ISSN: 2710-0588

Analysis of the Impact of Tax Preferential Incentive Policies on the Digital Transformation and Upgrading of Enterprises: Taking the Accelerated Depreciation Policy of Fixed Assets as an Example

Yuxuan Xia, Zihao Chen, Hongli Zhang*

Anhui University of Finance and Economics, Bengbu, China

* Corresponding Author: 17315756028@163.com

Abstract

This article investigates the impact of accelerated depreciation policies for fixed assets on the digital transformation of enterprises. The policy encourages enterprises to increase fixed assets investment by reducing the tax burden of enterprises, thus promoting digital transformation. Using data from A-share listed companies in Shanghai and Shenzhen from 2011 to 2020, a multi temporal DID model was constructed, and empirical results showed that this policy significantly promoted the digital transformation of enterprises. The study also found that there are differences in the effectiveness of policies among enterprises of different natures, with enterprises with better growth potential and greater industry competition benefiting more significantly. This article provides a theoretical basis for policy-making and has practical significance for promoting digital transformation of enterprises.

Keywords

Accelerated depreciation of fixed assets, Digital transformation of enterprises, Tax incentives, DID model.

1. Introduction

1.1. Research Background

In 2015, the concept of "digital transformation" was first explicitly proposed and the "Made in China 2025" was promulgated. This is the action plan for the first decade of China's implementation of the strategy of building a strong manufacturing country, promoting the intelligent development of the manufacturing industry and an important manifestation of digital transformation in the manufacturing industry. In 2020, the sudden COVID-19 epidemic has brought downward pressure on the economy. The digital economy has played a vital role in ensuring economic stability during the epidemic period, but also forced the whole society to further deepen the development of the digital economy. Under the urgent needs of practical development and policy guidance, China's digital economy continues to grow rapidly and has become an important force in promoting high-quality economic development. According to the "Digital China Development Report (2020)", China's digital economy has developed rapidly until 2020, with its total volume jumping to the second largest in the world, becoming an important driving force for global digital economy innovation. The added value of core industries accounts for 7.8% of GDP. The "Overall Layout Plan for Digital China Construction" issued in 2023 points out that China needs to further achieve modernization construction. Enhancing international competitiveness requires digital development as a strategy. Therefore, accelerating digital construction, providing new momentum for enterprises, and providing strength for social development are urgent tasks and important directions for future

ISSN: 2710-0588

development. Developing the digital economy and promoting digital transformation can contribute new momentum to the enhancement of national competitiveness and are also important measures in the national economic development blueprint. The digital economy has characteristics such as technological innovation, low marginal costs, economies of scale, and network externalities. Digital transformation is of great significance in stimulating consumption, driving investment, creating employment, enhancing innovation and competitiveness, and other aspects (Jing Wenjun and Sun Baowen, 2019).

To further promote the digital transformation of enterprises, China has actively introduced a series of policies, such as tax incentives. Compared to fiscal subsidy policies, tax incentives have the characteristics of pre incentives and have a wider coverage. The government often uses tax incentives to motivate enterprises to innovate and achieve digital transformation. The policy of accelerated depreciation of fixed assets is an important part of tax incentives. Reasonably utilize fixed assets to accelerate depreciation tax preferential policies, reducing the tax burden on enterprises, and helping to accelerate the process of digital transformation. In order to drive the transformation and development of enterprises, the Ministry of Finance and the State Administration of Taxation issued the "Notice on Improving the Enterprise Income Tax Policy for Accelerated Depreciation of Fixed Assets" (Caishui [2014] No. 75) in October 2014. The notice allows enterprises in six pilot industries, namely biopharmaceutical manufacturing, specialized equipment manufacturing, railway, ship, aerospace and other transportation equipment manufacturing, computer, communication and other electronic equipment manufacturing, instrument manufacturing, and information transmission, software and information technology services, to shorten the depreciation period or accelerate the depreciation of newly purchased fixed assets. In September 2015, the Ministry of Finance and the State Administration of Taxation further improved the enterprise income tax policy for accelerated depreciation of fixed assets and issued the "Notice on Further Improving the Enterprise Income Tax Policy for Accelerated Depreciation of Fixed Assets" (Caishui [2015] No. 106), allowing enterprises in key industries such as light industry, textile, machinery, and automobiles to shorten the depreciation period or accelerate the depreciation of newly purchased fixed assets. All fixed assets in the six key industries and four key areas covered by these two policies can have their depreciation period shortened or accelerated, which can comprehensively improve the innovation willingness of enterprises and help them continuously enhance their motivation for transformation and upgrading. The difficulty of applying for accelerated depreciation policies is relatively low, and enterprises only need to declare the accelerated depreciation of fixed assets during the annual income tax settlement to enjoy tax relief benefits. Compared to external financing channels such as banks, accelerated depreciation policies can alleviate financing constraints for enterprises in the short term, thereby increasing their enthusiasm for expanding innovation investment.

1.2. Research significance

1.2.1. Theoretical significance

Since the release of the Notice on Improving the Enterprise Income Tax Policy for Accelerated Depreciation of Fixed Assets in 2014, although there have been a large number of domestic and foreign literature analyzing and discussing the tax incentive policy of accelerated depreciation of fixed assets, very few literature has paid attention to the impact of the policy on the digital transformation of enterprises. Therefore, this project takes this as a starting point to analyze the impact mechanism of the accelerated depreciation policy of fixed assets on the digital transformation of enterprises, expand the understanding of tax tools from the perspective of micro subjects, enrich the theoretical research on government tax tools and micro enterprise digital transformation, and provide certain references for subsequent research.

ISSN: 2710-0588

1.2.2. Practical significance

At present, China has not formulated a tax incentive policy specifically for the digital transformation of enterprises. This project takes the digital transformation of enterprises as the starting point to study the impact of the accelerated depreciation policy of fixed assets on the economic activities of enterprises. It can not only help local governments understand the impact and direction of the accelerated depreciation policy of fixed assets in digital transformation, further strengthen the regulatory role of tax preferential policies in the process of enterprise digital transformation, but also analyze the impact effects of different categories of enterprises, reveal the impact of the accelerated depreciation policy of fixed assets on enterprises of different natures in the process of digital transformation, and provide new ideas for the design of tax preferential policies and the digital transformation of enterprises.

1.2.3. Proposed Problems to be Solved

Clearly outline the theoretical mechanisms and pathways through which accelerated depreciation policies for fixed assets affect digital transformation. To provide a theoretical basis for the future development of tax preferential policies in China, thereby promoting the digital development of enterprises.

Establish a multiple difference model and a mediation effect model to empirically test the impact and transmission mechanism of the accelerated depreciation policy of fixed assets on digital transformation. Conduct sample grouping, estimate the impact of policies on mediating variables, and test them comprehensively and systematically to analyze the impact and transmission mechanism of accelerated depreciation policies on digital transformation, providing a basis for formulating differentiated policies.

1.3. Innovation points and research characteristics

1.3.1. Innovative research perspective

Through the study of tax incentives for accelerated depreciation of fixed assets, the mechanism of the relationship between accelerated depreciation of fixed assets and digital transformation can be concretely demonstrated. This project takes the accelerated depreciation tax incentive policy for fixed assets as the starting point to explore its impact on digital transformation. Using a multi period double difference model and data from listed companies on the Shanghai and Shenzhen A-shares from 2011 to 2020, the implementation of the accelerated depreciation policy is used as a quasi natural experiment to empirically test the impact of the tax incentive policy on the digital transformation of enterprises. Relevant robustness tests are conducted to reveal the heterogeneity of its impact, and a mediation mechanism model is constructed to analyze its transmission path. Finally, corresponding tax incentive policy recommendations are proposed based on empirical analysis.

1.3.2. Appropriate research methods

This project adopts panel data analysis to build multiple regression model, structural equation model and time series analysis model, evaluate the impact of accelerated depreciation policy on digital transformation, analyze the relationship between policy, fixed assets investment and digital transformation, reveal the mechanism of each factor, and understand the long-term impact and trend of accelerated depreciation policy on digital transformation.

1.3.3. Feasibility of research conclusions and recommendations

This project is based on an analysis of the current status of the digital economy and the policy of accelerated depreciation of fixed assets. It is believed that there are areas where the current policy of accelerated depreciation of fixed assets is not suitable for the digital economy. Therefore, this article systematically studies the characteristics of digital economy value creation and the mechanism of fixed asset accelerated depreciation policy through the analysis of the current situation and problems of the digital economy, as well as the analysis of the

ISSN: 2710-0588

current situation and problems of fixed asset accelerated depreciation policy and its impact. Feasible and effective policy recommendations are proposed.

2. Literature Review

2.1. Economic effects of accelerated depreciation policy on fixed assets

The release of the United States Tax Code in 1954 sparked intense discussions in foreign literature regarding accelerated depreciation policies. Among them, represented by Hall and Jorgenson (1967), they explained the role of tax policy on enterprise investment theoretically and empirically. They believed that fixed assets investment decisions depended on investment returns, capital costs and tax credits. If an enterprise adopts accelerated depreciation policy, the net present value of depreciation of fixed assets will be higher and the after tax rate of return will be higher, making some investment projects that were not feasible become feasible, thus encouraging enterprises to increase investment in fixed assets investment.

Domestic scholars believe that the accelerated depreciation policy for fixed assets transfers the time value of money to enterprises through the early provision of fixed asset depreciation. This not only reduces the cost of capital expenditure for enterprises, but also accelerates the process of capital expenditure being transferred to production costs, effectively promoting enterprises to increase investment. It is a tax preferential policy with capital bias characteristics (Zhao Can and Liu Qiren, 2022). From the perspective of enterprise investment, accelerated depreciation policy can effectively encourage enterprises to increase fixed assets investment, and this promotion effect is more reflected in the existence of certain financing constraints for those enterprises that have long-term assets and need to update fixed assets urgently (Liu Qiren, 2019), enterprises that rely on external financing, smaller enterprises or non-state-owned enterprises (Liu Hang et al., 2019). From the perspective of corporate asset structure, the asset structure of a company can also affect its investment choices. Companies with long-term assets and urgent need for fixed assets are more likely to be incentivized by accelerated depreciation policies, thereby reducing the need for "leasing" and choosing "purchasing" (Liu Qiren et al., 2019; Lin Zhifan and Liu Shiyuan, 2022). Some studies suggest that accelerated depreciation policies can promote corporate investment, but the effect is limited. In the long run, accelerated depreciation policies cannot increase corporate performance, but instead lead to a decline in fixed asset utilization, investment efficiency, overcapacity, and ultimately a decrease in total factor productivity (Liu Yi et al., 2017; Xiong Bo and Du Jiaqi, 2020). Some studies suggest that tax incentives do not have a significant effect on promoting corporate investment (Cao Yue and Chen Wenrui, 2017).

The policy of accelerated depreciation of fixed assets is considered an important policy tool in relevant theoretical research that can stimulate corporate investment and innovation, and promote economic growth. By delving into the theoretical basis of the policy of accelerated depreciation of fixed assets, we can better understand the mechanism and impact path of the policy, and thus guide the formulation and implementation of the policy.

2.2. Research on Digital Transformation

Enterprise digitization refers to the process in which enterprises utilize emerging technologies for industrial upgrading and transformation (Zhang Yongjun et al., 2021). In fact, digital transformation of enterprises is of great significance and necessity for both the development of the enterprise itself and the Chinese economy. For enterprises themselves, digital transformation is an effective path to fully utilize production and market resources, improve their own operational efficiency, and is also a necessary measure for enterprises to combat risks, stabilize the market, and maintain competitiveness (Wu et al., 2021).

ISSN: 2710-0588

From a macroeconomic perspective, enterprises are a highly dynamic and important micro component of the macro economy. Their digital transformation is a necessary path to unleash the amplification, superposition, and multiplication effects of digital technology on China's economic development, and is also an inherent requirement of the 14th Five Year Plan for the development of China's digital economy (Li Liangliang and Xing Yunwen, 2024). From the perspective of enterprise operations, digitalization and related technologies will not only improve efficiency, but also build competitive advantages through dynamic data management, analysis, and prediction, disrupt existing operational management processes, bring innovation to operational management models, and enhance enterprise value (Chen Jian et al., 2020; HELFAT&RAUBITSCHEK, 2018). Digitalization of enterprises can alleviate financing constraints, improve management efficiency, enhance factor allocation, and strengthen innovation capabilities, thereby increasing enterprise value (Li Yanlong et al., 2022; Huang Dayu et al., 2021).

2.3. Research on Tax Preferential Policies and Enterprise Digital Transformation

In recent years, China has introduced many tax incentive policies and government subsidy policies to overcome market failures and drive enterprise transformation and development. Compared to government subsidies with selective and differentiated characteristics, tax incentive policies with "pre incentive" features can cover a wider range and are important policy tools for government incentives for enterprise transformation and development. Domestic scholars believe that tax incentives, fiscal subsidies, and other financial policies can effectively address the externalities brought about by digital technology innovation in the process of digital transformation for enterprises, help them share innovation risks, and increase confidence in digital transformation (Sun Wei and Ye Chusheng, 2023).

Among numerous tax incentives, the accelerated depreciation policy for fixed assets is an indirect tax incentive policy. Although it does not affect the overall tax burden, it reduces the tax burden pressure on enterprises in the early stage, helps them break through resource boundaries and solve the problem of insufficient investment, and creates positive conditions for the digital transformation of enterprises. Therefore, the policy of accelerating depreciation of fixed assets can effectively assist enterprises in their digital transformation. Currently, a small portion of literature has focused on the impact of accelerated depreciation policies on the digital transformation of enterprises. Domestic research has shown that accelerated depreciation policies significantly improve the level of digital transformation of enterprises (Cao Zhi and Wu Fei, 2023). From the perspective of digital transformation of resource-based enterprises, some scholars have explored the impact of two tax incentives, R&D expense deduction and tax reduction, on the digital transformation of enterprises. Empirical research using threshold regression method shows that these two tax incentives can effectively promote the digital transformation of enterprises, but the support of the two policies should be at a moderate level, too high or implemented simultaneously, and the incentive effect on digital transformation is not significant (Cheng Qiongwen and Ding Hongyi, 2022). From the perspective of different types of enterprises, some scholars believe that by using forward-looking effective tax rates as a measure of tax incentives, empirical evidence shows that tax incentives significantly promote the digital transformation of enterprises, and the promoting effect of this transformation is more pronounced in enterprises with high external financing dependence, high-tech industries, innovative environments, and regulatory industries (Zeng Hao, 2022). Technological transformation and upgrading are the foundation for the overall digital transformation and upgrading of enterprises. Research has found that accelerated depreciation policies for fixed assets can enhance the innovation efficiency of digital enterprises (Deng Feng and Yang Guoanthem, 2021).

ISSN: 2710-0588

Chen et al. (2022) explored the impact of tax incentives on the digital transformation of enterprises based on the accelerated depreciation policy of fixed assets, which is most relevant to this study. This study indicates that the policy of accelerated depreciation of fixed assets can effectively improve the degree of digital transformation of enterprises, and this promoting effect is more pronounced in enterprises with good growth potential, high industry competition, and high regional marketization level. The analysis of the research mechanism indicates that the policy of accelerated depreciation of fixed assets optimizes the financial situation of enterprises, promotes R&D innovation, provides a foundation for digital transformation of enterprises, and thus promotes digital transformation of enterprises.

3. Empirical Analysis

3.1. Model Settings

Due to the implementation of the accelerated depreciation policy for fixed assets in two stages, this article constructs a multi temporal DID model to measure the impact of tax incentives on the digital transformation of enterprises

3.2. Variable selection

On the one hand, in order to effectively identify the impact of accelerated depreciation policies on the digital transformation of enterprises, this article draws on the approach of previous literature and chooses to construct a multi time point double difference model for empirical analysis. The general expression of the model is as follows.

$$Digit_{it} = \beta_0 + \beta_1 post_i * treat_t + \sum_j \alpha_j \, control_{it}^j + \delta_c + \gamma_t + \varepsilon_{it} \quad (1)$$

On the other hand, in order to further verify the intrinsic mechanism of the accelerated depreciation policy of fixed assets on the digital transformation of enterprises, this paper constructs a mediation effect model, and the general expression of the model is as follows.

$$M_{it} = \beta_0 + \beta_1 post_i * treat_t + \sum_j \alpha_j \, control_{it}^j + \delta_c + \gamma_t + \varepsilon_{it} \quad (2)$$

$$Digit_{it} = \beta_0 + \beta_1 post_i * treat_t + \beta_2 M_{it} + \sum_j \alpha_j \, control_{it}^j + \delta_c + \gamma_t + \varepsilon_{it} \quad (3)$$

In the above expression, i represents the individual enterprise and t represents the year; δ_cRepresenting industry fixed effects; $\gamma_t$represents fixed time effects; A set of $control_{it}^j$ are control variables, ε_{it} represents a random interference term.

3.3. Data sources

The research topic of this article is the impact of accelerated depreciation policies for fixed assets on the digital transformation of enterprises. The research object of this article is A-share listed companies in Shanghai and Shenzhen. Based on considerations of data availability and timeliness, this article selects annual data from 2011 to 2020 as sample data. The data in this article mainly comes from the CSMAR database and WIND database. This article has processed the data in the following ways: (1) excluding samples of listed companies in the financial industry; (2) Exclude samples of financially abnormal enterprises such as ST and * ST; (3) Exclude enterprise samples with missing values; (4) Shrink the tail of continuous variables.

ISSN: 2710-0588

3.4. Empirical Results and Analysis

3.4.1. Descriptive statistical analysis

The research topic of this article is the impact of accelerated depreciation policies for fixed assets on the digital transformation of enterprises. The research object of this article is A-share listed companies in Shanghai and Shenzhen. Based on considerations of data availability and timeliness, this article selects annual data from 2011 to 2020 as sample data. The data in this article mainly comes from the CSMAR database and WIND database.

3.4.2. Quantile Regression of Benchmark Regression and Double Check Score

Explore the impact of accelerated depreciation policies on fixed assets on enterprises and the impact of different types of enterprises on their digital transformation and upgrading. And to verify the robustness of the empirical results, this article gradually increases the control variables for parameter estimation of the model based on the inclusion of core variables.

3.4.3. Robustness test

Parallel trend test. The parallel trend assumption is an important prerequisite for the application of the double difference model. The difference in differences model can only be applied when the experimental group and the control group have the same trend before policy implementation.

Placebo test. The placebo test is a counterfactual test that infers the effects of a policy by making assumptions that do not match the facts. If there are indeed unobserved factors that affect the transformation and upgrading of enterprises, then the experimental group receiving placebo will also show changes.

Change the time sample. Due to the further expansion of the scope of the accelerated depreciation policy for fixed assets in 2018 and 2019, and the increase in the one-time deduction limit, the sample period of this project has been shortened to 2017 to avoid potential interference from the continued expansion of the policy implementation scope.

Exclude interference from other policies. Due to the sample period of this project being from 2010 to 2020, there were pilot policies such as the "Broadband China" policy, the "Business Tax to Value added Tax" reform, and the integration of technology and finance. In order to eliminate the possible impact of policies on this project, the logarithm of enterprise value-added tax was used as an indicator to measure policies and control variables were added.

3.4.4. Heterogeneity Analysis

Individual cross-sectional heterogeneity. The impact of accelerated depreciation policies on the digital transformation of fixed assets varies among enterprises of different natures. The impact of accelerated depreciation policies for fixed assets on the digital transformation of enterprises may lie in the nature of ownership and industry competition

Differences in degree, industry attributes, and enterprise lifecycle. This project uses sample grouping regression method to study the heterogeneity of the impact between the two.

Heterogeneity of strategic perspectives. As an important manifestation of corporate strategic change, the impact of digital transformation on corporate strategic behavior has not been explored in existing research. This project further explores the differences in the impact of tax incentives on the digital transformation of enterprises from a strategic perspective, and examines the progress, deviation, and market specificity of strategic incentives.

4. Conclusion

The policy of accelerating depreciation of fixed assets has a significant positive promoting effect on the digital transformation of enterprises.In addition, from the regression results, it can be found that the accelerated depreciation policy of fixed assets has a slightly more significant

ISSN: 2710-0588

promoting effect on the digital transformation of enterprises in the central region, a more significant promoting effect on the digital transformation of state-owned enterprises, and a more significant promoting effect on the digital transformation of large-scale enterprises.

Acknowledgements

This work is supported by Anhui University of Finance and Economics Undergraduate Research and Innovation Fund Project (Grant No: XSKY25041ZD).

References

[1] Wang Qing, Wei Liting Tax incentives, digital transformation, and corporate entity investment [J]. Journal of South China University of Technology (Social Sciences Edition), 2025, 27 (01): 72-85.

[2] Zhang Xueyuan, Hou Wang Impact of accelerated depreciation policy of fixed assets on Baijiu enterprises [J]. Cooperative Economy and Technology, 2025, (03): 110-112.

[3] Gu Cheng, Chen Qing, Zhang Chunlei Research on the Mechanism of the Accelerated Depreciation Policy of Fixed Assets Affecting the R&D Innovation Level of Enterprises [J]. Research Management, 2025, 46 (02): 108-118.

[4] Li Jianjun, Hu Sheng Does tax incentives promote the digital transformation of enterprises? "Tax Economics Research, 2024, 29 (05): 27-38.

[5] Li Wei, Guan Xiaoxiao, Li Yuanheng The impact and mechanism of accelerated depreciation policy for fixed assets on the green transformation of enterprises [J]. Financial Development, 2024, (02): 57-79.

[6] Huang Yisong Can tax incentives promote digital transformation of enterprises? "Contemporary Finance and Economics, 2023, (12): 144-156.