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Does China's Selective Industrial Policy Enhance the Risk-Taking of Corporations?

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Abstract

Moderately increasing risk-taking can promote the high-quality development of enterprises. This paper uses the difference-in-differences method to examine the influence of the selective industrial policy on enterprise risk-taking using the qualification recognition policy of high-tech enterprises as a quasi-natural experiment. The results show that selective industrial policy plays a significant role in promoting enterprise risk-taking. Specifically, such policies significantly affect the risk-taking level of listed and highly rated enterprises. Further research shows that financing constraints are the main channel for the recognition policy of the high-tech qualification industry to enhance the level of enterprise risk-taking.

Keywords: selective industrial policy, risk-taking, high-tech enterprise, financing constraints

1. Introduction

Enterprise risk-taking reflects the willingness and ability of enterprises to pursue high profits and choose and pay for venture investment projects in investment decisions (Boubakri et al., 2013; Hilary & Hui, 2009). At the macro level, higher risk-taking is conducive to accelerating social capital accumulation and improving total factor productivity, thus becoming the key to long-term economic growth. It is mainly achieved through enterprises' investment in high-risk, innovative projects, which can promote technological progress on the one hand and accelerate social capital accumulation on the other to keep social productivity at a high level. From the micro level, Faccio et al. (2016) believe corporate risk-taking improves capital allocation efficiency (De Long & Summers, 1991). Risk-taking can enhance enterprise value, and higher risk-taking is often reflected in the increase of capital expenditure and R&D investment of enterprises, which is conducive to improving the competitiveness of enterprises and achieving long-term, high-quality development. In a perfect market, enterprises should follow the net present value (NPV) rule when choosing investment projects, that is, choose to invest in those projects with a positive NPV. However, the long-term existence of information asymmetry, coupled with the adverse selection behavior of borrowing enterprises, reduces the willingness of financial institutions to lend and increases the financing cost, thus limiting the possibility of external financing of enterprises, reducing the willingness to take risks, and reducing the demand for

foreign investment, resulting in the phenomenon of underinvestment in enterprises and thus hindering the high-quality development of enterprises.

In order to improve the independent innovation ability of enterprises and build an innovation-oriented country, China's Ministry of Science and Technology, the State Administration of Taxation, and the Ministry of Finance jointly formulated the Administrative Measures for the Identification of High-Tech Enterprises in 2008. By the end of 2018, 181,000 high-tech enterprises had been identified nationwide. Improving enterprises' willingness to take risks will help enterprises increase innovation and research and development payments, take the initiative to choose high-risk and high-return projects, and accelerate societal capital accumulation. Therefore, the top research priority is whether the selective industrial policy affects the level of firm risk-taking and its mechanisms.

This main innovations and possible contributions of this paper are mainly reflected in the following three aspects. First, it enriches the research results in selective industrial policy. Second, it broadens the relevant research in the field of enterprise risk-taking. The research on the impact of corporate risk-taking has been extended in scope. However, the impact of selective industrial policy on micro-corporate risk-taking is rarely explored, so this paper explores some research space. Third, this paper provides a reference for policy formulation. This paper empirically tests the impact of the identification policy of high-tech enterprises on enterprise risk-taking to provide a reference for policymakers to use selective industrial policies further to promote the high-quality development of enterprises.

2. Literature Review

Enterprise risk-taking is a resource-consuming activity with strong resource dependence (Almeida & Campello, 2007; Fazzari et al., 1987). The macro-control department guides the direction of economic resource allocation through selective industrial policies and introduces elements and resources into the department. When enterprises have sufficient resources, they can take the initiative to choose high-risk and high-return projects in project selection and decision-making. Therefore, introducing resources will inevitably change the identified enterprises' risk-taking level. In addition, the high-tech qualification industry identification policy has sent a positive signal to the credit market. The enterprises with new support will be "favored" by banks. Commercial banks will increase the credit supply to the identified enterprises, especially those with good credit status, markets, and prospects. The more credit support an enterprise has, the stronger its liquidity and willingness to take risks, the more likely it is to invest in high-quality projects and carry out innovative research and development activities.

According to Pecking Order Theory, when faced with investment opportunities, enterprises will arrange financing in the order of internal and external financing, in which external financing prioritizes debt financing and then considers equity financing. Projects with potential profit opportunities tend to be high-risk and have an extended cash flow cycle. Due to long-standing information asymmetry, principal-agent problems, and other problems, many enterprises face strong financing constraints. It is difficult to obtain funds through external financing, and it is difficult for internal funds to meet the needs of high-risk projects, so they have to give up many projects with positive NPV. Therefore, the stronger the financing constraints enterprises face, the lower the willingness to take risks, the lower the possibility of investing in high-risk projects, and the more likely it is to deviate from the investment decision based on NPV.

3. Data and Variable Construction

3.1 Data

This paper takes the A-share listed enterprises in China's Shanghai and Shenzhen stock markets from 2002 to 2022 as the research object. This paper's primary corporate financial data are from the Wind database, and the macroeconomic data are from the National Bureau of Statistics website. In order to avoid the influence of extreme values, all continuous data are winsorized at 1% and 99% quartiles.

3.2 Variable Definition

The difference-in-differences method is used in this paper to evaluate the effect of the policy of qualification recognition of high-tech enterprises on enterprise risk-taking:

$$Risk_{i,t} = \alpha_0 + \alpha_1 did_{i,t} + \alpha_2 Controls_{i,t} + c_i + \gamma_t + \varepsilon_{i,t} \quad (1)$$

(1) Explained variables.

Current literature mainly uses the volatility of corporate performance to measure the level of corporate risk-taking ($Risk_{i,t}$) (Coles et al., 2006; Faccio et al., 2011). The higher corporate performance volatility, the more likely it is that an enterprise will take risks and invest in high-risk projects. This paper adopts corporate profit volatility to measure corporate risk-taking, where ROA represents the net interest rate of total assets of the i enterprise in the corresponding period. The specific formula is as follows:

$$\text{AdjROA} = ROA_{i,t} - \frac{1}{N}\sum_{n=1}^{N} ROA_{i,t} \tag{2}$$

$$Risk1_{i,t} = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(AdjROA - \frac{1}{T}\sum_{t=1}^{T} AdjROA\right)^2 |T=3} \tag{3}$$

$$Risk2_{i,t} = Max\left(AdjROA_{i,t}\right) - Min\left(AdjROA_{i,t}\right) \tag{4}$$

where $ROA1_{i,t}$ is the standard deviation of enterprise ROA after industry adjustment, $ROA2_{i,t}$ is the range of ROA after industry adjustment.

(2) Explanatory variables.

As the grouping variable of the experimental group, 1 is taken if enterprise i have been identified as a high-tech enterprise from 2002 to 2022, and 0 is taken otherwise. It is the virtual variable of the policy period, and its value is 1 in the year of the policy implementation in the subsequent periods and 0 before. This variable is 0 for all enterprises in the control group (Chen et al., 2015). The intersection term is the policy effect evaluation variable because this paper controls individual and time-fixed effects.

(3) Control variables.

The definition of control variables and specific measures are shown in Table 1.

Table 1. Definition of the Control Variables

Variable	Definition
Size	The natural logarithm of asset plus one
Age	The natural logarithm of establish time of enterprise plus one
Cffo	The ratio of cash flows generated from operating activities to total assets
Lev	The ratio of total liabilities to total assets
Tangible	The ratio of tangible assets to total assets
Ser	Ratio of shareholders' equity to total assets
Lsp	The proportion of the first major shareholder
GDP	GDP year-over-year growth rate
Fin	The natural logarithm of the social financing scale of the province in which it is located
Ind	Industry classification

3.3 Summary Descriptive

Descriptive statistics for the main variables are shown in Table 2. There is a significant gap in the level of risk-taking by private enterprises in the sample. It is worth noting that the indicators of enterprise profitability have a significant standard deviation; that is, there is a large gap between enterprises in corporate performance and growth, and there is a situation of unbalanced development.

Table 2. Summary Descriptive

Variable	Mean	Median	Std	Min	Max
Risk1	0.903	0.595	1.266	0.041	12.047
Risk2	1.664	1.100	2.255	0.000	20.745
Size	6.032	5.941	1.022	3.777	8.285
Age	3.051	3.070	0.251	2.067	3.604
Cffo	0.012	0.011	0.026	-0.070	0.095
Lev	0.606	0.612	0.123	0.240	0.993
Tangible	20.159	18.682	16.031	-31.573	63.994
Ser	29.649	29.006	14.903	-0.053	74.756
Lsp	0.495	0.475	0.226	0.114	1.000
Gdp	6.120	6.900	5.074	-6.700	19.500
Fin	8.984	9.095	0.917	5.725	10.448

4. Empirical Analysis

4.1 Baseline Results

Table 3 reports the results of the primary effect test. After controlling the individual and time-point fixed effects, the corresponding policy effect evaluation results are shown in the coefficients of the intersection term $did_{i,t}$ in columns (1)–(4), which are 0.271, 0.177, 0.347, and 0.318, respectively, all of which are significantly positive at the 5% level. According to the regression results, selective industrial policy has a significant positive effect on improving enterprise risk-taking. Standard error are clustered at firm level.

Table 3. Baseline Results

Variables	(1) Risk1	(2) Risk	(3) Risk2	(4) Risk2
did	0.212**	0.177**	0.347**	0.318**
	(0.087)	(0.075)	(0.149)	(0.151)
	(0.076)	(0.069)	(0.134)	(0.140)
Cons	3.446	5.580	6.934	12.675*
	(4.007)	(3.521)	(6.778)	(6.915)
Firm FE	NO	YES	NO	YES
Year FE	NO	YES	NO	YES
observations	15762	15438	15642	15457
R-squared	0.500	0.482	0.620	0.601
Adj R-squared	0.439	0.422	0.573	0.555

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

4.2 Heterogeneity Analysis

The credit ratings of the enterprises in the research sample mainly include AA-, AA, AA+, and AAA ratings. We classified the enterprises with AA+ and AAA ratings when corporate bonds were listed in the high rating group and the corresponding enterprises with AA- and AA ratings into the low rating group. Groups again tested the primary effect model, and Table 4 displays the regression results. According to the estimated coefficient of $did_{i,t}$, the policy effect evaluation variable, it can be found that, compared with low-rated enterprises, the high-tech qualification recognition policy is more

effective in improving enterprise risk-taking for high-rated enterprises. The regression coefficients of the main explanatory variables are 0.195 and 0.331, respectively, which are significantly positive at the 5% level.

Table 4. Heterogeneity Analysis

Variables	(1) Risk1	(2) Risk	(3) Risk2	(4) Risk2
did	0.226	0.298	0.195**	0.331**
	(0.157)	(0.266)	(0.088)	(0.154)
Cons	23.737***	40.837***	-9.942*	-15.492*
	3.446	5.580	6.934	12.675*
	(4.007)	(3.521)	(6.778)	(6.915)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
observations	8256	8125	7057	6934
R-squared	0.560	0.517	0.487	0.494
Adj R-squared	0.479	0.434	0.426	0.437

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

4.3 Mechanism Analysis

The baseline regression shows that the policy of high-tech qualification identification can effectively improve the level of enterprise risk-taking. According to the theory of resource dependence, the more resources an enterprise has, the stronger its willingness to take risks, and innovative projects tend to have high risks. The wider the financing channels, the more likely it is to reduce financing constraints and the greater the probability of investment in high-risk projects. Referring to the measurement method of corporate financing constraints proposed by Charles et al. (2010), this paper uses the absolute value of the financing constraint index (SA) as the proxy variable for the financing constraints faced by enterprises. Enterprises face more severe financing constraints the higher the SA.

Following Vig (2013), in order to test the impact of financing constraints on the relationship between high-tech qualification recognition policy and risk-taking, this paper adopts the following model for testing:

$$Risk_{i,t} = \alpha_0 + \alpha_1 did_{i,t} \times SA_{i,t} + \alpha_2 SA_{i,t} + \alpha_3 did_{i,t} + \alpha_4 Controls_{i,t} + c_i + \gamma_t + \varepsilon_{i,t} \quad (5)$$

The empirical results are shown in Table 5. The results show that the improvement effect of the risk-taking level of enterprises recognized as high-tech qualified enterprises increases with the easing of financing constraints. The regression coefficients of the mechanism of action are -0.387 and -0.628, respectively, which are significantly negative at the 5% level. The results indicate that enterprises with a greater degree of easing of financing constraints brought about by the signaling effect of selective industrial policies have more access to external financing channels and resources, which can stimulate enterprises to increase investment and risk-taking.

Table 5. Mechanism Analysis

Variable	Risk1	Risk2
Did×SA	-0.387**	-0.628**
	(0.190)	(0.319)
did	0.288***	0.476**
	(0.111)	(0.190)

SA	-0.578		0.392
	(1.795)		(2.957)
_cons	2.311		10.596
	(9.849)		(16.262)
Controls		YES	
Firm FE		YES	
Year FE		YES	
observations	15489		15364
R-squared	0.503		0.484
Adj R-squared	0.441		0.424

Note: *** p < 0.01, ** p < 0.05, * p < 0.1.

5. Conclusion

This paper takes the A-share listed enterprises in Shanghai and Shenzhen stock markets of China from 2002 to 2022 as the research sample, takes the high-tech qualification recognition policy as the natural experiment, and focuses on the effect and transmission mechanism of the policy on enterprise risk-taking based on the resource dependence theory, to make a marginal contribution to how the selective industrial policy affects the supported enterprises to promote high-quality economic development. The following findings are obtained. (1) Selective industrial policy significantly affects enterprise risk-taking. (2) Selective industrial policy significantly affects the risk-bearing capacity of listed enterprises with a high rating. (3) Selective industrial policy can improve the willingness of enterprises to take risks by easing the financing constraints they face. From the perspective of risk, this paper makes new research on selective industrial policy to provide direct empirical evidence for the impact of selective industrial policy on firm risk-taking.

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