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Patient Capital and Maturity Mismatch of Investment and Financing: Synergistic Effect of Financial Slack

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Abstract: *Analyzing panel data from China's A-share listed enterprises (2007-2023), this paper examines how patient capital influences maturity mismatch of investment and financing of enterprises, while investigating its mechanism. The results indicate that patient capital significantly mitigates the severity of maturity mismatch of enterprises. Furthermore, financial slack demonstrates a synergistic interplay with patient capital, amplifying its mitigating effect on such mismatch. These findings provide empirical evidence for the economic consequences of patient capital enrichment, and also provide a new solution to the problem of maturity mismatch of investment and financing of enterprises.*

Keywords: *Patient Capital; Maturity Mismatch of Investment and Financing; Financial Slack; Capital Market*

1. Introduction

The maturity mismatch of investment and financing is a global challenge to financial stability, as well as a manifestation of the pronounced short-term orientation in global capital markets. The structural imbalance between short-term debt and long-term assets exacerbates corporate liquidity risks. Take China's listed firms as an example: The Securities Association of China's 2023 report reveals that the current liability ratio of A-share listed companies reached 78%, significantly exceeding the OECD average of 55%. This gap is particularly prominent in advanced manufacturing, real estate and other asset industries. While existing studies have explored tools such as debt rollovers and asset securitization to mitigate maturity mismatch of investment and financing of enterprises (DUCHIN et al., 2017)[1], preference for short-term debt instruments fails to resolve the structural contradiction of insufficient long-term capital supply. Patient capital, as a long-term and stable funding source, inherently aligns with addressing corporate investment-financing maturity mismatch. Therefore, prioritizing long-term-oriented patient capital is critical to addressing this challenge. Patient capital reduces firms' dependence on external short-term financing. Furthermore, equity-based patient capital—characterized by long-term ownership and active governance—provides a direct solution to such maturity mismatch. However, the long-term nature of capital is only a necessary condition; its sufficiency requires synergies with firms' internal resource endowments. Financial slack, as an internal resource, not only cushions short-term debt repayment pressures but also amplifies the practical efficacy of patient capital through resource complementarity and signaling mechanisms. Using a corporate dataset spanning China's A-share market (2007-2023), this research probes two critical questions concerning capital market: First, to empirically establish the relationship between patient capital and investment-financing maturity mismatch of investment and financing of enterprises. Second, to clarify the synergistic role of financial slack in moderating this relationship. Results demonstrate that patient capital effectively alleviates maturity mismatch, while its interaction with financial slack further enhances this mitigating effect.

Compared to prior studies, this paper's marginal contributions lie in two aspects: (1) Theoretically, it innovatively integrates patient capital with financial slack under the maturity mismatch framework, analyzing corporate investing and financing behavior through a dynamic internal-external interaction lens. (2) Empirically, while existing studies focus on patient capital's links to innovation and firm performance, this research expands its economic consequences, providing evidence to refine the theoretical foundations of patient capital.

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2. Literature Review

From an investor perspective, providers of patient capital seek targeted returns from long-term investments and maintain their positions during adverse short-term conditions (Deeg & Hardie, 2016)[2], exhibiting characteristics of prolonged holding periods and elevated risk tolerance. In terms of investment performance, patient long-term strategies frequently deliver returns exceeding market averages (Cremers & Pareek, 2016)[3]. For corporates, existing research predominantly focuses on how patient capital's resource effects influence non-financial dimensions to ultimately enhance corporate performance. For instance, in the AI era, patient capital provides dedicated funding for frontier technology research, amplifies innovation investment, elevates risk tolerance for experimental initiatives, thereby strengthening innovation capabilities and ultimately improving corporate performance (Fu, 2024)[4].

The drivers of corporate maturity mismatch of investment and financing stem from the interplay between external macroeconomic pressures and internal micro-level decision-making biases. Externally, the short-term orientation of global capital markets coupled with China's economic policy uncertainty has led to constrained capital supply, limiting firms' access to sufficient discretionary cash flows (Valencia, 2017)[5]; internally, managerial characteristics drive aggressive financing strategies and investment choices, precipitating maturity mismatch dilemmas (Valencia, 2017)[6].

Financial slack refers to discretionary resources retained after meeting essential obligations, which managers can rapidly redeploy to achieve strategic objectives (Teirlinck, 2020)[7]. Scholarly understanding of financial slack has evolved from defensive to synergistic paradigms: Initially, it was viewed as a buffer against external shocks and crisis events (Guo et al., 2020)[8]; subsequently, financial slack is recognized as an innovation-enabling resource that signals organizational resilience and supports strategic experimentation (Zhang & Guan, 2018)[9].

This paper examines how patient capital optimizes corporate financial structures, thereby extending research on its economic consequences and solutions for maturity mismatch of investment and financing, while investigating the synergistic role of financial slack in this process.

3. Theoretical Analysis and Research Hypothesis

3.1 Patient Capital and the Maturity Mismatch of Investment and Financing of Enterprises

The maturity matching theory posits that aligning the maturities of corporate assets and liabilities is essential for sustaining stable business operations (Zhou et al., 2024)[10]. Patient capital injects external long-term funding, which secures durable financing, mitigates reliance on short-term debt, thereby reducing refinancing volatility and suppressing liquidity risks—critical safeguards against unexpected capital needs. Concurrently, long-term investors' strategic interests align with corporate sustainability, driving active oversight of managerial decisions. This governance mechanism deters short-sighted behaviors and intrinsically lowers the likelihood of investment-financing maturity mismatch (Harford et al., 2018)[11]. Collectively, patient capital demonstrates multifaceted benefits: stabilizing capital structures, de-risking financial strategies, and optimizing governance frameworks. Based on this rationale, this paper formulates Hypothesis H1.

H1: Patient capital can effectively mitigate the maturity mismatch of investment and financing of enterprises.

3.2 Patient Capital, Financial Slack and the Maturity Mismatch of Investment and Financing of Enterprises

Under the paradigm of liquidity management, patient capital delivers stable, long-term funding that enables firms to optimize capital structure allocation and mitigate maturity mismatch of investment and financing. Meanwhile, financial slack leverages its operational flexibility to amplify the efficacy of patient capital through resource buffering effects (Guo et al., 2020)[8] and signaling mechanisms (Connelly et al., 2011)[12]. Concretely, this synergy manifests in three dimensions: First and absolutely, financial slack mitigates short-term debt servicing pressures. Furthermore, in volatile markets, the coexistence of substantial financial slack and patient capital creates dual safeguards, allowing firms to dynamically adjust investing and financing strategies in response to internal resource fluctuations and external investment cycles—a hallmark of strategic flexibility. Notably, patient capital's extended

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financing horizons reduce refinancing frequency, while diminished liquidity constraints facilitate slack accumulation, establishing a virtuous cycle between slack resources and long-term capital. Finally, abundant financial slack signals financial soundness to external stakeholders, mitigates information asymmetry, and attracts incremental patient capital inflows. Collectively, financial slack and patient capital exhibit mutually reinforcing interactions that systematically resolve maturity mismatch of investment and financing of enterprises. Consequently, this paper formulates Hypothesis H2.

H2: Financial slack plays a synergistic role in patient capital to mitigate the maturity mismatch of investment and financing.

4. Research Design

4.1. Data Sources and Sample Selection

Focusing on China's A-share market constituents, this investigation encompasses corporate data spanning 2007-2023, and preprocesses the original data as follows: (1) Exclude the samples of financial companies; (2) Removing enterprises with special treatment designations (ST/*ST/PT) indicating financial distress; (3) Omit observations containing critical variable deficiencies through listwise deletion (4) Implementing “Winsorize” technique at 1% thresholds to mitigate extreme value distortions. The data sources of this paper mainly include CSMAR database and annual report information disclosed by listed companies.

4.2. Variable Definition

4.2.1. Dependent Variable

Maturity Mismatch of Investment and Financing (abbreviated to MMIF in chapter four and five). Building upon established methodologies (Song et al., 2024)[13], our empirical framework operationalizes the maturity mismatch indicator (MMIF) through this computational formula: "[Fixed asset investment outflows - (current increase of long-term loans + current increase of equity + net cash flow of operating activities + cash inflow of selling fixed assets)] / total assets of the previous period" and uses "short finance and long investment" to measure the MMIF of enterprises.

4.2.2. Independent Variable

Patient Capital (abbreviated to PC in chapter four and five). Referring to the research of existing scholars (Yan & Zhang, 2009)[14](Kim et al., 2019)[15], the investment term is measured by the turnover rate of investors, and institutional investors are divided into three groups according to the turnover rate. Considering the right-skewness of the data, this paper adds 1 to take the natural logarithm.

4.2.3. Moderating Variable

Financial Slack. According to the existing scholars' research (LINS et al., 2017)[16](Altman, 1968)[17], this paper further uses quick ratio (Quick) and Z-Score (ZScore) to measure the financial slack of enterprises. Empirical evidence suggests that enterprises with high liquidity demonstrate greater operational resilience through strategic deployment of financial slack. The higher the quick ratio is, the more assets the enterprise can realize and the more abundant the financial resources at its disposal. Meanwhile, the higher the Z-Score is, the better the enterprise's financial and operational situation is, and the stronger the ability to resist risks is, which can also be used as a proxy variable for financial slack. Model (1) is the calculation method of Z-Score, where X_1= Operating Capital/Total Assets, X_2 = Retained Earnings/Total Assets, X_3 = EBIT/Total Assets, X_4 = Market Value of Equity/Carrying Value of Total Liabilities, X_5 = Operating Income/Total Assets.

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5 \quad (1)$$

4.2.4. Control Variable

Following extant studies, we select the following control variables: Age of Listing (age) is operationalized as the logarithmically transformed duration since a firm's initial public offering; Enterprise Property (soe) is represented by the dummy variable of whether the enterprise is state-owned or not; Independent Director Ratio (inddirect) calculates the proportion of independent directors within total board membership; Supervisory Board Size (supervisor) applies logarithmic transformation to the count of supervisors; Leadership Duality (dual) is operationalized as a dichotomous measure (1 =

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chairman-CEO overlap, 0 = separation); Equity Balance (balance) derives from aggregating shares held by 2nd-5th largest shareholders relative to the top shareholder's stake; Capital Occupied by Major Shareholders (occupy) is calculated by dividing net other receivables by total assets. The list of definitions of variables is shown in Table 1.

4.3. Model Setting

In order to investigate the relationship between PC and the MMIFS of coporates, we establish the empirical model shown in Model (2).

$$MMIF_{i,t} = \alpha_0 + \alpha_1 PC_{i,t} + \alpha_2 Controls + \sum ID + \sum YEAR + \varepsilon_{i,t} \quad (2)$$

Where $MMIF_{i,t}$ represents the level of investment and financing maturity mismatch of enterprise i at the end of the year of t, $PC_{i,t}$ represents the patient capital level of enterprise i at the end of the year of t, and $Controls_{i,t}$ represents a set of control variables. $\sum ID$ and $\sum YEAR$ denote firm individual fixed effects and year fixed effects. $\varepsilon_{i,t}$ is the error term. Whether PC can mitigate the MMFI of enterprises depends on whether the coefficient of α_1 is negative. To address potential biases from heteroscedasticity, all empirical models employ clustered standard errors at the firm level.

Table 1: Definition of Variable List

Variable Categories	Variable Name	Symbol	Variable Definition
Dependent Variable	Maturity Mismatch of Investment and Financing	MMIF	Please See Above
Independent Variable	Patient Capital	PC	The natural logarithm of long-term institutional investors plus one
Moderating Variable	Financial Slack	Quick	Ratio of quick assets to current liabilities
		ZScore	Altman Z-Score Model
Control Variable	Age of Listing	age	ln (Current year - Listing year +1)
	Enterprise Property	soe	1=state-owned enterprise, 0=non-state owned enterprise
	Proportion of Independent Directors	inddirect	Ratio of the number of independent directors to the size of directors
	Supervisory Board Size	supervisor	ln(the number of supervisor)
	Leadership Duality	dual	1=chairman-CEO overlap, 0=separation
	Equity Balance	balance	Proportional representation of non-controlling blockholders (positions 2-5) versus dominant equity holder
	Capital Occupation of Major Shareholders	occupy	Ratio of net other receivables to total assets

5. Empirical Results

5.1. Descriptive Statistic

Table 2 Descriptive Statistic Analysis

VarName	Obs	Mean	SD	Min	Median	Max
MMIF	36046	-0.1110	0.2077	-1.1263	-0.0750	0.2558
PC	36046	1.8906	1.4889	0.0000	1.6735	4.4020
Quick	36046	1.5283	1.8063	0.1059	0.9598	11.4726
ZScore	36046	4.7226	5.3178	0.1222	3.0543	34.3607
age	36046	2.1642	0.7978	0.0000	2.3026	3.3673
soe	36046	0.4022	0.4903	0.0000	0.0000	1.0000
inddirect	36046	37.4066	5.2362	33.3300	33.3300	57.1400
supervisor	36046	1.2383	0.2454	1.0986	1.0986	1.9459
dual	36046	0.2641	0.4408	0.0000	0.0000	1.0000
balance	36046	0.6977	0.5848	0.0266	0.5351	2.6880
occupy	36046	0.0144	0.0213	0.0001	0.0069	0.1289

The distributional characteristics of key variables are systematically summarized in Table 2. MMIF exhibits a mean value of −0.1110 (median = −0.0750, max = 0.2558), which are basically consistent with existing studies. This empirically validates the existence of loan-investment term mismatches within

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China's listed corporates. The median of PC is 1.6735, which is lower than the average of 1.8906, and is 4.3306 and 16.6445 respectively before the natural logarithm transformation, indicating the right-skewed characteristics of the shareholding data of long-term institutional investors, and the shareholding proportion of long-term institutional investors in most enterprises is relatively low. The mean of the quick ratio is 1.5283, which is normal. The descriptive statistical results of the remaining variables are basically consistent with the existing research.

5.2. Benchmark Regression Analysis

The benchmark regression outcomes are systematically displayed in Table 3. Column (1) demonstrates the baseline estimates excluding both fixed effects and control variables, while Column (2) incorporates dual fixed effects at both firm and year levels, with Column (3) progressively introducing control variables while maintaining the fixed effects framework. The benchmark estimates show a pronounced negative association (coefficient of PC is -0.0036 and significant at 1% level), which preliminarily indicates that H1 is valid. This demonstrates that the sustained capital infusion stemming from PC, coupled with the governance oversight effects derived from long-term investors, mitigates MMIF of enterprises.

Table 3 Benchmark Regression Results

	(1)	(2)	(3)
	MMIF		
PC	-0.0054***	-0.0034***	-0.0036***
	(0.0007)	(0.0009)	(0.0009)
age			0.0516***
			(0.0068)
soe			0.0209**
			(0.0087)
inddirect			-0.0000
			(0.0004)
supervisor			0.0271**
			(0.0130)
dual			0.0043
			(0.0045)
balance			-0.0383***
			(0.0047)
occupy			0.6149***
			(0.0797)
Constant	-0.1007***	-0.1045***	-0.2409***
	(0.0019)	(0.0017)	(0.0267)
ID	No	Yes	Yes
YEAR	No	Yes	Yes
N	36046	36046	36046
R^2	0.0015	0.1864	0.1962
Adj.R^2	0.0015	0.0859	0.0967

Note: Standard errors in parentheses. ***, **, * Indicates significance at the 1%, 5%, 10% level, same as below.

5.3. Robust Tests

5.3.1. Replace Independent Variable

According to the existing research of scholars (David et al., 2008)[18], we use relational debt (Debt) as an alternative measure of patient capital to represent long-term capital relations. Specifically, the proportion of relational debt = total long-term bank loans / (bank loans + bonds payable + notes payable). Column (1) of Table 4 documents a statistically significant Debt coefficient of −0.0572 ($p<0.01$). Notably, this empirical confirmation of Hypothesis 1 underscores the methodological soundness of our analytical framework.

5.3.2. Higher Dimensional Fixed Effect

In order to avoid the influence of many common ingredients on the research results of enterprises in the same industry, this paper further controls the industry fixed effect for regression on the basis of Model (2), so as to separate these common factors from the error term and avoid the estimation bias caused by

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ignoring the industry factors. Column (2) of Table 4 indicates that the coefficient of PC remains consistent with the benchmark regression and is significant at the 1% level, which further substantiates the robustness of our findings.

5.3.3. Exclude Samples from Special Periods

The COVID-19 pandemic dealt a significant blow to corporate operations in early 2020.The choice of institutional investors and the investment and financing decisions of enterprises may be affected by force majeure to varying degrees. Therefore, the samples in 2020 and 2021 are excluded here to ensure the robustness of the conclusions. Column (3) of Table 4 shows that the coefficient of the core variable is − 0.0053, which is significant at the level of 1%, and the empirical results are still robust.

5.3.4. Double Debiased Machine Learning

In order to mitigate the problem of biased estimation caused by limited control variables, gain insight into the nonlinear relationship of control variables, and finally obtain an unbiased and robust estimator, this paper adopts the methodologies established by previous scholars (Chernozhukov et al., 2018)[19] and uses Double Debiased Machine Learning Regression to conduct robustness test. In Models (3) and (4), $Y_{i,t}$ is MMIF, $D_{i,t}$ is PC, $X_{i,t}$ is the set of control variables, and $U_{i,t}$ is the error term. The conditional mean is zero. The disposal variable estimator θ_0 is obtained by using machine learning algorithm estimation.

$$Y_{i,t} = \theta_0 D_{i,t} + g(X_{i,t}) + U_{i,t} \tag{3}$$

$$E(U_{i,t} \mid D_{i,t}, X_{i,t}) = 0 \tag{4}$$

In this paper, the sample split ratio of 1:4 is adopted, the machine learning method of Lasso regression is adopted, and the quadratic term of control variables is further incorporated into the model on the basis of including control variables into the model. As documented in Table 4's Column (4), the coefficient of PC is −0.0046, persisting with 1% statistical precision ($p<0.01$). This empirical result strongly corroborates the theoretical predictions established in prior literature.

5.3.5. Propensity Score Matching

To address potential selection bias, we implement a propensity score matching (PSM) methodology. The analytical protocol stratifies the sample cohort based on PC median values, followed by nearest-neighbor matching employing a 0.05 caliper width. As evidenced in Table4 (5)-(6), both 1:1 and 1:2 matching configurations yield statistically significant PC coefficients (-0.0027, $p<0.05$; -0.0032, $p<0.01$), demonstrating robust estimator consistency.

Table 4 Robust Test Results

	(1)	(2)	(3)	(4)	(5)	(6)
	MMIF					
PC		-0.0036***	-0.0053***	-0.0046***	-0.0027**	-0.0032***
		(0.0009)	(0.0010)	(0.0009)	(0.0012)	(0.0010)
Debt	-0.0572***					
	(0.0119)					
CV	Yes	Yes	Yes	Yes	Yes	Yes
CV^2	No	No	No	Yes	No	No
Constant	-0.2442***	-0.2409***	-0.2106***	-	-0.2137***	-0.2083***
	(0.0267)	(0.0267)	(0.0287)	-	(0.0377)	(0.0309)
ID	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY	No	Yes	No	No	No	No
N	36046	36046	29836	36046	18454	26668
R^2	0.1967	0.1962	0.2051	-	0.2945	0.2325
Adj.R^2	0.0972	0.0946	0.0833	-	0.1160	0.1027

5.4. Moderating Effect Analysis

The above analysis shows that PC can effectively mitigate the MMIF of corporates. The moderating effect analysis will verify that PC can better mitigate the MMIF when there is sufficient financial slack.

$$MMIF_{i,t} = \beta_0 + \beta_1 PC_{i,t} + \beta_3 Moderator_{i,t} + \beta_4 D \times M_{i,t} + \beta_5 Controls + \sum ID + \sum YEAR + \varepsilon_{i,t} \tag{5}$$

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In Model (5), if the coefficient of core explanatory variable β_1 and the coefficient of interaction term β_4 are both significantly negative, it indicates that financial slack has a synergistic effect when PC mitigates the MMIF of enterprises.

Table 5 presents the results of the moderating effect described in Model (5). Using Quick ratio (Quick) and Z-Score (ZScore) as the proxy variables of financial laxity, the coefficients of the interaction term are −0.0015 and −0.0005 respectively, both of which are significant at the level of 5%. In addition, the coefficients of PC are both significant at the 1% level, so H2 is confirmed. These findings reveal that financial slack exhibits a synergistic role in amplifying the mitigating effects of PC on MMIF of corporates. The complementary interplay between financial slack and PC enhances strategic coherence in corporate financing decisions, enabling proactive debt maturity alignment rather than merely reactive liquidity preservation. Furthermore, robust financial slack signals operational stability to external stakeholders, attracting incremental patient capital investments and fostering a self-reinforcing cycle.

Table 5: Moderating Effect Results

	(1)	(2)
	MMIF	
PC	-0.0039***	-0.0038***
	(0.0009)	(0.0009)
Quick	-0.0179***	
	(0.0017)	
PC*Quick	-0.0015**	
	(0.0006)	
ZScore		-0.0038***
		(0.0005)
PC*ZScore		-0.0005**
		(0.0002)
CV	Yes	Yes
Constant	-0.1991***	-0.2452***
	(0.0266)	(0.0266)
ID	Yes	Yes
YEAR	Yes	Yes
N	36046	36046
R^2	0.2035	0.1994
Adj.R^2	0.1048	0.1002

6. Conclusions and Policy Implications

6.1. Conclusions

This study leverages panel data from Chinese A-share listed companies (2007–2023) to investigate the mechanisms through which patient capital influences corporate maturity mismatch of investment and financing. Our analysis reveals a pronounced dampening effect of patient capital on maturity mismatch of investment and financing of enterprises. Furthermore, moderating effect analyses confirm that financial slack amplifies the mitigating impact of patient capital on such mismatch. Notably, the core findings withstand multiple robustness checks, reinforcing their empirical validity.

6.2. Policy Implications

Policy implications emerge in two dimensions: First, governments should expand and institutionalize patient capital by incentivizing long-term investors (e.g., pension funds, insurers, family offices) through tax advantages and regulatory mandates, thereby stabilizing patient capital supply. Concurrently, policymakers should enhance legal protections for long-horizon investment vehicles and prioritize fintech-enabled financial infrastructure development to systematically address maturity mismatch of investment and financing.

Second, corporates must adopt strategic management of financial slack by dynamically calibrating reserve levels based on operational needs and strategic priorities, supported by rigorous monitoring systems. Additionally, firms should forge strategic alliances with patient capital providers to leverage their resource advantages, thereby optimizing capital structure alignment and mitigating maturity mismatch risks.

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