

Research Status and Prospects of Tax Preference and Enterprise Innovation

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Abstract. Innovation is the new engine driving China's economic development. Tax preferences are an important means for the government to stimulate enterprises to innovate. In order to fully understand the research status of tax incentives and enterprise innovation at home and abroad, this paper firstly conducted a visualized analysis of the research status based on CiteSpace software, and then combed the main conclusions of existing research from two aspects: tax preferences and innovation input, tax preferences and innovation output. This paper found that there are still some limitations in tax incentives and enterprise innovation. The relationship between tax incentives and innovation quality is expected to become a hot research topic in the future.

1. Introduction

China now has entered the economic new normal featuring structural slowdown. According to the calculation of the macroeconomic operation and policy simulation laboratory of the Chinese Academy of Social Sciences, the potential growth rate range of China in the two periods of 2015-2020 and 2021-2030 is 5.7-6.6% and 5.4-6.3%, respectively with an obvious slowdown (Li Yang, 2016). In the context of the new normal, innovation is a new engine that drives China's economy to cross the middle-income trap and transform from high-speed development to high-quality development.

Further deepening the driving role of innovation relies on the support and guarantee of innovative incentive policies. The government regards tax incentives as an important starting point for stimulating corporate innovation. The 2018 government work report further emphasized that it is necessary to greatly reduce corporate tax burdens and support high-quality innovative enterprises to go public. On April 25, 2018, the State Council executive meeting decided to introduce seven more tax reduction policies to support entrepreneurial innovation. From 2011 to 2015, the tax reduction and exemption of China's high-tech enterprises was 53.96 billion yuan, 52.75 billion yuan, 58.55 billion yuan, 61.31 billion yuan, and 70.23 billion yuan. The research and development expenses plus tax deduction and exemption were 25.24 billion yuan 29.85 billion yuan, 33.37 billion yuan, and 44.93 billion yuan respectively¹. It can be seen that the absolute effect of tax cuts on innovation-related tax incentives is considerable. However, the academic research conclusions on tax incentives and enterprise innovation vary.

2. Research status of tax preferences and enterprise innovation at home and abroad

2.1 Visual analysis using CiteSpace Software

Visualized analysis of the literature related to this study was carried out using CiteSpace software developed by Professor Chen Chaomei from the Drexel University. The analysis data is from the Chinese Social Science Citation Index (CSSCI) and Web of Science (WOS) core database retrieval system. The research strategy adopted is searching the title containing "tax preference" and

¹ Source: Statistical Yearbook of Science and Technology Activities of Industrial Enterprises 2016

“innovation” in Chinese or “tax credits” and “innovation” in English; “time period=1998-2018”, “document type=paper”, “fuzzy search”. In the end, 1053 Chinese and 190 English articles were obtained. Figure 1 shows the CSSCI analysis result, while Figure 2 shows the WOS analysis results.

The result in Figure 1 shows that domestic research shows the following characteristics: (1) In the selection of research samples, focus is more given to high-tech enterprises, strategic emerging companies and small and micro enterprises. (2) From the perspective of tax incentives, most studies focus on the relationship between corporate income tax and innovation. (3) In terms of enterprise innovation activities, technological innovation, independent innovation and R&D investment (R&D investment/innovation investment) are the focus of existing research. (4) From the research results, most studies consider the incentive effect of tax incentives for enterprise innovation is quite obvious. The results in Figure 1 show that foreign research and domestic research are the same. Research at home and abroad both show that research and development is still the main research entry point. Unlike domestic research, foreign research has a richer perspective, focusing on innovation performance, product innovation, competitive advantages and many other aspects.

Table 1 Chinese Social Science Citation Index (CSSCI) Visual Search Analysis

Co-occurrence frequency	Key words	Co-occurrence frequency	Key words	Co-occurrence frequency	Key words
319	tax preference	30	high-tech enterprise	17	preferential
217	tax policy	30	middle and small-sized enterprises	14	financial subsidies
115	tax preference policy	26	scientific innovation	14	foreign capital
65	tax	24	Small micro enterprise	13	Fiscal policy
54	independent innovation	20	strategic emerging industry	13	tax categories
47	technical innovation	20	High-tech enterprise	11	incentive effect
44	tax incentive	19	innovation	11	enterprise innovation
40	fiscal taxation policy	18	income tax	11	law of corporation income tax
39	fiscal revenue	18	R&D	10	VAT
37	corporate income tax	17	firm	10	tax reform

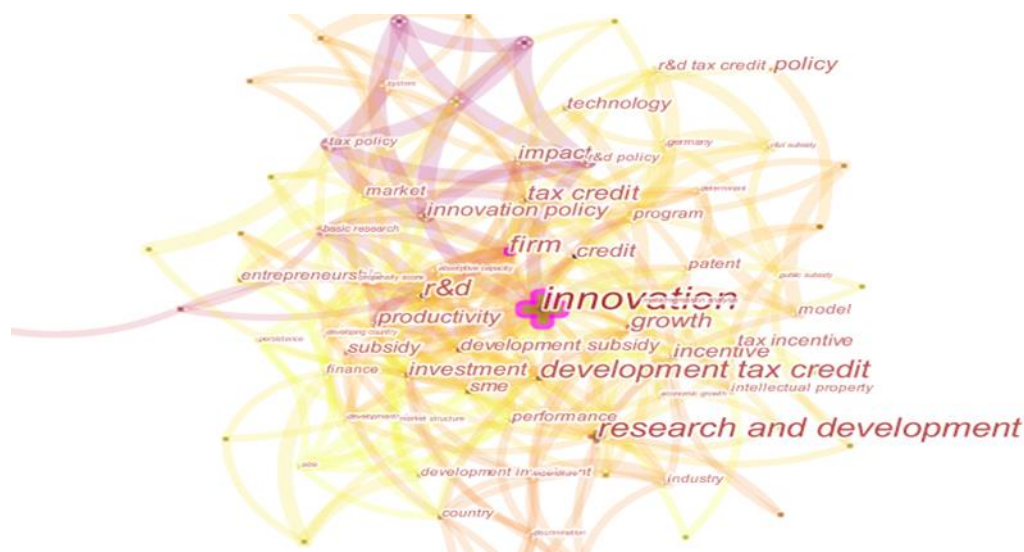


Figure 1 Web of Science (WOS) Visualized Retrieval Analysis

2.2 Tax incentives and R&D

2.2.1 Tax preferences generate significant incentives for innovation investment

Foreign research on tax incentives and innovation investment started late (Hall, 1993, Bloom, et al., 2002). The research shows that the tax cost flexibility of R&D investment is negative, that is, tax

incentives are conducive to promoting enterprises to increase R&D input, and its long-term incentive effect is more significant. The continuity and stability of tax incentives will have an impact on its implementation. Harris (2009) studied the feasibility of taxation policy as a tool to accumulate R&D capital in economically backward regions from the perspective of regional tax incentives. Hiroyuki (2014) analyzed the impact of Japan's 2003 R&D tax policy reform on corporate R&D investment. The results show that the reform increased the average R&D expenditure of the company by 3.0%-3.4%. Finley (2015) studied the impact of tax incentives of the Alternative Simplified Credit on corporate R&D investment. The results show that the Alternative Simplified Credit has a significant positive impact on R&D investment, with a \$1 reduction in taxes leading to a \$2.26 increase in R&D spending. Rao (2016) used the confidential data obtained by the US Internal Revenue Service from corporate tax returns to analyze the impact of the US federal R&D tax credits from 1981 to 1991. The results show that tax credits reduced the R&D user cost by 10%, leading to an increase of 19.8% company's research strength (R&D expenditure to sales ratio) in the short term. Guceri (2018) evaluated the effects of tax incentives on R&D investment and R&D personnel. The results show that tax incentives help to increase R&D spending at the company level, and the increase in R&D staff due to tax cuts will bring additional R&D effects.

After the reform of corporate income tax in 2008, domestic research on tax incentives and corporate innovation investment gradually emerged. Wang Cangfeng (2009) conducted an empirical research, pointing out tax reduction has a significant role in promoting R&D investment of domestic enterprises. The larger the enterprise is, the more obvious the promotion effect will be. Further research conducted by Xia Li (2012) confirmed that only in enterprises in relatively good institutional environments with no political connections can tax incentives significantly promote technological innovation. Xie Xiangbing (2016) confirmed that the company's R&D expenditure after the tax reform in 2008 is higher while R&D expenditure-tax burden elasticity decreased. In addition, the R&D expenditure intensity and the elasticity of tax burden-R&D expenditure of private enterprises are greater than those of state-owned enterprises. Liu Fang (2016) found out that tax incentives help to encourage enterprises to invest in innovation; the stronger the financing constraints are, the stronger the product market competition is, the higher the regional marketization process is, the more significant the incentive effect is. The tax leverage incentives for private enterprises to invest in R&D and innovation are stronger than those of state-owned enterprises. Wu Zuguang (2017) and Cheng Yao, Yan Huihui (2018) compared the impact of different tax incentives on corporate innovation investment. Wu Zuguang (2017) pointed out that compared to tax credits through deduction and investment, tax reduction through innovative product income is more effective in stimulating enterprise innovation investment. Cheng Yao, Yan Huihui (2018) adopted the tendency score method, and found out that the research and development expenses are deducted, the incentive effect is decreasing in turn from R&D costs plus deductions, R&D costs plus deductions plus preferential tax rate, to the preferential tax rate.

2.2.2 Tax incentives do not generate significant incentives for R&D

Some studies suggested that tax policies may inhibit corporate innovation. Carpenter and Petersen (2002) pointed out that when companies cannot rely on internal funds, lower liquidity can hinder companies from investing in R&D, thus inhibit corporate innovation. Zhang Jiayi (2016) believed that fiscal and tax incentives have a substitution effect or a crowd-out effect on corporate R&D investment. Kaplan (2001) and Shao Cheng, Wang Shengguang (2010) pointed out that tax incentives do not generate significant incentives for R&D investment. Fabiani and Sbragia (2014) argued that although fiscal policy can promote enterprises to invest in innovation, it is difficult to implement tax incentives, making them lower than government expectations. Jiang Xihe and Wang Shuijuan (2015) used a random utility model and conducted an empirical research based on the questionnaire data from 128 sample companies in Jiangsu Province. They found that the new policy of pre-tax deduction of R&D expenses has a positive impact on R&D investment, but insignificant.

Some studies found that there is a nonlinear relationship between tax incentives and corporate innovation investment. Wang Chunyuan and Ye Weijun (2018) found that the negative effects of

financing constraints will offset or even exceed tax incentives using the double difference model of rough exact matching method from the perspective of financing constraints. The positive promotion of corporate innovation makes it difficult for tax incentives to produce the expected positive results. Han Xianfeng, Dong Mingfang (2018) pointed out that the impact of R&D investment on corporate performance presents a significant inverted U shape. Only moderate R&D investment can promote corporate performance while excessive R&D investment intensity tends to hinder the corporate performance.

2.3 Tax incentives and innovation output

Compared with innovation input, research on tax incentives and innovation output started relatively late. Czarnitzki (2011) found that R&D tax credits can effectively promote innovative outputs such as new products in Canadian manufacturing companies. Cappelen (2012) studied the impact of the Norwegian R&D tax credit policy on innovative outputs such as patent, pointing out that this policy exerts different impact on different innovation outputs: it has a significant impact on new processes, a certain impact on new products, and no impact on the patent. Shaun P (2013) mentioned that tax preferences can stimulate small companies' innovative output, enabling them to reduce costs and increase patent output. Beck (2016) divided innovation output into radical innovation and incremental innovation. His study found out that fiscal incentives have a significant positive impact on the original innovation, but no significant impact on incremental innovation. Chen Lin and Zhu Weiping (2008) constructed a static Cournot model between North and South, using the number of patents as an indicator of innovation output. The study found that export tax rebates and innovative subsidy policies in developing countries can effectively stimulate innovation output. Zhang Xindong (2014), by using the tendency-score matching method, found that companies that enjoyed tax incentives had more patents, new products, and technology rewards. Hua Hailing and Wu Hecheng (2013) mentioned that tax incentives have a significant positive effect on innovation output. The elasticity of the number of patents to R&D costs plus deductions and tax incentives of high-tech enterprises is 0.40 and 0.45 respectively; new products The elasticity of sales income to research and development expenses plus deductions and high-tech enterprise tax incentives is 0.74 and 0.25 respectively. Cheng Xi and Cai Xiuyun (2017) examined its impact on innovation input and output from the two dimensions of income tax concessions and turnover tax concessions. They found that only the turnover tax concessions have a significant incentive effect on innovative outputs for state-owned enterprises and non-high-tech enterprises.

3. Research outlook

The research perspective of tax incentives and enterprise innovation is limited somehow as it mainly focuses on the impact of tax incentives on innovation investment and innovation output, lacking systematic researches, especially domestic ones, on tax incentives and innovation quality. Kao (2018) took the US companies from 1997 to 2007 as the sample to study the relationship between tax credits and innovation quality, pointing out that tax credit policies can improve the innovation quality. Domestic literature related to tax incentives and innovative quality literature is not traced yet. Cai Shaohong and Yu Liping (2017) believed that only by taking into account the quality of innovation and the number of innovations can enterprises achieve better innovation results and contribute to the corporate efficiency. Huang (2018) argued that the improvement of innovation quality can affect the accounting and market performance of enterprises, thus have a positive effect on corporate performance. It can be seen that only high-quality innovation can be transformed into enterprise productivity to improve total factor productivity and drive the high-quality development of China's economy. The relationship between tax incentives and innovation quality will become a hot research topic in the future.

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