

BỘ GIÁO DỤC VÀ ĐÀO TẠO  
TRƯỜNG ĐẠI HỌC KINH TẾ TP. HỒ CHÍ MINH



**CÔNG TRÌNH DỰ THI**  
**GIẢI THƯỞNG**

**ĐỀ TÀI MÔN HỌC XUẤT SẮC UEH500 NĂM 2023**

**TÊN CÔNG TRÌNH:** The impact of interest rate and cash holdings on firms' stock return: Evidence in Vietnamese stock market.

**ĐỀ TÀI THUỘC KHOA/VIỆN:** Viện Đào tạo quốc tế ISB

MSĐT (Do BTC ghi):

TP. Hồ Chí Minh - 2023

**Abstract**

This paper examines the relationship between the interest rate, cash holdings and the general common stock return. The co-movement of interest rate and cash holdings are correlated to stock market return which indirectly affects the firm, a significant negative relationship. Using a sample of the 30 biggest blue-chip firms (VN30 Index) in Vietnam covering a ten-year period from 2013 to 2022, we find evidence that interest rate has a significant negative impact while cash holdings have a significant positive impact on stocks' firm returns.

**Keywords:** interest rate; cash holdings; stock return.

## Table of Content

<b>Abstract .....</b>	<b>I</b>
<b>Table of Content .....</b>	<b>II</b>
<b>1. Introduction: .....</b>	<b>1</b>
1.1. Research problem.....	1
1.2 Research aims and questions.....	2
1.3 Research Contribution.....	3
<b>2. Literature Review:.....</b>	<b>4</b>
Hypothesis 1: The interest rate has a significantly negative impact on the stock returns of firms. ....	5
Hypothesis 2: The negative relationship between interest rate and stock return is weaker when a firm is state-owned.....	6
Hypothesis 3: The cash holdings have a significantly negative impact on the stock returns of firms. ....	8
Hypothesis 4: The negative relationship between cash holdings and stock return is weaker when a firm is state-owned.....	9
<b>3. Data selection/ Methodology .....</b>	<b>9</b>
3.1 Data selection/ sources.....	9
3.2 Basic model .....	9
3.2.1 Dependent variable: Stock return (SR), Cash holdings (CH).....	11
3.2.2 Main independent variables: Interest rate (IR), Cash holdings (CH).....	12
3.2.3 Control variables.....	12
3.2.4 Model specifications .....	13
<b>4. Empirical Results.....</b>	<b>14</b>
4.1 Descriptive statistics.....	14
4.2 Correlations .....	16
4.3 The impact of interest rate and cash holding on Stock return.....	17
4.4 Interaction .....	21
<b>References.....</b>	<b>25</b>

## **1. Introduction:**

### **1.1. Research problem**

Recently, in Vietnam, we still have not had any research about the relationship between the interest rate, cash holdings and firms' stock returns. That is the reason, we have the motivation to do this research to contribute to the impact mutually between the interest rate, cash holdings and firms' stock return. This study indicates the impacts of interest rates and cash holdings on firms' stock returns by using empirical data from the Vietnamese data. It is now widely acknowledged that macroeconomic issues, particularly interest rates and cash holdings have an impact on stock markets. Because borrowing costs increase or decrease for both consumers and businesses, the economy and stock markets are affected when the Federal Open Market Committee (FOMC) raises the interest rate (Hall, 2022). The greater cash-holdings impact seems to be a manifestation of accruals-based anomalies, which are unlikely to be safe stocks since they are intimately tied to mispricing and arbitrage restrictions (Palazzo, 2012). Investors prefer bonds in an environment of rising interest rates because they believe that stock values will fall as a result of the higher interest rate. A rise in stock values, however, results from a decline in interest rates. Studies on the interaction of interest rates are rather uncommon despite their crucial role in the economy because of the short history of Vietnam's stock market (Bekaert & Wu, 2000).

The purpose of this study is to investigate how interest rates and cash holdings affect firms' stock returns in Vietnam. The main conclusion of this study is supported by the empirical results, which demonstrate how changes in interest rates and cash holdings impact stock values. According to the asymmetric framework, a higher interest rate causes the stock's return to be lower in the current month and greater in the month prior (Huy & Binh, 2021). Since the Fed can primarily influence moderate long-term interest rates by attaining low and stable inflation, that goal is not typically seen as a stand-alone one. Additionally, the term "maximum sustainable employment" is sometimes used to refer to the highest level of employment that can be sustained without

pushing inflation higher. As a result, the mandate is seen as having two objectives: maintaining price stability and full employment (Meyer, 2001).

## **1.2 Research aims and questions**

Collecting the data from 30 blue-chip firms in the stock market, this study contributes to understanding the effects of long-term, short term and discount interest rates, and high or low cash holdings on firms' stock returns under the stock market. The interest rate topic is highly debated among economic and financial structuralists after the global financial crises and with its impact on developed economies and developing ones. For developing economies, some studies find a leading impact of finance on growth restructuring in the global stock market as well as facing unexpected risks. Hitherto, this research domain has not been investigated intensively by extant research. Many channels of interest rates affect economic growth directly and indirectly through other macro factors, simultaneously. Shortly, the problems raise questions about the research aim in Vietnam market stock returns.

Firstly, interest rate risk - the risk arising from fluctuations in interest rates, affecting cash flow and profits. Thus, firms with large loans, banks and credit institutions will be at high risk, subject to a lot of interest rate risk. During periods of slow economic growth, interest rates are often adjusted lower to stimulate the economy. Global interest rates have remained low since the "Great Recession" of 2008 when central banks needed to act urgently to stimulate the economy (Verick & Islam, 2010). Now, with Covid-19 threatening to have a major negative impact on the economy, the prime rate (currently at 0.1% in the UK) is not far off before reaching zero. The prospect of low-interest rates is certainly a controversial one (Verick & Islam, 2010). However, BoE (Bank of England) policymakers argue that as the enterprise continues to deteriorate due to Covid-19, they need every tool they can use to try and fix it.

Secondly, there are going to be some worrying things with short-run and long-run risks. The introduction of the Doi Moi period encouraged tremendous growth (Turley & Selden, 2019). However, Vietnamese enterprises still face many difficulties in the innovation period. Interest rates not only constrain the growth potential of the economies, but through their multivariate channels, it also constrains the economic

growth rate. Vietnam's policy orientations and regulatory framework for innovation have improved significantly to cover all innovation-related issues at both the micro and macro levels (Vo, Nguyen, & Dinh, 2018).

Thirdly, holding cash and cash equivalents will affect stock returns. whether the association between cash holdings and average stock returns is robustly positive. According to Palazzo (2012), statistically riskier firms with higher projected returns should logically hold onto more capital to prevent the need for expensive external borrowing in the event that their future cash flows become insufficient. However, (Ortiz-Molina, Phillips, & Analysis, 2014) contend that the asset base of high-cash holding firms is less hazardous because of the increased liquidity that more cash gives them. In this paper, we re-examine to illuminate the result of the current argument, whether the association between cash holdings and average stock returns is robustly positive or negative and pay attention to the Vietnamese stock market with empirical evidence of the 30 biggest firms based on the VN30 Index.

Relating to the research aims, our study is set to fulfil the following questions:

1. How do interest rates and cash holdings affect the firms' stock returns?
2. Based on the data analysed, is there any significant difference in the effect of interest rate and cash holdings on the firms' stock returns?
3. If interest rates suddenly move higher/lower, what stock investors will do and how will it affect the stock returns?
4. If cash and cash equivalents will be held move high or low by the firms, what stock investors will do and how will it affect the stock returns?
4. In conclusion, both the interest rate and cash holdings are significant factors when defining factors that affect firms' stock returns, isn't it?

### **1.3 Research Contribution**

In the first week of June 2022, after the market benchmark VN-Index had plunged up from 1,524 points to 1,150 points within two months, the 2 percent interest rate support package's announcement became a savior for the stock market in Vietnam (VNA, 2022). We can see that the interest rate support package does have a positive

effect on the stock market (VNA, 2022). Hence, by examining the impact of interest rate on stock returns is proved to be very crucial.

Additionally, a study by (H. Chen, Yang, Zhang, & Zhou, 2020) stated that cash holdings represented an important element for a firm's strategy which could make an effect on the firm's overall performance. This can also suggest that this research would be an asset for the business world's implication.

Furthermore, the interplay between interest rates, cash holdings, and stock returns can probably clarify how changes in interest rates and cash holdings interact with each other and influence stock returns (Anbar, Alper, & journal, 2011). By delving deep into these interesting dynamics of the Vietnamese stock market, this research enhances our understanding of the relationship between interest rates, cash holdings, and stock returns in the Vietnamese stock market.

## **2. Literature Review:**

According to (Saeed & Akhter, 2012), short-term interest rates and exchange rates can affect the Banking Index significantly, meanwhile it could make a negative impact on stock prices. Though, firms' stock return could be affected easily due to the fluctuations in those two components either. Apparently, these two variables become critical in the swings of the stock price (Özlen, Ergun, & Sciences, 2012). Short-term interest also served as an important factor on the stock price in BRIC countries (Krishna & Trading, 2015).

Throughout the time of low-interest rates, (Huang, Mollick, Nguyen, & Finance, 2016) found proof that the association between U.S. S&P 500 stock returns and interest rates became stronger after January 2009, when negative real interest rates went down. Their study, which relied on weekly data and VAR and copula methods, well captured the relationship structure. Fluctuating inflation and currency rates, as well as higher deposit rates, have hampered the development of the Sri Lankan stock market (Kmmcb & Publications, 2015). The relationship between interest rates and stock prices varies over time, with different trends observed between 2005 and 2018 (Gu, Zhu, & Wang, 2022). The stock market has shown responsiveness to interest rate changes at specific



times of the year, with a bullish stock market observed when interest rates are low or high, and a bearish stock market when interest rates are high (Abbass et al., 2022).

Based on the framework of VN30 in the Vietnamese market, these elucidations above led to the formulation of our initial hypothesis.

***Hypothesis 1: The interest rate has a significantly negative impact on the stock returns of firms.***

State ownership is inversely correlated with firm cash holdings, according to (R. Chen, El Ghouli, Guedhami, Nash, & analysis, 2018) study, which sampled recently privatized businesses from 59 nations. They demonstrate that better institutional contexts attenuate the negative relationship between residual state ownership and the value of cash holdings by NPFs, building on (Kalcheva & Lins, 2007) and (Pinkowitz, Stulz, & Williamson, 2006). Particularly in nations with less investor protection, fewer press freedom, and lessened political accountability, the value of cash holdings by these firms is lower when the government has a bigger position in partially privatized businesses. Overall, expanding our knowledge of how the institutional environment influences corporate finance decisions and giving evidence that state ownership has an impact on cash holdings both contribute to the literature on corporate finance. The relationship between cash holdings and stock returns in China, a nation with lax investor protection and high state ownership, was also highlighted by (Megginson, Ullah, Wei, & Finance, 2014). It is shown that firms with greater growth prospects, less debt, and less volatile cash flows have stronger relationships between their cash holdings and stock returns. Additionally, it discovers that the link is weaker for state-owned enterprises (SOEs) than for non-SOEs, indicating that agency issues caused by state ownership lower the value of cash holdings. (Thi, Tran, & Doan, 2021) also looks into how state ownership and foreign ownership affect business cash holdings in Vietnam and how that has changed as a result of the global financial crisis. It reveals that state ownership has a bad impact on business cash reserves, and the effect is more pronounced during a time of crisis. In addition, it discovers that corporate cash holdings are positively correlated with foreign ownership, while the correlation is less strong during a crisis. The study makes the case that SOEs may experience increasing political

meddling and corruption, which may lessen their access to external finance and diminish their demand for liquidity. However, foreign-owned businesses could benefit from greater financial flexibility and advantages from diversification, which might raise their desire for cash holdings.

The relationship between state ownership and firm cash holdings in China's share-issue privatized firms from 2000 to 2012 is examined by (Megginson et al., 2014). They discover a negative relationship between cash holdings and state ownership, which is in line with (Kornai, 1979) original soft-budget constraint theory's prediction. After adjusting for year effects, firm fixed effects, China's reform of the split share structure, and potential endogeneity, this conclusion is solid. A 10 percentage-point decrease in state ownership results in a rise of around RMB 55 million in cash holdings for the typical firm in our sample. Due to the fact that many institutional owners are owned by or under the jurisdiction of different levels of government, there is a negative correlation between the amount of cash held and institutional ownership as well. They also discover that smaller, more successful, and higher-growing businesses keep more cash, and that short-term debts and net working capital have a negative relationship with cash holdings, indicating that they may be used as a substitute for cash.

In the VN30-Index, the research has examined in the stock market and relied on many different research papers, our hypothesis is as follows:

***Hypothesis 2: The negative relationship between interest rate and stock return is weaker when a firm is state-owned.***

The relationship between cash holdings and stock returns has been widely studied in the corporate finance literature. However, the evidence on this relationship is still controversial. Some studies have found a positive relationship between cash holdings and stock returns, while others have found a negative relationship. According to a suggestion in theoretical studies, a study by (Chuan'Chewie'Ang et al., 2019) found that there is a positive relationship between cash holdings and average stock returns. This positive link remains steadfast even when the adjustment of risk, constructing portfolios based on cash holdings, and the weighting scheme of portfolio returns. This

means that firms that have more cash and cash equivalents relative to their total assets tend to have higher returns on their equity. (Vergara Garavito, Chi6n, & Science, 2021) found that firms with higher cash holdings tend to have higher equity expected returns and higher volatile cash flows. This positive association between cash holdings and cash flow volatility is favorable, which supports the fact that firms hold on to cash for precautionary motives, which suggests that firms accumulate cash to cope with uncertainties and risks in the future. Cash holdings can enable firms to avoid financial distress, reduce the costs of external financing, and take advantage of profitable investment opportunities. Then firms that have higher cash holdings, have higher volatility cash flows (means higher risks) and higher expected equity returns . (Riddick & Whited, 2009) shows that cash holding is positively related to a firm's risk. According to (Ye, 2018), empirical research results show that when an enterprise is facing financial difficulties, there is a significant positive correlation between cash flow risk and cash holdings. That is, the higher the cash flow risk, the higher the firm's cash holdings, which also supports preventive motivation of holding cash. Thus, if cash holdings expose various sources of risk, such as fluctuations in cash flows and financial constraints, and therefore, high risk is associated with expected return on equity (Simutin, 2010).

Both of these studies suggest a positive relationship between cash holdings and stock returns. (Ortiz-Molina et al., 2014), on the other hand, believe that the asset base of high-cash holding firms is less risky since more cash gives better liquidity. Therefore, the expected returns for high cash holding firms are lower. This implies a negative relationship between cash holdings and stock returns. According to (Rashed, Ghoniem, & Innovations, 2022), firms with higher levels of cash holding have higher investment alternatives and then lower stock returns. Moreover, the results support the trade-off between risk and return by using cash holding to finance operational activities and investing in higher investment alternatives and then lower stock returns. (Acharya, Davydenko, & Strebulaev, 2012) suggests that firms with higher cash holdings are safer. Since it poses low risk, the stock will have a low return in accordance with the trade-off between risk and return in investing.

In the Vietnam context, the research has examined the top 30 firms in the Vietnamese stock market and based on different findings from research papers, our last hypothesis is formulated:

***Hypothesis 3: The cash holdings have a significantly negative impact on the stock returns of firms.***

The interest rates that state-owned banks (SOBs) offer to firms are lower than those of private banks, regardless of the firms' borrowing capacity from the latter. SOBs tend to lend more to large firms and those in economically disadvantaged areas. The political affiliation of the SOBs also influences their lending behavior: the more dominant the party associated with the SOB is in the region where the firm operates, the more favorable the interest rates are. State-owned enterprises (SOEs) are shown to have lower economic well-being than non-state owned enterprises (Allen, Qian, & Qian, 2005). One way to explain the difference in interest rates is to assume that state-owned banks are either more efficient than privately owned banks or have lower costs, and therefore are able to charge lower interest rates. According to (Dinc & Gupta, 2011), The government, as the controller of a firm, may use its influence and exercise manipulation to pursue other objectives than maximizing profit.. As other studies on denationalizations have shown (Dinc & Gupta, 2011), that state-owned enterprises are significantly less profitable as a result of lower efficiencies. Non-stated-owned enterprises are more flexible and can adjust and reduce costs, such as through layoffs, while SOEs are under pressure to maintain their workforce and investments in all situations. This happens when SOEs have full control by the state and not when the state only owns a minority shareholder. When the state faces constraints, SOEs are managed like private enterprises.

Previous research points out the problems associated with the partial tradability of the first wave of privatization, including weak corporate governance systems due to mismatch of incentives between majority and minority shareholders (Liao, Liu, & Wang, 2014), low financing function, since most of equity financing is mainly raised through tradable shares(Cain, McKeon, & Solomon, 2017), and investor speculation, price manipulation, and high stock price fluctuations (Liu, Pan, Tian, & Finance, 2018).

Moreover, studies show that non-tradable state ownership increases the volatility of stock returns (Z. Chen, Guan, & Ke, 2013). (Vitoria, Bressan, & Iquiapaza, 2020) offer significant implications for investors and portfolio managers, whose aim is to create efficient portfolios with greater stock expected return and interest rate for a given level of measurable beta risk. In this sense, the results implicate that SOE are riskier than private firms during periods of high volatility, which is not reflected in the pre-crisis CAPM beta, with privatized portfolios being less risky in both scenarios. According to previous research papers, SOEs have lower stock returns and higher risk than private firms, and that the interest rate sensitivity of SOEs is higher during periods of high inflation and political instability. Thus, we find that interest rate has a negative and significant effect on stock returns, and that this effect is stronger for state-owned enterprises (SOEs) than for private firms.

***Hypothesis 4: The negative relationship between cash holdings and stock return is weaker when a firm is state-owned.***

### **3. Data selection/ Methodology**

#### **3.1 Data selection/ sources**

We collected accounting data on Vietnamese firms from the VN Index, developed by including listed firms, amounting to 2,791 observations. The data on interest rates were retrieved from the world bank indicator over a period of 10 years, starting from 2013. Also, data on Exchange rates, and Unemployment were obtained from the World Bank Development Indicators.

At this stage stock price data collection is conducted by using the source of Yahoo Finance. The stock data that are used several stock prices under the VN30 Index, also called blue-chip including listed firms, amounting to 30 firms. The stock price data that is used are monthly stock close prices from 2013 to 2022. Then the normality test is conducted on the stock close price data using Excel software.

#### **3.2 Basic model**

**Table 1**

**Definition of variables**

Variable	Description	Source
SR	The positive or negative change in value of an investment or asset over time of firm i and month j, measured by natural logarithm of the price on month j divided the price on month j-1	Yahoo Finance
IR	Interest rate of Vietnam in month j	World Bank indicator
Cash holdings	The ratio of money that firms keep available to spend rather than invest, measured by cash and cash equivalent, scaled by total assets of firm i on month j	Financial Statements
INF	Inflation Measure the Vietnam inflation rate based on the GDP deflator index in month j	World Bank indicator
ER	Exchange rate mean the price of a VND in relation to Dollar in month j	As above
UE	The unemployment rate measures the share of workers in the labor force who do not currently have a job but are actively looking for work in month j	As above
TTC	The total tax and contribution rate measures the amount of taxes borne by the business in the second month of operation, expressed as a percentage of "commercial profit"	As above
FS	Firm size is natural logarithm of total asset firm i and month j	Financial Statements

LR	The ratio of total debt to the book value of total assets in firm i and month j	As above
ROE	Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity	As above
ONS	A dummy variable that ownership or (State-owned) takes value of 1 if the companies owned by government above 50%, zero otherwise	As above
IP	The industrial production growth in VietNam (IP) is a monthly economic metric that evaluates the actual output of the manufacturing, mining m electric, and gas sectors	CEIC

### 3.2.1 Dependent variable: Stock return (SR), Cash holdings (CH)

Investors can create more profit if they can understand deeply about stock return, cash holdings and the other factors that may have an impact on the stock market and stock firm. However, stock returns and cash holdings may have an impact on market capitalization and the future cash flow of a business because the price of a stock can increase or decrease the funding, Return on assets and cash flow of investors in the enterprise. The stock price data that is collected by us are monthly stock close prices from January 2012 to December 2022. Then the normality test is conducted on the stock close price data using Excel software. At this stage, the expected stock returns formulation is conducted. In forecasting the stock returns, these studies use the Natural Logarithm or Napierian Logarithm (Logarithm based on the mathematical constant "e=2.71828...") of monthly price to measure Stock returns (Panna & Commerce, 2017).

$$r_{i,j} = \ln(price_{i,j}) - \ln(price_{i,j-1}) = \ln \left[ \frac{price_{i,j}}{price_{i,j-1}} \right]$$

where  $r_{i,j}$  represent the return of firms  $i$  on month  $j$ , respectively.

### 3.2.2 Main independent variables: Interest rate (IR), Cash holdings (CH).

To measure interest rate in a country, we use lending interest rate ( $IR$ ) from the WGIs by the World Bank, which has been widely used in interest research (Alam, Uddin, & Management, 2009). This indicator measures international trends or slowdowns and upgrades in trend productivity growth and the government in control of inflation and monetary policy with the other country (Holston, Laubach, & Williams, 2017). This index ranges from 7 to 20, with a higher index indicating high inflation and a slowdown trend in productivity growth.

In order to measure the cash holdings of a firm, we use the following formula:

$$ch_{i,j} = \frac{(cash\ and\ cash\ equivalents)_{i,j}}{(total\ assets)_{i,j}}$$

in which  $ch_{i,j}$  represents the cash holding of the firm  $i$  on month  $j$ . We also follow (Coles, Daniel, & Naveen, 2006) for cash holding calculation, which suggests that the firms hold cash to evade the expenses incurred due to the lack of liquid assets (Baumol, 1952; Keynes, 1937; Miller & Orr, 1966). Cash holdings have been calculated by the percentage of cash and cash equivalents, scaled by total assets. The firm with higher cash holdings which means this firm has a harder to meet the default risk than, otherwise, easier to face the default risk.

### 3.2.3 Control variables

Following the previous studies, we included a rich set of firm and country-level control variables that may influence the stock return ( $SR$ ). In terms of firm-level variables, we include return on equity (ROE measured by the net income, scaled by equity), which is a measure of financial performance calculated by dividing net income by shareholders' equity. The higher the ROE, the more efficient a firm's management is



at generating income and growth from its equity financing. We also capture investment opportunities by including the firm size (measured by the natural logarithm of total assets) ( $FS_{i,j}$ ). Another is that A leverage ratio ( $LR_{i,j}$ ) (measured by total debt divided by total assets) is any one of several financial measurements that assesses the ability of a firm to meet its financial obligations. A leverage ratio may also be used to measure a firm's mix of operating expenses to get an idea of how changes in output will affect operating income (Barth & Miller, 2018). Regarding country-level characteristics, we include unemployment ( $UE_{i,j}$ ), total tax and contribution ( $TTC_{i,j}$ ), and exchange rate ( $EX_{i,j}$ ). Further, a firm's financial decisions are influenced by economic development (Lee & Shin, 2018). Indicating that Improvements in financial services are linked to advancements in economic growth, which affects financial business and investment decisions.

### 3.2.4 Model specifications

To investigate the influence of interest rate on stock return, we built the basic model as follows:

$$\begin{aligned} stock\ return_{i,j} = & \beta_0 + \beta_1 interest\ rate_{i,j} + \beta_2 cash\ holdings_{i,j} + \\ & \delta firm\ control_{i,j} + \theta macro\ control_j + firm\ dummies_{i,j} + \mu_{i,j} \end{aligned} \quad (E)$$

where subindexes  $i$  and  $j$  represent the firm and monthly, respectively. The dependent variable, *Stock return<sub>j</sub>* ( $SR$ ), is the measure of the percentage of increase in stock price. Our main independent variables include *Interest rate<sub>i,j</sub>* ( $IR$ ) and *Cash holding<sub>i,j</sub>* ( $CH$ ). *Firm Control<sub>i,i</sub>* is a set of control variables at the firm-level, including *Return on equity* ( $ROE$ ), *Leverage ratio* ( $LR$ ), *Firm size* ( $FS$ ).

*Macro Control<sub>i,j</sub>* denotes two country-level variables: *Exchange rate* ( $ER$ ), *Total tax and contribution* ( $TTC$ ) and *unemployment* ( $UE$ ). Note that and in equation (E) are used to gauge the effects of interest on stock return. If a higher level of interest rates and cash holdings lead to lower stock price, one would expect to be negative and we posit that becomes negative and significant.

The dummy variable included in the model is state-owned, denoted as ONS. ONS is equal to 1 if the firms are owned by the state; otherwise, ONS is equal to 0. A firm is owned by the state when the state owns over 50% of firm shares.

## 4. Empirical Results

### 4.1 Descriptive statistics

**Table 2:**

**Descriptive statistics of variables**

Variable	Mean	SD	Min	Max	Obs
SR	0.0089131	0.1048281	-1.163609	0.5420221	2,844
IR	0.05127	0.016421	0.0259	0.0899	3,600
LR	0.669767	0.233469	0.1776303	0.96	3,565
ROE	0.1831517	0.1213997	-0.2047572	1.299089	3,219
INF	0.03204	0.0146339	0.0063	0.0659	3,600
ER	22.3375	0.8273312	20.933	23.271	3,600
UE	0.017425	0.0037018	0.0116	0.0238	3,600
SIZE	18.1636	1.503964	14.30004	21.47493	3,570
IP	0.0219	0.0994768	-0.108	0.2	3,600
TTC	0.3683192	0.0505517	0.227	0.408	3,600
CH	0.0981873	0.0696769	0.0004492	0.4876839	3,549

Table 2 indicates summary data for key variables in our regression model. The firms in our sample had a low mean of SR which is only 0.0089131, ranging from -1.163609 to 0.5420221. Secondly, the average categorical of IR is 0.05127, which could be considered good for student loans. LR had a mean of 0.669767 which is usually considered good by industry standards. A ratio of less than 1 indicates that more of a firm's operations are funded by equity than debt. ROE had a mean of 0.1831517. Meanwhile, the distance between min and max of ROE is quite big, -0.2047572 and 1.299089, respectively. A 0.05127 inflation rate would ease the constraints on monetary

policy arising from the zero bound on interest rates, with the result that economic downturns would be less severe. The distance between min and max of the exchange rate is quite small, which is considered a stable rate. The mean of UE is 0.01725 with a small standard deviation of 0.0037018. SIZE had a high mean and also high standard deviation, which is 18.1636 and 1.503964, respectively. The total tax and contribution rate had a mean of 0.3683192. Moreover, the number of observations of IR, INF, ER, UE, IP and TTC is 3,600 because of macro variables. The observations of firm variables are less than 3,600 because of a lack of information.

## 4.2 Correlations

**Table 3:**

**Correlation coefficient matrix**

	IR	CH	LR	ROE	INF	ER	UE	SIZE	IP	TTC
<i>IR</i>	1									
<i>CH</i>	0.0893***	1								
<i>LR</i>	0.0228	-0.2015***	1							
<i>ROE</i>	-0.1072***	0.0809***	-0.2483***	1						
<i>INF</i>	-0.3282***	0.0962***	-0.0026	-0.420**	1					
<i>ER</i>	-0.3130***	-0.2369***	-0.0389**	0.0813***	-0.4364***	1				
<i>UE</i>	0.1187***	-0.1523***	-0.0115	0.0068	-0.5927***	0.6163***	1			
<i>FS</i>	-0.1116***	-0.0074	0.6177***	-0.1543***	-0.1318***	0.3154***	0.1981***	1		
<i>IP</i>	0.1460***	0.0380**	0.0247	0.0617***	-0.5330***	-0.1467***	-0.1511***	-0.0700***	1	
<i>TTC</i>	0.1753***	0.1442***	0.0370**	-0.0321*	0.3907***	-0.6126***	-0.6777***	-0.2159***	0.3897***	1

Note: This table provides the correlation coefficient matrix of the main independent variables. The sample includes 30 Vietnamese listed firms from the VN30 index over the period 2013– 2022.

\*Significance at the 10% level.

\*\*Significance at the 5% level.

\*\*\*Significance at the 1% level

This table displays all pairwise correlation coefficients for the main variables.

Table 3 provides summary statistics and pairwise correlations between variables included in our regression analysis. Based on the data presented in Table 3, we found that most of the independent variables exhibit a significant positive correlation with each other. Notably, correlations between LR and INF , LR and UE, and CH and SIZE are not statistically significant.

Furthermore, the correlations between variables generally have low values, all below 0.8. This suggests that the presence of perfect multicollinearity is not a severe problem for our study, indicating that the variables are not highly linearly dependent on each other.

In contrast, we observed positive and significant correlations at the 5% significance level between CH and IP, as well as between LR and TTC. These findings indicate a meaningful relationship between cash holdings and industrial production, as well as between leverage and total taxation and contribution.

Interestingly, no positive but significant correlations were discovered. Nevertheless, a negative and significant correlation at a 10% significance level was observed between ROE and TTC. This suggests that as return on equity decreases, total tax and contribution tend to increase, albeit at a lower level of significance.

Additionally, the remaining correlations between the other variables were found to be significant at the 1% significance level, indicating strong associations among these variables in our regression analysis.

Overall, the correlation analysis reveals important relationships and interdependencies between the variables under investigation, highlighting potential factors influencing our study. However, it is crucial to consider additional analysis and domain-specific knowledge to fully interpret the implications of these correlations.

### **4.3 The impact of interest rate and cash holding on Stock return**

**Table 4:**  
**Independent variables**

Independent variable	Dependent variable: Stock Returns
IR	-0.695*** (0.003)
CH	0.011 (0.738)
LR	0.020 (0.113)
ROE	0.035* (0.057)
INF	-0.187 (0.719)
ER	-0.023*** (0.000)
UE	5.580*** (0.000)
FS	-0.004* (0.062)
IP	-0.021 (0.711)
TTC	0.058 (0.494)
Firm fixed effects	YES
Year fixed effects	YES
R-squared	0.0258
Observations	2,791

Table 4 presents the result of the basic model, in which the interaction term is not included. The estimations on the effects of interest rate and cash holdings on stock returns is used to test hypothesis 1 and 3.

\*Significance at the 10% level.

\*\*Significance at the 5% level.

\*\*\*Significance at the 1% level.

Table 4 displays the estimated findings for testing the effect of IR, CH and macroeconomic conditions on the SR of enterprises. Specifically, Column (1) displays the results of testing Hypothesis 1 by executing the regression model using IR as the key independent variable and Hypothesis 3 by executing the regression model using CH as the key independent variable, along with macro factors and firm variables. As demonstrated in the column (1), the coefficient on IR is considerably negative at 69.5%, demonstrating a negative relationship between IR and SR. In terms of economic impact, a one-unit rise in the IR will result in a 0.695 deterioration in the SR of firms. This research provides excellent support for our first hypothesis, which states that businesses are more likely to enhance the value of their firm's SR after obtaining loans with greater IR. This result is consistent with the findings of (Özlen et al., 2012), who determined that the ER and IR are the most influential variables on SR fluctuations. Concentrating on Vietnamese emerging markets, it has demonstrated that IR have a significant negative impact on the SR of firms during certain times of the year when the stock market has demonstrated a high degree of sensitivity to IR changes (Duy & Technology, 2016; D. T. N. Huy et al., 2021). Firms with higher loan IR experience lower stock price returns as a constraint on the development of capital resources, resulting in high IR on bank loans while capital is insufficient to improve the firm's production and service efficiency (Saeed & Akhter, 2012). Therefore, higher IR they get are negatively correlated with the success of the firm's shares.

As also demonstrated in the column (1), the coefficient on CH is quite low and positive at 0.7%, and has a p-value larger than 10% which is 73.8%. It results that CH has no effect on SR volatility which does not support Hypothesis 3. CH can signal that a firm has no profitable investment opportunities or growth prospects, which can lower investor expectations and valuations of the enterprise (Ezekoye, Koller, & Mittal, 2016). Perhaps, this is because the evidence as to why firms accumulate cash is less convincing. The most important influence on firm value is board size. Presumably, this points to the fact that firms with larger board sizes offer better management capabilities, weakening an individual's control, and benefiting from a better set of technologies and experiences lead to a positive impact on SR. They want it to be a more profitable investment or to

be returned to them (Isshaq, Bokpin, & Mensah Onumah, 2009). Although corporate managers have no direct control over the stock prices of their firms, they can behave in ways that are consistent with the desires of investors, which will reflect the value of the enterprise. Corporate managers need to think about their governance structure in light of the expectations of the investing public. Returning more cash to shareholders or putting money into a profitable project is better than keeping it on the balance sheet.

The results are presented in Table 4. Consistently, LR, INF, IP and TTC do not negligibly and simply affect SR volatility due to the p-value higher than 10%, respectively. Because firms with high operating LR can benefit from higher profit growth as sales increase, they may also experience lower profit growth as revenue declines (Zhang, 2021). INF, IP and TTC may reflect overall economic activity and demand within a country or region. Therefore, the relationship between them and SR may depend on a variety of factors such as policy, income, tax. The ER and SIZE have a negative effect on SR because of negative coefficients and the p-value less than 10%. SIZE refers to the observation that smaller firms are more profitable and higher SR than larger firms, on average over the long run (Crain, 2011). The UE and ROE have a positive relationship with SR volatility because they affect the expectations of investors. When the UE or the ROE changes unexpectedly, it can cause investors to revise their forecasts of future cash flows and discount rates, which can affect the SR volatility. This can make the stock price go down and fluctuate unexpectedly. On the other hand, the increase of ROE shows that the firm is doing well financially.



#### 4.4 Interaction

**Table 5:**  
**Interactions of independent variables**

Independent variable	Dependent variable: Stock Returns
IR	-0.674*** (0.005)
CH	0.005 (0.903)
IRxONS	-0.096 (0.761)
CHxONS	0.006 (0.922)
ONS	0.006 (0.710)
LR	0.021 (0.102)
ROE	0.037* (0.053)
INF	-0.187 (0.720)
ER	-0.022*** (0.000)
UE	5.576*** (0.000)
FS	-0.004* (0.057)
IP	-0.021 (0.707)
TTC	0.058 (0.496)
Firm fixed effects	YES
Year fixed effects	YES
R-squared	0.0259
Observations	2,791

Table 5 presents the result of the basic model, in which the interaction term is included. The estimations on the effects of interest rate and cash holdings on stock returns is used to test hypothesis 2.

\*Significance at the 10% level.

\*\*Significance at the 5% level.

\*\*\*Significance at the 1% level.

This table reports the differential impact of changes in ONS of 30 of the largest firms in VietNam on the relationship between IR and the SR, the relationship between CH and the SR. The estimation results are presented in Table 5 include a dummy variable (ONS). ONS takes value of 1 if the firms owned by the government are above 50%, zero otherwise. We observe that the coefficient of interaction term ONS and interest rate is negative at -9.6% and the p-value is 76.1%. This means that this indicator is not support for the hypothesis 2, because the hypothesis shows that the negative relationship between IR and SR is weaker when a firm is state-owned, but in this research the p-value of interaction term ONS and IR is larger than 10% demonstrates that ONS does not relative to the effect of IR on SR. Another prediction from a social point of view is that state-owned enterprises lend money to firms for which it is difficult or too expensive to raise capital from private banks. Thus, the data do not seem to support the social view unless it is acknowledged that state-owned banks strive to reduce the average cost of capital for certain firms, while still allowing firms to face market IR on a margin (Sapienza, 2004). This evidence is inconsistent with the findings (Z. Chen et al., 2013) the negative relationship between IR and SR is weaker when a firm is state-owned Hypothesis 2. This can be explained by the fact that banks tend to increase lending IR in a context of uncertainty and high risk. Thus, firms that have higher debt tend to suffer more from interest burden and this is not affected by state control.

Table 5 also reports the coefficient of interaction term ONS and CH is quite low and positive at 0.6%, and the p-value is 92.2% which is larger than 10%. This means that this indicator does not support hypothesis 4 which is that the negative relationship between CH and SR is weaker when a firm is state-owned. The p-value demonstrates that ONS does not relate to the effect of CH on SR. Several studies have found that ONS can affect cash flow, as managers with higher ONS tend to rely more on internal cash flow than on external funding (Chuan'Chewie'Ang et al., 2019). This can reduce the cost of capital and increase SR. This can increase SR volatility. Many studies (Huang et al., 2013) demonstrate that holding too much cash can reduce performance because cash, as a short-term asset, is very sensitive to managers involved in accumulating to pursue their personal goals (Dittmar & Mahrt-Smith, 2007). This can

diminish SR volatility. Therefore, these conflicting arguments make it difficult to determine the relationship with the impact of CH on SR. It depends on how ONS interacts with other factors to determine the optimal level and cash allocation for each enterprise.

## **5. Conclusion, discussion, and limitations:**

Macroeconomic factors, notably interest rates, are now commonly recognised to have an impact on stock markets. Also, this study delves into the relationship between cash holdings and stock returns within the dynamic context of the Vietnamese stock market. Thus, the goal of our study is to determine how interest rates and cash holdings affect firms' stock returns in Vietnam. The empirical findings, which show how changes in interest rates and holding cash and cash equivalents affect stock values, corroborate the study's principal thesis. Through collecting accounting data on Vietnamese firms from the VN Index , developed by including listed firms, amounting to 2,791 observations.

This paper explores two main relationships between interest rate and firm's stock returns, cash holdings and stock returns, with examining a total of 4 hypotheses. Firstly, in this study, using a large sample of Vietnamese firms between 2013 and 2022, we have found a negative and statistically significant relationship between interest rate and firm's stock returns. Therefore, our result supports hypothesis 1. The reason that our result matches hypothesis 1 can be explained by the fact that in a context of uncertainty and high risk, forcing banks to increase lending interest rate. Thus, firms tend to suffer more from interest burden and business efficiency decrease and stock return decrease. So, the result here is just an overall effect on the return rate of firms in the list, it does not give a view of the effect of each factor to a specific type of firms like banking, real estate, insurance,... Secondly, we also find that ownership does not affect the relationship between interest rate and stock return. This implies that the influence of interest rates on stock performance remains consistent across ownership types. Concerning the cash holdings, we reject hypothesis 3 and 4, indicating that cash holdings have no relationship with firm stock returns, therefore hypothesis 4 is inevitably rejected. Legislators both domestically and internationally have paid close attention to the astonishing expansion of Vietnam's economy. Research on the effects

of interest rates and cash holdings on stock returns can benefit policymakers looking for an effective understanding of the macroeconomic situation of Vietnamese firms in a number of ways. The study can assist decision-makers in understanding how monetary policy impacts firms' profitability and liquidity, particularly in the banking industry, which is essential for the health and expansion of the economy. The findings can also assist policymakers in determining the ideal amount of cash holdings for businesses, which can strike a balance between the advantages and disadvantages of retaining cash. This may have an impact on financial regulation, taxation, and corporate governance. The research does provide light on how macroeconomic factors and uncertainties affect the choices that businesses make about financing and investments. This could assist policymakers in developing suitable policies to reduce risks and improve opportunities for businesses in various economic circumstances.

Besides our study contributes valuable insights to the finance field, it still has several limitations that could be addressed in future research. Firstly, the sample used in this paper is small, including only 30 Vietnamese firms in VN30 over the period from 2013 to 2022; and we only focused on the Vietnamese stock market and our results may not be generalizable to other markets or other firms not in VN30. Another limitation is that several variables that have been utilized in previous studies are not taken into account in this paper since the data is not available. As a result, the results may be inaccurate and different from the actual value.

Future research could expand on our findings by incorporating a broader set of macroeconomic variables and extending the analysis to cover a broader time frame. Another important issue to research could be to examine the relationship between cash holdings and stock returns, and investigate the potential moderating effect of state ownership on this relationship in the context of the future duration of the VN stock market being longer, which will appear to have a correlation.

## References

- Abbass, K., Sharif, A., Song, H., Ali, M. T., Khan, F., & Amin, N. J. R. P. (2022). Do geopolitical oil price risk, global macroeconomic fundamentals relate Islamic and conventional stock market? Empirical evidence from QARDL approach. 77, 102730.
- Acharya, V., Davydenko, S. A., & Strebulaev, I. A. J. T. R. o. F. S. (2012). Cash holdings and credit risk. 25(12), 3572-3609.
- Alam, M. M., Uddin, G. J. I. J. o. B., & Management. (2009). Relationship between interest rate and stock price: empirical evidence from developed and developing countries. 4(3), 43-51.
- Allen, F., Qian, J., & Qian, M. J. J. o. f. e. (2005). Law, finance, and economic growth in China. 77(1), 57-116.
- Anbar, A., Alper, D. J. B., & journal, e. r. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. 2(2), 139-152.
- Barth, J. R., & Miller, S. M. J. J. o. F. S. (2018). Benefits and costs of a higher bank “leverage ratio”. 38, 37-52.
- Baumol, W. J. J. T. Q. j. o. e. (1952). The transactions demand for cash: An inventory theoretic approach. 66(4), 545-556.
- Bekaert, G., & Wu, G. J. T. r. o. f. s. (2000). Asymmetric volatility and risk in equity markets. 13(1), 1-42.
- Cain, M. D., McKeon, S. B., & Solomon, S. D. J. J. o. f. e. (2017). Do takeover laws matter? Evidence from five decades of hostile takeovers. 124(3), 464-485.
- Chen, H., Yang, D., Zhang, J. H., & Zhou, H. J. J. o. C. F. (2020). Internal controls, risk management, and cash holdings. 64, 101695.
- Chen, R. R., El Ghouli, S., Guedhami, O., Nash, R. J. J. o. f., & analysis, q. (2018). State ownership and corporate cash holdings. 53(5), 2293-2334.
- Chen, Z., Guan, Y., & Ke, B. J. T. A. R. (2013). Are stock option grants to directors of state-controlled Chinese firms listed in Hong Kong genuine compensation? , 88(5), 1547-1574.
- Chuan‘Chewie’Ang, T., Lam, F. E. C., Ma, T., Wang, S., Wei, K. J. J. I. R. o. E., & Finance. (2019). What is the real relationship between cash holdings and stock returns? , 64, 513-528.
- Coles, J. L., Daniel, N. D., & Naveen, L. J. J. o. f. E. (2006). Managerial incentives and risk-taking. 79(2), 431-468.
- Dinc, I. S., & Gupta, N. J. T. J. o. F. (2011). The decision to privatize: Finance and politics. 66(1), 241-269.
- Gu, G., Zhu, W., & Wang, C. J. E. r.-E. i. (2022). Time-varying influence of interest rates on stock returns: evidence from China. 35(1), 2510-2529.
- Hall, M. (2022). How Do Interest Rates Affect the Stock Market?
- Holston, K., Laubach, T., & Williams, J. C. J. J. o. I. E. (2017). Measuring the natural rate of interest: International trends and determinants. 108, S59-S75.
- Huang, W., Mollick, A. V., Nguyen, K. H. J. T. Q. R. o. E., & Finance. (2016). US stock markets and the role of real interest rates. 59, 231-242.
- Huy, N. D., & Binh, N. T. T. (2021). Interest and Inflation Rates as Leading Indicators of Vietnam’s Stock Returns

- Kalcheva, I., & Lins, K. V. J. T. r. o. f. s. (2007). International evidence on cash holdings and expected managerial agency problems. *20*(4), 1087-1112.
- Keynes, J. M. J. T. q. j. o. e. (1937). The general theory of employment. *51*(2), 209-223.
- Kmmcb, K. J. I. J. o. S., & Publications, R. (2015). Macroeconomic factors and stock market development: With special reference to Colombo Stock Exchange. *5*(8), 1-7.
- Kornai, J. J. E. J. o. t. E. S. (1979). Resource-constrained versus demand-constrained systems. 801-819.
- Krishna, R. J. J. o. S., & Trading, F. (2015). Macroeconomic variables impact on stock prices in a BRIC stock markets: an empirical analysis. *4*(2), 1-7.
- Lee, I., & Shin, Y. J. J. B. h. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *61*(1), 35-46.
- Liao, L., Liu, B., & Wang, H. J. J. o. F. E. (2014). China' s secondary privatization: Perspectives from the split-share structure reform. *113*(3), 500-518.
- Liu, Q., Pan, X., Tian, G. G. J. J. o. B., & Finance. (2018). To what extent did the economic stimulus package influence bank lending and corporate investment decisions? Evidence from China. *86*, 177-193.
- Megginson, W. L., Ullah, B., Wei, Z. J. J. o. B., & Finance. (2014). State ownership, soft-budget constraints, and cash holdings: Evidence from China's privatized firms. *48*, 276-291.
- Meyer, L. H. J. F. R. B. o. S. L. R. (2001). Inflation targets and inflation targeting. *83*(November/December 2001).
- Miller, M. H., & Orr, D. J. T. Q. j. o. e. (1966). A model of the demand for money by firms. *80*(3), 413-435.
- Ortiz-Molina, H., Phillips, G. M. J. J. o. F., & Analysis, Q. (2014). Real asset illiquidity and the cost of capital. *49*(1), 1-32.
- Özlen, S., Ergun, U. J. I. J. o. A. R. i. B., & Sciences, S. (2012). Macroeconomic factors and stock returns. *2*(9), 315.
- Palazzo, B. J. J. o. F. E. (2012). Cash holdings, risk, and expected returns. *104*(1), 162-185.
- Pinkowitz, L., Stulz, R., & Williamson, R. J. T. J. o. F. (2006). Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis. *61*(6), 2725-2751.
- Rashed, A., Ghoniem, W. J. I. M., & Innovations, F. (2022). The impact of cash holding on stock returns in small and medium enterprises on the Egyptian Nile Stock Exchange. *19*(3), 83-92.
- Riddick, L. A., & Whited, T. M. J. T. J. o. F. (2009). The corporate propensity to save. *64*(4), 1729-1766.
- Saeed, S., & Akhter, N. J. I. J. o. C. R. i. B. (2012). Impact of macroeconomic factors on banking index in Pakistan. *4*(6), 1200-1218.
- Simutin, M. J. F. M. (2010). Excess cash and stock returns. *39*(3), 1197-1222.
- Thi, Q. N. N., Tran, Q. T., & Doan, H. P. J. I. J. o. E. M. (2021). Foreign ownership, state ownership and cash holdings under the global financial crisis: evidence from the emerging market of Vietnam. (ahead-of-print).
- Turley, W. S., & Selden, M. (2019). *Reinventing Vietnamese socialism: Doi Moi in comparative perspective*: Routledge.

- Vergara Garavito, J., Chi6n, S. J. J. J. o. E., Finance, & Science, A. (2021). Relationship between cash holdings and expected equity returns: evidence from Pacific alliance countries. 26(51), 77-93.
- Verick, S., & Islam, I. (2010). The great recession of 2008-2009: causes, consequences and policy responses.
- Vitoria, R., Bressan, A. A., & Iquiapaza, R. A. J. B. B. B. R. (2020). Do state-owned enterprises in Brazil require a risk premium factor? , 17, 488-505.
- VNA. (2022). Interest rate support package has little effect on stock market.
- Vo, T. T., Nguyen, A., & Dinh, T. J. I. p. i. A. (2018). Innovation Policy in Viet Nam. 247-276.
- Ye, Y. J. M. E. (2018). A literature review on the cash holding issues. 9(6), 1054-1064.