The Impact of "Two-invoice System" Reform on Tax Risk of Pharmaceutical Manufacturing Industry

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Abstract. In the context of the comprehensive implementation of the "two-invoice system" reform, the impact of the "two-invoice system" on the tax risk of pharmaceutical manufacturing enterprises is studied by using the financial data of China's Shanghai and Shenzhen A-share listed companies in the pharmaceutical manufacturing industry in the period from 2012 to 2022. The study finds that the "two-invoice system" reform increases the tax risk of pharmaceutical manufacturing enterprises at the 5% significance level, and this effect is different in different types of enterprises, compared with state-owned enterprises, non-state-owned enterprises are much more affected by the implementation of the policy, and the tax risk increases at the 1% significance level.

Keywords: "two-invoice system"; pharmaceutical manufacturing industry; tax risk; heterogeneity; double-difference scores

1 Introduction

With the gradual transformation of China's economy to high-quality development, enhancing the awareness of tax risk management and management capacity of pharmaceutical manufacturing enterprises has also been given great significance. In order to solve the chaos in the circulation of the pharmaceutical industry, reduce the circulation of medicines, reduce the price of medicines[2]; to combat the illegal tax evasion behaviours of pharmaceutical distribution enterprises, such as illegal invoicing, money laundering, and dependence, the state launched the ‘two-invoice system’ at the end of 2016. The ‘two-invoice system’ refers to the fact that drugs are invoiced once from pharmaceutical companies to first-tier distributors, and then invoiced again from distributors to pharmaceutical organisations[3]. Through combing the existing literature, we found that the ‘two-invoice system’ by reducing the circulation of drugs, to a certain extent, to curb the circulation of the pharmaceutical industry, ‘hanging invoices’ chaotic phenomenon, so that the pricing of medicines and the circulation channel tends to be standardised. However, academics still have doubts about whether the ‘two-invoice system’ can achieve its original purpose and whether it will bring new derivative problems[4]. At the same time, with the improvement of tax management

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level and the on-line of Golden Tax IV, pharmaceutical manufacturing industry is facing an unprecedented strict regulatory environment, and the tax-related risk of enterprises has risen sharply [5]. Faced with such an environment, pharmaceutical enterprises need to review the tax risks they face, and actively respond to the tax risks faced by enterprises in the strict regulatory environment after the reform of 'two-invoice system'.

2 Research hypothesis

H1: The implementation of the 'two-invoice system' policy will significantly increase the tax risk of pharmaceutical manufacturing enterprises.

H2: after the implementation of the 'two votes system', different types of enterprises are facing different tax risk increase, and compared with state-owned enterprises, non-state-owned enterprises are subject to a much larger impact.

3 Research Design

3.1 Model Setting

This paper applies the double difference method to study the impact of the 2017 'two-invoice system' reform on the tax risk of the pharmaceutical manufacturing industry, and establishes the following model: Triskit =α0 + α1treati + α2timet + α3treati×timet + αcontrolit +Ɛit

3.2 Selection and definition of variables

1. Explained variables.

Regarding the measure of enterprise tax risk, this paper takes the difference rate of enterprise's actual tax burden as the measure of enterprise tax risk [6].

2. Explanatory variables.

This paper takes the interaction term of Time and Treat (Time×Treat) as the explanatory variable. Among them, Time is the time of the 'two-ticket system' reform. Since China has implemented the 'two-vote system' since 2017, 2017 is chosen as a node, and 2012-2016 is set as 0, and 2017-2022 is set as 1.

3. Control variables.

Based on the existing literature combing, referring to the related practice of (Tan Guangrong et al., 2019) a series of firm-level characteristic variables are controlled, such as operating profit growth rate Growth, asset-liability ratio Lev, nature of the firm Soe, size of the firm Size, total asset turnover ratio Rat, total net asset profit ratio Roa, price-to-book ratio Pb, inventory intensity Stock, Fixed Asset Ratio Fix and Capital Intensity Capint[1].

4 Empirical analysis

4.1 Analysis of empirical results

1. Benchmark model regression results.

The empirical analysis of the impact of tax risk after the implementation of the ‘two-voucher system’ found that the DID coefficients of the results of the study of the unfixed company and year, the results of the study of the fixed company but the unfixed year and the results of the regression results of the fixed company and the year are 0.105, 0.0872, 0.0865, respectively, and all of them have reached the significant level of 5 per cent. significant level. That is, the research results show that the ‘two-vote system’ has a significant positive impact on the tax risk of China's pharmaceutical companies, consistent with the main hypothesis H1.

2. Heterogeneity analysis.

In order to examine whether the magnitude of tax risk increase of different types of enterprises will be different after the implementation of ‘two-invoice system’, this paper introduces the dummy variable Soe, i.e., when the enterprise is a state-owned enterprise2, Soe is set to 1, and when it is a non-state-owned enterprise, Soe is set to 0. From the panel fixed-effects estimation, after the implementation of ‘two-invoice system’, pharmaceutical enterprises have a significant positive impact on tax risk, which is consistent with the main hypothesis H1. After the implementation of the ‘two-vote system’, the tax risk of state-owned enterprises in pharmaceutical enterprises does not increase. In addition, the panel fixed effects regression analysis of selected samples of non-state-owned enterprises reveals that the ‘two-invoice system’ increases the tax risk of non-state-owned enterprises in pharmaceutical enterprises at the 1% significant level, and increases the tax risk faced by non-state-owned enterprises by 0.133 percentage points. The empirical analysis shows that ‘two-invoice system’ has a strong impact on the tax risk of non-state-owned enterprises. The above findings are consistent with the hypothesis H2 of this paper, i.e., the reform of ‘two-vote system’ has a greater impact on the tax risk of non-state-owned enterprises.

4.2 Robustness Test

1. Parallel trend test.

In order to avoid the problem of complete covariance, we choose 2016 as the reference group. The results show that most of the regression coefficients in the five years prior to the policy shock are close to zero and insignificant whereas the regression coefficients in the last three years of the policy shock are highly significant. This result confirms the hypothesis of the parallel trend test and shows that the obtained conclusions are robust.

2. Placebo test.

In order to exclude the possibility that there are other unobservable factors that lead to the conclusion of the benchmark regression is a placebo effect, this paper conducted a placebo test [7]. The test results show that most of the coefficients deviate from the true value, and most of the scatter points are concentrated in the vicinity of 0, the estimated coefficients are not significant, indicating that the impact of the ‘two-voucher system’ on the tax risk of pharmaceutical companies is not interfered with by other unknown factors; most of the t-values deviate from the true value, and most of the scatter points are concentrated in the vicinity of 0. Most of the t-values deviate from the true value, and most of the scatter points are concentrated around 0, indicating that the influence of ‘two-vote system’ on the tax risk of pharmaceutical enterprises is not a placebo effect.

5 Conclusions and Implications of the Study

The study finds that:(1) The implementation of the ‘two-invoice system’ policy has significantly increased the tax risk faced by enterprises in China's pharmaceutical manufacturing industry;(2) After the implementation of the ‘two-invoice system’, the increase in tax risk of different types of pharmaceutical enterprises is not the same, compared with the state-owned enterprises, non-state-owned enterprises are much larger impact.

Based on this, this paper puts forward the following suggestions: First of all, pharmaceutical enterprises should build their tax risk management system with the help of their own relatively mature financial risk management system, and at the same time, according to the implementation of the ‘two-vote system’, make timely adjustments to their own risk management to cope with all kinds of tax risks that may arise under the ‘two-vote system’ [8]. Secondly, the enterprise should continuously improve the internal control system: (1) strengthen contract management, prevent and control the risk of invoice false invoicing [9]; (2) make the standardisation of the audit and management of invoices and vouchers; (3) actively cooperate with the tax inspection, and actively safeguard their legitimate rights and interests [10].

Although this paper uses the data of listed enterprises in China's pharmaceutical manufacturing industry and adopts the double-difference method to test the impact of the implementation of the ‘two-invoice system’ on the tax risk of pharmaceutical enterprises, there are still some limitations. In addition, due to the limited space of the article, the empirical part will not be detailed here, if necessary, please contact me.

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