition on urban innovation. Subscript i denotes the city, and t denotes the year. $\ln_patent_{it}$ is the explained variable, namely the level of urban innovation; $\ln_tax_burden_{it}$ is the core explanatory variable, namely the degree of local tax competition; X_{it} is a series of city-level control variables; α' is the coefficient vector to be estimated; μ_i represents city individual fixed effects; δ_t represents year fixed effects; and ε_{it} is the random disturbance term.

To test the mediating transmission effect of fiscal science and technology expenditure and to verify research hypothesis H2, a stepwise mediating effect model is further constructed:

$$\ln_science_tech_{it} = \eta_0 + \eta_1 \ln_tax_burden_{it} + \eta' X_{it} + \delta_t + \mu_i + \varepsilon_{it} \quad (2)$$

$$\ln_patent_{it} = \gamma_0 + \gamma_1 \ln_tax_burden_{it} + \gamma_2 \ln_science_tech_{it} + \gamma' X_{it} + \delta_t + \mu_i + \varepsilon_{it} \quad (3)$$

The mediating variable $\ln_science_tech_{it}$ represents the intensity of fiscal science and technology expenditure of city i in year t . Equation (2) is used to test the effect of local tax competition on the mediating variable, namely the intensity of fiscal science and technology expenditure. Equation (3) adds the mediating variable, namely the intensity of fiscal science and technology expenditure, to the benchmark regression model, and judges whether fiscal science and technology expenditure is an effective transmission channel through which tax competition empowers urban innovation according to the significance of the coefficients.

3.2 Variable Selection

3.2.1 Explained Variable: Urban Innovation Level

This study uses the total annual patent applications of each prefecture-level city, including invention patents, utility model patents, and design patents, as the core measurement indicator of urban innovation output. Compared with the number of patent grants, the number of patent applications can more accurately reflect the activity of a city's current innovation output. The data are taken from the Patent Statistical Annual Report of the China National Intellectual Property Administration and the science and technology statistical bulletins of prefecture-level cities. To eliminate the interference of heteroscedasticity, the indicator is processed by taking the natural logarithm.

3.2.2 Core Explanatory Variable: Degree of Local Tax Competition

Referring to the macro tax burden measurement method commonly used in academia, this study uses the proportion of urban tax revenue in urban GDP to characterize the local effective tax burden level. The tax burden level is negatively correlated with the degree of local tax competition. While local governments improve the effective tax burden by standardizing collection and administration and moderately enriching tax sources, they can optimize the supply of innovation-related public services through stable fiscal capacity, ultimately affecting regional innovation output. This study also applies logarithmic processing to this indicator. The data come from the China City Statistical Yearbook and the China Fiscal Yearbook.

3.2.3 Mediating Variable: Intensity of Fiscal Science and Technology Expenditure

The proportion of urban fiscal science and technology expenditure in total local general public budget expenditure is used as the proxy variable. It directly depicts the degree to which local governments tilt their investment toward science and technology innovation and measures the intensity with which fiscal increments brought by tax competition are allocated to the innovation field.

3.2.4 Control Variables

To exclude the interference of other city-level factors with innovation output, this study selects the following control variables:

- (1) Population size, characterized by the natural logarithm of the total population of the city at year-end;

(2) Economic development level, characterized by the natural logarithm of the city's per capita gross regional product;

(3) Degree of opening to the outside world, characterized by the proportion of the city's actual utilized foreign investment in GDP;

(4) Advancement of industrial structure, characterized by the ratio of the added value of the tertiary industry to the added value of the secondary industry;

(5) Human capital level, characterized by the proportion of students enrolled in ordinary higher education institutions per 10,000 people;

(6) Financial development level, characterized by the proportion of the sum of deposits and loans of urban financial institutions in GDP;

(7) Degree of government intervention, characterized by the proportion of local general public budget expenditure in GDP.

All original data are taken from the China City Statistical Yearbook over the years.

3.3 Data Sources

This study selects 293 prefecture-level cities nationwide from 2000 to 2024 as the initial research sample. After excluding city samples with serious data missing, 4,809 valid observations are finally obtained. All variables are winsorized at the two-sided 1% level to eliminate the interference of outliers.

4. Empirical Analysis

4.1 Descriptive Statistical Analysis

The descriptive statistics of the variables are shown in Table 1. According to the statistical results, the mean value of $\ln_patent$ is 7.254, the maximum value is 12.710, the minimum value is 1.609, and the standard deviation is 1.877, indicating that there are large differences in innovation output levels among prefecture-level cities in China. The mean value of $\ln_tax_burden$ is -3.911, the maximum value is -1.690, the minimum value is -6.071, and the standard deviation is 0.548, reflecting obvious differentiation in the tax burden strategies and tax competition intensity of different local governments. The means and standard deviations of other control variables, such as $\ln_population$ and $\ln_economic_development$, are all within reasonable ranges. The numerical intervals of each variable are normal and suitable for conducting a two-way fixed effects model.

Table 1: Descriptive Statistical Analysis

Variable	N	Mean	Standard deviation	Minimum	Maximum
$\ln_patent$	4860	7.254	1.877	1.609	12.710
$\ln_tax_burden$	4860	-3.911	0.548	-6.071	-1.690
$\ln_population$	4851	1.921	0.108	1.365	2.206
$\ln_population_density$	4851	5.737	0.998	1.803	9.089
$\ln_economic_development$	4851	2.433	0.066	2.192	2.599
$\ln_open_level$	4860	0.160	0.208	0.000	1.505
$\ln_industrial_structure$	4860	0.351	0.069	0.082	0.608
$\ln_human_capital$	4809	0.016	0.018	0.000	0.110
$\ln_finance_level$	4860	1.181	0.295	0.445	3.105
$\ln_science_tech$	4860	0.003	0.002	0.000	0.022

4.2 Benchmark Regression Results

This study uses a two-way fixed effects model to explore the impact of the local tax burden on urban innovation. The benchmark regression results are shown in Table 2. Column (1) includes only the core explanatory variable, and the result shows that the coefficient is 1.867, which is significantly positive at the 1% statistical level. Column (2) adds all city-level control variables, and the coefficient of the tax burden is 0.251, which is significantly positive at the 1% statistical level. This result verifies H1: moderately increasing local

tax competition can enrich local general public budget revenue. Local governments can expand public fiscal inputs in education, science and technology, and industrial supporting facilities, improve innovation infrastructure and the industrial support environment, and ultimately empower the growth of urban innovation output.

Table 2: Benchmark Regression Results

	(1)	(2)
	Core explanatory variable only	Benchmark regression
ln_tax_burden	1.867*** (0.073)	0.251*** (0.039)
ln_population		8.476*** (1.525)
ln_economic_development		16.908*** (0.395)
ln_open_level		-0.113 (0.210)
ln_industrial_advanced		0.422*** (0.128)
ln_education_expenditure		8.823*** (2.078)
ln_human_capital		1.054 (3.134)
ln_finance_level		1.155*** (0.129)
ln_gov_intervention		-0.606 (0.475)
_cons	14.567*** (0.284)	-51.039*** (3.078)
N	4860	4809
R ²	0.875	0.903
adj.R ²	0.874	0.903

Standard errors are in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The same applies below.

4.3 Robustness Tests

To verify the reliability of the above conclusions and exclude estimation bias caused by indicator measurement, extreme values, reverse causality, and the functional form of variables, this study adopts four methods for robustness testing. They are: (1) replacing the explained variable by changing patent applications to patent grants; (2) using the core explanatory variable without taking the logarithm and conducting regression with the level term; (3) winsorizing all continuous variables at the two-sided 1-99% level to eliminate the interference of extreme values; and (4) lagging the core explanatory variable by one period to alleviate the bidirectional causal endogeneity problem between the tax burden and urban innovation. The four test results are shown in Table 3. After the explained variable is replaced by patent grants, the coefficient of the explanatory variable remains positive and significant. After the core explanatory variable is replaced by the level term and after 1-99% winsorization is conducted, the regression results remain consistent with the benchmark results. After the tax burden is lagged by one period to alleviate the bidirectional causal relationship, it remains significant. The above tests show that the core conclusion of this study is robust.

Table 3: Robustness Test Results

	(1) Replace explained variable	(2) X without logarithm	(3) 1-99% winsorization	(4) X lagged one period
ln_tax_burden	0.084** (0.039)			
ln_population	8.935*** (1.570)	8.014*** (1.570)	8.476*** (1.525)	8.651*** (1.565)
ln_economic_development	18.731*** (0.423)	16.979*** (0.393)	16.908*** (0.395)	17.096*** (0.409)
ln_open_level	-0.036	-0.057	-0.113	-0.129

	(1) Replace explained variable	(2) X without logarithm	(3) 1-99% winsorization	(4) X lagged one period
	(0.318)	(0.213)	(0.210)	(0.220)
ln_industrial_advanced	0.535***	0.438***	0.422***	0.470***
	(0.139)	(0.127)	(0.128)	(0.129)
ln_education_expenditure	10.531***	8.747***	8.823***	9.835***
	(2.598)	(2.064)	(2.078)	(2.149)
ln_human_capital	6.705*	1.188	1.054	2.440
	(3.453)	(3.145)	(3.134)	(2.884)
ln_finance_level	1.473***	1.176***	1.155***	1.070***
	(0.151)	(0.132)	(0.129)	(0.129)
ln_gov_intervention	-1.037*	-0.591	-0.606	-0.312
	(0.582)	(0.468)	(0.475)	(0.463)
tax_burden		9.510*** (1.660)		
ln_tax_burden_w199			0.251*** (0.039)	
L_ln_tax_burden				0.225*** (0.039)
_cons	-57.903*** (3.243)	-51.565*** (3.081)	-51.039*** (3.078)	-51.967*** (3.181)
R ²	0.888	0.892	0.893	0.886
N	4809	4809	4809	4478

4.4 Heterogeneity Analysis

Existing research on local government behavior under the Chinese-style decentralization framework has long confirmed that there is natural systematic differentiation in the logic of official incentives, fiscal resource endowments, and the distribution of innovation factors among different regions in China [16]. The effect of local government tax behavior on regional economic activities is by no means homogeneously distributed and will eventually show distinct regional heterogeneity [17]. Based on the traditional regional division standard, this study divides the full sample into eastern, central, and western regions and conducts regressions separately. The regression results are shown in Table 4 [18]. The results show that the coefficients of the core explanatory variable are positive and significant in all three regions, but the effect intensity shows a gradient difference of central region > western region > eastern region. Central cities have a relatively low fiscal self-sufficiency rate and a relatively high dependence on transfer payments, and their own tax revenue is the core source of funds for local public inputs. The fiscal increment brought by the increase in the tax burden can be directly invested in science and technology, education, and industrial innovation supporting facilities, and the marginal innovation return of fiscal resources is the highest. Therefore, the elasticity of innovation driven by the tax burden is the largest. The western region has a weak tax base and a limited economic scale. Tax burden growth can slightly expand fiscal innovation input, but constrained by the weak industrial foundation and the shortage of innovative talent, the efficiency of fiscal funds in transforming into innovation output is weaker than that in the central region. The coefficient of opening to the outside world is significantly negative, reflecting low-end foreign trade and insufficient innovation spillovers from foreign investment in the western region, which further compresses the space for innovation growth. Eastern cities have developed economies, sufficient tax sources, and abundant total fiscal funds, and the marginal returns of tax increments decrease. At the same time, the degree of marketization in the eastern region is higher, enterprise innovation funds rely more on market-based financial channels, and the marginal driving effect of local fiscal input on innovation is relatively limited.

Table 4: Regional Heterogeneity Analysis

	(1) Eastern region	(2) Central region	(3) Western region
ln_tax_burden	0.169*** (0.052)	0.361*** (0.059)	0.204** (0.079)
ln_population	8.210*** (1.889)	10.029*** (2.971)	7.196*** (2.152)
ln_economic_development	16.948*** (0.854)	16.258*** (0.572)	16.130*** (0.657)
ln_open_level	-0.061	0.263	-0.806**

	(1) Eastern region	(2) Central region	(3) Western region
ln_industrial_advanced	(0.277) 0.481*	(0.353) -0.156	(0.367) 0.888***
ln_education_expenditure	(0.254) 8.167*	(0.190) 14.422***	(0.215) 5.149**
ln_human_capital	(4.765) 5.104	(3.620) 1.110	(2.384) 1.755
ln_finance_level	(6.502) 0.679***	(3.608) 1.695***	(5.080) 1.437***
ln_gov_intervention	(0.177) 1.127	(0.228) -0.914	(0.251) -0.904*
_cons	(0.961) -50.460***	(0.967) -52.346***	(0.492) -47.649***
R ²	(3.799) 0.905	(5.914) 0.906	(4.599) 0.876
N	1779	1735	1295

4.5 Mechanism Test Results

The benchmark regression above confirms that the local tax burden can improve urban innovation. To explore the internal path through which the tax burden affects urban innovation, this study selects the intensity of fiscal science and technology expenditure as the mediating variable and tests its transmission mechanism. The results are shown in Table 5. The coefficient of the core explanatory variable is 0.0003 and is significantly positive at the 1% level, verifying H2. This indicates that tax competition increases local own-source fiscal revenue, gives the government more fiscal allocation space, increases the proportion of budgetary science and technology funds, directly subsidizes research institutes, high-tech enterprises, and innovation platform construction through fiscal funds, continuously increases the regional public supply for innovation, and thereby promotes the improvement of urban patent output and empowers urban innovation.

Table 5: Mechanism Test

	(1) M1: Fiscal science and technology expenditure intensity
ln_tax_burden	0.000*** (0.000)
ln_population	0.026*** (0.004)
ln_economic_development	0.009*** (0.001)
ln_open_level	0.002** (0.001)
ln_industrial_advanced	0.000 (0.000)
ln_education_expenditure	0.009 (0.006)
ln_human_capital	-0.014 (0.009)
ln_finance_level	0.000 (0.000)
ln_gov_intervention	0.000 (0.001)
_cons	-0.070*** (0.008)
R ²	0.285
N	4809

5. Conclusions and Policy Suggestions

5.1 Research Conclusions

Based on panel data from 293 prefecture-level cities nationwide from 2000 to 2024, this study constructs an indicator system with urban innovation as the core explained variable and local tax competition as the core explanatory variable, covering multiple dimensions such as economic development, population size, opening level, industrial structure, human capital, financial development, and government intervention. Empirical testing is carried out through a two-way fixed effects model, and the following core conclusions are finally obtained:

The benchmark regression results show that the behavior of moderately increasing the local tax burden and enriching own fiscal capacity can support local governments in expanding public inputs in education, science and technology, and industrial supporting facilities, make up for shortcomings in regional innovation infrastructure, optimize the local industrial support environment, and ultimately effectively drive the growth of urban patent output. After successively completing four types of robustness tests, namely replacing the explained variable, using the level term for the core explanatory variable, winsorizing all continuous variables at the two-sided 1%-99% level, and lagging the core explanatory variable by one period, and after fully excluding indicator measurement bias, interference from extreme values, bias in the functional form of variables, and bidirectional causal endogeneity, the core conclusion that the improvement of the local tax burden significantly empowers urban innovation always holds.

Second, the driving effect of tax competition on urban innovation has obvious regional heterogeneity, and its effect intensity shows a gradient distribution of central region > western region > eastern region. The fiscal self-sufficiency rate in the central region is relatively low, and own tax revenue is the core source of funds for local public innovation input. The marginal innovation return of newly increased fiscal and tax resources is the highest. The western region is limited by its weak industrial foundation and insufficient stock of innovation factors, and the efficiency with which fiscal and tax increments are transformed into innovation output is lower than that in the central region. The eastern region has abundant tax sources and a relatively high degree of marketization. The funding sources of regional innovation activities rely more on allocation through market-based channels, and the marginal driving effect of local tax increments on innovation naturally decreases gradually.

Third, fiscal science and technology expenditure is the key transmission channel through which tax competition empowers urban innovation. The increase in the local tax burden directly enriches the disposable fiscal capacity of the local general public budget, giving local governments greater budget allocation space to increase the proportion of science and technology funds in fiscal expenditure. It can share the R&D risks of market entities by directly subsidizing research projects and supporting high-tech enterprises, and can also directionally improve the supply of regional innovation public services, thus providing support for urban innovation growth from both the supply and demand sides.

5.2 Policy Suggestions

First, at the national level, top-level institutional design should be carried out well, and the central-local fiscal and tax distribution relationship under the Chinese-style decentralization framework should be straightened out. On the premise of maintaining compatibility between local governments' fiscal and tax autonomy and innovation support incentives, nationally coordinated guidance policies for local tax competition should be issued to prevent local governments from falling into the misunderstanding of vicious competition through race-to-the-bottom tax reductions. Local governments should be guided to rely on stable own fiscal capacity to build a long-term innovation input mechanism, form a benign pattern at the national level in which the tax order is standardized and innovation resources flow in an orderly manner, and build a solid institutional foundation for urban innovation growth in the stage of high-quality economic development. Second, differentiated fiscal and tax support policies should be implemented according to the differences in resource endowments among the three major regions. For the central region, the precise support of equalization transfer payments should be further increased, supporting central provinces in relying on the current advantage of high marginal innovation returns from fiscal funds and continuously tilting newly increased fiscal and tax resources toward innovation support fields, so as to build a central rise belt for regional innovation growth.

For the western region, industrial supporting facilities should be improved and talent shortcomings should be supplemented at the same time, while export-oriented industries should be guided to upgrade toward the high end of the value chain, so as to solve the obstructive effect of low-end foreign trade on innovation spillovers and gradually improve the efficiency with which fiscal and tax resources are transformed into innovation output. For the eastern region, direct fiscal intervention by local governments in innovation activities should be moderately weakened, and mature local financial market systems should be relied upon to guide more market capital into the innovation field and fully release the endogenous innovation motivation of market entities. Finally, a full-chain support mechanism should be improved around the transmission channel of fiscal science and technology expenditure. On the one hand, diversified government innovation guidance funds should be established to leverage social capital to jointly participate in the incubation of early-stage science and technology innovation projects and amplify the leveraging effect of fiscal science and technology funds. On the other hand, the implementation channel of fiscal innovation support should be opened, the fiscal funding process for research institutes, innovation platforms, and specialized, refined, distinctive, and innovative enterprises should be optimized, and a full-cycle fiscal support system covering R&D incentives, achievement transformation, and implementation support should be established. At the same time, targeted talent introduction and cultivation incentive policies should be introduced to reduce the mobility and settlement costs of innovative talent and consolidate the factor foundation for innovation-driven development.

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Conflicts of Interest

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