Optimization of tax structure and high-quality economic development

Ping Liu[a], Ziqiu Liu

Anhui University of Finance and Economics, Bengbu, China
[a]1398794760@qq.com

Abstract: *With the promotion of the new round of fiscal and taxation system reform, the optimization of the tax system structure will continue to play a role in the quality of China's economic growth. This paper selects panel data of 38 countries from 2000 to 2020 to build a two-way fixed-effect model to empirically test the specific impact of tax structure on the quality of economic growth. The results show that the proportion of direct tax is significantly positively correlated with the quality of economic growth. The indirect tax ratio has a significant negative correlation with the quality of economic growth. From the perspective of major taxes, the higher the proportion of corporate income tax and individual income tax, the more conducive to the improvement of the quality of economic growth; The greater the proportion of consumption tax and value-added tax in tax revenue, the more detrimental it is to the improvement of the quality of economic growth. Based on the above empirical results, it is proposed to increase the proportion of direct tax, optimize the structure of indirect tax, and promote the improvement of the quality of economic growth through the optimization of tax structure.*

Keywords: *tax structure; The quality of economic growth; Entropy method*

1. Introduction

It is found that the tax structure of a country has a greater impact on economic growth (Myles,2000)[1]. Due to the different economic base and policy objectives of different countries, the tax structure types of different countries are also different. According to the characteristics of their main tax types, the tax structure types are divided into the following three categories: first, the tax structure with indirect tax as the main body; Second, the tax system structure with direct tax as the main body; Third, the tax structure of both direct and indirect taxes. Since the reform of the tax sharing system in 1994, China has established a tax structure with indirect tax as the main body and direct tax as the supplement. In the process of rapid economic development, the drawbacks of this tax system structure have become increasingly prominent. Low-income people tend to bear more indirect tax burden, which makes it difficult for tax to realize its regulating effect on income distribution, and the tax burden has a regressive effect, which violates the principle of tax fairness. The tax system structure needs to be optimized urgently. The report of the 19th National Congress of the Communist Party of China pointed out that now China's economy has entered a stage of high-quality development, effective fiscal and taxation systems and mechanisms are more conducive to promoting sustained economic growth and improving the quality of economic growth, and the tax structure has an important impact on the quality of a country's economic growth. At present, China's economy is in a critical period of transformation from the pursuit of "quantity" to the pursuit of "quality". It is of great significance to study the influence of the tax structure of OECD countries on the quality of economic growth in order to improve the modern financial and taxation system of our country.

2. Literature review

As for the impact of indirect tax, direct tax and other taxes on the quality of economic growth, the academic community has not reached a unanimous conclusion. Most scholars believe that direct tax affects individual consumption choices and enterprise production decisions by regulating residents' income and enterprise profits, thus affecting the quality of economic growth. Therefore, the proportion of direct taxes should be increased. Scholars used OLS regression, fixed effect model and GMM estimation method to verify that direct tax would promote the improvement of economic growth quality [2,5,6,7]. Some scholars argue that direct taxation is not conducive to improving the quality of

economic growth. Based on the panel data of OECD countries, Jens Matthias Arnold specifically analyzed the impact of various taxes on economic growth and came to the conclusion that income tax is not conducive to economic growth and property tax is not conducive to economic growth. [3] Yadawananda Neog used the panel data regression model of 14 Indian states to draw a conclusion that policymakers should reduce income tax while increasing property tax to improve the quality of Indian economic growth, which further confirmed Arnold's conclusion [4]. Cao Runlin and Chen Hailin concluded through empirical research that the proportion of personal income tax is positively correlated with the quality of economic growth. The proportion of corporate income tax is negatively correlated with the quality of economic growth, and the difference between eastern and western regions will also affect the result [5]. Some scholars believe that both indirect tax and direct tax can improve the quality of economic growth, such as Sun Yingjie, Lin Chun, Cui Yongrui et al. [8,15]. In addition, some scholars believe that the impact of tax structure on economic development is related to the level of economic development, and the impact of tax structure on economic development is also different at different levels of economic development, with obvious regional differences [8,9,10]. Based on the data of OECD countries, this paper constructs the index system of economic growth quality, and studies the impact of tax structure on the quality of economic growth from two aspects: tax structure and tax type structure [11].

3. Analysis of influence mechanism

3.1. Effect mechanism of tax structure on economic growth efficiency

The tax structure affects the efficiency of economic growth by influencing the total factor productivity. Both direct and indirect taxes affect total factor productivity by affecting technological progress. From the perspective of major taxes, the enterprise income tax will affect the total factor productivity through tax incentives. For example, the additional deduction policy can reduce the R&D cost of enterprises, encourage technological innovation of enterprises, and thus improve the total factor productivity of enterprises. The implementation of low tax rate for scientific and technological innovative enterprises not only reduces the burden of enterprises but also encourages enterprises to innovate. Low tax rate can encourage enterprises to carry out technological innovation activities, and thus promote the improvement of total factor productivity of enterprises.

Tax structure affects economic growth efficiency by influencing GDP growth rate. First of all, the tax structure will have an impact on consumers' consumption behavior. For example, consumption taxes can limit the consumption demand of some consumers. Secondly, the tax structure will also affect the investment behavior of investors. For example, income tax will reduce the investment returns of enterprises and individuals, thus affecting their investment preferences and investment ability.

The structure of tax system affects the efficiency of economic growth by affecting labor productivity. Personal income tax affects the choice of work and leisure. At the same time, indirect taxes will also have an impact on labor supply. Indirect taxes are easily transferred along the flow of transactions to the end consumer. The increased tax burden borne by consumers will change the relative price of leisure and labor, thus affecting the choice of workers between leisure and labor.

3.2. Influence mechanism of tax structure on economic growth structure

The tax structure affects the economic growth structure by influencing the proportion of the secondary industry in the economic structure. Generally, high pollution and high energy consumption pollution industries belong to the secondary industry, and the environmental protection tax will strictly control the secondary industry. We will reduce the proportion of secondary industry and optimize the industrial structure.

The structure of tax system affects the structure of economic growth by influencing the flow of capital elements. Factors of production gradually flow into government-supported industries, thus changing the direction of capital factor flows. The "green" elements of the tax system will also allow capital elements to flow from polluting industries to government-encouraged green industries in order to optimize capital allocation.

3.3. Influence mechanism of tax structure on economic growth stability

The tax structure affects the stability of economic growth by influencing the consumer price index.

On the supply side, the cost of food production enterprises is reduced through policies such as exemption or reduction of value-added tax and corporate income tax. On the demand side, the indirect tax rate of goods is reduced, the consumption cost is reduced, and the consumption ability and willingness of consumers are maintained.

The structure of the tax system affects the stability of economic growth by influencing the rate of unemployment and inflation. Tax structure can adjust economic fluctuations through automatic stabilization mechanism and discretionary mechanism.

3.4. Impact mechanism of tax structure on the openness of economic growth

The structure of tax system affects the openness of economic growth by influencing the degree of dependence on foreign trade. Specifically speaking: first, countries with a high proportion of secondary industry tend to produce products with a certain competitiveness in the world and a high degree of dependence on foreign countries; Countries with a high proportion of tertiary industry have a low degree of external dependence and a low degree of trade. The tax structure can affect the foreign trade dependence by adjusting the industrial structure. The second is to adjust the tax rebate rate through the export tax rebate policy, which affects the degree of foreign trade dependence.

The tax structure affects the openness of economic growth by influencing foreign direct investment. Tax will have an impact on the marginal return on investment of enterprises, and the marginal return will have an impact on foreign direct investment. In terms of tax rate: the reduction of the corporate income tax rate will reduce the tax burden of enterprises, thereby reducing the operating costs of enterprises and increasing the after-tax profits of enterprises. Therefore, the promotion effect of tax rate on FDI is opposite. Tax incentives generally adopted by countries around the world reduce the investment and operating costs of enterprises and attract foreign direct investment.

4. Research design

4.1. Measurement of the quality of economic growth

Referring to the specific indicators considered by Wei Jie, Ren Baoping[12], Zhan Xinyu and Cui Peipei[13], this paper constructs 11 secondary basic indicators to comprehensively measure the quality of economic growth based on the four dimensions of economic growth efficiency, structure, stability and openness. The original data of these indicators mainly come from: World Bank Database, EPS Global Statistics Database, CEIC Database, International Labour Organization Database, The Conference Board Total Economy Database, OECD Database. For details, see Table 1.

Table 1 Quality index system of economic growth

Primary index	Secondary index	Stats
Efficiency of economic growth	Labor productivity	+
	GDP growth rate	+
	Total factor productivity	+
Economic growth structure	Investment as a share of GDP	+
	Consumption as a share of GDP	+
	Value added of tertiary industry/Value added of secondary industry	+
Economic growth is uncertain	Consumer price index	-
	Unemployment rate	-
	Inflation rate	-
Openness to economic growth	Dependence on foreign trade	+
	Foreign investment dependence	+

Based on the research ideas of Hu Xueping and Xu Pei, this paper selects the entropy method to measure the dispersion of each indicator according to the scientific and accurate standards, and then assigns each indicator according to its dispersion degree, so as to obtain the quality of economic growth of OECD countries from 2000 to 2020[14]:

4.2. Measurement model construction

Based on the panel data of OECD countries from 2000 to 2020, this paper studies the impact of tax

structure on the quality of economic growth. Based on the analysis of basic theories and influencing mechanisms in Chapter 2, the following data model is set up to further analyze the impact of tax structure on the quality of economic growth.

$$EQ_{it} = \alpha_0 + \alpha_1 TS_{it} + \beta X_{it} + u_i + v_t + \varepsilon_i \qquad (1)$$

EQ_{it} is the quality of economic growth in OECD countries; α_0 is a constant term; α_1 is coefficients representing explanatory variables; TS_{it} is the tax structure of each country, is the core explanatory variable; X_{it} is the control variable, u_i is the individual fixed effect, v_t is the time fixed effect, ε_i is the random error term.

4.3. Variable selection

The explained variable. The explained variable of this paper is the quality of economic growth, which is calculated.

Core explanatory variable. The core explanatory variable of this paper is the structure of tax system, and the following two levels are used to measure the structure of tax system: First, from the macro perspective, the proportion of direct tax and indirect tax in the total tax revenue is used to measure the structure of tax system; Second, from the micro perspective, the tax structure is measured by the proportion of corporate income tax, individual income tax, consumption tax and value-added tax.

Control variables. Real GDP per capita, expressed as a percentage of total population. The macro tax burden is expressed as the proportion of tax revenue to GDP. The level of urbanization is measured by the proportion of urban population to total population. Population density is expressed as the ratio of total population to total land area. Table 2 shows the descriptive statistical analysis of variables.

Table 2 Descriptive statistical analysis

variable	definition	N	Mean	SD	Min	Max
EQ	Economic growth quality index system	756	0.39	0.11	0.075	0.81
ZJS	Direct tax revenue/tax revenue	756	40.73	16.15	15.03	68.63
JJS	Indirect tax revenue/tax revenue	756	32.99	7.807	16	63.80
QYS	Corporate income tax receipts/tax receipts	756	2.994	1.504	0.200	12.60
GRS	Personal income tax revenue/tax revenue	756	7.983	4.5E	0	26.20
ZZS	VAT revenue/tax revenue	756	6.482	2.140	0	10.80
XFS	Consumption tax revenue/tax revenue	756	2.560	0.968	0.400	5.300
TB	Tax revenue /GDP	756	32.94	7.816	11.40	50.30
AGDP	Real GDP/ total population	756	10.19	0.781	7.733	11.73
CZ	Urban population/total population	756	77.28	10.68	50.75	98.08
PD	Total population/land area	756	133.0	133.8	2.477	531.1

5. Empirical analysis

5.1. Empirical results on the effect of tax system structure on the quality of economic growth

According to the empirical model constructed above, regression analysis is conducted on the relationship between tax structure and economic growth quality, and the results are shown in Table 3.

According to the results of hausman test, it can be seen that the fixed effect model is more suitable. The regression results are shown in Table 3: Model (1) shows the impact of direct tax on the quality of economic growth without control variables, which is estimated to be significant at the significance level of 1%, and control variables are added to models (2)~(4). From the perspective of tax structure, these four models prove that tax structure has a significant impact on the quality of economic growth. Specifically, the higher the proportion of direct tax in the tax system structure, the more conducive to the improvement of the quality of economic growth. Model (4) is significant at the significance level of 1%, and its coefficient is about 0.0038, which indicates that the higher the proportion of direct tax revenue to total tax revenue, the more conducive to improving the quality of economic growth. Because the tax burden of direct tax is difficult to transfer, it can better play the regulating role of tax on income distribution, and indirectly affect the government's supply of public goods and services by adjusting income distribution. At the same time, since the collection of direct tax will have an impact on the profits of enterprises, it will also have an impact on the investment behavior of investors and the decision-making behavior of enterprise managers. It is beneficial to encourage enterprises to improve

production efficiency and encourage investors to invest in industries encouraged by policies, thus promoting the improvement of the quality of economic growth.

Table 3 Regression analysis of tax structure and economic growth quality

	(1)	(2)	(3)	(4)	(5)
	eq	eq	eq	eq	eq
ZJS	0.0041***	0.0038***	0.0038***	0.0038***	
	(0.001)	(0.001)	(0.001)	(0.001)	
JJS					-0.0032***
					(0.001)
TB		-0.0083***	-0.008***	-0.0086***	-0.0060***
		(0.001)	(0.001)	(0.001)	(0.001)
InGDP		-0.0172	-0.0112	0.0126**	0.0142**
		(0.014)	(0.014)	(0.015)	(0.016)
CZ			0.0025	0.0023***	0.0025***
			(0.001)	(0.001)	(0.001)
PD			0.0001*	0.0011***	0.0015***
			(0.000)	(0.000)	(0.000)
_cons	0.1892*	0.6842	0.4347	0.2941	0.5067
	(0.0561)	(0.146)	(0.197)	(0.263)	(0.278)
N	756.000	756.000	756.000	756.000	756.000
i2	0.0193	0.6566	0.6587	0.6718	0.6663
r2_a	-0.0353	0.6274	0.6293	0.6414	0.6362
country	Yes	Yes	Yes	Yes	Yes
time	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In order to prove the above conclusion, model (5) takes the proportion of indirect tax revenue to total tax revenue as an explanatory variable to analyze its impact on the quality of economic growth. At the significance level of 1%, the regression is significant and the coefficient is about -0.0032, which indicates that the higher the proportion of indirect tax in the tax structure, the more adverse it is to the improvement of the quality of economic growth. Because the indirect tax burden is easily transferred through the way of positive rotation, the actual indirect tax paid by enterprises is less, and the tax burden perception is lower. This is not conducive to the play of indirect tax regulation. Indirect tax exists in the price of transaction circulation, which increases consumers' perception of indirect tax burden, inhibits consumers' consumption, and is not conducive to improving the quality of economic growth.

5.2. Robustness test

Referring to the regression method of Wei Jie and Ren Baoping, the principal component analysis method is used to measure the quality of economic growth, and the regression analysis is carried out.

Table 4 Robustness test of replacement variables

	(6)	(7)	(8)
ZJS	0.0141***(0.004)	0.0212***(0.004)	
JJS			-0.0186***(0.005)
TB		-0.0322***(0.007)	-0.0235***(0.007)
InGDP		0.2047**(0.049)	0.2056**(0.046)
CZ		-0.0014***(0.006)	-0.0042***(0.007)
PD		-0.001***(0.001)	-0.000***(0.001)
_cons	-0.1995(0.171)	-0.7986(1.215)	0.4787(1.279)
N	756.000	756.000	756.000
r2	0.5631	0.5936	0.4870
r2_a	0.412	0.472	0.434
country	Yes	Yes	Yes
time	Yes	Yes	Yes

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The regression results of model (6) and model (4) are consistent, and the regression results of model (8) and model (5) are consistent with the economic growth quality measured by entropy, indicating that the empirical test results are robust and reliable.

5.3. Further analysis of the impact of tax structure on the quality of economic growth

The regression results of the impact of the proportion of major tax types on the quality of economic growth are shown in Table 5:

Table 5 Regression analysis of major taxes and quality of economic growth

	(9)	(10)	(11)	(12)
GRS	0.0086***(0.003)			
QYS		0.0069***(0.004)		
ZZS			-0.0074**(0.045)	
XFS				-0.0423***(0.007)
TB	-0.0079***(0.002)	-0.0072***(0.002)	-0.0000***(0.002)	-0.0021***(0.002)
InGDP	0.0241**(0.015)	0.0121(0.015)	0.0201**(0.015)	0.0175(0.015)
CZ	0.0023***(0.001)	0.003***(0.001)	0.0025***(0.001)	0.0017***(0.001)
PD	0.0013***(0.000)	0.0016***(0.000)	0.0019***(0.000)	0.0016***(0.000)
_cons	0.3215(0.267)	0.3271(0.268)	0.2064(0.266)	0.3609(0.262)
N	756.000	756.000	756.000	756.000
r2	0.6652	0.6647	0.6263	0.6576
r2_a	0.6351	0.6345	0.6333	0.6247
country	Yes	Yes	Yes	Yes
time	Yes	Yes	Yes	Yes

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results of model (9) are significant at the significance level of 1%, and the correlation coefficient is 0.0086. The human income tax has a positive guiding role in promoting stable economic growth in regulating social income distribution and optimizing income distribution structure. The results of model (10) are significant at the significance level of 1%. Since the tax burden of corporate income tax is difficult to transfer, it can better exert the regulating effect of tax on income distribution. Since the imposition of enterprise income tax will have an impact on the profits of enterprises, it will also have an impact on the investment behavior of investors and the decision-making behavior of enterprise managers. Therefore, the imposition of enterprise income tax is conducive to encouraging enterprises to improve production efficiency and encourage investors to invest in industries encouraged by the policy, thus promoting the improvement of the quality of economic growth. The results of model (11) are significant at the significance level of 5%, and the correlation coefficient is -0.0074. Oecd countries have many VAT tax rates, which is difficult to reflect the neutral characteristics of taxation, and their tax burden is regressive, which is not conducive to social equity and therefore the stability of economic growth. The results of model (12) are significant at the significance level of 1%, and the correlation coefficient is -0.042. On the one hand, consumption tax is conducive to guiding economic development, on the other hand, it increases the consumption burden of consumers, and has a inhibitory effect on consumption behavior. Through the empirical analysis, we can see that the consumption tax has a reverse inhibitory effect on the quality of economic value-added.

6. Research conclusions and implications

6.1. Research Conclusions

From a macro point of view, direct tax is positively correlated with the quality of economic growth, while indirect tax is negatively correlated with the quality of economic growth. From a micro point of view, increasing the proportion of corporate income tax and individual income tax revenue is conducive to improving the quality of economic growth. Increasing the proportion of VAT and consumption tax revenue in total tax revenue is not conducive to improving the quality of economic growth.

6.2. Enlightenment to the optimization of China's tax structure

6.2.1. Increase the proportion of direct tax and give full play to the regulating function of direct tax

China may gradually include other income from the individual income tax in the scope of the comprehensive income tax and strengthen the regulatory role of the individual income tax. In order to increase the share of personal income tax, the government can broaden the tax base by lowering the tax rate. The government should make use of the preferential tax policy of enterprise income tax to

encourage the development of high-tech enterprises, promote technological progress, help the development of small and micro enterprises, increase employment rate, promote consumption, so as to improve the total factor productivity and promote the improvement of the quality of economic growth.

6.2.2. Optimize the indirect tax structure and expand domestic market demand

The government should simplify the VAT rate and preferential tax policies, which can reduce the collection cost of tax authorities and ensure the integrity of the VAT deduction chain. The government should focus on luxury goods, high pollution and high energy consumption products, and bring products that exceed environmental protection standards into the scope of collection in a timely manner, so that high-consumption groups bear more consumption tax. At the same time, the government should also reduce the tax rate of mass consumer goods, which is conducive to social equity and stimulate consumers' spending power.

Acknowledgements

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