

# Cash Holding Management and Firm Performance: Empirical Evidence for Financially Constrained Firms in Indonesia

Berto Mulia Wibawa<sup>1,\*</sup>, Ninditya Nareswari<sup>1</sup>

<sup>1</sup>*Department of Business Management, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia*

<sup>\*</sup>*Corresponding author. Email: berto@mb.its.ac.id*

## ABSTRACT

A firm must determine the level of cash holding to improve the efficiency of the firm. This study aims to examine the impact of cash holdings on firm performance in Indonesia. Data were obtained from OSIRIS database with the observation period 2010 – 2016. The results showed there is an u-shaped inverted impact of cash holdings on firm performance which is indicated the optimum level of cash holding. In addition, the optimum level of cash holding was lower for the financially constrained firms.

**Keywords:** *cash, cash holding, firm performance, financial constraints*

## 1. INTRODUCTION

The investment decision is one of the most important decision that has directly effect on operation activities. Both long-term and short-term investments have different benefits and risks. So, if financial managers allocated a long-term and short-term investment without deep analyzed, it would have negative impact on firm performance due to a limited cash or disturbance in operational activity. Therefore, firms must have the right decision when they allocate their asset, included the amount of cash holdings. If firm hold a large cash, it might make a firm get higher flexibility and lower risk [1]. But, holding a large cash could make firms lose the opportunity to invest on fixed asset and get higher return [2]. It means, financial managers must determine the optimum level of cash holdings.

Several financial theories have explored the reason why firm hold cash. Based on trade off theory explained that optimum level of cash holding is determined by the balance between the benefits and costs of holding liquid assets. The main cost of holding cash is the opportunity cost of the money held in liquid assets [3]. Second, the pecking order theory considered to minimize asymmetric information. Asymmetric information occurs due differences between internal and external fund. Therefore, before firms decide to use external fund, firms must finance their investment with internal fund to prevent the risk. [4]. Third, the free cash flow theory argued that sometime managers don't want to distribute a free cash to its shareholder [5]. So, free cash flow showed that manager pursue their own interest over the shareholder's interests. By holding cash, managers can decide to invest in some assets under their control and gain discretionary power over the firm's investment decisions [3].

Prior research has shown the positive and negative impact of cash holding. In frictionless economy, the amount of cash holding is irrelevant, but in the real world, cost of external fund is higher than that of internal funds due to the market frictions such as transaction costs, information asymmetry, and agency cost and various other financial restrictions [6]. Therefore, the external fund is not the best substitute for internal fund [7]. Firms must determine the optimum level of cash holdings. The optimum level of cash holdings might different for financially constrained firm due the asymmetry information. Financially constrained firm will have higher cost of external fund than financially unconstrained firm.

This study aims to examine non-linear effect of cash holdings on firm performance. In addition, this study compares the optimum level of cash holdings between financially constrained and financially unconstrained firms. This study focus of whether and how cash holdings affect firm performance. This study also compares the optimum level of cash holdings between financial constrained firms and financial unconstrained firms. This study contributes to the cash holdings literature in several ways. First, this study offers a new evidence on the effect of cash holdings on firm performance by examining a possibilities of non-linear effect. Second, this study investigates the effect of cash holding on firm performance according to the financing constraints of the firms. Third, this study offers a comparison the optimum level of cash holdings between financially constrained firms and financial unconstrained firms.

## **2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

### ***2.1. The Effect of Cash Holdings on Firm Performance***

Firm must determine the optimum level of cash holding because holding liquid assets such as cash can be a double-edged sword for a [8]. On the one hand, it increases the flexibility of the firms by allowing them to avoid costs from underinvestment in favorable projects due to lack of resources. Therefore, the asymmetric information can be minimized. On the other hand, [5] explained through free cash flow theory that cash holdings can be invested in unfavorable projects by managers or directors to pursue their own interest over the shareholder's interests. In line with [9], costs that have been analysed typically include low returns and possible tax disadvantages of cash reserves.

Empirical studies also provide mixed results. [7] reported a positive effect of cash holdings on firm performance, consistent with pecking order theory. Previous empirical studies [10, 11, 12] also provide evidence suggesting that cash holdings positively affect financial performance of firms in developed countries as well as in emerging markets. In contrast to [13] reported a negative effect of cash holdings on firm profitability. In line with [14], the result showed a positive relationship determinant of corporate cash holdings that indicate the precautionary motive in private manufacturing firms in Kenya. Based on previous literature and empirical studies, there is positive and negative effect of cash holdings on firm performance, so the hypothesis 1 is proposed.

H1: There is an inverted U-shaped impact of cash holdings on firm performance.

### ***2.2. The Effect of Cash Holdings on Financially Constrained Firms***

If the results verify the hypothesis 1 that there is an inverted U-shaped impact of cash holdings on firm performance, the optimum level of cash holdings for financially constrained firms will be expected to be lower than financially unconstrained firms. The optimum cash holdings are determined by investment opportunities. Financially constrained firms will have difficult access to the capital market and have less investment opportunities so they can only rely on internal funding. Since market imperfections have asymmetry information and agency costs, means to get external financing will increase higher costs than internal financing [15]. In line with [2] showed empirical evidence the value of cash holdings is affected by firm - specific characteristics. On the one hand, [16] reported the conservative firms have different determinant of cash holdings due to different characteristics.

Financially constrained firms prefer to increase a level of working capital rather than increase a level of cash holdings

due to optimize the limited access of external financing. The cash reserves is not as important as working capital in operational activity. The operational activity of the firms can still work although the firms don't have enough cash reserves. In contrast, if the firms don't have enough working capital, such as inventory, the operational activity will be disturbed. Therefore, financially constrained firms tend to optimize the working capital and choose to have a small amount of cash holdings.

H2: Financially constrained firms will have lower level of optimum cash holdings than financially unconstrained firms.

## **3. METHODOLOGY**

### ***3.1. Data and Sample***

The sample used in this study were a non-financial firm listed on the Indonesia Stock Exchange during the period 2010-2016. Financial and insurance firms were excluded because they have different composition. Data were obtained from OSIRIS database. During sample selection, firms who have negative in equity and delisted were removed. Therefore, the final sample consisted 176 firms with 1201 observation. Table 1 provide summary variables of this study.

Based on the hypothesis and research analysis model, the variables used in the study are divided into dependent variables (ROA), independent variables (Cash Holdings), grouping variables of financially constrained firms (Cash flow, Interest coverage, and cost of external financing), and control variables (Size, leverage, sales growth, and asset growth). Furthermore, financial constrained firm were measured by dummy variables. 1 for financially constrained firm and 0 financially unconstrained firm using the following variables [17].

Cash Flow

If the firms have cash flow above the median then they are financially unconstrained firms, and vice versa.

Cost of external financing

If the firms have cost of external financing above the median then they are financially constrained firms, and vice versa.

Interest coverage

If the firms have interest coverage above the median then they are financially unconstrained firms, and vice versa.

**TABLE 1. SUMMARY OF VARIABLES CALCULATIONS AND DEFINITION**

Variables	Measurement
Return on total assets (ROA)	earning after taxes divided by its total assets
Cash Holdings (CH)	cash+ cash equivalent / total asset
Cash flow (CF)	(earning before interests and taxes+depreciation)/total assets
Interest coverage (INTCOV)	earning before interest and taxes divided by interest expenses at the end of financial year
Cost of external financing (COEXF)	financial expenses divided by its total debt
Size	natural logarithm of total sales
Leverage (LEV)	total debt divided by its total assets
Sales Growth (SG)	(total sales- total sales in its previous period)/ total sales
Asset Growth (AG)	(total asset - total assets in its previous period)/ total asset

**3.2. Specification of The Model and Methodology**

This work used panel regression model to examine the impact of cash holdings on firm performance. Using panel data allows us to control for unobservable heterogeneity and, eliminate the risk of obtaining biased [18]. This work used Hausman test to choose using fixed effect or random effect model. Based on Hypothesis 1, the following model were estimated:

$$ROA_{i,t} = \beta_0 + \beta_1CH_{i,t} + \beta_2CH^2_{i,t} + \beta_3SIZE_{i,t} + \beta_4LEV_{i,t} + \beta_5SG_{i,t} + \beta_5AG_{i,t} + \varepsilon_{i,t} \quad (1)$$

If hypothesis 1 was supported it means there would be a non linier effects of cash holdings on firm performance. Therefore, the hypothesis 2 can be examined. In order to examine whether or not the optimum cash holdings level of financially constrained firms differs from that of financially unconstrained firms, the following models were estimated:

$$ROA_{i,t} = \beta_0 + (\beta_1 + \delta_1DFC_{i,t}) + (\beta_2 + \delta_2DFC_{i,t}) + \beta_3SIZE_{i,t} + \beta_4LEV_{i,t} + \beta_5SG_{i,t} + \beta_5AG_{i,t} + \varepsilon_{i,t} \quad (2)$$

Based on the model (2), the optimum level of cash holdings comes from  $-\beta_1/2\beta_2$  and the optimum of financially constrained firms is measured with  $-(\beta_1 + \delta_1)/2(\beta_2 + \delta_2)$ .

**4. RESULTS AND DISCUSSION**

**4.1. Descriptive Statistics**

**TABLE 2. DESCRIPTIVE STATISTICS**

	Mean	Median	Stdev	Min	Max
ROA	0.048	0.03877	0.075	-0.3617	0.6088
CH	0.09	0.05477	0.0992	5,17e-07	0.7252
CF	0.1116	0.09972	0.0861	-0.3008	0.54282
INTCOV	14.6235	3.48881	49.091	-139.55	564.924
COEXF	0.7848	0.08092	12.187	0.00135	313.562
SIZE	21.2598	21.2389	1.7075	15.944	26.03
LEV	0.2677	0.24597	0.17188	8.07E-06	0.901
SG	0.2471	0.103	1.8657	-0.9593	45.466
AG	0.1109	0.09986	0.1717	-2.107	0.9236

Table 2 reports summary statistics for firm performance, cash holdings, financial constraints variables, and control variables. As shown in Table 2, the average of ROA in sample is 0.048 while the median is 0.0387. The mean cash holdings is 0.09 while the median is 0.05477. With respect to the control variables included in the regression model, the average of size is 21,25. The average of leverage is 0.2677 suggesting that about 27% of the firm’s assets were financed by debt. The average of sales growth is 0.2471 while the mean of asset growth is 0.1109. This suggest that the increasing of sales were higher than the increasing of asset.

In addition, the formal test was conducted to examine the multicollinearity problem. Using the variance inflation factor (VIF), the results showed that there was no multicollinearity problem in the sample because it is far from 10 [19]. Effects of cash holding on firm performance Table 3 shows the results obtained from eq (1). The results of Hausman test for eq (1) were not significant, therefore random effect models was used for estimation. Consistent with hypothesis 1, the result confirms a statistically significant inverted u-shaped effect of cash holdings on firm performance due positive coefficient for CH ( $\beta_1 = 0,26$ ) and negative coefficient for CH<sup>2</sup> ( $\beta_2 = -0,431$ ). In addition, the optimum cash holdings is 30,15% of total asset.

**4.2. Cash Holdings Management and Financial Constraints**

Table 4 shows the results obtained from eq (2). Using cash flow as a measurement of financial constraints, The Hausman test showed a significant result, therefore a fixed effect model was conducted. The result shows statistically significant inverted u-shaped effect of cash holdings on firm performance and the interaction effect between cash

holdings and firm performance is also statistically significant. In line with hypothesis 2, the optimum level of cash holdings for financially unconstrained firm is 32,53% of total asset while for financially constrained firm is 30,218% of total asset.

Table 5 shows the results obtained from eq (2). Cost of external financing was used as a measurement of financial constraints. The results of Hausman test were not significant so a random effect model was conducted. The result shows statistically significant inverted u-shaped effect of cash holdings on firm performance. However, the interaction effect between cash holdings and firm performance is not statistically significant. So the hypothesis 2 was not supported while using cost of external financing as a measurement of financial constraints.

**TABLE 3. THE EFFECT OF CASH HOLDINGS ON FIRM PERFORMANCE**

	Mean
C	-0.24738***
CH	0.260146***
CH <sup>2</sup>	-0.43145***
SIZE	0.014152***
LEV	-0.14162***
SG	-0.00005
AG	0.09158***
R-sq Overall	0.3270
Observation	1201

All variables are defined in Table I. Coeficients are in front of parentheses\*, \*\*, \*\*\* Significant at 0,1; 0,05; and 0,01 levels, respectively

**TABLE 4. THE EFFECT OF CASH HOLDINGS ON FIRM PERFORMANCE ACCORDING TO THE FINANCIAL CONSTRAINTS**

	Mean
C	-0.3544499**
CH	0.5065683***
CH <sup>2</sup>	-0.7784579**
CH*DFC	-0.5682296***
CH <sup>2</sup> *DFC	0.8804611**
SIZE	0.0192931**
LEV	-0.125498***
SG	-0.0000798
AG	0.0841872***

R-sq Overall	0.3971
Observation	1201

All variables are defined in Table I. DFC is measured by the median of cash flow, 1 for the sample who have cash flow below the sample median , 0 otherwise. Coefficients are in front of parentheses\*, \*\*, \*\*\* Significant at 0,1; 0,05; and 0,01 levels, respectively

Table 6 shows the results obtained from eq (2). Interest coverage was used for financial constraints measurement. The Hausman test showed a significant result, so this model used fixed effect model. The result shows statistically significant inverted u-shaped effect of cash holdings on firm performance and the interaction effect between interest coverage and firm performance is also statistically significant. In line with hypothesis 2, the optimum level of cash holdings for financially unconstrained firm is 34,01% of total asset while for financially constrained firm is 26,90% of total asset.

**TABLE 5. THE EFFECT OF CASH HOLDINGS ON FIRM PERFORMANCE ACCORDING TO THE FINANCIAL CONSTRAINTS**

	Mean
C	-0.2445993***
CH	0.52270734**
CH <sup>2</sup>	-0.2545816*
CH*DFC	0.02977
CH <sup>2</sup> *DFC	-0.2272401
SIZE	0.0144482***
LEV	-0.14276***
SG	-0.0000525
AG	0.0896307***
R-sq Overall	0.3280
Observation	1201

All variables are defined in Table I. DFC is measured by the median of cost of external financing, 1 for the sample who have cost of external financing above the sample median , 0 otherwise. Coefficients are in front of parentheses\*, \*\*, \*\*\* Significant at 0,1; 0,05; and 0,01 levels, respectively

**TABLE 6. THE EFFECT OF CASH HOLDINGS ON FIRM PERFORMANCE ACCORDING TO THE FINANCIAL CONSTRAINTS**

	Mean
C	-0.3986662**
CH	0.4443472***
CH <sup>2</sup>	-0.6535081***
CH*DFC	-0.5413538***
CH <sup>2</sup> *DFC	-0.832775**
SIZE	0.02122**
LEV	-0.1093165***
SG	-0.0000804
AG	0.077537**
R-sq Overall	0.3655
Observation	1201

All variables are defined in Table I. DFC is measured by the median of interest coverage, 1 for the sample who have interest coverage below the sample median, 0 otherwise. Coefficients are in front of parentheses\*, \*\*, \*\*\* Significant at 0,1; 0,05; and 0,01 levels, respectively

## 5. CONCLUSION

This paper aims to examine the effect of cash holdings on firm performance. Using 176 non-financial firms in Indonesia, empirical evidence showed the level of cash holdings have inverted U-shaped impact on firm performance which was measured by ROA. Therefore, it showed the optimum level of cash holdings. This finding indicate that that firms have an optimum cash holdings level that balances the costs and benefits of holding cash and maximizes their performance. The optimum level of cash holdings was 30,17% of total asset.

This paper also examined the optimum level of cash holding according to the financing constraints of the firms. The empirical evidence showed the optimum level of cash holdings for financially constrained firms was lower than financially unconstrained firms. Using cash flow as a measurement of financial constraints, the optimum level of cash holdings for financially unconstrained firm is 32,53% of total asset and for financially constrained firm is 30,218% of total asset. While using interest coverage as a measurement of financial constraints, the optimum level of cash holdings for financially unconstrained firm is 34,01% of total asset while for financially constrained firm is 26,90% of total asset.

There are several implication of this study. First, the results suggest that managers should be concerned about cash holdings due to the cost of external funding. Managers should determine the optimum cash holdings to avoid the negative effect on firm performance such as tax disadvantage or the opportunity cost. Second, the finding suggest to consider financial condition when determining the optimum cash holdings due the different effects. This study also extend the literature

This study has some limitation. First, this study only use ROA as a measurement of firm performance. For the future study, firm performance can be measured with another measurement such as ROE and Tobin's Q. Second, this study only use dummy variables for measure a financial constraints. A measurement of financial constraints only based on median of cash flow, cost of external financing, and interest coverage that can't measure financial constraints precisely. For the further study, a measurement of financial constraints can be developed. Third, this study only use data panel regression that can't control potential endogeneity problem, therefore for the future study can use other statistic tool to minimize that problem such as GMM.

## ACKNOWLEDGMENT

This research was fully funded by Institut Teknologi Sepuluh Nopember (ITS), with young researcher funding scheme. We thank our colleagues from Department of Business Management, especially Entrepreneurship and Small Medium Enterprises Development (ESME) Laboratory that greatly assisted the research surveys and data analysis.

## REFERENCES

- [1]. J. Loeys, D. Mackie, P. Meggyesi and N. Panigirtzoglou, *Corporates are driving the global saving glut*. London, UK.: JPMorgan REsearch, 2005.
- [2]. M. La Rocca and D. Cambrea, "The effect of cash holdings on firm performance in large Italian companies", *Journal of International Financial Management & Accounting*, vol. 30, no. 1, pp. 30-59, 2019. Available: 10.1111/jifm.12090.
- [3]. M. Miller and D. Orr, "A Model of the Demand for Money by Firms", *The Quarterly Journal of Economics*, vol. 80, no. 3, pp. 413-435, 1966. Available: 10.2307/1880728.

- [4]. S. Myers and N. Majluf, "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, 1984. Available: 10.1016/0304-405x(84)90023-0.
- [5]. M. Jensen, "Agency Cost Of Free Cash Flow, Corporate Finance, and Takeovers", *SSRN Electronic Journal*, vol. 76, no. 2, pp. 323-329, 1986. Available: 10.2139/ssrn.99580.
- [6]. B. Thakur and M. Kannadhasan, "Corruption and cash holdings: Evidence from emerging market economies", *Emerging Markets Review*, vol. 38, pp. 1-17, 2018. Available: 10.1016/j.ememar.2018.11.008.
- [7]. Vijyakumaran and Atchyuthan, "Cash Holdings and corporate performance: Evidence from Sri Lanka", *International Journal of Accounting and Business Finance*, vol. 1, pp. 1-11, 2017. Available: 10.5296/ijafr.v7i2.12137.
- [8]. M. Ammann, D. Oesch and M. Schmid, *Cash holdings and Corporate Governance Around the World: Working paper, Swiss Institute of Banking and Finance, Stern School of Business, and University of Mannheim. Greene, W. H. (2000). Econometric Analysis. Upper Saddle River, N.J: Prentice Hall, 2011.*
- [9]. M. Bigelli and J. Sánchez-Vidal, "Cash holdings in private firms", *Journal of Banking & Finance*, vol. 36, no. 1, pp. 26-35, 2012. Available: 10.1016/j.jbankfin.2011.06.004.
- [10]. B. Palazzo, "Cash holdings, risk, and expected returns", *Journal of Financial Economics*, vol. 104, no. 1, pp. 162-185, 2012. Available: 10.1016/j.jfineco.2011.12.009.
- [11]. S. Abushammala and J. Sulaiman, "Cash Holdings and Corporate Profitability: Some Evidences from Jordan", *International Journal of Innovation and Applied Studies*, vol. 8, no. 3, p. 898, 2014. Available: 10.5539/ibr.v8n5p212.
- [12]. D. Debatta, "Effects of Cash Holdings on Corporate Performance and Value: Evidence from Indian Companies", *ISBR Management Journal*, vol. 2, no. 1, pp. 82-88, 2017. [Accessed 2 March 2019].
- [13]. Y. Wang, "Liquidity management, operating performance, and corporate value: evidence from Japan and Taiwan", *Journal of Multinational Financial Management*, vol. 12, no. 2, pp. 159-169, 2002. Available: 10.1016/s1042-444x(01)00047-0.
- [14]. Kariuki, S. Nduati, G. Namusonge and G. Orwa, "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, 2015. [Accessed 4 June 2019].
- [15]. B. Greenwald, J. Stiglitz and A. Weiss, "Informational imperfections in the capital market and macroeconomic fluctuations", *American Economic Review*, no. 74, pp. 194-199, 1984. [Accessed 5 January 2019].
- [16]. M. Guizani, "The Financial Determinants of Corporate Cash Holdings in an Oil Rich Country: Evidence from Kingdom of SAudi Arabia", *Borsa Istanbul Review*, 2017. Available: 10.1016/j.bir.2017.05.003. [Accessed 12 April 2019].
- [17]. S. Baños-Caballero, P. García-Teruel and P. Martínez-Solano, "Working capital management, corporate performance, and financial constraints", *Journal of Business Research*, vol. 67, no. 3, pp. 332-338, 2013. Available: 10.1016/j.jbusres.2013.01.016.
- [18]. W. Greene, *Econometric analysis*. Upper Saddle River, N.J: Prentice Hall, 2000.
- [19]. D. Gujarati, *Basic econometrics*. New York: McGraw-Hill, 2003.