



# Analysis of Tax Burden of Industrial Internet Enterprises and Its Influencing Factors

Defa Cai<sup>(✉)</sup> and Yang Chen

School of Finance and Public Administration, Harbin University of Commerce, Harbin, China  
abcd04754@126.com

**Abstract.** Since the concept of “Industrial Internet” was first proposed in 2012, the “14th Five-Year Plan” and the outline of the long-term goals for 2035, the industrial Internet has been listed as a key industry in the digital economy. By applying SPSS statistical analysis software, this paper takes 66 listed companies in the industrial Internet industry from 2016 to 2021 as the research object, incorporates profitability, operating capacity, financial structure, and asset size into the research framework, and selects descriptive statistics in combination with preferential tax policies. And multiple linear regression to analyze the impact of four factors on corporate tax burden. The results show that: operating capacity, financial structure, and asset size are all negatively correlated with tax burden, while profitability is positively correlated with tax burden. Enterprises should pay attention to tax planning and risk management, and the government should increase tax cuts, improve preferential tax policies, and inject new momentum into the development of the industrial Internet industry.

**Keywords:** Industrial Internet · Tax burden · Tax policy

## 1 Introduction

Since the concept of industrial Internet was proposed by General Electric in 2012, major industrial countries such as the United States, Japan and Germany have successively implemented a series of “re-industrialization” strategies aimed at the digital transformation and upgrading of traditional industries. China, as a manufacturing power, has promoted the overall development of Chinese industry from “big” to “strong” since the “Made in China 2025” initiative was proposed in 2015. In 2021, the Ministry of Industry and Information Technology and other eight departments jointly issued the “14th Five-Year Plan for Intelligent Manufacturing Development” to further promote the digital transformation and intelligent upgrading of manufacturing industry, accelerate the construction of industrial Internet platform, deeply integrate the new generation of information technology and industrial enterprises, and achieve a new type of industrialization [5].

Industrial Internet enterprises mainly come from traditional manufacturing, information transmission, software and information technology services [6]. Through the connection (communication) technology, the whole process of industrial production

**Table 1.** Overall tax burden of industrial Internet enterprises from 2016 to 2021 (Owner-drawing)

year	various taxes paid (One hundred million yuan)	operating income (One hundred million yuan)	Enterprise comprehensive tax burden rate (%)
2016	350.10	9032.71	3.88
2017	417.09	12015.51	3.47
2018	485.99	14966.18	3.25
2019	508.17	20176.34	2.52
2020	410.29	15119.21	2.71
2021	458.50	17749.22	2.58

Data source: CSMAR Database

elements and resources interconnection, storage and calculation of data, optimization of the production process, open up the weak links, so as to achieve the enterprise “cost reduction, quality improvement, efficiency, reduce storage” goal. By analyzing the tax burden level of the industrial Internet industry and the main factors affecting the comprehensive tax burden of enterprises, this paper promotes the implementation of tax policies, reduces the pressure of enterprise development, stimulates the innovation vitality of enterprises, and realizes the transformation and upgrading of the manufacturing industry during the 14th Five-Year Plan period.

## 2 Industry Tax Burden

Data of listed companies in Shanghai and Shenzhen A-share industrial Internet industry from 2016 to 2021 were selected as samples. Excluding the listed companies with ST and \*ST in each year and the samples with negative operating revenue and net tax expenditure data, the samples of each year from 2016 to 2021 were obtained, which were 105, 104, 115, 126 and 119 respectively. When measuring the overall tax burden of industrial Internet companies in this paper, the main tax type of industrial Internet companies in my country is value-added tax, and the tax burden cannot be completely passed on to consumers during the transfer process. A tax credit is a direct reduction of the tax payable, such as a VAT credit. Therefore, this paper selects the comprehensive tax burden index based on the cash flow statement to reflect the comprehensive tax burden of enterprises relatively appropriately. The caliber adopted is: the comprehensive tax burden rate of the enterprise = (all taxes paid - tax rebates received)/operating income \* 100% [3].

From Table 1, it can be seen that in the past six years, the tax burden rate of listed companies in the industrial Internet industry statistically from 2016 to 2021 has generally shown a downward trend, decreasing from 3.88% in 2016 to 2.58% in 2021, a decrease of 33.35%. In 2020, due to the impact of the pandemic, the operating revenue decreased significantly, leading to an increase in the tax burden ratio. In 2021, the tax burden rate will decrease under the combination of various policies.

Industrial Internet technology is widely used in the heavy equipment manufacturing industry. In the process of production and use, industrial enterprises will also be

involved in the raw material industry, equipment manufacturing industry, supporting product industry, highway construction industry, energy industry, sales industry, service industry and transportation industry, etc., the upstream and downstream industry chain is complete and has a wide range. Although the operating conditions of some enterprises have been improved to a certain extent, due to the overcapacity of traditional industries, the sluggish market demand, and the continuous decline of product prices, enterprises still face high production and operation costs and poor sales. Problems such as smooth liquidity, high pressure on capital turnover, and difficulty in financing have a negative impact on corporate profitability and operational capacity. Because the industrial Internet industry mainly combines the Internet with traditional industrial production, it processes and manufactures equipment and machines. Enterprises have to purchase a large number of production equipment and need to update in time. However, according to my country's current value-added tax law, fixed assets cannot be deducted, so enterprises have become the main taxpayers of value-added tax. At the same time, due to the low sales volume of products in traditional industries, the inability to obtain or obtain output tax in a timely manner will lead to credit sales, high bad debt rates, and breakage of the deduction chain, which will indirectly lead to an increase in the value-added tax burden of enterprises.

### **3 Research Hypothesis**

According to the existing research literature and theoretical analysis and combined with the characteristics of industrial Internet enterprises, the tax burden of the industrial Internet industry is studied on factors such as profitability, operating capacity, capital structure and enterprise scale.

The first hypothesis: the stronger the corporate profitability, the higher the tax burden rate. The second hypothesis: the stronger the operating ability of the enterprise, the lower the tax burden rate. The third hypothesis: the higher the corporate asset-liability ratio, the lower the tax burden rate. The fourth hypothesis: the larger the asset size, the lower the tax burden rate.

## **4 Study Design and Statistical Analysis**

### **4.1 Sample Selection and Data Sources**

This paper applies SPSS statistical analysis software, takes 66 industrial Internet companies as the research object, excludes companies that are subject to ST and ST\*, excludes samples with missing data, excludes extreme values in the samples, and excludes samples with negative comprehensive tax burden TTR. Using the data from the CSMAR database from 2016 to 2021, analyze the impact of profitability, operating ability, financial structure and enterprise size on the comprehensive tax burden.

**Table 2.** Definitions, formulas and attributes of variables (Owner-drawing)

Variable symbol	The variable name	Variable calculation formula	Variable meaning
TTR	Comprehensive tax burden rate (%)	Various taxes paid - tax refunds received)/Operating income,	The tax burden
GPR	Gross profit margin on sales (%)	(Operating income - Operating cost)/Operating income [2]	Profitability
TAT	Total asset turnover (%)	Total operating income/ending assets	Operation ability
LEV	Asset liability ratio (%)	Total liabilities/total assets	Financial structure
SIZE	Enterprise size	Ln (total assets at end of period) [1]	Asset size

## 4.2 Variables and Definitions

This paper studies the tax burden of industrial Internet enterprises through regression analysis, and the model is as follows:

$$TTR_{it} = \beta_0 + \beta_1 GPR_{it} + \beta_2 TAT_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \xi_{it} \quad (1)$$

Among them,  $i$  represents the  $i$ th industrial Internet company,  $t$  represents the time span, from 2016 to 2021,  $\beta$  represents the estimated value of the regression coefficient, and  $\xi_{it}$  represents the error term. Use SPSS13.0 statistical analysis software to perform regression analysis on the linear equation, summarize the Anova of the regression equation and the estimated results of the regression equation parameters. The meaning of each relevant variable is shown in Table 2.

## 4.3 Statistical Analysis

Model summary shows the coefficient of determination of the regression equation, adjusted R square = 0.358. Anova table is the F-test result of the equation, and the significance value is less than 0.05, which passes the F-test, indicating that the multivariate linear equation is significant. The significance of the four independent variables is lower than 0.05. The test is passed, which supports the research hypothesis 1 to hypothesis 4 of this paper: the gross profit margin of sales increases by 0.066, and the tax burden rate increases by one unit. It is positively correlated with the tax burden rate; the total asset turnover rate decreases by 0.004, and the tax burden rate increases by one unit, indicating that the total asset turnover rate is negatively correlated with the tax burden rate; the asset-liability ratio decreases by 0.007, and the tax burden rate increases by

one unit, indicating that the asset-liability ratio It is negatively correlated with the tax burden rate; the asset size decreases by 0.395, and the tax burden rate increases by one unit, indicating that the asset size is negatively correlated with the tax burden rate.

## 5 Conclusion

The Internetization of manufacturing enterprises is an important step in my country's transformation from a manufacturing power to a manufacturing power, and infrastructure such as the Industrial Internet provides support for it. For example, the traditional manufacturing industry adopts mobile Internet technology, which is convenient for users to remotely control and automatically collect and analyze data, thereby improving the user satisfaction of industrial products. Based on the relevant financial data of industrial Internet companies, the main conclusions are: (1) In the past six years, the tax burden rate of listed companies in the industrial Internet industry from 2016 to 2021 has generally shown a downward trend. (2) There are five factors that affect the tax burden of industrial Internet companies. Operational ability, financial structure, and asset size are all negatively related to the tax burden, and profitability is positively related to the tax burden. Enterprises should attach importance to cultivating tax planning capabilities, reduce their own costs, and at the same time improve risk management awareness and optimize capital structure. Large-scale enterprises are more capable of training high-quality fiscal and tax talents for tax planning and processing, and enterprises can expand their scale by appropriately increasing debt financing. Most industrial Internet companies are high-tech companies [4]. When industrial Internet companies enjoy tax incentives, they are usually rated as high-tech companies and obtain "high-tech enterprise certificates". The government should improve preferential tax policies, support technological innovation-oriented enterprises and small and medium-sized enterprises, directly benefit enterprises that focus on research and development, and provide subsidies for research and development talents to help the industrial Internet industry flourish.

## References

1. Li Li. Research on tax burden of listed Manufacturing companies in Beijing-Tianjin-Hebei Province [D]. Tianjin University of Finance and Economics, 2019.
2. Jiang Nanchun. The Impact of tax burden and endogenous factors on enterprise R&D Input: Empirical data from China's listed manufacturing companies [J]. *Commercial Accounting*, 2020(24):23–26.
3. Ye Ziteng. Analysis on the influence factors of tax burden on advanced manufacturing industry in China [D]. Jiangxi University of Finance and Economics, 2021.
4. Xu Lei. Measurement and Influencing Factors of high-tech Enterprise Income tax burden [D]. Southwestern University of Finance and Economics, 2021.
5. China Commercial Industry Research Institute. China Industrial Internet Market Prospect and Investment research report [J]. *Electrical Equipment Industry*, 2021(11):6–29.
6. Qi Jin, WANG Wei, Chen Mengxi, Xu Bin, Dong Zhenjiang, Sun Yanfei. The concept, Architecture and Key Technologies of Industrial Internet [J]. *Journal of Internet of Things*, 222, 6(02):38–49.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

