

The Relationship between Entrepreneurship and Patient Capital

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Abstract

Based on the sample of Chinese A-share listed companies from 2010 to 2022, this paper empirically tests the relationship between entrepreneurship and patient capital, and further analyzes it from the perspective of ownership nature. The results show that there is a positive correlation between entrepreneurship and patient capital. Compared with state-owned enterprises, the correlation between entrepreneurship and patient capital is more significant in non-state-owned enterprises. This study provides some empirical evidence for promoting the cultivation of entrepreneurship and the development of patient capital, and provides a new perspective for the long-term development of enterprises.

Keywords

Entrepreneurship; Patient Capital; Non-state-owned Enterprises.

1. Introduction

In recent years, China's economic growth model has accelerated its transformation from factor-driven to innovation-driven, and innovation has become the core fulcrum-point of the national development strategy. According to the National Bureau of Statistics, China's R&D investment will reach 2.64 percent in 2023, 0.98 percentage points higher than that in 2010, among which the proportion of enterprise R&D investment will remain stable at more than 77 percent. Under the background of this transformation, the technological innovation activities of enterprises show significant systematic characteristics: on the one hand, technological breakthroughs in hard science and technology fields (such as semiconductors, biomedicine, new energy, etc.) require long-term investment of more than 5 years, and the average R&D failure rate is as high as 62%; On the other hand, the industrialization of innovation achievements is faced with multiple uncertainties such as market verification and supply chain coordination, which makes the traditional capital supply mode of pursuing short-term returns difficult to meet the demand. In this context, the meeting of the Political Bureau of the CPC Central Committee held on April 30, 2024 included "strengthening patient capital" into the strategic framework of the cultivation of new quality productivity for the first time, and clearly required "building a long-term capital supply system that matches the law of scientific and technological innovation", which indicates that the logic of capital factor allocation in China is undergoing fundamental changes. A large amount of literature has studied the impact of patient capital on enterprises, and enterprises can use patient capital to increase enterprise performance and ESG performance (Wu M J, 2022; Li S F & Wen L, 2025)^{[1][2]}. Are part of the study to analyze enterprises affect patient capital perspective (Jiang H et al., 2024)^[3], but few based on the analysis of Angle of entrepreneurship, entrepreneurship and patience capital is an important factor to promote enterprise innovation, there are important, the correlation of both based on this article selects 2010-2022 China's a-share listed companies as samples, Based on the selection of Chinese A-share listed companies from 2010 to 2022 as samples, this paper deeply analyzes the relationship between entrepreneurship and patient capital, and provides a better reference for the development of patient capital in China.

2. Theoretical Analysis and Research Hypotheses

As the core elements of modern innovation economic system, the connotation definition of entrepreneurship and patient capital shows the characteristics of dynamic coupling. Based on Schumpeter's innovation theory, entrepreneurship can be deconstructed as follows: technical insight ability, resource reorganization efficiency and institutional breakthrough willingness. The deconstruction of the three aspects emphasizes its essential function of realizing the transition of production factors through creative destruction (Li T H, 2024) ^[4]. Correspondingly, patient capital has three attributes: spanning the technology maturity cycle in the time dimension, containing the uncertainty of market verification in the risk dimension, and balancing financial returns and social benefits in the value dimension (Pan et al., 2025) ^[5]. The two form value resonance at the level of innovation-driven: entrepreneurship creates long-term value anchor through breakthrough technology route selection, while patient capital reduces the trial error cost of innovation through cross-cycle resource allocation (Ji Z H, 2024) ^[6]. Taking CATL as an example, its R&D investment intensity continued to be higher than 15% from 2011 to 2018. During this period, the capital provided financial support for 7 years through convertible bonds, perpetual bonds and other tools, and finally promoted the technological leap of power battery energy density from 160Wh/kg to 300Wh/kg. The spirit of innovation is the core of entrepreneurship, reflecting the attitude and psychology of enterprises in the face of market competition. Managers with entrepreneurship can continuously improve technology in the development of enterprises, increase innovation investment to improve the management and production efficiency of enterprises, and reduce the operating cost of enterprises (Li W & Ding C, 2016) ^[7]. From the perspective of entrepreneurship, entrepreneurship can capture market gaps and provide innovation platforms, which is conducive to relieving financing constraints for enterprises. Entrepreneurs can make more use of long-term capital to develop enterprises for a long time, while patient capital is investment without sacrificing long-term returns (DEEG & HARDIE, 2016) ^[8]. Entrepreneurship is formed by entrepreneurs in long-term practice. The spiritual quality, value appeal and code of conduct with advanced cultural values and scientific management concepts as the main content are important parts of the soft power of corporate culture, constitute the core and soul of the comprehensive competitiveness of enterprises, and are the key factors to promote enterprises to continuously explore and innovate, pursue excellence and achieve high-quality development (Fang S N, 2025) ^[9]. The intervention of patient capital investment enables enterprises to focus on the research and development of core technology and long-term strategy planning under stable financial guarantee, avoid enterprises to give up long-term development opportunities due to excessive short-term financial pressure, and lay a solid foundation for the long-term stable development of enterprises (Wu X M, 2025) ^[10]. It can be seen from the above analysis that entrepreneurship has the same attributes and perspectives in the perspective of financing constraints and long-term asset holding. Based on this, this paper proposes the following research hypotheses:

Hypothesis 1: Entrepreneurship is positively correlated with patient capital.

3. Research Design

3.1. Sample Selection and Data Sources

This paper selects Chinese A-share listed companies from 2010 to 2022 as samples. At the same time, in order to improve the validity of the data and ensure the quality of the research, the data are processed as follows: (1) the ST and * ST listed companies and financial listed companies with abnormal operation during the sample period are excluded. (2) The samples with seriously incomplete data are eliminated. (3) Winnow the continuous variables by 1%. The data in this paper come from China Stock Market & Accounting Research Database (CSMAR), Wind, financial

reports of listed companies, Chinese Research Data Services (CNRDS) and China Statistical Yearbook.

3.2. Variable Definition

3.2.1. Explained Variable--Enterprise Patient Capital(Debt and INVH)

The explained variable in this paper is corporate patient capital. Referring to the research of Wu Min jia(2022)^[1], it is measured by two methods. The first is Debt, which is the proportion of relational debt. All bank loans are regarded as relational debt, and the calculation method is: proportion of relational debt = total long-term bank loans/(bank loans + bonds payable + notes payable). The second is INVH, which is a stable equity index. The overall shareholding ratio of institutional investors is used to measure the overall level of institutional investors, and the stability index of institutional investors is calculated according to this level. That is, the ratio of investor shareholding ratio of company *i* in year *t* to the standard deviation of shareholding ratio in the past three years. The greater the INVH is, the higher the stability of institutional investors in the time dimension is. The formula is shown in (1).

$$INVH = \frac{INVH_{it}}{STD(INVH_{i,t-3}, INVH_{i,t-2}, INVH_{i,t-1})} \quad (1)$$

3.2.2. Explanatory Variable --Entrepreneurship(Entre)

The explanatory variable is entrepreneurship. Referring to the method of Zhang San bao (2024)^[11], the five main indicators of patriotism, courage to innovate, integrity and law abiding, international vision and social responsibility are used to evaluate the five indicators. The weight of the five indicators is determined respectively.

3.2.3. Control Variables

The following seven control variables are selected with reference to existing research. The detailed definitions of all variables are shown in Table 1.

Table 1. Variable definitions

Types	Name	Variables	Definition
Explained variables	Corporate patient capital	Debt	Share of relational debt
		INVH	Stable equity indicator
Explanatory variables	Entrepreneurship	Entre	Entrepreneurship
Control variables	Company size	Size	Take the logarithm of total assets at year-end
	Asset-liability ratio	Lev	Total year-end liabilities/total year-end assets
	Return on assets	ROA	Net interest rate/average balance of total assets
	Ownership concentration	TOP1	Shareholding ratio of the largest shareholder
	Number of years listed	ListAge	Take the natural logarithm of the current year minus the listing year plus one is taken
	Management expense ratio	Mfee	Overhead/operating income
	Big Four audit or not	Big4	1 for companies audited by Big 4, 0 otherwise

3.3. Measurement Model

In order to explore the impact of entrepreneurship on enterprise patient capital, the measurement model shown in Equation(2) is constructed to verify Hypothesis 1 of this paper.

$$y_{it} = \alpha_0 + \alpha_1 \text{Entre}_{it} + \sum_{j=2}^8 \alpha_j \text{Controls}_{it} + \mu_{it} + \tau_{it} + \varepsilon_{it} \quad (2)$$

Where subscript *i* denotes the company and *t* denotes the year. The key explained variable in this paper is enterprise patient capital(y_{it}), and the key explanatory variable is(Entre_{it}), and Controls_{it} represents the control variable. In addition, this paper controls individual fixed effects (μ_{it})and year fixed effects(τ_{it})as much as possible in the regression model, and adopts the robust standard error of heteroscedasticity clustering at the enterprise level in all regression equations.

4. Empirical Test

4.1. Descriptive Statistics

Table 2 presents the main results of the descriptive statistics. As can be seen from Table 2, the total sample is 29203. The mean value and median value of corporate patient capital(Debt)are 0.127 and 0.051, and the mean value and median value of patient capital(INVH)are 0.432 and 0.445. The median value is 43.37, indicating that most of China's entrepreneurship is left skewed, and the entrepreneurship is relatively low. The other control variables are within a reasonable range and will not be described here.

Table 2. Descriptive statistical results

Variables	N	Mean	p50	SD	Min	Max
Debt	29023	0.127	0.051	0.167	0.000	0.744
INVH	29023	0.432	0.445	0.244	0.001	0.924
Entre	29023	43.31	43.37	6.487	22.89	63.87
Size	29023	7.693	7.629	1.198	4.111	11.180
Lev	29023	0.416	0.409	0.199	0.027	0.925
ROA	29023	0.039	0.039	0.067	-0.375	0.254
Top1	29023	0.333	0.310	0.146	0.0810	0.758
ListAge	29023	2.196	2.303	0.765	0.693	3.401
Mfee	29023	0.089	0.071	0.070	0.007	0.641
Big4	29023	0.056	0.000	0.230	0.000	1.000

4.2. Correlation Coefficient Analysis

Table 3. Correlation coefficient analysis

	Debt	INVH	Entre	Size	Lev	ROA	Top1
Debt	1						
INVH	0.173***	1					
Entre	0.051***	0.097***	1				
Size	0.160***	0.345***	0.348***	1			
Lev	0.319***	0.174***	0.037***	0.371***	1		
ROA	-0.094***	0.126***	0.116***	0.076***	-0.358***	1	
Top1	0.053***	0.497***	-0.012**	0.147***	0.017***	0.143***	1
ListAge	0.194***	0.224***	0.055***	0.289***	0.346***	-0.187***	-0.074***
Mfee	-0.069***	-0.172***	-0.126***	-0.296***	-0.233***	-0.199***	-0.143***
Big4	0.092***	0.233***	0.154***	0.268***	0.090***	0.048***	0.122***
ListAge	Mfee	Big4					
ListAge	1						
Mfee	-0.079***	1					
Big4	0.096***	-0.094***	1				

Note: * represents $p < 0.1$, ** represents $p < 0.05$, and *** represents $p < 0.01$.

Table 3 shows the correlation number table, from which it can be seen that entrepreneurship(Entre) has a significantly positive correlation with enterprise patient capital(Debt and INVH), which preliminarily verifies Hypothesis 1. The two indicators of corporate patient capital(Debt and INVH) have a significant positive correlation, indicating that relational debt and stable equity have the same development trend.

4.3. Benchmark Regression

Columns(1) and (2) of Table 4 show the benchmark regression results. The regression coefficient of entrepreneurship(Entre) and patient capital(Debt) is 0.0013 and positively correlated at the level of 1%, and the regression coefficient of entrepreneurship(Entre) and patient capital (INVH) is 0.0011 and positively correlated at the level of 1%, which proves Hypothesis 1. It shows that entrepreneurship can improve the patient capital holding level of enterprises.

Table 4. Regression analysis

	(1)	(2)
	Debt	INVH
Entre	0.0013***	0.0011***
	(5.010)	(4.581)
Size	0.0117***	0.0244***
	(3.765)	(7.422)
Lev	0.2732***	-0.0399***
	(19.955)	(-3.218)
ROA	0.0471***	0.1707***
	(2.660)	(8.714)
Top1	0.0521**	0.4768***
	(2.392)	(15.312)
ListAge	0.0300***	-0.0168***
	(5.825)	(-3.240)
Mfee	0.1126***	-0.0265
	(3.797)	(-0.984)
Big4	0.0061	0.0273**
	(0.542)	(2.149)
_cons	-0.2276***	0.0855***
	(-8.308)	(2.875)
ID	Yes	Yes
Year	Yes	Yes
N	29023	29023
F	78.6220	69.4584
r2_a	0.6100	0.8758

Note: * represents $p < 0.1$, ** represents $p < 0.05$, and *** represents $p < 0.01$; The figures in parentheses are t-statistics, the same below.

4.4. Robustness Test

4.4.1. Lagged One-period Explanatory Variables

In order to verify the stability of the above regression results, this paper adopts the method of one-period-lagged robustness test, and puts entrepreneurship(Entre) into the regression model with one-period-lagged regression. The regression results are shown in Columns(1) and (2) of Table 5. The correlation coefficients of one-period lagged entrepreneurship(Lentrel) with Debt and INVH are still significantly positive.

4.4.2. Substitution Variable(INVH1)

In addition to the one-period lagged explanatory variables, this paper replaces the ratio of institutional investment shareholding in the original explained variable INVH, which measures the ratio of institutional investment shareholding in the total share capital, with the ratio of institutional investment shareholding in the tradable shares, and regresses the recalculated INVH1. The regression results are shown in Column(3) of Table 5. The correlation coefficient between entrepreneurship(Entre) and INVH1 is 0.0032. The regression results are basically consistent with the original regression after replacing the explained variables.

4.4.3. Changing the Sample Interval

Since the outbreak of COVID-19 at the end of 2019 May have an impact on the regression results, this paper removes the samples in 2020 to conduct the regression test again. As shown in Columns(4) and (5) of Table 5, the correlation coefficients between entrepreneurship(Entre) and patient capital are both significantly positive at the level of 1%.

Table 5. Robustness test

	(1)	(2)	(3)	(4)	(5)
	Lagged one period		Substitution variable	Changing the sample interval	
	Debt	INVH	INVH1	Debt	INVH
Lentre1	0.0009***	0.0006**			
	(3.187)	(2.482)			
Entre			0.0032***	0.0015***	0.0012***
			(3.061)	(5.128)	(4.421)
Size	0.0120***	0.0297***	0.1021***	0.0118***	0.0233***
	(3.625)	(8.355)	(7.589)	(3.784)	(7.104)
Lev	0.2812***	-0.0429***	-0.1016*	0.2640***	-0.0391***
	(18.904)	(-3.330)	(-1.874)	(19.095)	(-3.078)
ROA	0.0676***	0.1581***	0.4015***	0.0314*	0.1893***
	(3.617)	(8.013)	(5.007)	(1.649)	(8.898)
Top1	0.0436*	0.4768**	1.6428**	0.0544**	0.4823**
	(1.821)	(14.882)	(11.137)	(2.472)	(15.325)
ListAge	0.0347***	-0.0095	-0.5696***	0.0298***	-0.0156***
	(4.441)	(-1.266)	(-18.615)	(5.752)	(-2.986)
Mfee	0.1096***	-0.0290	-0.1677	0.1160***	-0.0261
	(3.434)	(-1.001)	(-1.612)	(3.827)	(-0.966)
Big4	0.0052	0.0217*	0.0587	0.0058	0.0275**
	(0.435)	(1.866)	(0.880)	(0.508)	(2.119)
_cons	-0.2240***	0.0518	0.4682***	-0.2317***	0.0874***
	(-6.892)	(1.438)	(3.188)	(-8.371)	(2.923)
ID	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
N	24664	24664	29023	26048	26048
F	62.9858	59.6215	106.3959	74.3686	70.2957
r2_a	0.6250	0.8835	0.5325	0.6074	0.8711

4.4.4. Propensity Score Matching

In order to reduce the sample self-selection problem caused by company differences, the median of entrepreneurship is taken as the standard, and the entrepreneurship higher than the median of the sample is defined as the experimental group. The specific measurement methods

of covariates are shown in Table 1. Then, one-to-one nearest neighbor and no return matching was performed for PSM matching, and the average treatment effect and balance test after matching were passed. The results are shown in Table 6. The regression coefficient between entrepreneurship(Entre)and patient capital(Debt)is 0.0014 at the level of 1%, and the regression coefficient between Entre and patient capital(INVH)is 0.0014 at the level of 1%, and the results are still robust after PSM.

Table 6. Propensity score matching

	(1)	(2)
	Debt	INVH
Entre	0.0014***	0.0014***
	(3.964)	(4.659)
Size	0.0103***	0.0200***
	(2.610)	(4.958)
Lev	0.2914***	-0.0404***
	(17.457)	(-2.658)
ROA	0.0568**	0.1653***
	(2.310)	(6.632)
Top1	0.0505*	0.4876***
	(1.766)	(13.180)
ListAge	0.0302***	-0.0152**
	(4.760)	(-2.307)
Mfee	0.1659***	-0.0513
	(4.245)	(-1.519)
Big4	0.0045	0.0382**
	(0.311)	(2.386)
_cons	-0.2339***	0.0956**
	(-6.514)	(2.546)
ID	Yes	Yes
Year	Yes	Yes
N	14660	14660
F	56.4307	46.5981
r2_a	0.6039	0.8759

4.5. Heterogeneity Analysis

The entrepreneurship of state-owned enterprises is subject to the constraints of salary incentive, tenure assessment and other systems. The investment of patient capital needs to balance short-term performance indicators and long-term technology incubation, and major innovation projects often need to support special authorization mechanism. In contrast, non-state-owned enterprises have a more flexible development mechanism, and entrepreneurship emphasizes more risk taking and market acumen. It can adjust capital allocation quickly in response to market demand, and it is easier to form a profit-oriented patient capital cultivation mode. Therefore, this paper holds that the impact of entrepreneurship in non-state-owned enterprises on patient capital is more significant than that in state-owned enterprises. Based on this, the samples are divided into state-owned enterprises and non-state-owned enterprises and regression is conducted. In the non-state-owned enterprise samples, the regression coefficients of Entre are 0.0014 and 0.0012 respectively, and both are significantly positive at the level of 1%. In the state-owned enterprise samples, the regression coefficients of Entre are 0.0012 and 0.0007 respectively, and both are significantly positive at the level of 5%. It shows

that the role of entrepreneurship in promoting patient capital is more obvious in non-state-owned enterprises. At the same time, the empirical p values are all 0.000, indicating that the coefficient of Entre is significantly different between the two groups.

Table 7. Heterogeneity analysis

	(1)	(2)	(3)	(4)
	Non-state-owned	State-owned	Non-state-owned	State-owned
	Debt	Debt	INVH	INVH
Entre	0.0014***	0.0010**	0.0012***	0.0007**
	(4.388)	(2.349)	(3.823)	(2.288)
Size	0.0172***	0.0012	0.0295***	0.0153***
	(4.873)	(0.213)	(6.515)	(3.480)
Lev	0.2929***	0.2353***	-0.0402**	-0.0412**
	(17.042)	(10.304)	(-2.514)	(-2.147)
ROA	0.0614***	-0.0012	0.1758***	0.1471***
	(3.098)	(-0.032)	(7.389)	(4.386)
Top1	0.0336	0.0836**	0.5277***	0.4200***
	(1.256)	(2.336)	(11.555)	(10.553)
ListAge	0.0327***	0.0117	-0.0160**	-0.0193*
	(4.835)	(1.172)	(-2.397)	(-1.798)
Mfee	0.1135***	0.1205*	0.0184	-0.1047***
	(3.680)	(1.892)	(0.515)	(-2.797)
Big4	0.0255	-0.0156	0.0568***	-0.0010
	(1.456)	(-1.126)	(2.664)	(-0.080)
_cons	-0.2841***	-0.0733	-0.0426	0.3133***
	(-9.397)	(-1.317)	(-1.102)	(6.707)
ID	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
N	18109	10914	18109	10914
F	60.2409	18.3491	45.7350	23.5981
r2_a	0.5080	0.6947	0.8630	0.8339
P-value	0.000		0.000	

Note: (1)* represents $p < 0.1$, ** represents $p < 0.05$, and *** represents $p < 0.01$. (2) The empirical p-value is used to test the significance of the difference in the coefficient of entrepreneurship (Entre) among different groups, which is obtained by bootstrap 1000 times.

5. Conclusion and Implications

Based on the sample of China's A-share listed companies from 2010 to 2022, this paper explores the impact of entrepreneurship on patient capital from the perspective of entrepreneurship. Based on the research of this paper, we get the following enlightenment: first, we should attach importance to and cultivate entrepreneurship with Chinese characteristics, establish a rapid response mechanism for enterprising disputes, protect the legitimate rights and interests of entrepreneurs, enhance investment confidence, and continuously stimulate entrepreneurship and innovation. Second, patient capital is an important long-term driving force for the development of enterprises. The government should combine the allocation of patient capital with the national strategy of major scientific and technological breakthroughs and regional coordinated development, improve the scale and efficiency of patient capital, and accelerate the process of scientific and technological innovation and industrial upgrading while

ensuring the security of capital. Third, in cultivating patient capital, state-owned enterprises need to set up scientific and technological innovation risk compensation funds together with local governments to cover the early trial and error costs of frontier technology exploration, optimize the reform of mixed ownership, break through the constraints of short-term returns, and realize the long-term returns of patient capital while ensuring the security of capital.

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