Research on the Impact of Digital Economy on the Degree of Revenue Tax Source Deviation

Based on the Perspective of Yangtze River Delta Integration

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Abstract. Based on the theoretical mechanism of digital economy and tax deviation, an evaluation system is constructed, and using the balanced panel data of 41 cities in the Yangtze River Delta (YRD) region from 2011 to 2021, the following conclusions are drawn through the regression of two-way fixed-effects model: the improvement of the level of development of the digital economy can significantly alleviate the degree of tax deviation. Based on the above analysis, this paper puts forward four countermeasure suggestions from the perspective of YRD integration.

Keywords: Digital economy; tax revenue source deviation; Yangtze River Delta integration; industrial structure.

1 Introduction

1.1 Background

With the rapid development of the digital economy, its position in the global economy is increasingly prominent. The digital economy, with its unique business model and operation mode, has had a profound impact on the traditional tax system and tax source structure. The direct impact of the digital economy on the deviation of tax sources needs to be further studied and explored. In this context, the integration of the Yangtze River Delta, as an important engine for China's economic development, has become an urgent issue for research and exploration on how its tax system can respond to the challenges of the digital economy, as well as how to maintain the stability and sustainability of tax sources.

The early exploration of China's digital economy mainly focused on the fields of information construction and e-commerce development. The evolution of the digital economy has roughly gone from the initial stage of information construction to the stage of e-commerce development and deepening of information construction, and finally to a new stage of digital economy development. Under the traditional economic model, tax sources are usually based on physical locations and physical transactions, while in the digital economy, tax sources rely more on network transmission and virtual

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transactions. This change makes tax administration more complex, as traditional tax regulatory methods may no longer be applicable. In addition, the anonymity and cross-border transmission characteristics of the digital economy have also increased the difficulty of tax regulation. Therefore, how to adapt to the changes brought about by the digital economy, effectively manage and collect taxes, has become an important issue faced by governments and tax departments in various countries. The rapid development of the digital economy has multiple impacts on the tax system. Firstly, it changes the nature and distribution of tax sources, making it difficult for traditional tax regulatory methods to adapt to the new economic environment. Secondly, transactions in the digital economy often involve cross-border transfers and virtual currencies, making tax administration more difficult and complex. The anonymity and privacy protection technologies of the digital economy also pose challenges to tax administration. The rapid development of the digital economy has posed many challenges to the traditional tax system. On the one hand, the transaction methods of the digital economy often have concealment and virtuality, making it difficult for tax authorities to effectively monitor and collect taxes; On the other hand, the operation mode of the digital economy differs significantly from that of the traditional economy, leading to the loss of tax sources and the exacerbation of tax inequality. The existence of these problems not only affects the stability and sustainability of tax revenue, but also affects the healthy development of national finance.

1.2 Research Significance

The digital economy, as a rapidly developing new economic form and a new engine of global economic growth in recent years, is changing the global tax pattern and the formation mechanism of tax sources. Many aspects of the traditional tax system are no longer able to adapt to the new economic environment. Therefore, in-depth research on tax policies for the digital economy is of great significance for optimizing the tax system and improving tax efficiency. At the same time, in the digital economy environment, the widespread application of information technology has brought about significant changes in the transaction methods between enterprises, leading to the decentralization and concealment of tax sources, and increasing the difficulty for tax departments to obtain effective tax sources. The Yangtze River Delta region, as an important area for China's economic development, is significantly affected by the digital economy in terms of its tax source deviation. Therefore, this study aims to analyze the impact of the digital economy on the deviation of tax sources and propose corresponding strategies to optimize the tax system and improve tax collection efficiency.

In addition, this study also has a positive impact on promoting the integration of the Yangtze River Delta. The Yangtze River Delta region is one of the most developed regions in China's economy and also one of the most active areas for the development of digital economy. The development of the digital economy not only poses new challenges to the tax system in the region, but also provides new opportunities for the economic development of the area.

1.3 Literature Review

Currently, scholars generally believe that the digital economy refers to economic activities that utilize digital technology for production, distribution, exchange, and consumption.[1][2]The literature on the deviation between the digital economy and tax sources has mainly been analyzed from the following four aspects: ①Regions with high levels of digital economy development are usually the places where corporate income tax revenue is imported.[3] ②The main influencing factors include the level of development of the digital economy and tax policies.[4] ③The phenomenon of tax source deviation has a certain impact on economic development.[5] ④Under the background of digital economy, tax governance faces many challenges. [6]

2 Mechanism Analysis

The digital economy, as a new economic model, is having a comprehensive impact and changing our tax life:

Firstly, from the perspective of digital technology, the rapid development of the digital economy has provided new means and technologies for tax collection and management. Secondly, the development of the digital economy has made data resources an important factor of production and source of wealth, providing tax departments with more channels and means of obtaining information. In addition, digital technology can improve the transparency of tax policies, enhance taxpayers' trust in the tax system, and thus reduce tax deviations.[7] In the context of the digital economy, competition among enterprises has become increasingly fierce, and tax incentives have gradually lost their position as the main factor in enterprise location selection and investment decisions. The digital economy focuses on technological innovation and high added value, and enterprises pay more attention to digital capabilities, market prospects, innovation potential, and other aspects, rather than solely focusing on tax incentives as in the traditional industry era. When choosing business locations and making investment decisions, enterprises will consider more factors such as the technological ecology, talent gathering, and innovation environment that the digital economy relies on. Due to the fact that tax incentives are no longer the main consideration in decision-making, companies have reduced their motivation to maximize profits through tax planning, which is expected to slow down the trend of tax source deviation. Finally, the booming development of the digital economy has provided new sources of taxation, and emerging industries have not only expanded the breadth of taxation, but also contributed to the diversification of tax revenue. Based on the above analysis, this article proposes the following hypothesis:

Hypothesis 1: The digital economy has slowed down the degree of tax source divergence.

3 Indicator Selection and Model Design

3.1 Dependent Variable

The degree of deviation between taxation and tax sources (Y). It uses the difference between the proportion of local tax revenue to the total tax revenue and the proportion of the region's GDP to the total GDP of the Yangtze River Delta region to measure the deviation of tax sources

$$Y_i = \frac{R_i}{\sum_{i=1}^{n} R_i} - \frac{I_i}{\sum_{i=1}^{n} I_i} \tag{1}$$

Among them, Y_i is the dependent variable, $R_i$represents the tax revenue of the Yangtze River Delta city in the current year, I_i is the regional GDP of the Yangtze River Delta city in the current year.

3.2 Core Explanatory Variable

Development level of digital economy (dig). Taking the Internet as a starting point, five three-tier indicators are selected to use the entropy weight standard to build a measurement system for the development level of the digital economy. The specific indicators are shown in Table 1.

Table 1. Indicator System for Comprehensive Development Level of Digital Economy[8]

1st indicator	2nd indicator	3rd indicator	Indicator Attribute
dig	Internet penetration	Internet users per 100 people	+
	Number of Internet related practitioners	Proportion of computer service and software professionals	+
	Internet related output	Per capita total telecommunications services	+
	Number of mobile Internet users	Number of mobile phone users per 100 people	+
	Inclusive development of digital finance	China Digital Inclusive Finance Index	+

3.3 Control Variables

(1) Industrial upgrading (UPG): measured by the ratio of the added value of the city's tertiary industry to the added value of the secondary industry, the formula is as follows:

$$UPG_i = \frac{T_i}{S_i} \tag{2}$$

In the formula, T_i represents the added value of the tertiary industry in city i in the current year, and S_i represents the added value of the secondary industry in city i in the current year.

(2) Talent flow (flo): measured by the proportion of non registered residence population in the total population in each region.

(3) Economic level (lnGDP): measured using the logarithm of per capita GDP in each region.

(4) Financial development (finance): measured by the proportion of year-end deposit balances of financial institutions in the total GDP of each region.

(5) Fixed investment (inv): measured by the proportion of fixed assets investment in the total GDP of each region.

(6) Government intervention (gov): measured by the proportion of fiscal expenditure in the total GDP of each region.

4 Empirical Analysis

4.1 Regression

This article uses a balanced panel bidirectional fixed effects model for regression.

$$Y_{it} = \beta_0 + \beta_1 DIG_{it} + \beta_2 X_{it} + \delta_i + \mu_t + \varepsilon_{it} \tag{3}$$

Table 2 reports the overall impact of the digital economy development level of the Yangtze River Delta urban agglomeration on the deviation of tax sources of each city in 2011-2021.

Based on the above analysis, it is shown that the level of development of the digital economy has a significant negative impact on the deviation of tax sources. The development of the digital economy promotes the integration of tax sources in the Yangtze River Delta urban agglomeration. Hypothesis 1 of this article is valid.

Table 2. The Results of Regression

Variables	(1) Mode1	(2) Mode2	(3) Mode3
dig	-0.2561**	-0.1390*	-0.3364***
	(0.0035)	(0.0110)	(0.0002)
upg	/	-0.0060***	-0.0064***
		(0.0000)	(0.0000)
flo	/	0.0002	0.0006
		(0.8745)	(0.7083)
lngdp	/	-0.0023*	-0.0003
		(0.0180)	(0.8494)
fin	/	0.0004	0.0021
		(0.7537)	(0.2037)
gov	/	0.0258**	0.0221*
		(0.0049)	(0.0239)

inv	/	-0.0058***	-0.0050***
		(0.0000)	(0.0009)
Fixed time	Yes	No	Yes
Fixed Individual	Yes	Yes	Yes
_cons	0.0033**	0.0314**	0.0112
	(0.0094)	(0.0027)	(0.5650)
N	451	451	451
adj. R^2	-0.1039	0.0885	0.0869

5 Conclusions and Recommendations

The following conclusion is drawn from this article: 1. The development of the digital economy will slow down the deviation of urban tax sources. 2. The level of rationalization of industrial structure will significantly alleviate the impact of the digital economy on the deviation of tax sources.

Based on the above analysis, this article proposes the following countermeasures and suggestions:

Rebuilding the tax distribution mechanism and promoting the integration of the Yangtze River Delta. Improve the tax law system and strengthen tax supervision. Utilize the digital economy to expand the 'tax cake' and improve the level of tax services. Strengthen information sharing and promote cross regional collaboration. Optimize industrial structure and promote coordinated development of industries.

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