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### **Determinants of corporate cash holdings: evidence from Vietnamese materials firms**

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#### **Abstract**

This paper investigates factors affecting cash holdings of materials firms listed on Vietnamese stock exchanges. By analyzing data collected from 51 companies in a period of 7 years (from 2013-2019), using FGLS procedure based on fixed effect estimation, the study shows that leverage, profitability, cash conversion cycle, cash flows and growth opportunities significantly affect the level of cash holdings of Vietnamese materials companies. This study adds more insights in the field of liquidity management in general and cash management in particular by determining factors influencing cash holdings. Outcomes from this research would help managers, investors, and consultants in making corporate governance decisions.

**Keywords:** Cash Holdings Issues, Corporate Governance

#### **1. Introduction**

Holding of cash and other liquid assets have always been important for the strategic decisions of companies. Accordingly, an effective financial management policy would be an indispensable part contributing to a sustaining growth and performance of a company. Since the 2008 financial crisis, cash holdings level has become one of the biggest concerns of corporate governance. There have been several reports of cash held by corporations conducted in many different markets. Cash availability is closely related to companies' operations and a core requirement to ensure continued operations. The term of cash holdings in this study refers to the amount of cash and cash equivalent items that is available for a company to meet their short-term and emergency needs. Shah (2011) argue that cash is one of the least productive assets of a company because most of the time cash does not create any accounting income.

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However, firms assert that it is essential to keep a certain amount of cash in their assets. According to Acharya *et al.* (2007), Almeida *et al.* (2004), Bates *et al.* (2009), and Cruz *et al.* (2019), company's managers see that cash reserves allow businesses to be ready for any unanticipated fluctuations in cash flows, to fund day-to-day operations, to finance long-term investment and to prepare for risk. Additionally, this capital for investment opportunities will be included in the firm's balance sheet as a type of bridge financing, signaling its financial strength. In the current challenging situation of the new COVID-19 outbreak, cash availability even plays an unequivocal role when firms suffer from difficulties in their business. Adequate level of cash reserves within the firms will protect them from insolvency by helping to cover all expenses payment incurred in daily operations.

Because each industry and sector has its own characteristics, it leads to different demand and requirements for the optimal level of cash holdings of firms operating within each industry and sector. Therefore, the understanding on corporate cash holdings pattern and factors affecting the level of cash holdings should be investigated for each industry separately. To the best of the authors' knowledge, there has been no research considering this matter in materials manufacturing industry. The materials manufacturing industry development is now an urgent and fundamental goal for the sustainable economic development of Vietnam, especially in the current global economic integration. This sector produces input materials for various commodity production markets; hence it has a strong impact on actively promoting the growth of other industries in the economy, founding the development basis for new sectors and occupations, enhancing competitive position and well preparing for globalization. According to the report of Mordor Intelligence Inc, Vietnam's materials industry is the best performing in the Asia-Pacific area. Despite the great economic volatility in 2021, Vietnam's materials industry is still projected to recover at the same growth rate prior to the pandemic because Vietnamese authorities have responded by outlining a plan for materials manufacturing development in the next few years and investing more resources into this sector to improve the manufacturing quality of domestic enterprises and the capacity of laborers.

Researches also identified incentives for materials firms to hold cash, including theoretical motives and industrial characteristic motives. Theoretically, the theories including trade-off, pecking order and free cash flow can be used explain the cash holdings behavior of firms. Theoretical frameworks are used in many studies regarding this topic, such as Opler *et al.* (1999), and Ferreira and Vilela (2004). In terms of transaction motives, it is suggested that appropriate level of cash reserves is fundamental for a smooth operation of firms. Firms can reduce transaction costs associated with external fundings by using cash to make payments. Brokerage fees incentivize corporations to maintain more liquid assets, according to Miller and Orr (1966). It is more expensive to raise external funds than it is to use internal funds in the presence of asymmetric knowledge, according to Myers and Majluf (1984), thus enterprises should keep a specific amount of cash to meet their investment needs. Another incentive for businesses to maintain cash on hand is to protect themselves against unexpected financial shortages, known as the precautionary motive. According to

Almeida *et al.* (2004), financially constrained businesses are in demand to have more cash reserves than financially unconstrained companies, supporting this hedging argument and the pecking order theory.

According to Greenwood and Hanson (2015), faced with intense problem of information asymmetry, materials firms shall have high level of cash flow risk due to the coverage nature. The evidences were also found by Drobetz *et al.* (2016b), and Ahrends *et al.* (2018), among others. Furthermore, the materials industries tend to depend heavily from external financing through capital markets, which could influence the firms' cash holdings decision (Ahrends *et al.*, 2018). Additionally, the characteristics of high degree of asset tangibility and high level of fixed cost of the materials industry are also major motives for firms to preserve cash. Industrial machinery and production lines are highly industry-specific assets, which affects the ability of materials firms access external funding. This would in turn influences the investment opportunities due to liquidity conditions (Drobetz *et al.*, 2016a). Therefore, the importance of excess cash holdings was emphasized. Even though investment declines after crises was severe in the materials sector, cash holdings still can offer financial flexibility and mitigate the adverse effects of the global economy. Despite this importance, many organizations in Vietnam are losing significant capital by failing to effectively manage their cash flows, according to the report of PwC in 2018. This research also pointed out that Vietnam's cash performance lagged behind most regional and global peers, which is primarily engineering and materials sectors' responsibility. Therefore, the question is what are the factors significantly attributing to firms' behavior of maintaining cash. By understanding these factors, managers can develop appropriate policies related to the improvement of the effectiveness of cash holdings. Although there are plenty of studies investigated the determinants of cash holdings across different nations and different sectors, only several studies have been carried out on factors influencing the decisions of cash holdings in emerging market in general and in Vietnam in particular. This paper adds to the literature upon the issue of cash holdings in emerging market in some respects by: (1) using financial data from materials firms in Vietnam; and (2) investigating other factors which were not frequently examined in earlier studies such as cash conversion cycle and dividend payout. Upon which, financial managers, investors, and corporate governance experts can use the findings to make a clear understanding of the patterns of cash holdings.

The study employs quantitative research method to analyze a of 51 Materials firms listed on both Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX). The conclusions of this study show that the results are mostly in line with the pecking theory's expectations, which anticipates that leverage, cash conversion cycle and dividend payout ratio negatively affect the level of cash holdings while the other variables show positive influences.

The paper will first present the theoretical framework applied in this study. A review of previous study on cash holdings behavior, which enables the development of the various hypotheses, will be discussed next. After that, the methods used to test these hypotheses will

be presented. The data are then analyzed in the following part, followed by a discussion of the findings. The conclusion section will close this study.

## **2. Theoretical framework**

There are different theories explaining why firms would want to hold cash instead of other liquid assets or transform to other forms of long-term investment. According to different reasons, cash is needed to prevent financial distress, for financing investment or for the purpose of assets controlling. These theories are summarized below.

### ***2.1 Trade-off theory***

According to trade-off theory, there is an optimal amount of cash holdings with a given level of debt. Corporations can determine this optimal level by weighing the marginal costs and advantages of keeping cash on hand (Opler *et al.*, 1999). Holding cash would bear the “cost-of-carry” under the assumption that managers seek to optimize shareholder capital. The main cost of holding cash is often associated with the opportunity cost of the capital invested in liquid assets (Ferreira and Vilela, 2004). The prime benefit of holding cash is to minimize the external capital raising costs and to avoid missing growth opportunities because of the shortage of liquid assets (Dittmar *et al.*, 2003; Faulkender and Wang, 2006). In addition, Ferreira and Vilela (2004) stated that cash holdings can protect firms from the likelihood of financial distress. In Vietnam, the bankruptcy related costs are significant, which makes the trade-off theory more supportive of cash holdings decisions (Al-Najjar, 2013). However, cash reserve is not always beneficial for businesses. Firms that stockpile cash levels more than the optimal balance might obtain the low rate of return on cash or liquid assets. The agency cost of managerial discretion also increases the cost of cash holdings in the case that managers maintain cash to keep more assets under their control for their own interests rather than acting on shareholders’ wealth, according to Saddour (2006).

Several studies using financial determinants of cash holdings to investigate the trade-off theory on cash holding behavior. For example, Al-Najjar and Belghitar (2011), Ferreira and Vilela (2004), and Opler *et al.* (1999) employ leverage, liquidity, dividend payout, firm size and growth to empirically examine this theory.

### ***2.2 Pecking order theory***

Pecking order (or financial hierarchy) theory was first introduced by Donaldson (1961) and extended by Myers and Majluf (1984). This theory upholds the concept of funds priority order when firms decide which funds to use for financing investments. The theory states that firms prefer to finance their projects by internal resources which can be accessed at ease. After that, they will adjust their dividend levels to exploit retained earnings (available liquid assets), even if the firms follow a sticky dividend policy (Tahir *et al.*, 2016). If retained earnings ratio can no more be adjusted, firms would tend to sell liquid assets and external capital raising is only their last resort. This theory focuses on using internal resources as the least expensive resource for firms financing, thereby firms can reduce costs of capital. Pecking order theory

comes from asymmetric information and agency problem theories to minimize costs related to equity issuing. The theory supports the idea that if a firm is profitable enough to finance its investments, there should be no or less external funding.

### ***2.3 Free cash flow theory***

Free cash flow theory, which usually explains the pattern of cash holdings, was first developed by Jensen (1986). According to Jensen (1986), managers prefer to keep high level of cash for their assets controlling. Free cash flow theory on this agency problem analysis is a major part of the modern financial literature. Agency problems are also caused by the optimal level of cash holding of the firm. Excess cash can facilitate management to pursue investments projects and financing decisions. For example, in case the capital market is not willing to finance new projects, managers need to use available cash within the firm as a risk-free investment. A risk-averse manager would maintain a high cash retention ratio to minimize the company's risk exposure and abandon investments with positive risky NPV (Tong, 2006). Beside the conflict in terms of making financial decisions, the conflict over payout policy are especially severe when free cash flow is substantially available (Jensen, 1986). It seems that management accumulates cash by lowering the payout ratio to keep funds within the firm.

## **3. Literature review**

Plenty of relevant articles have extensively discussed the motivations to hold cash of firms, together with empirical evidence. The following section explores and reviews important papers and their findings in order to develop research hypotheses, based on important found determinants and research gaps.

### ***3.1 The determinants of cash holdings***

There have been many studies conducted across different markets based on theories associated with cash holdings decisions of firms' managers. Firms hold cash to ensure the optimal timing of investment and to avoid financial distress events. On the other side, excess of cash would lessen the firm value due to lower investment activities (Easterbrook, 1984; Dittmar *et al.*, 2003).

Regarding this topic, cash holding behavior of U.S. firms gains much attention from the literature (Chang-Soo *et al.*, 1998; Opler *et al.*, 1999; Faulkender and Wang, 2006; Bates *et al.*, 2009; Gao *et al.*, 2013; Tahir *et al.*, 2016). The model used in Opler *et al.* (1999) is widely employed to examine determinants of cash holding decisions in other empirical studies. Opler *et al.* (1999) implemented this model on the US data, while Gill and Shah (2012) investigated the cash holdings determinants on a sample of 166 Canadian firms. The UK context studied by Ozkan and Ozkan (2004), and Al-Najjar and Belghitar (2011) also applied the same model. Beside some firm-specific characteristics such as leverage, liquidity, investment opportunities and cash flow that were inherited from previous works, Ozkan and Ozkan (2004) also assess the role of the ownership structure in the U.K. context. In addition to these variables,

Khuong *et al.* (2020) examine real activities management as an important determinants of cash holdings. Ferreira and Vilela (2004) choose the EMU market for their cash holdings investigation. Garcia-Teruel and Martinez-Salona (2008) analyzed cash holdings determinants of 860 Spanish SMEs, showing a positive association between leverage and cash holdings.. In Vietnamese market, the research of determinants of cash holding in manufacturing firms was conducted by Thieu (2013). This report used data of listed manufacturing firms between 2006 and 2011 applying three most popular theories as his theoretical framework. This paper only focused partly on the impact of firm characteristics of manufacturing firms in Vietnam and does not mention cash holdings target.

Because of imperfect market condition, especially in an emerging market like Vietnam, cash holdings level is relevant when assessing financial decisions and firm value (Opler *et al.*, 1999). This section reviews the extant literature and develop hypotheses regarding the determinants of cash holdings in case of materials manufacturing firms listed on Vietnamese stock exchanges.

### *Leverage*

Leverage, which means the proportion of debt in the capital structure, is one of the most critical determinants of cash holdings. It is argued that as the precautionary motive, firms with high leverage ratio tend to hold high level of cash so that they can reduce the default risk (Khalil, 2017; Masood *et al.*, 2018). Jebran *et al.* (2019) concluded that, after crisis period, firms choose to issue more debts to enhance their cash level. The pecking order theory, on the other hand, predicts that leverage and cash holding have an inverse relation (Diamond, 1991; Ozkan and Ozkan, 2004; Sheikh *et al.*, 2018), implying that companies capable of borrowing through bonds would hold less cash, and tend to focus on investment activities. Empirically, the negative relation between leverage and cash holding is found in several studies such as Ferreira and Vilela (2004), Afza and Adnan (2007), Shah (2011), Ogundipe *et al.* (2012), Ahmed *et al.* (2018), Das and Goel (2019), and Yudaruddin (2019). In Vietnam, most Vietnamese firms rely on short-term borrowings (Nguyen, 2006), and Vietnamese companies tend to borrow in the short run to substitute for the need of cash (John, 1993). The reason of accumulating a certain level of cash for these firms is to minimize the risk of insolvency in a market with high bankruptcy related costs like Vietnam (Al-Najjar, 2013). The negative association between leverage and cash holdings in Vietnamese market was also showed in Phung and Nguyen (2018) with the explanation that a high interest expense on a high leverage would lead to a low ability to hold cash. Based on previous findings, the following hypothesis is presented:

*H1: There is a negative relationship between leverage and cash holdings of Vietnamese materials manufacturing firms.*

### *Profitability*

Cash is an outcome of the profitable financing and investment activities (Dittmar *et al.*, 2003). Firms with great profitability could have resources for dividend payments, debt payback

and accumulation purposes. Opler *et al.* (2009) concluded that firms with high performance will tend to accumulate cash. Profitable companies have easier and cheaper access to the capital market, they have more resources to pay their shareholders dividends and repay their debt (Ferreira and Vilela, 2004; Almeida *et al.*, 2004). Thus, they tend to accumulate more cash to minimize the possibility of short of liquidity for those payments or future earnings unpredictability. This positive linkage is also found in Yudaruddin (2019). In addition, the pecking order theory also implies that profitable firms, especially small ones in Vietnam, prefer to hold cash for refinancing their operations and reinvesting their projects due to high information asymmetry, which makes equity issue too costly. Based on previous findings and the pecking order theory, the following hypothesis is presented:

*H2: There is a positive relationship between profitability and cash holdings of Vietnamese materials manufacturing firms.*

#### *Cash conversion cycle*

As cash conversion cycle ensures abilities of companies to meet their short-term obligations and, it would save the reputation of a company. According to Shah (2011), short cash cycle improves a company's capacity to replenish funds fast. As a result, businesses with a short cash cycle are less likely to face cash shortages. However, Junli (2011) and Mahjabeen and Rizwan (2018) showed that cash conversion cycle has a positive impact on level of cash holdings. Based on previous findings, the authors predict a negative relationship between cash conversion cycle and cash holdings:

*H3: There is a negative relationship between cash conversion cycle and cash holdings of Vietnamese materials manufacturing firms.*

#### *Cash flow*

According to pecking order and free cash flow theories, firms prefer internal over external finance (Myers and Majluf, 1984). Firms with high free cash flow can easily pursue their projects when cash is available. Opler *et al.* (1999) found that companies with high growth potential and cash flows tend to have a larger quantity of cash. Drobetz and Grüniger (2007) also showed that cash balance is positively correlated to operating cash flows. Many studies have been conducted using the cash flow sensitivity to cash holdings to examine the relationship between OCF and cash holdings. Hung *et al.* (2020) and Quoc (2019) recognized the positive linear relation between cash flow and cash holdings. Based on previous research and existing theories, the following hypothesis is developed:

*H4: There is a positive relationship between free cash flow and cash holdings of Vietnamese materials manufacturing firms.*

#### *Growth opportunities*

One of the most significant determinants of cash retained by companies is the availability of growth/investment opportunities. Saleem *et al.* (2021) argued that growth opportunities are negatively associated with the cash holdings level, which implied that due to agency conflicts,

firms with high level of cash holdings might avoid investing in projects. This result was also supported by the finding of Sheikh *et al.* (2018). In contrast, besides studies supporting the negative linkage between growth opportunities and cash holdings, the positive association is found in several other studies. Firms with high growth typically have low information asymmetry, according to asymmetric information theory. Firm may have troubles in finding places to distribute their investments, resulting in a higher cash balance (Phung and Nguyen, 2018). According to Shabbir *et al.* (2016), companies that have more growth prospects will need to increase their capital. The positive association is found in some empirical studies such as Opler *et al.* (1999), Kim *et al.* (2011), Ferreira and Vilela (2004), and Ahmed *et al.* (2018). In the context of Vietnam, Nguyen *et al.* (2013) also found a positive association between market-to-book ratio which is used as measurement proxy for growth opportunities and cash holdings. Based on theoretical framework and previous empirical results, the following hypothesis is developed:

*H5: There is a positive relationship between growth opportunities and cash holdings of Vietnamese materials manufacturing firms.*

#### *Dividend payout*

Drobetz and Grüninger (2007) find that cash reserves are positively correlated with dividend payments. This result was also concluded by Guizani (2017), Chirecka and Fakoya (2017), and Ahmed *et al.* (2018). It is explained that, in order to prepare for the case of insufficient cash when paying dividend, firms paying dividend would hold the excess cash so that they can keep the reputation of dividend payments (Guizani, 2017). However, according to trade-off theory, dividend payout should be negatively associated with the level of cash holdings of firms. Kim *et al.* (2011) found that there is less cash kept by businesses paying dividends. It is suggested that firms paying dividends can have another substitution of holding cash by decreasing dividend payout when the cash shortfall occurs. According to Opler *et al.* (1999), dividend payments significantly reduce level of cash holdings. Previous studies such as Sheikh *et al.* (2018) and Saleem *et al.* (2021) also suggested this significantly negative association between dividend payments and cash holdings of firms. Based on previous findings, the following hypothesis is developed:

*H6: There is a negative relationship between dividend payout and cash holdings of Vietnamese materials manufacturing firms.*

### **3.2 Research gap**

The literature suggests that leverage, liquidity, profitability, growth opportunities, free cash flows, net working capital, firm size and dividends impact the level of corporate cash holdings. However, the results are mixed across countries and across sectors.. In addition, to the best of our knowledge, among existing literature of cash holdings in Vietnamese context, none have studied cash holding determinants for firms in materials manufacturing industry. Therefore, this study is aimed filling in this research gap by empirically analyzing which theory and factors describe cash holdings behavior in the Vietnamese materials manufacturing sector.



**Table 1.** Previous studies on determinants of cash holding level

Variables	Positive relationship (+)	Negative relationship (-)	Hypotheses development
Leverage	Ferreira and Vilela (2004); Khalil (2017); Masood et al. (2018); Jebran et al. (2019)	Hardin et al. (2009); Ahmed et al. (2018); Das and Goel (2019); Yudaruddin (2019)	H1 - Negative
Profitability	Nguyen (2006); Yudaruddin (2019)	Drobetz and Grüninger (2007)	H2 - Positive
Cash conversion cycle	Junli (2011); Mahjabeen and Rizwan (2018)	Shah (2011)	H3 - Negative/ Positive
Cash flow	Opler et al. (1999); Pinkowitz and Williamson (2001)	Kim et al. (1998); Ferreira and Vilela (2004)	H4 - Positive
Growth opportunities	Ferreira and Vilela (2004); Kim et al. (2011); Ahmed et al. (2018)	Sheikh et al. (2018); Saleem et al. (2021)	H5 - Positive
Dividend payout	Drobetz and Grüninger (2007); Guizani (2017); Ahmed et al. (2018)	Al-Najjar (2013); Sheikh et al. (2018); Saleem et al. (2021)	H6 - Negative

**Source:** The authors' compilation

## 4. Data and methodology

### 4.1 Data collection

In this study, quantitative method is employed using secondary data from annual audited financial statements of targeted companies. Targeting a sample of materials manufacturing companies listed on Vietnamese stock exchange, the authors collect data from FiiTrade Platform. Due to some constraints during data collection process such as non-availability of data or non-working companies in a year, the total number of observations are 51 companies over 7 years.. Thus, the research has 357 observations in total..

### 4.2 Methodology

The following regression model is used:

$$CHR_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 ROE_{i,t} + \beta_3 CCC_{i,t} + \beta_4 GRTH_{i,t} + \beta_5 CFLOW_{i,t} + \beta_6 DPR_{i,t} + \mu_{i,t}$$

where CHR represents cash and cash equivalents ratio; LEV is leverage ratio; ROE means return on equity; CCC is cash conversion cycle; GRTH denotes growth opportunities; CFLOW is free cash flow ratio; DPR means dividend payout ratio;  $\mu$  represents random error term/residuals.

**Table 2.** Measurement of variables

Variables	Model input	Measurement	References
Cash holdings level	CHR	$\frac{\text{Cash and cash equivalents}}{\text{Total assets}}$	Opler et al. (1999); Afza and Adnan (2007)
Leverage	LEV	$\frac{\text{Total debts}}{\text{Total assets}}$	Ferreira and Vilela (2004); Afza and Adnan (2007)
Profitability	ROE	$\frac{\text{Net income}}{\text{Total equity}}$	Nguyen (2006); Al-Najjar (2013)
Cash conversion cycle	CCC	CCC = RCP + ICP - APP	Shah (2011)
Cash flow ratio	CFlow	$\frac{\text{Free cash flow}}{\text{Total assets}}$	Cap (2014)
Growth opportunities	GRWTH	$\frac{\text{Price per share}}{\text{Book value per share}}$	Nguyen (2006); Kim et al. (2011)
Dividend payout ratio	DPR	$\frac{\text{Dividend per share}}{\text{Earnings per share}}$	Nguyen (2006); Saddour (2006)

**Source:** The authors' compilation

### 4.3 Descriptive Statistics

Descriptive statistics of dependent and independent variables of 357 firm - year observations of 51 Vietnam materials manufacturing companies from 2013 to 2019 are presented in Table 3.

**Table 3.** Descriptive Statistics

Variables	Observation	Mean	Std. Dev.	Min	Max
CHR	357	0.0834134	0.0861461	0.0001157	0.5211058
LEV	357	0.4546902	0.2006204	0.0589278	0.8707558
ROE	357	0.1386917	0.134545	-0.41113	0.6344157
CCC	357	105.037	105.1224	-198.8168	774.9073
CFlow	357	0.0502254	0.1471334	- 0.58062	0.6241435
GRWTH	357	1.36096	1.100218	0.1387799	8.986499
DPR	357	0.0918227	0.0988234	0	0.9325

**Source:** The authors' calculation

The results show that the average level of cash holdings is 8.34% of total assets, and its standard deviation is 8.61%. The standard deviation of cash ratio observations is quite high, with the maximum and minimum values of cash holdings ratio are 52% and 0.01% respectively. This shows that cash holdings are fluctuate among a wide range. The average leverage ratio which was used as proxy to measure the financial health of a company is 45.5%

with a standard deviation of 20%, which indicates a wide variance across firms. Average return on equity (ROE) is 13.87%, implying that this industry has the potential to be profitable. The mean of cash conversion cycle is 105 days with a standard deviation is 105 days. The cash flow ratio has the mean value of 5%, indicating that firms in this industry have a low efficiency in cash availability. The growth opportunities ratio is represented by the price-to-book ratio (P/B). The average of P/B at 1.36 reveals that the current capital market is overvaluing the materials firms. The mean value for dividend payout is 9.2%..

## 5. Empirical results

### 5.1 Correlation Analysis

Prior to regression, Pearson's correlation analysis is conducted to verify the relationship between variables.

**Table 4.** Correlation matrix

Variables	CHR	LEV	ROE	CCC	CFlow	GRWTH	DPR
CHR	1.0000						
LEV	-0.3642	1.0000					
ROE	0.2311	-0.0563	1.0000				
CCC	-0.1213	-0.1812	- 0.1437	1.0000			
CFlow	0.3540	-0.3120	0.1651	0.0067	1.0000		
GRWTH	0.1478	0.1351	0.5058	- 0.0303	0.1071	1.0000	
DPR	0.2660	- 0.1765	0.4036	- 0.0678	0.2001	0.2454	1.0000

**Source:** The authors' calculation

Although the highest correlation result between return on equity and growth opportunities is quite high (+0.5058), the correlation coefficient is still within the allowable level (<0.8). Therefore, it can be concluded that there is no perfect multicollinearity in the regression.

### 5.2 Collinearity diagnosis

**Table 5.** Collinearity diagnosis result

Variable	VIF	1/VIF
ROE	1.56	0.639600
GRWTH	1.43	0.700331
DPR	1.25	0.797959
LEV	1.24	0.807733
CFlow	1.16	0.864429
CCC	1.07	0.932246
Mean VIF	1.29	

**Source:** The authors' calculation

Besides, the study tests for multicollinearity to detect if there is any linear relationship between variables. Variance inflation factor (VIF) is used for this test.

According to the test result, the mean VIF is 1.29 which is much smaller than 10. Also, each VIF value is consistently smaller than 10 and greater than 1. Therefore, it can be concluded that the model is free from multicollinearity.

### 5.3 Regression model selection and results

Initially, this research used Pooled OLS, Fixed effect and Random effect regression analyses to investigate the impact of each proxy on cash holdings level. The result is shown in Table 6 with estimated coefficient of each independent variable and its level of significant in explaining effects on cash holdings.

The results of adjusted - R2 of Pooled OLS, fixed effect model, random effect model are 25.64%, 13.13% and 23.93% respectively (Table 6). This result implies that the independent variables used as determinants in the model can explain 25.64%, 13.13% and 23.93% of changes in levels of cash reserve of materials manufacturing firms listed on Vietnam stock market. Because the p-value of each estimated model among the three models above is 0.0000, less than the significance level of 0.05, all models are statistically significant.

**Table 6.** Regression results and robustness tests

Proxy variables	Pooled OLS	FEM	REM
LEV	-0.137*** (-6.29)	0.0104 (0.25)	-0.0718* (-2.34)
ROE	0.0365 (1.00)	0.0838* (2.36)	0.0635 (1.91)
CCC	-0.000133*** (-3.42)	-0.0000508 (-1.14)	-0.0000825* (-2.01)
CFlow	0.125*** (4.33)	0.144*** (5.74)	0.135*** (5.51)
GRWTH	0.00848* (1.98)	0.0140* (2.27)	0.0118* (2.38)
DPR	0.0928* (2.08)	0.0105 (0.25)	0.0299 (0.75)
_cons	0.128*** (9.41)	0.0452* (1.98)	0.0903*** (4.75)
Observations	357	357	357
	F(6,350) = 21.46	F(6,300) = 7.85	Wald chi2(6) = 64.27
	Prob > F = 0.0000	Prob > F = 0.0000	Prob > chi <sup>2</sup> = 0.0000
	Adj R-squared = 0.2564	R-sq: within 0.136	R-sq: within 0.1223

t statistics in parentheses

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

**Table 6.** Regression results and robustness tests (*continued*)

Proxy variables	Pooled OLS	FEM	REM
<b>Modified Wald test for groupwise heteroskedasticity in fixed effect regression model</b>			
H0: $\sigma(i)^2 = \sigma^2$ for all I			
chi <sup>2</sup> (51) = 6767.55			
Prob>chi <sup>2</sup> = 0.0000			
<b>Wooldridge test for autocorrelation in panel data</b>			
H0: no first order autocorrelation			
F(1, 50) = 25.118			
Prob > F = 0.0000			

**Source:** The authors' calculation

According to the result for heteroskedasticity and autocorrelation tests after running OLS regression, the impact of each proxy on cash holdings level is not being fully reflected by the estimation by Pooled OLS model and statistic errors as heteroskedasticity and autocorrelation still exist. The Modified Wald test presents the result of Prob > chi<sup>2</sup> = 0.0000, indicating that OLS model suffer from heteroskedasticity.

Additionally, the Wooldridge test shows that autocorrelation exists in the OLS regression model. Therefore, the Pooled OLS model is not the most appropriate model.

This led the authors to use the Hausman test to check for the appropriation of fixed effect model and random effect model. The result of this test suggested that fixed effect model is more appropriate for the regression.

The fixed effects model results show that except for cash conversion cycle, all remaining factors positively affect cash holdings level. However, only the factor ROE, cash flow ratio and growth opportunities have significant impacts on the dependent variable.

Although fixed effect model is the most appropriate models in the three models above, the Modified Wald suggested that heteroskedasticity still occurs in this model.

#### **5.4 Feasible least squares regression result**

Due to the existence of heteroskedasticity and autocorrelation in fixed effects model, the feasible generalized least squares (FGLS) is conducted hereafter with the aim to fix these problems. This estimator with AR1 level allows estimation in the presence of heteroscedasticity and autocorrelation within the panel. It can be clearly seen from the summary table result that the estimates have changes in their magnitude after running FGLS to fix violations of the model. However, all the impact direction of independent variables on cash holdings level, except the variable of leverage ratio, are still the same as that of fixed effect model.

The regression model of level of cash holdings after fixing violations by feasible least squares model is:

$$\text{CHR} = 0.0811 - 0.0752 \text{LEV}_{i,t} + 0.0538 \text{ROE}_{i,t} - 0.000067 \text{CCC}_{i,t} + 0.00686 \text{GRWTH}_{i,t} + 0.112 \text{CFLOW}_{i,t} + 0.0448 \text{DPR}_{i,t}$$

**Table 7.** FEM and FGLS regression result

Proxy variables	FEM	FGLS
LEV	0.0104 (0.25)	-0.0752*** (-3.90)
ROE	0.0838* (2.36)	0.0538* (2.50)
CCC	-0.0000508 (-1.14)	-0.0000673** (-2.89)
CFlow	0.144*** (5.74)	0.112*** (6.97)
GRWTH	0.0140* (2.27)	0.00686** (2.87)
DPR	0.0105 (0.25)	0.0448 (1.67)
_cons	0.0452* (1.98)	0.0811** (6.58)
Observations	357	357
	F(6,300) = 7.85	Wald chi <sup>2</sup> (6) = 126.44
	Prob > F = 0.0000	Prob > chi <sup>2</sup> = 0.0000
	R-sq: within 0.136	

**Notes:** t statistics in parentheses, \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.

**Source:** The authors' calculation

The model's p-value is  $0.0000 < 5\%$  level of significance which implies that the regression result is statistically significant at 5% level of significance. The empirical results indicate that LEV, CCC, CFlow and GRWTH are statistically significant at the 0.05 level as in Table 7. On the other hand, DPR has no significant impact on level of cash holdings.

## 6. Discussion and limitations

### 6.1 Discussion

It is found that leverage has a significant negative influence on cash holdings of Vietnamese materials manufacturing firms, at 1% level of significance. This negative correlation supports the precautionary motive and Hypothesis 1. The result is consistent with the prediction of pecking order theory and the findings of Opler *et al.* (1999), Hardin *et al.* (2009), Afza and Adnan (2007), Megginson and Wei (2010), Ogundipe *et al.* (2012), Khalil (2017), and Jebran *et al.* (2019). With a higher level of debt, firms can see debt as a substitute for cash holdings. Although the impact has changed its direction after the running of the feasible generalized least squares model, it presents a more significant influence in this final model. At the level of 1% significance, the leverage variable has a strong impact on the decision of holding cash. In a material firm with a high level of debt financing, managers and stakeholders would want

to use their cash and cash equivalent to make the most of investment opportunities to avoid wasting money on high interests from the financial market. This tendency then reduces the demand for cash.

The coefficient for ROE is significant and has a value of 0.0538, showing the positive impact of profitability on cash holding level of materials companies. This finding supported Hypothesis 2. This result can be explained by transaction motive and is consistent with expectation of pecking order theory. This relationship is also confirmed by some studies on the developed markets such as Nguyen (2006) Tokyo market and Opler *et al.* (1999) on the US market. The positive impact is also found in emerging markets by evidence from Nigeria (Ogundipe *et al.*, 2012), China (Megginson and Wei, 2010), and Indonesia (Yudaruddin, 2019). This could imply that profits from businesses could be used as a good source of internal funds in some emerging markets where the agency costs of debts are high. Further possible argument can be concluded from free cash flow theory which states that conservative managers tend to hold excess cash from cash flow generated from operation profits to pursue their own projects for their own interests.

The result of regression running indicates a negative impact of cash conversion cycle on cash holdings level. However, this effect is at a low magnitude, just -0.0000673. This finding accepts the prediction of hypothesis H3 and is consistent with trade-off theory and pecking order theory. The negative relationship between cash conversion cycle and cash holdings can be explained that shortening cash conversion cycle can increase the cash reserve in the bank account of a firm and that firm would not go with shortage of cash for long. To be specific, the shorter cash conversion cycle is, the more cash free to be accumulated by managers to prepare for investments and projects. The result of cash conversion cycle effect in this study is also supported by Shah (2011).

The coefficient between cash flow and cash holdings level showed a significant positive impact of cash flow on the level of cash holdings. Notably, cash flow ratio is the strongest proxy influencing on the level of cash reserves in firms in this study, as its coefficient is 0.112, and significant at the 1% level. The positive relationship indicates that Hypothesis 4 is accepted, and pecking order and free cash flow theories hold in this case. This result suggests that materials manufacturing firms in Vietnam with high cash flow ratio tend to retain more cash to finance their new investments. Cash is kept within firms in order to safeguard the firms against potential losses and sudden unexpected events, as a transactional and precautionary move. Pecking order theory reflected through this result can be understood that firms prefer to finance themselves by internal funds before resorting to the market. This positive influence of cash flow ratio on cash holdings is also strongly supported in the study of Kariuki *et al.* (2015) on Kenya market. In Cap (2014), it is reported that this outcome is not only seen in the overall sample of the research, but also remains the same when analyzing the effect on sub-samples classifying by industry. This finding is also confirmed by Mahjabeen and Rizwan (2018) while investigating non-financial Pakistani companies' determinants of cash holdings. Opler

*et al.* (1999), Pinkowitz and Williamson (2001) reported the same outcome when examining the effect of cash flow on cash holding behaviors.

Growth opportunities, which is measured by the market-to-book ratio, has a positive influence on level of cash holdings in firms at the 5% level. Hypothesis 5 is accepted by this empirical result. The finding is also consistent with the result reported by Ozkan and Ozkan (2004), Ferreira and Vilela (2004), Jani *et al.* (2004), D’Mello *et al.* (2008), Bates *et al.* (2009), and Ahmed *et al.* (2018). The relationship can be explained by all three theories. To avoid financial distress, a growing corporation with significant growth potential tends to accumulate greater cash reserves, which corresponds to the precautionary reason for holding cash. This direction of the impact can be explained by the fact that the company would have higher bankruptcy costs as a company has greater investment potential (Ferreira and Vilela, 2014). Pecking order theory also predicts the same correlation, high investment opportunities would lead a firm to having more cash to avoid shortage and in turn, go for costly external capital raising.

In contrast to the findings of significantly positive relationship between dividend payment and cash holdings reported by Guizani (2017) and Ahmed *et al.* (2018), there is a positive and insignificant relationship between dividend payout ratio and cash holdings level. Thus, dividend payout ratio has no significant relationship with cash reserves of companies, hence, it can be concluded that dividend payout ratio does not affect cash holdings of materials firms in Vietnam. According to free cash flow theory, it seems like there is little agency problems in materials companies in Vietnam although the authors did not detect significant relationships.

**Table 8.** Summary of research findings

Variables	Trade-off theory	Pecking order theory	Free cash flow theory	Prediction	Final finding
LEV		(-)	(-)	(-)	(-)
ROE	(+)	(+)		(+)	(+)
CCC	(-)	(-)	(+)	(-)	(-)
CFRatio	(-)	(+)	(+)	(+)	(+)
GRWTH	(+)	(+)	(+)	(+)	(+)
DPR	(-)	(-)		(-)	(-)

**Source:** The authors’ compilation

As the outcomes of this research suggested, in general the incentive for cash holding by Vietnamese material firms could be explained by pecking order theory, with all of the empirical results consistently fit to the afore-mentioned theory. There are slight differences between this research’s outcomes compared to other theories, but in general, final findings are consistent with the authors’ initial predictions.



## 6.2 Limitations

This study is limited to the sample of materials firms listed on Vietnamese stock exchanges. Therefore, the whole situation of cash holdings' determinants of the whole materials manufacturing sector might not fully be reflected. In addition, another drawback of this study is only to apply regression according to three basic methods of estimation without implementing additional methods to consider the model's suitability.

For more accurate evaluation of the materials sector, future research should investigate for all currently active companies. Internal corporate governance considerations such as board structure, audit processes and robust policies, and CEO characteristics should also be considered.

## 7. Conclusion

This research is conducted to investigate the cash holdings decisions in the emerging market of Vietnam. Results from several previous studies indicate that the influence of each factor is diversified across countries and across industries. However, there are few studies in Vietnam focus on this topic, especially in a specific industry. Therefore, the main purpose of this research is to understand why companies keep cash from the viewpoint of the Vietnamese materials manufacturing industry. The study is carried out by using secondary data from audited financial reports of 51 materials companies listed on both Hanoi stock exchange (HNX) and Ho Chi Minh stock exchange (HOSE) for the period of 2013-2019. The authors use the feasible generalized least squares model as the final regression result to test the hypotheses.

The research outcomes show free cash flow ratio has the strongest impact on cash holdings among the remaining evaluated variables, leverage ranked the second, profitability ranked third while growth opportunities and cash conversion cycle have the lowest impact on cash holdings level of firms. Dividend payout ratio has no significant relationship with cash balances of companies. Under that perspective, it is advised that Vietnamese material firms may take these factors as the considerations in understanding their own cash position influencing factors to make proper decisions. It may also be beneficial to researchers and regulators in providing timely and effective adjustment regarding cash holdings of these companies.

## References

- Acharya, V., Almeida, H. and Campello, M. (2007), "Is cash negative debt? A hedging perspective on corporate financial policies", *Journal of Financial Intermediation*, Vol. 16 No. 4, pp. 515 - 554.
- Afza, T. and Adnan, S.M. (2007), "Determinants of corporate cash holdings: a case study of Pakistan", in Proceedings of *Singapore Economic Review Conference (SERC) 2007*, August 01-04, Singapore Economics Review and The University of Manchester (Brooks WorldPoverty Institute), Singapore, pp. 164 - 165.
- Ahmed, R., Qi, W., Ullah, S. and Kimani, D. (2018), "Determinants of corporate cash holdings: an empirical study of Chinese listed firms", *Corporate Ownership & Control*, Vol. 15 No. 3, pp. 57 - 65.

- Ahrends, M., Drobetz, W. and Nomikos, N.K. (2018), “Corporate cash holdings in the shipping industry”, *Transportation Research Part E: Logistics and Transportation Review*, Vol. 112, pp. 107 - 124.
- Al-Najjar, B. (2013), “The financial determinants of corporate cash holding: evidence from emerging markets”, *International Business Review*, Vol. 22, pp. 77 - 88.
- Al-Najjar, B. and Belghitar, Y. (2011), “Corporate cash holdings and dividend payments: evidence from simultaneous analysis”, *Managerial & Decision Economics*, Vol. 32 No. 4, pp. 231 - 241.
- Almeida, H., Campello, M. and Weisbach, M. (2004), “The cash flow sensitivity of cash”, *The Journal of Finance*, Vol. 59 No. 4, pp. 1777 - 1804.
- Bates, T., Kahle, K. and Stulz R. (2009), “Why do U.S. firms hold so much more cash than they used to?”, *The Journal of Finance*, Vol. 64 No. 5, pp. 1985 - 2021.
- Cap, K.H. (2014), *Corporate cash holdings: determinants and implications from Vietnamese market*, Unpublished Manuscript, Master’s dissertation, Royal Docks Business School, University of East London.
- Chang-Soo, K., Mauer, D.C., Sherman, A.E. and Kim, C.S. (1998), “The determinants of corporate liquidity: theory and evidence”, *Journal of Financial and Quantitative Analysis*, Vol. 33 No. 3, pp. 335 - 359.
- Chireka, T. and Fakoya, M.B. (2017) “The determinants of corporate cash holdings levels: evidence from selected South African retail firms”, *Investment Management and Financial Innovations*, Vol. 14 No. 2, pp. 79 - 93.
- Cruz, A.F., Kimura, H. and Sobreiro, V.A. (2019), “What do we know about corporate cash holdings? A systematic analysis”, *Journal of Corporate Accounting and Finance*, Vol. 30 No. 1, pp. 77 - 143.
- Das, S. and Goel, U. (2019), “Determinants of excess and deficit cash holdings of firms: evidence from emerging market”, *Global Business Review*, Vol. 22 No. 5, pp. 1202 - 1215.
- D’Mello, R., Krishnaswami, S. and Larkin, P.J. (2008). “Determinants of corporate cash holdings: evidence from spin-offs”, *Journal of Banking and Finance*, Vol. 32 No. 7, pp. 1209 - 1220.
- Diamond, D. (1991), “Debt maturity structure and liquidity risk”, *The Quarterly Journal of Economics*, Vol. 106 No. 3, pp. 709 - 737.
- Dittmar, A., Mahrt-Smith, J. and Servaes, H. (2003), “International corporate governance and corporate cash holdings”, *Journal of Financial and Quantitative Analysis*, Vol. 38 No. 1, pp. 111 - 133.
- Donaldson, G. (1961), *Corporate debt capacity, Division of Research, Graduate School of Business Administration*, Harvard University, Boston.
- Drobetz, W. and Grüninger, M.C. (2007), “Corporate cash holdings: evidence from Switzerland”, *Financial Markets and Portfolio Management*, Vol. 21 No. 3, pp. 293 - 324.
- Drobetz, W., Haller, R. and Meier, I. (2016a), “Cash flow sensitivities during normal and crisis times: evidence from shipping”, *Transportation Research Part A: Policy and Practice*, Vol. 90, pp. 26 - 49.
- Drobetz, W., Menzel, C. and Schröder, H. (2016b), “Systematic risk behavior in cyclical industries: the case of shipping”, *Transportation Research Part E: Logistics and Transportation Review*, Vol. 88, pp. 129 - 145.

- Easterbrook, F.H. (1984), “Two agency-cost explanations of dividends”, *American Economic Review*, Vol. 74 No. 4, pp. 650 - 659.
- Faulkender, M. and Wang, R. (2006), “Corporate financial policy and the value of cash”, *Journal of Finance*, Vol. 61 No. 4, pp. 1957 - 1990.
- Ferreira, M.A. and Vilela, A.S. (2004), “Why do firms hold cash? Evidence from EMU countries”, *European Financial Management*, Vol.10 No. 2, pp. 295 - 319.
- Gao, H., Harford, J. and Li, K. (2013), “Determinants of corporate cash policy: insights from private firms”, *Journal of Financial Economics*, Vol. 109 No. 3, pp. 623 - 639.
- Garcia-Teruel, P. and Martinez-Salona, P. (2008). “On the determinants of SME cash holdings: evidence from Spain”, *Journal of Business Finance and Accounting*, Vol. 32 No. 1-2, pp. 127 - 149.
- Gill, A. and Shah, C. (2012), “Determinants of corporate cash holdings: evidence from Canada”, *International Journal of Economics and Finance*, Vol. 4 No. 1, pp. 70 - 79.
- Greenwood, R. and Hanson, S. (2015), “Waves in ship prices and investment”, *The Quarterly Journal of Economics*, Vol. 130 No. 1, pp. 55 - 109.
- Guizani, M. (2017), “The financial determinants of corporate cash holdings in an oil rich country: evidence from Kingdom of Saudi Arabia”, *Borsa Istanbul Review*, Vol. 17 No. 3, pp. 133-143.
- Hardin III, W.G., Highfield, M.J., Hill, M.D. and Kelly, G.W. (2009), “The determinants of REIT cash holdings”, *The Journal of Real Estate Finance and Economics*, Vol. 39 No. 1, pp. 39 - 57.
- Hung, D.N, Van, V.T.T. and Hung, N.D. (2020), “The sensitivity of cash flows to cash holdings: case studies at Vietnamese enterprises”, *Investment Management and Financial Innovations*, Vol. 17 No. 1, pp. 266 - 276.
- Jani, E., Hoesli, M. and Bender, A. (2004), “Corporate cash holdings and agency conflicts”, Working paper, University of Geneva.
- Jebran, K., Iqbal, A., Bhat, K.U., Khan, M.A. and Hayat, M. (2019), “Determinants of corporate cash holdings in tranquil and turbulent period: evidence from an emerging economy”, *Financial Innovation*, Vol. 5 No. 3, pp. 1 - 12.
- Jensen, M.C. (1986), “Agency costs of free cash flow, corporate finance and takeovers”, *American Economic Review*, Vol. 76 No. 2, pp. 323 - 331.
- John, T. (1993), “Accounting measures of corporate liquidity, leverage, and costs of financial distress”, *Financial Management*, Vol. 22, pp. 91 - 100.
- Junli, Z. (2011), *The relationship between working capital management and corporate cash holdings*, Master’s thesis, University of Eastern Finland, Department of Business.
- Kariuki, S., Namusonge, G. and Orwa, G. (2015), “Determinants of corporate cash holdings: evidence from private manufacturing firms in Kenya”, *International Journal of Advanced Research in Management and Social Sciences*, Vol. 4 No. 6, pp. 15 - 33.
- Khalil, M.S. (2017), “Determinants of cash holding in Pakistan: a case of oil and gas sector of Pakistan stock exchange”, *City University Research Journal*, Vol. 7 No. 2, pp. 167 - 177.
- Khuong, N.V., Liem, N.T. and Minh, M.T.H. (2020), “Earnings management and cash holdings: Evidence from energy firms in Vietnam”, *Journal of International Studies*, Vol. 13 No. 1, pp. 247 - 261.

- Kim, C., Mauer, D. and Sherman, A. (1998), “The determinants of corporate liquidity: theory and evidence”, *Journal of Financial and Quantitative Analysis*, Vol. 33 No. 3, pp. 335 - 359.
- Kim, J., Kim, H. and Woods, D. (2011), “Determinants of corporate cash-holding levels: an empirical examination of the restaurant industry”, *International Journal of Hospitality management*, Vol. 30 No. 3, pp. 568 - 574.
- Masood, A., Gulzar, S. and Quddoos, M.U. (2018), “Impact of working capital management on bank’s cash holding decisions in Pakistan”, *Pakistan Journal of Social Sciences (PJSS)*, Vol. 38 No. 2, pp. 641 - 650.
- Megginson, W.L. and Wei, Z. (2010), “Determinants and value of cash holdings: evidence from China’s privatized firms”, *SSRN Working Paper Series*, pp. 1 - 37.
- Mahjabeen, R.A. and Rizwan, F. (2018), “Working capital management and corporate cash holdings: a comparative analysis of large and small scale non-financial Pakistani firms”, *Journal of Social Sciences*, Vol. 18, pp. 1 - 12.
- Market research. (2021), “Vietnam Construction Market - Growth, Trends, COVID-19 Impact, and Forecasts (2021-2026)”, *Mordor Intelligence Inc.*, Available at <https://www.mordorintelligence.com/industry-reports/vietnam-construction-market> (Accessed 03 May, 2021).
- Miller, M. and Orr, D. (1966), “A model of the demand for money by firms”, *The Quarterly Journal of Economics*, Vol. 80 No. 3, pp. 413 - 435.
- Myers, S. and Majluf, N. (1984), “Corporate financing and investment decisions when firms have information that investors do not have”, *Journal of Financial Economics*, Vol. 13 No. 2, pp. 187 - 221.
- Nguyen, P., Rahaman, N. and Zhao, R. (2013), “Ownership structure and divestiture decisions: evidence from Australian firms”, *International Review of Financial Analysis*, Vol. 30, pp. 170 - 181.
- Nguyen, P. (2006), “How sensitive are Japanese firms to earnings risk? Evidence from cash holdings”, Available at <https://ssrn.com/abstract=889502> (Accessed 29 March, 2021).
- Ogundipe, S., Salawu, R.O. and Ogundipe, L.O (2012), “The determinants of corporate cash holdings in Nigeria: evidence from general method of moments (GMM)”, *World Academy of Science, Engineering and Technology*, Vol. 61, pp. 978 - 984.
- Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R. (1999), “The determinants and implications of corporate cash holdings”, *Journal of Financial Economics*, Vol. 52 No. 1, pp. 3 - 46.
- Ozkan, A. and Ozkan, N. (2004), “Corporate cash holdings: an empirical investigation of UK companies”, *Journal of Banking and Finance*, Vol. 28 No. 9, pp. 2103 - 2134.
- Pinkowitz, L. and Williamson, R. (2001), “Bank power and cash holdings: evidence from Japan”, *Review of Financial Studies*, Vol. 14 No. 4, pp. 1059 - 1082.
- Phung, A.T. and Nguyen, V.K. (2018), “Factors effect on corporate cash holdings of the energy enterprises listed on Vietnam’s stock market”, *International Journal of Energy Economics and Policy*, Vol. 8 No. 5, pp. 29 - 34.
- PwC report. (2018), “Cash for growth or growth for cash”, Available at <https://www.pwc.com/vn/cash-for-growth> (Accessed 06 June, 2021).

- Quoc, T.T. (2019), "Corporate cash holdings and financial crisis: new evidence from an emerging market", *Eurasian Business Review*, Vol. 10, pp. 271 - 285.
- Saddour, K. (2006), "The determinants and the value of cash holdings: evidence from French firms", Working Paper No. 2006-6, Dauphine Recherches en Management - Université Paris Dauphine.
- Saleem, F., Zafar, L., Khan, M.T., Khan, Z., Jamil, S. and Ataula (2021), "Factors effecting corporate cash holdings of the listed non-financial firms in Pakistan", *Ilkogretim Online - Elementary Education Online*, Vol 20 No. 3, pp. 1765 - 1775.
- Shabbir, M., Hashmi, S.H. and Chaudhary, G.M. (2016), "Determinants of corporate cash holdings in Pakistan", *International Journal of Organizational Leadership*, Vol. 5, pp. 50 - 62.
- Shah, A. (2011), "The corporate cash holdings: determinants and implications", *African Journal of Business Management*, Vol. 5 No. 34, pp. 12939 - 12950.
- Sheikh, N.A., Mehmood, K.K. and Kamal, M. (2018), "Determinants of corporate cash holdings: evidence from MNCs in Pakistan", *Review of Economics and Development Studies*, Vol. 4 No. 1, pp. 71 - 78.
- Tahir, M., Alifiah, M., Arshad, U. and Saleem, F. (2016), "Financial theories with a focus on corporate cash holding behavior: a comprehensive review", *International Journal of Economics and Financial Issues*, Vol. 6 No. 35, pp. 215 - 219.
- Thieu, D. (2013), *Determinants of corporate cash holdings: a study of listed manufacturing companies in Vietnam*, Digital Repository Library, Ho Chi Minh University, Vietnam.
- Tong, Z. (2006), "Risk reduction as a CEO's motive for corporate cash holdings", Working Paper No. 07/02, Xfi Centre for Finance and Investment, University of Exeter.
- Yudaruddin, R. (2019), "Determinants of corporate cash holdings: evidence of the mining sector in Indonesia", *International Journal of Scientific & Technology Research*, Vol. 8 No. 10, pp. 1523 - 1526.