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IMPACT OF DEBT MATURITY AND CASH HOLDING ON INVESTMENT DECISIONS IN VIETNAMESE COMPANIES

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ABSTRACT

The study used data from 520 listed firms between 2004 and 2020 to ascertain the relationship between debt maturity, cash holding, and investment decisions in Vietnamese enterprises. The use of more conservative tactics results from the rise in agency costs. Increased cash holding encouraged businesses to employ internal resources to reduce external financing risks, favorably impacting investment decisions. The negative link between investment decisions and intangible assets indicates increased external funding costs. A high tax shield benefited the investment since it freed up financial flows for productive assets. The robustness test revealed that cash holding positively corresponds with investment decisions in consumer and technology enterprises and that technology firms are incredibly responsive to changes in debt maturity.

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1. Introduction

Modern corporate finance acknowledges that company financial and investment policies are interrelated and contingent on business growth prospects. Myers (1977) shows that investors without growth opportunities may not be able to make positive NPVs because there is an information imbalance between shareholders and debtors, which leads to underinvestment problems if the repayment of such projects is only beneficial to debtors. Jensen & Meckling (1986) demonstrated that managers of companies with restricted growth prospects and surplus cash tend to expand their companies beyond the scale, resulting in issues of overinvestment. Dang (2011) recommends increasing leverage as a disciplinary tool to mitigate over-investment problems. Corporate financial policies are influenced by information asymmetry and agency conflicts, which are determined by corporate cash holding, debt levels, and debt maturity structures about corporate investment policies. Almeida et al. (2004) find a positive relationship between cash holding and capital expenditure, suggesting companies with more cash holding are more likely to invest in long-term projects. Opel et al. (1999) also found that companies with more cash holdings allocate more funds towards research and development.

Corporate financing policy encompasses crucial components such as debt level, debt maturity, and cash holding. Recent studies have primarily examined the two aspects of leverage and debt maturity in a company's capital structure, with less emphasis on how these financial decisions relate to a company's cash holding. Acharya et al. (2007) emphasize that overlooking the interrelationship between cash and debt policies can result in inaccurate conclusions. They argue that companies' cash holdings are influenced by their debt levels (excess of debt issuance) and cash flows (retaining cash from their cash flows). Furthermore, changes in leverage also affect cash balance and cash flow alterations. Duong et al. (2020) argue that the rise in cash assets is not a result of decreased company investment but is particularly noticeable in firms dealing with financial constraints or significant exposure to political uncertainty.

A study by Nguyen (2022) points out the foundation for understanding Vietnam's debt maturity and cash holdings. However, this study is only a first step, and there are still many aspects that need additional investigation. Vietnam is in the process of economic integration and development. The financial market is not fully developed and still has many limitations. Therefore, the debt term structure of listed companies in Vietnam becomes more complicated. Due to the imperfection of the debt market, the term structure of debt will have a certain impact on businesses' investment decisions. Cash is also the most liquid form of asset in a business, consisting of cash and equivalents plus short-term investments. Cash is often used for daily transactions, unexpected investment opportunities, due payables, or precautionary motives. In Vietnam, studies on the effects of debt maturity structure and holding cash on business investment decisions are still limited. Research on the influence of debt maturity and cash holdings on investment decisions can provide valuable insights for scholars and the financial sector, offering strategies for data-driven company managers and assisting investors in understanding the factors that influence a company's risk profile and financial health. It can assist market managers in creating customized strategies to take advantage of industry-specific opportunities, potentially leading to beneficial changes in Vietnam's financial sector. That is the reason why the author chose the topic of the impact of debt maturity and cash holdings on the investment decisions of businesses as the main topic of the research.

2. Literature review and hypothesis development

Investment decisions

According to Virlics (2013), investment is the allocation of capital aimed at bringing business efficiency to the enterprise. In addition, all resources are utilized for investment purposes. Investment decisions significantly impact the operational efficiency of the business (Santoso, 2019). The categories of investment factors, such as cash, physical assets, and human resources, all reflect the investment decisions of the enterprise. At the same time, this is most clearly manifested through the assets invested in, as evidenced by the types of fixed assets and current assets of the company.

The debt maturity structure and business investment decisions

Myers (1977) indicates the impact of debt maturity on corporate investment, noting that high-growth companies with long-term debts may forego profitable projects due to conflicts between debt holders and managers, resulting in underinvestment or "debt surpluses." This implies that firms with a higher proportion of long-term leverage are more prone to significant underinvestment issues than those with less short-term debt. Barclay et al. (1995) demonstrate that companies with limited growth options, substantial size, or stringent regulation tend to incorporate more long-term debt into their capital structures. Jensen (1986) suggests that investment decisions within surplus cash holdings, suggesting agency costs, may lead to inadequate or excessive investments, particularly in companies with substantial free cash flows.

In researching Pakistani corporations during economic downturns, Khan et al. (2021) conducted a thorough analysis. They discerned that companies maintaining an optimal blend of short-term and long-term debt demonstrated heightened investment performance. This finding suggests that firms endowed with a flexible and well-balanced debt maturity structure are more adept at navigating economic uncertainties and capitalizing on investment opportunities, even amidst challenging market conditions. The capacity to adapt the debt maturity composition following evolving economic circumstances equips these companies to make reasonable investment decisions, fostering resilience during downturns. This aligns with Myers' (1977) assertion on the significance of debt maturity in corporate investment, as flexibility in debt structures emerges as a strategic advantage in the face of economic fluctuations.

In contrast to Myers (1977), Diamond and He (2014) identify that emphasizing short-term debt could potentially contribute to future issues related to debt overload. Do and Phan (2022) point out that businesses with higher long-term debt ratios tend to engage in more substantial capital expenditures and long-term project investments. They argue that long-term debt provides reliable funding, mitigating short-term borrowing risks and enabling businesses to pursue extended investment objectives. According to their research, a company's capacity to undertake longer-term initiatives can be enhanced by maintaining a more substantial proportion of long-term debt, potentially leading to future growth and increased competitiveness.

The agency theory of Jensen and Meckling (1986) explains why firms avoid external financing when faced with higher interest costs. Conflicts of interest among managers, creditors, and shareholders can lead to increased external financing costs. Debt is a company's primary external financing channel, allowing creditors to earn interest and principal payments upon maturity. If payments are not made on time, liquid assets will be sold to raise funds. To protect creditors' interests, debt covenants

are created to pay higher interest rates and limit loan size. Barnea et al. (1980) argue that choosing a reasonable debt term for investment projects will minimize conflicts between shareholders and bondholders. Terra (2011) argues that small businesses often use more short-term debt, increasing agency costs and disputes between managers and shareholders.

The impact of cash holding on business investment decisions

Previous perspectives only viewed a company's cash holdings as a substitute for financial constraints, while new perspectives see cash playing a more important role in risk prevention and investment choices. Cash holding had a notable influence on investment choices as excess cash held by enterprises can cause agency problems and ultimately lead to the inefficiency of cash use, contributing to investment inefficiency Biddle et al. (2009). A study by Sheu and Lee (2012) shows that while the accumulation of excess cash can help financially strapped companies, it can also hurt shareholder interests by promoting disproportionate investment in business expansion, especially when those companies face stringent regulatory problems. This can pose risks for businesses that need help managing their finances effectively, especially when seeking high-cost external capital. Ozkan (2004) argues that holding cash is crucial in stimulating growth. Therefore, businesses need to determine the optimal level of cash holding, as excess cash reserves may lead to underutilization or investment in less profitable projects, resulting in reduced asset returns.

On the other hand, cash shortages can hinder companies from seizing good investment opportunities. Lei et al. (2021) demonstrated that preserving a higher cash supply increased financial flexibility for enterprises and reduced dependence on outside funding during investment opportunities or economic recession. Banker et al. (2011) demonstrated that better-positioned firms benefit from strategic investment opportunities, which in turn lead to higher returns, improved performance in the long term, and more cash holding. Furthermore, Carnes et al. (2023) shows that cash-rich companies pursuing profitable investment projects are less likely to encounter financial difficulties. Studies focus on the positive relationship between cash ownership and business investment decisions, helping to improve financial flexibility, reduce external economic dependence, and promote a favorable investment environment.

Other factors impact the investment decisions of enterprises:

Nga et al. (2019) demonstrate a direct correlation between **Leverage** and investment decisions. Leverage enables companies to access more capital and ensures financial resources to execute profitable investment projects. Companies can leverage high-performing projects with existing funds to gain tax advantages over equity funds, thus fostering overall growth. Leverage can help reduce investment bias and agency issues, promoting more conservative investment decisions.

According to (Malmendier & Tate, 2005), **Profitability** impacts business investment decisions in both favorable and unfavorable ways. High profits mean the company has many prospects for expanding its market, developing business strategies, and simultaneously accepting risks. However, too high profits lead to complacency in managers; they will have excessive investment strategies and lead to ignoring strategic business opportunities.

Based on the study of Almeida and Campello (2007), when companies can use their assets as collateral, it leads to a situation where investing and borrowing are interconnected. Tangible assets enable companies to borrow more, allowing for further investment in

tangible assets. This results in an increase in the responsiveness of investment cash flows at the tangible asset level of companies. The tangibility of assets determines whether companies are restricted or unrestricted in credit classification. Research emphasizes the importance of tangibility in corporate investment when facing financial limitations.

Graham's (2000) study showed that **non-debt tax shields** are crucial in positively impacting business investment decisions. Businesses with stronger non-debt tax shields typically exhibit increased investment levels. The inclination to invest is the objective behind tax-favorable endeavors of optimizing profits and reducing tax liabilities, significantly influencing company investment plan development.

Regarding firm size, Titman et al. (2004) illustrate that larger firms, due to their enhanced access to financial resources and economies of scale, can embark on more substantial investment endeavors, reflected in higher capital expenditure levels. Despite these advantages, the larger size of firms may be accompanied by agency problems and bureaucratic constraints, leading to sluggish decision-making processes and the potential for suboptimal investment choices. The research conducted by Ruiz-Porras and Lopez Mateo (2011) supports the positive influence of firm size on business investment decisions. However, Phan and Nguyen (2020) counter this perspective, suggesting that the impact of firm size on capital needs to be stronger and statistically insignificant.

The findings of Jensen (1986) show that excess **free cash flow** within companies tends to prompt management to allocate it towards non-profitable projects, thereby giving rise to agency problems. This surplus cash flow frequently leads to fewer investment choices, as managers may prioritize favoring personal interests above shareholder value and exhibit a lack of prudence in assessing investment opportunities, ultimately resulting in investments that erode shareholder value.

Research Hypothesis

According to Aivazianky's (2005) research, debt maturity and corporate investment are closely interconnected. Shorter debt maturities incur various costs that hinder companies from entirely modifying their debt maturities. Unexpected investment chances and costs associated with adjusting capital structure pose challenges for companies in aligning debt maturity with potential investment opportunities, impacting their overall maturity structure. Companies with larger quantities of long-term debt benefit from predictable and stable debt repayments, which increases their confidence in pursuing long-term investment initiatives. Different debt maturity patterns impact firm investment plans; long-term debt encourages higher investment risk-taking, while short-term debt is a constraint. This is in line with research conducted by Nguyen et al. (2020) and Dang et al. (2018). In this research, the author will examine whether and to what extent the debt maturity factor affects a company's investment decision.

Hypothesis 1: *Debt maturity has a positive relationship with business investment decisions.*

Adu-Ameyaw et al. (2024) indicate that the firm's investment choices are influenced by cash flow. The firm's cash holding significantly influences its investment decisions; companies that want to take advantage of potential investment opportunities and protect uncertain future cash flows will pursue a high cash reserve strategy. Large cash holding helps businesses gain security, confidence, and flexibility to pursue profitable strategies, allowing companies to quickly step in when favorable investment prospects arise (Carnes et al. 2023). Based on the previous study, the following research hypotheses are proposed:

Hypothesis 2: *Cash holding positively influences business investment decisions.*

Besides debt structure and cash holdings, there are other factors that influence investment decisions: leverage, Profitability, Profitability, non-debt tax shields, Firm size, free cash flow.

Nga et al. (2019) demonstrate a direct correlation between **leverage** and investment decisions. Leverage enables companies to access more capital and ensures financial resources to execute profitable investment projects. Companies can leverage high-performing projects with existing funds to gain tax advantages over equity funds, thus fostering overall growth. Leverage can help reduce investment bias and agency issues, promoting more conservative investment decisions.

According to (Malmendier & Tate, 2005), **Profitability** impacts business investment decisions in both favorable and unfavorable ways. High profits mean the company has many prospects for expanding its market, developing business strategies, and simultaneously accepting risks. However, too high profits lead to complacency in managers; they will have excessive investment strategies and lead to ignoring strategic business opportunities. Therefore, there needs to be a balance between profit and investment decisions.

Regarding tangible assets, based on the study of Almeida and Campello (2007). When companies can use their assets as collateral, it leads to a situation where investing and borrowing are interconnected. **C**assets enable companies to borrow more, allowing for further investment in collateralized assets. This results in an increase in the responsiveness of investment cash flows at the tangible asset level of companies. The tangibility of assets determines whether companies are restricted or unrestricted in credit classification. Research emphasizes the importance of tangibility in corporate investment when facing financial limitations. We propose the following research hypotheses:

Graham's (2000) study shows that **non-debt tax shields** are crucial in positively impacting business investment decisions. Businesses with stronger non-debt tax shields typically exhibit increased investment levels. The inclination to invest is the objective behind tax-favorable endeavors of optimizing profits and reducing tax liabilities, significantly influencing company investment plan development.

Larger **firms** typically possess enhanced access to financial resources and economies of scale, facilitating their engagement in more substantial investment projects. This capacity has been substantiated by Titman et al.'s (2004) identification of elevated capital expenditure levels within such entities. Nevertheless, the presumed advantages linked to larger size may encounter challenges stemming from agency problems and bureaucratic constraints. These factors can impede decision-making, leading to slower responses and suboptimal investment decisions. Contrastingly, the study by Ruiz-Porras and Lopez Mateo (2011) indicates a positive influence of firm size on business investment decisions, thereby highlighting a potentially beneficial relationship.

This conclusion challenges prevailing research hypotheses and suggests the need for a nuanced understanding of the interplay between firm size and investment choices in different contexts. The findings of Jensen (1986) show that **free cash flow** tends to prompt management to allocate it towards non-profitable projects, thereby giving rise to agency problems. This surplus cash flow frequently leads to less than ideal investment choices, as managers may prioritize favoring personal interests above shareholder value and exhibit a lack of prudence in assessing investment opportunities, ultimately resulting in investments that erode shareholder value.

3. Research Methodology

The study analyses 520 unbalanced panel data with 5,199 observations from the Hochiminh and Hanoi Stock Exchanges (2004-2020).

Modes

The study uses the approach of Nnadi et al. (2022). The general equation is expressed as follows:

$$IV_{i,t} = \beta_0 + \beta_1 DM_{i,t-1} + \beta_2 CH_{i,t-1} + \beta_3 LV_{i,t-1} + \beta_4 PF_{t,t-1} + \beta_5 TG_{i,t-1} + \beta_6 FC_{t,t-1} + \beta_7 SZ_{t,t-1} + \beta_8 TS_{t,t-1} + \varepsilon_{i,t}$$

Where:

$IV_{i,t}$ represent for investment decisions variable, $DM_{i,t-1}$: Debt maturity structure variable, $CH_{i,t-1}$: Cash holding variable, $LV_{i,t-1}$: Leverage variable, $PF_{t,t-1}$: Profitability variable, $TG_{i,t-1}$: Tangibility variable, $FC_{t,t-1}$: Free cash flow variable, $SZ_{t,t-1}$: Firm size, $TS_{t,t-1}$: Non-debt tax shield variable.

Table 1. Description of the variables

Variable definition	Abbreviation	Calculation	Previous authors
Investment decision	IV	$I_{i,t}/K_{i,t-1}$ I: the net investment of firm I during the period t; K: the lagged Net Fixed Assets	Nguyen et al. (2020)
Debt maturity structure	DM	Long-term debt/(Long-term debt + Short-term debt)	Nguyen et al. (2020)
Cash holding	CH	Total cash and short-term investments / total assets.	Powell (2018)
Leverage	LV	Total debt/ total assets.	Alhassan and Naka (2020)
Profitability	PF	Operating income / total assets.	Malmendier and Tate (2005)
Tangibility	TG	Net property, plant, and equipment all divided / total assets.	Nnadi et al. (2022)
Free cash flow	FC	Operating Cash Flow –Capital Expenditures	Jensen (1986)
Firm size	SZ	Log(Total assets)	Ruiz-Porras and Lopez Mateo (2011)
Non-debt tax shield	TS	Depreciation and amortisation / total assets	Nnadi et al. (2022)

To investigate the impact of each factor on investment decisions, as per the study by Nnadi et al. (2022), the authors implemented various model setups (1) through (9). Model (1) was established with two variables: debt maturity (independent variable) and investment decision (dependent variable). Model (2) was constructed with two variables: cash holdings (independent variable) and investment decision (dependent variable). Model (3) combined both debt maturity and cash holdings as dependent variables and investment decision as the independent variable (Brick & Liao, 2017). To assess the influence of control variables, the authors examined the effects of debt maturity and

cash holdings individually and sequentially introduced each control variable into the model, resulting in models 6, 7, 8, and 9, incorporating all independent and control variables (Nguyen, 2022).

To select the most appropriate model for the study, the study compares three estimations: Pooled OLS, FEM, and REM. In comparison, the F- test is used to choose between OLS and FEM, while the Hausman test selects between FEM and REM, and the Breusch-Pagan test chooses between OLS and REM.

Additionally, to identify violations occurring **in** the model, the study conducts tests as follows:

Multicollinearity test: If the variance inflation factor (VIF) is > 2, there are signs of multicollinearity. If VIF > 10, there is multicollinearity. If VIF <2: no multicollinearity.

Homoskedasticity test: The author uses the Breusch-Pagan test for heteroskedasticity in the OLS multivariate linear regression model. If the p-value <5 %, accepted hypothesis H1, indicating that the variance is not uniform, meaning that the variance changes. If the p-value is greater than 5%, then the variance is considered homogeneous, indicating constant variance.

Autocorrelation test: With the hypothesis H0 stating that there is no autocorrelation, if the value of Prob>chi2 in the Breusch-Godfrey test > 5%, accept the hypothesis H0, indicating that there is no autocorrelation phenomenon.

The feasible generalized least squares regression method is chosen for more accurate results when homogeneity and error independence assumptions are violated in OLS, FEM, or REM models.

Table 2. Model selection result

Test	Result
White	$Chi^2(44) = 157.5$, Prob > $Chi^2 = 0$. The results show that the variance is not uniform, meaning that the variance changes.
Hausman	$Chi^2(8) = 115.3$, Prob > $Chi^2 = 0$. FEM is a suitable option over REM.
Wald	$Chi^2(632) = 7.9e+38$, Prob > $Chi^2 = 0$. The results show that the FEM model is heteroskedasticity.
FGLS regression	To deal with heteroskedasticity and reduce endogeneity. The study uses the FGLS regression.

4. Result

The calculated results are described, especially the basic statistical parameters of the variables and regression model results.

4.1. Descriptive statistics of variables

Table 3 shows the descriptive statistics of the variables used in the study. Specifically, the average number of firm investment decisions and debt maturity structures are 4.091 and 0.265, respectively. Vietnamese companies have a relatively low debt structure in terms of long-term debt utilization. Thus, the debt maturity structure range varies from 0.000 to 1,000. In addition, the average value of CH is 0.115, the average value is 0.077, and the standard deviation is 0.117. In addition, the average values of LV are 0.195 for PF, TG, FC, SZ, and non-debt tax are 0.068, 0.236, 0.031, 1.431, and 27.184, respectively.

Table 3. The statistics of the variables included in the model

Variables	Mean	Median	Max	Min	Std.	Obs
IV	4.091	2.270	1169.422	-1.000	20.905	5,199
DM	0.265	0.119	1.000	0.000	0.310	5,199
CH	0.115	0.077	0.849	0.000	0.117	5,199
LV	0.195	0.183	0.875	-0.583	0.213	5,199
PF	0.068	0.053	0.993	-0.653	0.076	5,199
TG	0.236	0.181	0.966	0.000	0.201	5,199
FV	0.031	0.023	0.326	-0.016	0.032	5,199
SZ	1.431	-0.373	959.461	-455.633	29.649	5,199
TS	27.184	27.112	32.510	22.780	1.466	5,199

4.2. Correlation matrix

Table 4. Correlation matrix

	DM	CH	LV	PF	TG	TS	FC
DM	1						
CH	-0.018	1					
LV	0.105***	-0.520***	1				
PF	0.000	0.332***	-0.405***	1			
TG	0.479***	-0.192***	0.238***	0.003	1		
TS	0.288***	-0.083***	0.097***	0.146***	0.555***	1	
FC	-0.008	0.003	-0.013	0.041**	-0.070***	-0.075***	1
SZ	0.208***	0.086***	0.211***	-0.028**	0.101***	0.007	0.026*

Note: **, **, *** indicate statistical significance 10%, 5% and 1% test levels, respectively.*

Table 4 shows the correlation matrix of eight control variables. DM and CH have distinct effects on other variables. DM has a negative relationship with PROFIT but a positive relationship with LV, TG, TS, FC, and SZ. CH has a positive correlation with PF, FC, and SZ but a negative correlation with LV, TG, and TS. The VIF test results with a VIF coefficient of 1.39 < 2 indicate no autocorrelation in the model.

4.3. Relationship between Cash holding and debt maturity on corporate investment choices

Table 5 shows the outcomes of Feasible Generalised Least Squares regressions for nine models.

Table 5. FGLS regression results

DM	CH	LV	PF	TG	TS	SZ	FC	Constant
-0.794***								2.407***
(0.00)								(0.00)
	2.439***							1.799***
	(0.00)							(0.00)
-1.199***	2.212***							2.125***
(0.00)	(0.00)							(0.00)
-0.971***	1.099***	-0.754***						2.403***
(0.00)	(0.00)	(0.00)						(0.00)
-1.130***	1.188***	-0.66***	1.225***					2.297***
(0.00)	(0.00)	(0.00)	(0.00)					(0.00)
-0.138**	0.235	-0.32***	1.018***	-2.73***				2.865***
(0.01)	(0.16)	(0.00)	(0.00)	(0.00)				(0.00)
0.807***	-0.605**	-0.48***	-1.059***	-8.56***	24.17***			4.447***
(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)			(0.00)
1.193***	0.395	0.337**	-8.50***	-0.66*	22.43***	-0.268***		11.35***
(0.00)	(0.16)	(0.04)	(0.00)	(0.07)	(0.00)	(0.00)		(0.00)
-0.114**	0.96***	0.534***	1.28***	-2.99***	18.18***	-0.031***	-0.003***	2.58***
(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: **, **, *** indicate statistical significance 10%, 5% and 1% test levels, respectively.*

Debt maturity negatively impacts investment decisions in many models, as indicated by an average Beta coefficient of 0.293. This outcome is opposite to hypothesis 1 and the research conducted by Aivazianky (2005). Short-term debt obligations result in multiple expenses that prevent companies from effectively adjusting their debt repayment schedules. Unforeseen investment opportunities and expenses related to modifying the capital structure arise. Firms that heavily depend on short-term debt may experience increased agency costs from frequent debt refinancing, resulting in cautious investment approaches to maintain liquidity and manage debt responsibilities. Struggles to refinance short-term debts in a bearish market may send negative signals to investors, constraining options for future financial strategies and adversely affecting investment choices. The study findings align with Nguyen (2022), emphasizing Vietnam's economic environment, whichis marked by restricted access to various funding channels. This leads to a dependence on bank loans and suboptimal use of long-term debt by companies in Vietnam.

The study shows a significant positive impact of cash holding (CASH) on enterprises' investment decisions, with an average Beta coefficient of 1.58. From the result, the study accepts Hypothesis 2, like Lei et al. (2021). Companies with high cash holding tend to use their internal capital for investment because this financing method is considered the most effective and least detrimental. When there are investment opportunities or economic uncertainties, maintaining high cash holding

helps businesses gain financial flexibility and limit dependence on external resources. That underlines the important role of cash holdings in shaping a company's investment choices.

Maintaining higher cash holdings enhances financial flexibility and reduces dependence on external financing during investment opportunities or economic downturns, emphasizing the pivotal role of cash holdings in shaping a company's financial decisions.

The study reveals a negative relationship between TANG and investment choices, with Beta coefficients of -2.732, -8.560, -0.668, and -2.994, respectively. This result is consistent with the fifth hypothesis and is similar to the study of Almeida and Campello (2007). Firms with higher external financing costs are firms with better intangible assets. The study also indicates a positive relationship between high tax shields and investment choices, as it allows companies to use tax-deductible expenses to lower taxable income, reduce tax obligations, and allocate funds to productive assets to enhance cash flow.

Finally, the research results show a negative impact between company size and free cash flow on investment choices, specifically -0.0268 for SZ and -0.003 for FV, respectively. The findings are consistent with the seventh and eighth hypotheses and perspectives from Phan and Nguyen (2020) and the study by Jensen (1986). Too much free cash flow can cause financial problems if it is used for unprofitable projects or to expand one's empire, leading to less-than-ideal investment choices that prioritize personal gain over shareholder value. Large firms with greater structural intricacy typically decrease investment, while smaller companies are more adept at capitalizing on market opportunities and fostering growth.

The influence of cash holding and debt maturity on investment decisions through firm size

To explore the impact of cash holdings and debt maturity structure on a company's investment decision under the influence of firm size, Cao et al. (2017) demonstrated differences in cash holdings between small and large firms. Their findings underscored the significant influence of firm size in shaping financial approaches and investment behaviors. Therefore, to investigate how firm size affects cash holdings, debt maturity structure, and investment decisions among small and large enterprises in Vietnam, the authors classified the research data into two equally sized groups, representing small and large enterprises.

Table 6. The relationship between cash holding and debt term on investment choices through enterprise size

Factorial	Small enterprise	Big enterprise
DM	1.98***	0.39***
	(0.00)	(0.00)
CH	-0.11	0.072
	(0.77)	(0.82)
LV	2.51***	-0.952***
	(0.00)	(0.00)
TG	-10.39***	-6.777***
	(0.00)	(0.00)

Factorial	Small enterprise	Big enterprise
PF	0.073	0.038
	(0.88)	(0.93)
TS	24.38***	18.027***
	(0.00)	(0.00)
SZ	-0.369***	-0.314***
	(0.00)	(0.00)
FC	-0.009**	-0.272***
	(0.05)	(0.00)
Constant	6.619***	12.603***
	(0.00)	(0.00)
Observations	2,741	2,458

Note: **, ** ,*** indicate statistical significance 10%, 5% and 1% test levels, respectively.*

Table 6 shows a positive relationship between DM and investment decisions for small and big sizes. The Beta of DM for small and large companies are 1.98 and 0.39, respectively. The impact of debt term structure on the investment choices of small companies is about 5.06 times greater than that of large companies. This discovery supports the claims made by Scherr and Hulburt (2001) encountered by smaller enterprises with limited capital market accessibility and stricter financial limitations, causing them to prioritize the temporal aspects and agreements of repayment obligations in their investment choices.

Conversely, larger companies enjoy enhanced financial adaptability and entry to a broader array of sponsorship options, giving them the freedom to invest, and diminishing how their decisions are affected by the structure of debt maturity. However, there is an insignificant relationship between cash holding and investment choices for large and small companies.

The relationship between cash holding and debt term on investment choices through industries.

To delve deeper into examining the influence of cash holdings and debt maturity structure on investment decisions across different industries, the authors will conduct tests across various sectors such as Technology, Oil & Gas, Manufacturing, Healthcare, Consumer Goods, and Basic Materials.

Table 7. Regression results by industries

Fields	Technology	Petroleum and gas	Industrials	Health care	Consumers	Basic materials
DM	-1.987***	-0.433	0.577**	1.044**	0.559***	0.411*
	(0.00)	(0.50)	(0.01)	(0.01)	(0.00)	(0.09)
CH	4.068**	0.804	0.713	-0.121	0.593*	-0.853
	(0.02)	(0.76)	(0.29)	(0.88)	(0.09)	(0.23)
LV	1.99**	-2.501*	1.815***	0.843	-0.035	-1.551***
	(0.02)	(0.09)	(0.00)	(0.15)	(0.87)	(0.00)

Fields	Technology	Petroleum and gas	Industrials	Health care	Consumers	Basic materials
PF	-4.441**	2.700	1.783*	3.305***	1.073**	1.835**
	(0.04)	(0.40)	(0.05)	(0.00)	(0.04)	(0.05)
TG	-8.997***	-3.018**	-7.958***	-10.226***	-7.380***	-7.124***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
TS	13.295	-3.583	17.88***	8.332**	34.82***	26.34***
	(0.10)	(0.50)	(0.00)	(0.03)	(0.00)	(0.00)
SZ	-0.248**	-0.22**	-0.459***	-0.19**	-0.205***	0.035
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)	(0.41)
FC	-0.107***	-0.138**	-0.256***	-0.374***	0.001	-0.186***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.57)	(0.00)
Constant	10.17***	10.255***	16.13***	9.068***	8.547***	2.767**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Observations	157	59	2,473	227	1,366	917

Note: *, **, *** *indicate statistical significance 10%, 5% and 1% test levels, respectively.*

Table 7 presents the FGLS regression results on how DM (debt maturity structure) and CH (cash holding) affect investment choices in Vietnam's industry. The debt maturity structure adversely affects investment choices in technology and petroleum and gas firms but positively affects industries, including health care, consumers, and basic materials. Technology companies showed significant negative effects with a beta coefficient of 1.987, suggesting a high sensitivity to debt maturity structures, as observed by Aivazian et al. (2005). This is a consequence of "technical debt", where resources are redirected to meet future technological needs, reducing the funds available for new projects. Technology and consumer companies benefit from having cash holding, which positively influences their decision-making. Technology companies are much more responsive to the impact, with a sensitivity approximately 6.86 times greater than that of consumers. It highlights the importance of having cash holding and supports the findings of Lee and Wang's (2021)'s study. The study highlights the diverse impacts of debt maturity structure on various industries, especially within technology firms. The significant correlation between cash investment decisions and cash investments in technology and consumer goods domains highlights an overlooked aspect of research.

5. Conclusions

Debt maturity decreases firms' investment choices because of rising agency costs. Simultaneously, cash holding positively impacts investment decisions as businesses prefer utilising internal funds to reduce financing uncertainties. The study show that companies with significant intangible assets encounter elevated costs when seeking external financing, which hinders their ability to secure funds. Conversely, businesses with substantial non-debt tax shields tend to increase their investments due to tax benefits. The study shows a negative effect of enterprise size and free cash flow on investment choice. Large companies with greater organisational complexity typically decrease investment, and smaller companies with greater agility are better equipped to capitalise on business chances and create conditions for businesses to operate effectively.

To study the strong relationship between cash holding, debt maturity, and investment decisions according to enterprise size. The results show that the relationship between debt maturity structure and investment decisions positively impacts small and large enterprises. However, the relationship between cash holding and corporate investment decisions for large enterprises is insignificant.

Moreover, the study explores the relationship between cash holding, debt maturity structure, and investment choices across various fields, finding that technology companies experience a negative effect. In contrast, fields of activity include industrials, healthcare, consumers, essential materials, and benefits. Technology firms are highly responsive to alterations in the maturity structure of debt, which significantly influences their investment tactics. Cash holding positively correlates with investment choices in technology and consumer sectors, particularly affecting technology firms more significantly than consumer firms. This research could explore how these companies balance the use of debt and equity financing to support innovation and growth and illuminate an aspect not thoroughly examined in prior research.

In conclusion, companies should aim to optimize their debt maturity structures to balance between reducing agency costs and maintaining sufficient flexibility for investment opportunities. This is particularly important for smaller enterprises that may see a more significant positive impact from optimizing debt structures, and the bigger companies might rely on other strategies beyond cash reserves for their investment decisions. The findings that companies with significant intangible assets face higher costs when seeking external financing highlight the importance of developing strong relationships with financiers and investors who understand the value of intangible assets. It also suggests that such companies need to be more proactive in communicating their value proposition and the potential returns on investment to external stakeholders. Besides that, technology firms, in particular, need to carefully manage their debt and cash reserves to support innovation and growth.

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