



Research on the Influence of Digital Economy on the Tax Burden Level of Enterprises

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Abstract. Using entropy weight method, this paper calculates the development level of digital economy in 30 provinces (except Tibet) in China from 2011 to 2020, and empirically analyzes the influence and mechanism of digital economy development on corporate tax burden. It is found that the development of digital economy can obviously reduce the tax burden of enterprises, and tax payment is the main reason for the difference in the tax burden level of enterprises. Therefore, it is necessary to speed up the development of digital economy, promote industrial transformation and upgrading; strengthen regional information sharing, improve the efficiency of tax collection and management; increase support for tax preferential policies for digital economy enterprises and improve their accuracy.

Keywords: Digital economy development; Corporate tax burden; Tax collection and management

1 Introduction and literature review

It is mentioned in the Report on the Development of Digital Economy in China (2022) that in 2021, despite the pressure from the complicated international situation and the spread of domestic epidemics, the scale of China's digital economy reached 4.55 trillion yuan, accounting for 39.8% of GDP, and the digital economy played an increasingly important role in economic development. With the rapid development of digital economy, it has also brought many influences to the tax field. On the one hand, the digital industry represented by e-commerce has brought about the rapid growth of tax sources, and the increase in tax revenue has enabled local governments to find ways to broaden their fiscal revenue (Ai Hua et al., 2021[1]) and actively invest in the development of digital industries such as electronic information; On the other hand, the development of digital economy leads to problems such as difficulty in identifying taxpayers and ambiguity in determining the value of tax base, and the tax competition brought by digital economy affects the level of tax collection and management in different regions to some extent (Li Xiangju et al., 2022[2]), thus affecting the tax burden of enterprises.

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Review the existing literature, in the field of taxation, on the one hand, the development of digital economy has promoted the significant increase of regional tax revenue [3], but it has also caused the deviation between tax revenue and tax source, and increased the gap of tax revenue between regions [4]. On the other hand, the development of digital economy has also caused the loss of tax revenue, which has brought severe challenges to tax collection and management. For example, Meng Pingli and Li Man, by analyzing the reform of digital service tax in different countries, pointed out that digital service tax has many effects on improving the fairness of tax burden, reducing corporate tax evasion and leading to multiple taxation [5]. Therefore, we should actively participate in the reform of international tax governance and realize the construction of a new pattern of tax governance under the digital economy [6]. Moreover, it is necessary to build a new tax collection and management model and gradually promote the digitalization of tax collection and management [7].

The development of digital economy and corporate tax burden have been hot topics for scholars for a long period of time, but few scholars pay attention to the relationship between them, and few scholars make specific research on different taxes of corporate tax burden. Therefore, this paper takes the A-share listed companies in Shanghai and Shenzhen from 2011 to 2020 as research samples, and analyzes the influence and mechanism of digital economy development on corporate tax burden by using the fixed effect model, and analyzes the specific effects of digital economy development on corporate tax burden of different taxes. This is of great significance for accelerating the development of digital economy, enhancing the international competitiveness of digital industry, and effectively implementing the policy of tax reduction and fee reduction, so that enterprises can really benefit.

2 Research design

2.1 Model setting

In order to study the influence of the development of digital economy on the tax burden level of enterprises, this paper constructs the following benchmark model for empirical analysis:

$$\text{Taxburden}_{ijt} = a_0 + a_1 \text{Dige}_{ijt} + a_2 \text{Ind3} + a_3 \text{Pgdp} + a_4 \text{Fin} + a_5 \text{Leverage} + a_6 \text{ROA} + a_7 \text{PPE} + a_8 \text{Fluid} + a_9 \text{Size} + a_{10} \text{Age} + \mu_i + \delta_t + \varepsilon_{it} \quad (1)$$

Among them, Taxburden_{ijt} represents the overall tax burden level of enterprises, Dige_{ijt} represents the digital economy development level of the i -th province in the T period, Ind3 , Pgdp , Fin , Leverage , ROA , PPE , Fluid , Size and Age are the control variables, μ_i is the individual effect of enterprises, δ_t is the time-fixed effect, and ε_{it} is the random disturbance term.

2.2 Index selection and variable description

Explained variables.

This paper uses "(taxes paid-tax refund received)/operating income" to represent the overall tax burden level. At the same time, in this paper, the tax types are divided into income tax and turnover tax for specific analysis, and the real reasons for the different tax burden levels of enterprises are studied from the perspectives of tax payment and tax refund.

According to the research of Fu Chaogan and Fang Yongmei (2023) [8], the tax burden level of income tax is expressed as "(income tax expense-deferred income tax)/total profit before tax". Referring to the practice of Guo Ling (2022) [9], the tax burden level of turnover tax is expressed as "(various taxes paid-tax refund received-income tax expense)/operating income". Tax payment is represented by "various taxes paid/operating income" and tax refund is represented by "tax refund received/operating income".

Core explanatory variables.

This paper explains that the variable is the development level of digital economy. Through the research of Xie Xie, Meng Ting (2022)[10] and Zhao Tao, Zhang Zhi and others (2020) [11], this paper constructs a comprehensive index of the development level of digital economy from four aspects, including: the level of digital infrastructure is divided into the number of Internet broadband access ports, the number of mobile phones, the number of users and the length of long-distance optical cable lines. The development level of digital industry is divided into the number of employees in information service industry, the output value of information service industry and the telecom business volume; The innovation level of digital technology is divided into R&D expenditure of industrial enterprises above designated size, the number of R&D projects (projects) and the transaction amount of technology contracts; The development level of digital finance is divided into the breadth of digital finance coverage, the depth of digital finance use and the degree of digital finance. Finally, the development level of digital economy in each province from 2011 to 2020 is measured by entropy weight method.

Control variables.

Regional industrial structure level (Ind3), which is expressed by the ratio of the added value of the tertiary industry to GDP; Regional economic development level (Pgdp), expressed by local per capita GDP; Financial autonomy rate (Fin) is expressed by general public budget revenue and general public budget expenditure.; Leverage, which is the ratio of total liabilities to total assets; ROA is the ratio of net profit to average total assets; The ratio of fixed assets (PPE) is the ratio of fixed assets to total assets; The level of cash flow (Fluid) refers to the ratio of net cash flow generated from operating activities to total assets; Company Size, which is the logarithmic representation of the company's total assets; The company's operating life (Age) is the sample year minus the company's opening time.

2.3 Data sources and descriptive statistics.

Source of data.

This paper selects A-share listed companies in Shanghai and Shenzhen from 2011 to 2020 as the initial sample, and matches them to 30 provinces except Tibet according to their registered places. At the same time, carry out the following screening: (1) Exclude samples with total tax burden, income tax burden, turnover tax burden, tax payment and tax return less than 0; (2) Reject the samples whose net profit rate of total assets is less than 0; (3) Reject samples with asset-liability ratio greater than 1; (4) eliminating ST samples; (5) Excluding non-financial industry samples. Among them, the provincial data comes from China Statistical Yearbook, China Information Industry Yearbook and local statistical yearbooks, the data of listed companies comes from Guotai 'an database, and the relevant indicators of digital inclusive finance are obtained according to the research of Peking University Digital inclusive finance Index. In order to eliminate the influence of abnormal samples, all variables are truncated at 1% quantile and 99% quantile.

3 Empirical results

3.1 Benchmark regression analysis

In this paper, the fixed effect model is used for empirical analysis to test the impact of the development of digital economy on the tax burden level of enterprises. Columns (1)-(5) in Table 1 respectively show the influence of the development level of digital economy on the overall tax burden, income tax burden, turnover tax burden, tax payment and tax refund of enterprises.

The regression results show that the coefficient of the overall tax burden of enterprises is -0.0332, and it is significant at the level of 1%, that is, the development of digital economy can directly affect the tax burden of enterprises, and the impact on the tax burden of enterprises is significant. The coefficient of income tax burden is -0.0126, which passed the significance test of 1%, indicating that the development of digital economy is mainly to reduce the tax burden of enterprise income tax, which may be because the development of digital economy is virtual and breaks through the space constraints, making it unclear in taxpayer identification, tax object identification and tax jurisdiction division, thus helping enterprises to carry out tax planning and reduce their tax burden. The coefficient of tax payment is significantly negative, and the coefficient of tax return is not significant. Specifically, the development of digital economy has reduced the tax payment ratio of enterprises, and the reduction of tax payment by enterprises has greatly reduced the tax burden level of enterprises. Tax payment is the main reason for the difference in tax burden level among enterprises. At the same time, it also shows that in the development of digital economy, the tax reduction effect of tax incentives is not reflected in the tax refund to enterprises.

Table 1. Benchmark Regression Results

Var	(1) Taxburden	(2) Incometax	(3) Turnovertax	(5) Taxpayment	(6) Taxrebate
Dige	-0.033*** (-2.91)	-0.012*** (-2.73)	-0.018* (-1.80)	-0.036*** (-3.18)	-0.003 (-1.26)
Ind3	0.000 (0.85)	-0.000 (-0.44)	0.000 (0.68)	0.000 (0.74)	-0.000 (-0.68)
Pgdp	0.001*** (4.42)	0.000 (0.92)	0.001*** (4.68)	0.001*** (3.73)	-0.000** (-2.34)
Fin	0.001 (0.22)	0.010*** (3.15)	-0.007 (-1.12)	0.001 (0.22)	-0.000 (-0.09)
Leverage	-0.032*** (-10.15)	-0.011*** (-8.77)	-0.017*** (-6.48)	-0.035*** (-11.17)	-0.003*** (-4.96)
ROA	0.207*** (20.23)	0.188*** (37.74)	-0.002 (-0.28)	0.202*** (19.51)	-0.006*** (-3.31)
PPE	-0.022*** (-5.30)	-0.016*** (-9.57)	-0.007** (-2.16)	-0.021*** (-4.96)	0.002** (2.53)
Fluid	-0.002 (-0.45)	-0.000 (-0.02)	0.000 (0.18)	-0.002 (-0.40)	-0.000 (-0.06)
Size	0.000 (0.61)	0.003*** (9.88)	-0.002*** (-2.85)	0.001 (1.22)	0.000*** (4.10)
Constant	0.053** (2.45)	-0.056*** (-6.72)	0.096*** (5.43)	0.052** (2.37)	-0.002 (-0.50)
Observations	20,969	20,969	20,969	20,969	20,969
R-squared	0.812	0.791	0.751	0.809	0.783
Stkcd FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Note: * * *, * * and * mean significant at the level of 1%, 5% and 10% respectively; The results of robust standard error are shown in brackets. The same below.

4 Conclusions and suggestions

This paper calculates the development level of digital economy in 30 provinces of China from 2011 to 2020 by entropy weight method, and empirically analyzes the influence of digital economy development on corporate tax burden level through fixed individuals and time effect. Therefore, the main conclusions are as follows: (1) The development of digital economy can significantly inhibit the overall tax burden of enterprises, and from the perspective of different taxes, the development of digital economy can effectively reduce the tax burden of income tax and turnover tax; (2) The difference of tax burden level among enterprises is mainly caused by the difference of tax payment, and the tax preferential measures such as tax rebate have no significant influence on the tax burden level of enterprises.

According to the research findings, this paper puts forward the following suggestions: First, accelerate the construction of information infrastructure. China should

seize the opportunity of digital economy development, increase the support for R&D investment of enterprises, and promote the transformation and upgrading of enterprises. At the same time, explore a new mechanism for tax collection and management of digital economy business, make full use of big data, blockchain, artificial intelligence and other information technologies to improve the digital level of tax governance, reduce tax loss as much as possible, and promote the modernization of tax governance in China. Second, strengthen regional information sharing and improve the efficiency of tax collection and management. All regions should promote the establishment of friendly and cooperative relations and strengthen information sharing, so that corporate profits can not be transferred and tax evasion can be effectively reduced. When formulating tax policies, we should not only make overall consideration, but also pay attention to the economic development differences between different regions, give appropriate tax care to economically underdeveloped regions, and narrow the tax gap between regions. Third, increase support for tax preferential policies for digital economy enterprises and improve their accuracy. In the digital economy, most of the preferential tax policies are put forward for the development of the digital industry, and there are not many supporting policies for the digital transformation of the industry, and these policies lack pertinence. Therefore, in the process of digital transformation of enterprises, it is suggested that certain preferential tax policies should be given to the links with large expenditures such as R&D and production, and those that meet certain standards should be included in the coverage of preferential tax deduction policies, so as to effectively reduce the tax burden of enterprises and implement the tax reduction and fee reduction policies.

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