

Journal of Asian Finance, Economics and Business

JAFEB

- The Journal of Asian Finance, Economics and Business (JAFEB): *is an international peer-reviewed journal and is published twelve issues per year monthly in full English in joint sponsorship from the Korea Distribution Science Association (KODISA) and the Institute of Economics under the Ministry of Education and Science of the Republic of Kazakhstan (Institute of Economics).*
- The Journal of Asian Finance, Economics and Business (JAFEB): *publishes on the following dates: January 30, February 28, March 30, April 30, May 30, June 30, July 30, August 30, September 30, October 30, November 30, and December 30.*
- The Journal of Asian Finance, Economics and Business (JAFEB): *is published in international standards both in print and online with Digital Object Identifier (DOI) information: Print ISSN: 2288-4637 / Electronic ISSN: 2288-4645*
- The Journal of Asian Finance, Economics and Business (JAFEB): *is an Open Access journal distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC)*
- Editorial Head Office:
Anhui University of Finance and Economics (AUFE)
*School of International Economics and Trade [Postal Address: 962 Caoshan Road, Bengbu City, Anhui Province, China 233030]
Email: jwlee119@yahoo.com ; jungwan.lee@aufe.edu.cn*
- Publisher and Offprints Publishing Office:
Korea Distribution Science Association (KODISA)
*Hanshin Officetel 1030, 2463-4 Shinheung-dong Sujeong-gu, Seongnam-city, Gyeonggi-do, KOREA Tel: (+82 31) 740-7292 Fax: (+82 31) 740-7361
Email: kodisajournals@gmail.com*

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2021.vol8.no3.0373

The Impact of Financial Distress on Cash Holdings in Indonesia: Does Business Group Affiliation Matter?*

Michael HADJAAT¹, Rizky YUDARUDDIN², Sukisno Selamat RIADI³

Received: November 20, 2020 Revised: January 25, 2021 Accepted: February 03, 2021

Abstract

This study aims to investigate the impact of financial distress on the cash holding of non-financial companies in Indonesia as the largest emerging economy among ASEAN countries. Furthermore, the sub-sample business group to be investigated were divided into two, groups namely affiliated and non-affiliated groups. This was carried out to ascertain the difference in the impact of financial distress on cash holding between both groups. Sample collection was based on all firms listed on the Indonesian Stock Exchange (IDX) during 2008–2017, comprising 137 firms. The results showed that using the two-step system Generalized Method of Moments (GMM), the coefficients for financial distress (Z-Score) indices were positive and significant for all models. Therefore, the higher the Z-Score value, the lower the company's financial distress and vice versa. This implies that the lower the company's financial distress, the lower the cash holding. Furthermore, a positive and significant impact of the Z-Score on cash holding for non-affiliated groups was discovered. This implies that there are differences in the amount of cash holding between affiliated and non-affiliated groups. This result indicates that non-affiliated groups hold more cash during financial distress. However, these results had cash policy implications, particularly for non-affiliated groups.

Keywords: Financial Distress, Cash Holding, Business Group Affiliates

JEL Classification Code: G32, G34, G38

1. Introduction

This study aims to investigate the impact of financial distress on the cash holding of non-financial companies in

Indonesia for the period of 2008–2017. Furthermore, the sub-sample business groups to be investigated were divided into two groups, namely affiliated and non-affiliated groups. This was carried out to ascertain how the impact of financial distress on cash holding differ between both groups. Indonesia offers a suitable environment to affiliate groups for two reasons, first, the number of affiliated groups increased in the last 10 years, and second, as the largest emerging economy among the Association of Southeast Asian Nation (ASEAN) countries, it has experienced increased economic growth but was prone to economic turmoil, which triggered financial distress. Therefore, this study contributes to previous literature by examining the cash holding policies of business groups. Furthermore, it is the first among empirical cash holding studies to investigate the difference in the impact of financial distress on cash holding between affiliated and non-affiliated groups.

Cash management is the process that involves collecting and managing cash flows from the operating, investing, and financing activities of a company. In business, it is a key aspect of an organization's financial stability. The existence of cash management which is not optimal raises big questions by stakeholders or users of financial statements. This is because

*Acknowledgements:

This research was funded by the Department of Management, Faculty of Economics and Business, Mulawarman University, Indonesia (grant number 040/UN17.1/LT/2020). We would like to acknowledge the Department of Management, Faculty of Economics and Business, Mulawarman University, who provided insight and expertise that greatly assisted the research.

¹First Author. Lecturer, Faculty of Economics and Business, Mulawarman University, Indonesia.

Email: michael.hadjaat@feb.unmul.ac.id

²Corresponding Author. Associate Professors, Faculty of Economics and Business, Mulawarman University, Indonesia [Postal Address: Jl. Tanah Grogot No. 1, Samarinda Ulu, Gunung Kelua, Gn. Kelua, Kec. Samarinda Ulu, Kota Samarinda, Kalimantan Timur, 75117, Indonesia] Email: rizky.yudaruiddin@feb.unmul.ac.id

³Professors, Faculty of Economics and Business, Mulawarman University, Indonesia. Email: sukisno.selamet.riadi@feb.unmul.ac.id

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

a lot of things are capable of affecting the amount of cash in a company, such as a group affiliation and financial distress (Locorotondo et al., 2014). Affiliated groups may help in dealing with financial distress. George and Kabir (2008) stated that affiliated groups help provide funds for member companies in other affiliated groups. Furthermore, Cai et al. (2016) explained that affiliated companies hold less cash compared to non-affiliated companies. However, this theory is inversely proportional, because financial statements show higher cash holding in affiliated group companies.

Meanwhile, cash holding will have an effect on agency costs when more activities are carried out by the company, which leads to changes in the amount from time to time (Zaman, 2012). Agency cost is a type of internal company expense, which comes from the actions of an agent acting on behalf of a principal, for example, agency costs are incurred when the senior management team, when traveling, unnecessarily books the most expensive hotel or orders unnecessary hotel upgrades. The cost of such actions increases the operating cost of the company while providing no added benefit or value to shareholders. Jensen (1986) stated that large cash holding has a negative impact because it indicates agency problems in a company. Previous studies carried out by Opler et al. (1999), Kim et al. (2011), and Yudaruddin (2019) explained that there is a point where the level of cash balance is optimal and at that point, the advantages of cash holding cover its weaknesses. Furthermore, Acharya et al. (2007) showed the tendency of using excess cash flow to reduce the amount of debt that exists in the coming period and display the weak cash flow sensitivity of cash holding.

An affiliated group is a group of companies that has a special relationship, due to several reasons, such as family ties or being controlled by the same party. Therefore, companies belonging to these groups are able to easily obtain other sources of funding, allowing for an increase in the amount of debt. George and Kabir (2008) stated that affiliated groups assist in providing funds to member companies for them to compete more aggressively than others.

According to Chang and Hong (2008), one of the benefits of affiliated groups is that a member is able to obtain various intangible and financial resources from other members. Furthermore, Cai et al. (2016) and Locorotondo et al. (2014) explained that companies affiliated with the group have fewer funds compared to non-affiliated companies. This is due to several factors, one of which is lower information asymmetry between affiliated companies. Asymmetric information, also known as “information failure,” occurs when one party to an economic transaction possesses greater material knowledge than the other party. Hoshi et al. (1990) discovered that lower information asymmetry also caused a decrease in the financial cost pressures because

debt contracts are more easily negotiated. Deloof (2001) showed that to meet the liquidity needs, members of the affiliated group help each other by adjusting intra-group trade credits.

Affiliated groups also facilitate access to external credit therefore, the company does not only receive funds from the group (Chang & Hong, 2008; Gertner et al., 1994; Stein, 1997). Pinkowitz and Williamson (2001) focused on examining the impact of cash holdings of banks in Japan and they discovered that banks who are members of the KEIRETSU hold less cash compared to non-member firms. Furthermore, Bianco and Nicodano (2006) and Dewaelheyns and Van Hulle (2006) showed that affiliate group optimization is an important force in this process. Therefore, companies belonging to this group will benefit from sharing intangibles and financial resources with members (Chang & Hong, 2008).

Meanwhile, financial distress also affects financial ownership, because bankruptcies occur in companies that experience financial difficulties due to significant costs incurred (Hoshi et al. 1990). For this reason, problems with the availability of cash arise (Berger et al. 2001), which leads to a decline in finances. However, Kim et al. (2011) showed that there is a negative relationship between financial distress and cash holding.

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 describes and presents the methodology including sample and data. Section 4 contains the results and discussion. Finally, Section 5 concludes and future directions for empirical study in the field were made.

2. Literature Review

Cash holding motives are influenced by agency motive because the agents are managers and obtain authority from shareholders to manage company assets to provide them with benefits. Jensen (1986) explained the agency theory, which describes managers as “agents” and shareholders as “principals”. However, there are two problems in agency theory, particularly that which arises when the desires or goals of shareholders and managers are different. Shareholders cannot control what the managers do, because of the difficulty in accessing information or the high costs of doing so. Therefore, managers choose to save cash instead of having to distribute dividends to shareholders and high cash holdings lead to agency problems (Jensen, 1986).

Cash policy is influenced by many factors such as market imperfections, financial difficulties, agency conflicts, and information asymmetry. Agency conflicts and information asymmetry between creditors and shareholders make it difficult for companies to obtain funds (García-Teruel & Martínez-Solano, 2008). Myers (1977) also stated that agent

conflict between creditors and shareholders could make it more difficult for companies to obtain funds. Cash also influence investment decisions and stock return (Lau & Mahat, 2019; Nguyen & Nguyen, 2020).

However, the problem of information asymmetry may be reduced by having cash in local banks (Luo, 2014). All these may lead to distortions in company investment, which results in low investment problems. For this reason, companies that operate in the long or short term often hold their cash in large amounts, which may be affected by financial distress and they certainly do not want to experience financial distress that ends in bankruptcy. According to Ferreira and Vilela (2004), Chen and Chuang (2009), Iskandar-Datta and Jia (2012), based on agency theory, several US and European companies hold large amounts of their cash due to market imperfections, such as information asymmetry problems, agency problems, transaction costs, and financial distress. Therefore, companies should be able to determine with certainty the amount of cash that needs to be held to avoid bankruptcy.

Companies are affiliated when one company is a minority shareholder of another. In most cases, the parent company will own not less than a 50% interest in its affiliated company. Two companies may also be affiliated if they are controlled by a separate third party. Therefore, they easily obtain other sources of funding which allows an increase in the amount of debt (George & Kabir, 2008). According to Chang and Hong (2008), the benefit of affiliated groups is that member companies obtain various intangible and financial resources from other members.

Affiliated with companies and non-affiliated companies have many differences, one of which is the difference in cash holding y . This implies that an affiliated company has less cash holding than an unaffiliated company (Cai et al., 2016; Locorotondo et al., 2014). Furthermore, Deloof (2001) and Dewaelheyns and Van Hulle (2006) showed that affiliated companies have a negative effect on cash holding. Locorotondo et al. (2014) also showed that the cash holding policies of affiliated and non-affiliated companies differ. Therefore, affiliated companies have a negative effect compared to non-affiliated groups.

Financial distress according to Kim et al. (2011) is a situation that is being experienced by companies with the possibility of bankruptcy and it is expected that the company has a lower level of liquidity compared to the level of assets owned by the company. Bankruptcy which occurs in companies that experience financial distress is due to significant expenditure (Hoshi et al., 1990). Therefore, companies experiencing financial distress tend to face various types of bankruptcy costs including, those directly related to the bankruptcy process and the possibility of decreasing revenue from sales due to customer doubts

about their ability to maintain quality (indirect cost) (Shah, 2011). Besides, financial distress may cause cash availability problems for companies (Berger et al., 2001).

Most of the studies carried out have proven that there is a negative relationship between financial distress and cash holding. García-Teruel and Martínez-Solano (2008) and Kim et al. (2011) stated that companies holding large amounts of cash are likely to experience financial distress. Furthermore, Dewaelheyns and Van Hulle (2006) explained that financial distress may occur because the company holds a large amount of cash and the company will use all possible methods to avoid bankruptcy.

The expected relationship between affiliated groups and financial distress is ambiguous. Meanwhile, to reduce the cost of financial distress, a company must increase its cash level to decrease the risk of financial distress, including bankruptcy (Ferreira & Vilela, 2004; García-Teruel & Martínez-Solano, 2008). Financial distress is a condition in which a company or individual cannot generate sufficient revenues or income, making it unable to meet or pay its financial obligations. This is generally due to high fixed costs, a large degree of illiquid assets, or revenues sensitive to economic downturns. However, when the cash in the company consistently increases, the possibility of a rise in financial distress is more likely to occur in affiliated companies than in non-affiliated companies, because affiliated companies have more opportunities to generate funding resources for example, by selling non-essential assets and affiliations (Cai et al., 2016). Firms have a target cash level to which they attempt to converge. The level of this target is higher for firms with more growth opportunities and larger cash flows. In contrast, the target level for cash holdings falls when the use of bank debt and the presence of substitutes for cash increase. Moreover, when the interest rates in the economy increase firms reduce their cash holding (García-Teruel & Martínez-Solano, 2008; Kim et al., 2011).

3. Research Methods and Materials

Sample selection was based on all of the firms listed on the Indonesian Stock Exchange during 2008–2017 and financial statements were obtained from the site www.idx.co.id. Furthermore, business affiliation data was obtained from the annual reports of the firms. Kwan and Lau (2020) Locorotondo et al. (2014), and Cai et al. (2016) defines a business affiliate as a firm in which at least 50% of its shares are held by the controlling company or parent company (directly or indirectly). The population used in this study was manufacturing companies (consumer goods industry, basic industry and chemicals, and miscellaneous industry), listed on the Indonesia Stock Exchange (IDX). The sampling method was a technique based on criteria (purposive sampling) and the sample comprised 137 firms.

The variables used consisted of the dependent and independent variables with cash holding and financial distress as the independent and dependent variables respectively. Financial distress was measured using the Z-Score Altman formula (Altman, 1968), and was inversely related i.e. the higher the Z-Score value, the lower the company's financial distress and vice versa. The variables used in the study are explained in Table 1.

According to the trade-off theory, the relationship between size and cash holding was negative. The trade-off theory of capital structure is the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. Al-Najjar and Belghitar (2011), Chen, (2008), Guney et al. (2007), Ozkan and Ozkan (2004), and Drobetz and Gruninger (2007) argued that large companies tend not to hold cash reserves because they are considered more diversified than small companies. Opler et al. (1999) argued that in controlling their investments, large companies should have more cash to be successful.

Opler et al. (1999), Ferreira and Vilela (2004) and Al-Najjar and Clark (2016) argued that there is a positive relationship between profitability and cash holding. The pecking order theory states that a company should prefer to finance itself first internally through retained earnings. If this source of financing is unavailable, a company should then finance itself through debt. Furthermore, according to the pecking order theory, companies that have a high level of profit will accumulate the resulting cash flow, therefore, the level of liquidity needs to be maintained by holding more cash. Meanwhile, according to the trade-off theory, companies with high leverage tend to face financial difficulties and go bankrupt. Al Najjar and Belghitar (2011), Ferreira and Vilela (2004), and Kim et al. (2011) argued that to reduce the possibility of financial distress and bankruptcy, the company is expected to have more cash.

The following dynamic panel data model was estimated by examining the association between financial distress and cash holding based on the framework implemented by Cai et al. (2016), Locorotondo et al. (2014), and Opler et al. (1999).

$$CH_{i,t} = \alpha_t + \beta_1 CH_{i,t-1} + \beta_2 Zscore_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 DER_{i,t} + \beta_6 BOARD_{i,t} + \varepsilon_{i,t} \quad (1)$$

where for firm i in year t , CH refers to cash and cash equivalents divided by total assets, Z-Score refers to financial distress, SIZE is the natural logarithm of total assets, ROA refers to net income divided by total assets, DER refers to total liabilities divided by total equity and BOARD is the number of commissioners on the board.

Following Arellano and Bond (1991), Arellano and Bover (1995), and Bond and Blundell, (2000), the Generalized Method of Moments (GMM) is used for estimation, because it allows controlling endogeneity using instruments. To test for

endogeneity, you will need to have at least one instrument for your endogenous variable. Furthermore, following Arellano and Bond (1991), the methodology used assumed that there was no second-order serial correlation for lagged variables as instruments. Therefore, in the absence of second-order serial correlation, the Arellano and Bond test was included. The Arellano–Bond estimator is a GMM estimator used to estimate dynamic models of panel data. Meanwhile, the Hansen test for the absence of correlation between the instruments and for testing over-identifying restrictions in a statistical model (Hansen, 1982) was also included.

4. Results and Discussion

The summary statistics and correlation matrix for the variables used in the analysis are presented in Tables 1 and 2. Table 1 shows the mean and standard deviation values for variables. The standard deviation shows a deviation value from the mean, which represents the average value. Meanwhile, the cash holding (CH) average was 0.0924 for the selected time period of 2008–2017 and the standard deviation was 0.1088. The financial distress (Z-Score) mean was 2.2498 and showed a standard deviation of 3.3555. SIZE mean was 14.351 and showed a standard deviation value of 1.6152, while the ROA mean was 7.7010 and the standard deviation was 17.279 percent. Leverage (DER) showed a mean of 1.5464 and a standard deviation of 7.3612. Board Size (Board) average mean was 4.2149 and the standard deviation was 1.8287. Furthermore, Table 2 shows that the correlation among the independent variables was very low, which explained that no multicollinearity exists.

The main regression results focusing on the relationship between financial distress on cash holding and the explanatory variables are presented in Table 3. This study econometrically adopted the two-step GMM dynamic system panel estimator developed by Arellano and Bover (1995) and Bond and Blundell (2000). The estimation results pointed out the stable coefficients and the Hansen test showed no evidence of over-identifying. Inconsistency would be implied when the second-order autocorrelation presents restrictions, which is rejected by the test for AR(2) errors. The lagged dependent variable, which measures the degree of persistence of cash holding (CH), was statistically significant across all models, indicating a high degree of persistence of cash holding (CH) and justifying the use of a dynamic model.

Table 3 shows that the coefficients for financial distress (Z-Score) indices were positive and significant for all models. Therefore, the higher the Z-Score value, the lower the company's financial distress and vice versa. This result provides strong evidence of a negative relationship between Z-Score and cash holding (CH) i.e., a high degree of Z-Score

Table 1: Descriptive Statistics

Variables	Definitions	Obs.	Mean	Std. Dev	Max	Min
CH	Cash Holding = Cash and cash equivalents divided by total assets	1109	0.0924	0.1088	0.0004	0.7510
(Z-Score)	Financial Distress (Z-Score) $= 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$ X_1 = working capital / total assets X_2 = retained earnings / total assets X_3 = earnings before interest and taxes / total assets X_4 = market value of equity / book value of total liabilities X_5 = sales / total assets	1109	2.2498	3.3555	-17.751	27.810
Size	Natural logarithm of total assets	1109	14.351	1.6152	10.737	19.504
ROA	Net income/total assets	1109	7.7010	17.279	-67.339	320.67
DER	Total liabilities/total equity	1109	1.5464	7.3612	-30.598	216.26
Board	Number of commissioners on the board	1107	4.2149	1.8287	2	12

Source: IDX, author's calculation, 2020.

Table 2: Correlation Matrix

	CH	Z-Score	Size	ROA	DER	Board
CH	1.0000					
Z-Score	0.4409	1.0000				
Size	-0.0064	-0.0519	1.0000			
ROA	0.2583	0.2513	0.0843	1.0000		
DER	-0.0695	-0.0872	0.0089	-0.0766	1.0000	
Board	0.0763	0.0490	0.4692	0.1444	0.0044	1.0000

Table 3: The Impact of Financial Distress on Cash Holding – Baseline Regression

Explanation variables	Dependent variables: Cash Holding (CH)			
	(1)	(2)	(3)	(4)
CH (-1)	0.5390*** (0.0952)	0.5559*** (0.0978)	0.5458*** (0.0884)	0.5528*** (0.0899)
Z-Score	0.0059** (0.0022)	0.0052*** (0.0019)	0.0054*** (0.0019)	0.0050*** (0.0000)
Size		0.0008 (0.0024)		-7.41e-06 (0.0003)
ROA		0.0003 (0.0003)		0.0002 (0.0003)
DER		-0.0004 (0.0003)		-0.0004 (0.0003)
Board		0.0006 (0.0020)		0.0002 (0.0020)
Constanta	0.0249*** (0.0060)	0.0089 (0.0350)	0.0403*** (0.0131)	0.0348 (0.0397)
Year Dummies	No	No	Yes	Yes
Industry Dummies	No	No	Yes	Yes
Observations	988	987	988	987
Number of groups	121	121	121	121
Number of Instruments	11	15	11	15
AR(2) test	0.246	0.254	0.323	0.244
Hansen-J test	0.102	0.098	0.267	0.251

***, **, and * indicate significance at the 1%, 5% and 10%, respectively. Standard errors of each coefficient are in parentheses.

in companies may decrease their cash holding (CH). This implies that the lower the company's financial distress, the lower the cash holding. Furthermore, these results were in line with Ferreira and Vilela (2004), Chen and Chuang (2009), and Iskandar-Datta and Jia (2012).

To examine the possibility that the business group affiliates played different roles in the internal funding capacity that lowered information asymmetries and alleviated financial constraints, the original data was split into two subsamples i.e., affiliated and non-affiliated groups as shown in Table 4. It was discovered that there was a positive and significant impact of the Z-Score on cash holding for non-affiliated groups. Affiliated groups showed that the effect of Z-Score on cash holding was not important. This implies that there are differences in the amount of cash

holding between affiliated and non-affiliated groups. This result indicates that non-affiliated groups hold more cash during financial distress. Therefore, experiencing financial problems will certainly make the company's cash holding too small, leading to bankruptcy.

In this study, the two-stage robustness checks were carried out. First, the analysis was carried out using the one-period lag of Z-Score. The results obtained are presented in Table 5 and it showed that it has a positive and significant effect on cash holding. Second, an alternative estimator was used, and the results are presented in Table 6. Furthermore, for the fixed and random effect, the GLS approach was applied to check the validity of the results. Besides, results that support the baseline regression were still discovered.

Table 4: The Impact of Financial Distress on Cash Holding – Group Affiliation vs Non-Group Affiliation

Explanation variables	Dependent variables: Cash Holding (CH)							
	Group Affiliation				Non-Group Affiliation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CH (-1)	0.3275** (0.1275)	0.3194** (0.1438)	0.4067*** (0.0740)	0.4526*** (0.0717)	0.5571*** (0.1082)	0.5663*** (0.1105)	0.5738*** (0.1095)	0.5789*** (0.1111)
Z-Score	0.0037 (0.0035)	0.0032 (0.0029)	0.0044 (0.0035)	0.0044 (0.0030)	0.0064** (0.0027)	0.0057** (0.0024)	0.0058** (0.0024)	0.0053** (0.0021)
Size		-0.0019 (0.0037)		0.0052 (0.0030)		0.0001 (0.0026)		-0.0013 (0.0029)
ROA		0.0002 (0.0007)		-0.0003 (0.0004)		0.0004 (0.0004)		0.0004 (0.0003)
DER		-0.0014 (0.0018)		-0.0017 (0.0023)		-0.0003 (0.0003)		-0.0002 (0.0003)
Board		0.0040 (0.0030)		0.0009 (0.0027)		0.0008 (0.0029)		0.0001 (0.0028)
Constanta	0.0352*** (0.0095)	0.0446 (0.0486)	0.0678*** (0.0174)	-0.0124 (0.0376)	0.0226*** (0.0070)	0.0155 (0.0396)	0.0324*** (0.0161)	0.0453 (0.0488)
Year Dummies	No	No	Yes	Yes	No	No	Yes	Yes
Industry Dummies	No	No	Yes	Yes	No	No	Yes	Yes
Observations	202	201	202	201	786	786	786	786
Number of groups	24	24	24	24	97	97	97	97
Number of Instruments	11	15	21	25	11	15	21	25
AR(2) test	0.173	0.189	0.175	0.201	0.135	0.147	0.105	0.113
Hansen-J test	0.376	0.401	0.676	0.904	0.119	0.123	0.234	0.230

***, **, and * indicate significance at the 1%, 5% and 10%, respectively. Standard errors of each coefficient are in parentheses.

Table 5: The Impact of Financial Distress on Cash Holding – Robustness Check: Lag Effect

Explanation variables	Dependent variables: Cash Holding (CH)			
	(1)	(2)	(3)	(4)
CH (–1)	0.5318*** (0.1053)	0.5412*** (0.1064)	0.5432*** (0.0942)	0.5436*** (0.0972)
Z-Score (–1)	0.0054*** (0.0019)	0.0050** (0.0019)	0.0052*** (0.0015)	0.0049*** (0.0016)
Size		0.0006 (0.0025)		0.00002 (0.0026)
ROA		0.0005 (0.0003)		0.0005 (0.0003)
DER		–0.0005 (0.0004)		–0.0004 (0.0004)
Board		0.0003 (0.0020)		–0.0001 (0.0020)
Constanta	0.0266*** (0.0068)	0.0129 (0.0369)	0.0418*** (0.0142)	0.0342 (0.0397)
Year Dummies	No	No	Yes	Yes
Industry Dummies	No	No	Yes	Yes
Observations	988	987	988	987
Number of groups	121	121	121	121
Number of Instruments	11	15	21	25
AR(2) test	0.278	0.302	0.254	0.285
Hansen-J test	0.062	0.065	0.208	0.200

***, **, and * indicate significance at the 1%, 5% and 10%, respectively. Standard errors of each coefficient are in parentheses.

Table 6: The Impact of Financial Distress on Cash Holding – Robustness Check: Fixed Effect

Explanation variables	Dependent variables: Cash Holding (CH)			
	(1)	(2)	(3)	(4)
Z-Score	0.0061*** (0.0021)	0.0059*** (0.0021)	0.0061*** (0.0021)	0.0059*** (0.0020)
Size		–0.0038 (0.0079)		–0.0133 (0.0113)
ROA		0.0002 (0.0002)		0.0002 (0.0002)
DER		–0.0001 (0.0001)		–0.00009 (0.0001)
Board		–0.0101*** (0.0036)		0.0099*** (0.0036)
Constanta	0.0787*** (0.0049)	0.1750 (0.1142)	0.0859*** (0.0091)	0.2061 (0.1517)
Year Dummies	No	No	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Observations	1109	1107	1109	1107
Number of groups	121	121	121	121
Prob > F	0.0062	0.0016	0.0168	0.0002
R Sq: within	0.0401	0.0574	0.0487	0.0698

***, **, and * indicate significance at the 1%, 5% and 10%, respectively. Standard errors of each coefficient are in parentheses.

5. Conclusions

This study aims to investigate the impact of financial distress on the cash holding of non-financial companies in Indonesia. Furthermore, the sub-sample business groups to be investigated were divided into two groups, namely affiliated and non-affiliated groups. This was carried out to ascertain the difference in the impact of financial distress on cash holding between both groups. Sample collection was based on all firms listed on the Indonesian Stock Exchange (IDX) during 2008–2017, comprising 137 firms.

Meanwhile, the main regression results focused on the relationship between financial distress on cash holding. It was discovered that the coefficients for financial distress (Z-Score) indices were positive and significant for all models. This implies that the lower the company's financial distress, the lower the cash holding. Furthermore, it was discovered that there was a positive and significant impact of the Z-Score on cash holding for non-affiliated groups. Meanwhile, affiliated groups showed that the effect of Z-Score on cash holding was not important. However, these results have cash policy implications particularly for non-affiliated groups. Therefore, the comparison of the group-cash relationships between listed and non-listed affiliates across countries may also yield new insights.

References

- Acharya, V. V., Almeida, H., & Campello, M. (2007). Is cash negative debt? A hedging perspective on corporate financial policies. *Journal of Financial Intermediation*, 16(4), 515–554. <https://doi.org/10.1016/j.jfi.2007.04.001>
- Al-Najjar, B., & Belghitar, Y. (2011). Corporate cash holdings and dividend payments: Evidence from the simultaneous analysis. *Managerial and Decision Economics*, 32(4), 231–41. <https://doi.org/10.1002/mde.1529>
- Al-Najjar, B., & Clarck, E. (2017). Corporate governance and cash holdings in MENA: Evidence from internal and external governance practices. *Research in International Business and Finance*, 39, 1–12. <https://doi.org/10.1016/j.ribaf.2016.07.030>
- Altman, E. I. (1968). The prediction of corporate bankruptcy. *The Journal of Finance*, 22, 44–70. <https://doi.org/10.2307/2978933>
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–97. <https://doi.org/10.2307/2297968>
- Arellano, M., Bover, O., 1995. Another look at the instrumental variable's estimation of error component models. *Journal of Econometrics*, 68(1), 29–51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
- Berger, A. N., Udell, G. F., & Udell, G. F. (2001). The ability of banks to lend to informationally opaque small businesses. *Journal of Banking and Finance*, 25(12), 2127–2167. [https://doi.org/10.1016/S0378-4266\(01\)00189-3](https://doi.org/10.1016/S0378-4266(01)00189-3)
- Bianco, M., & Nicodano, G. (2006). Pyramidal groups and debt. *European Economic Review*, 50(4), 937–961. <https://doi.org/10.1016/j.eurocorev.2004.11.001>
- Blundell, R., & Bond, S. (2000). GMM estimation with persistent panel data: An application to production functions. *Econometric Reviews*, 19(3), 321–340. <https://doi.org/10.1080/07474930008800475>
- Boubaker, S., Derouiche, I., & Nguyen, D. K. (2015). Does the board of directors affect cash holdings? A study of French listed firms. *Journal Management & Governance*, 19, 341–370. <https://doi.org/10.1007/s10997-013-9261-x>
- Cai, W., Zeng, C. C., Lee, E., & Ozkan, N. (2016). Do business groups affect corporate cash holdings? Evidence from a transition economy. *China Journal of Accounting Research*, 9(1), 1–24. <https://doi.org/10.1016/j.cjar.2015.10.002>
- Chang, S. J., & Hong, J. (2008). Economic performance of group-affiliated companies in Korea: intragroup resource sharing and internal business transactions. *Academy of Management Journal*, 43(3), 429–448. <https://doi.org/10.2307/1556403>
- Chen, Y. R. (2008). Corporate governance and cash holdings: listed new economy versus old economy firms. *Corporate Governance: An International Review*, 16(5), 430–42. <https://doi.org/10.1111/j.1467-8683.2008.00701.x>
- Chen, Y. R., & Chuang, W. T. (2009). Alignment or entrenchment? Corporate governance and cash holdings in growing firms. *Journal of Business Research*, 62(11), 1200–1206. <https://doi.org/10.1016/j.jbusres.2008.06.004>
- Deloof, M. (2001). Belgian intragroup relations and the determinants of corporate liquid reserves. *European Financial Management*, 7(3), 375–392. <https://doi.org/10.1111/1468-036X.00161>
- Dewaelheyns, N., & Van Hulle, C. (2006). Corporate failure prediction modeling: Distorted by business groups' internal capital markets? *Journal of Business Finance and Accounting*, 33(5–6), 909–931. <https://doi.org/10.1111/j.1468-5957.2006.00009.x>
- Drobetz, W., & Grüninger, M. C. (2007). Corporate cash holdings: evidence from Switzerland. *Financial Markets and Portfolio Management*, 21(3), 293–324. <https://doi.org/10.1007/s11408-007-0052-8>
- Ferreira, M. A., & Vilela, A. S. (2004). Why do firms hold cash: Evidence from EMU countries? *European Financial Management*, 10(2), 295–319. <https://doi.org/10.1111/j.1354-7798.2004.00251.x>
- García-Teruel, P. J., & Martínez-Solano, P. (2008). On the determinants of SME cash holdings: Evidence from Spain. *Journal of Business Finance and Accounting*, 35(1–2), 127–149. <https://doi.org/10.1111/j.1468-5957.2007.02022.x>
- George, R., & Kabir, R. (2008). Business groups and profit redistribution: A boon or bane for firms? *Journal of Business Research*, 61(9), 1004–1014. <https://doi.org/10.1016/j.jbusres.2007.12.002>

- Gertner, R. H., David, S. S., & Jeremy, C. S. (1994). Internal versus external capital markets. *Quarterly Journal of Economics*, 109(11), 1211-1230. <https://doi.org/10.2307/2118361>
- Guney, Y., Ozkan, A., & Ozkan, N. (2007). International evidence on the non-linear impact of leverage on corporate cash holdings. *Journal of Multinational Financial Management*, 17(1), 45–60. <https://doi.org/10.1016/j.mulfin.2006.03.003>
- Hansen, L. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, 50, 1029–54. <https://doi.org/10.2307/191277>
- Hoshi, T., Kashyap, A., & Scharfstein, D. (1990). The role of banks in reducing the costs of financial distress in Japan. *Journal of Financial Economics*, 27(1), 67-88. [https://doi.org/10.1016/0304-405X\(90\)90021-Q](https://doi.org/10.1016/0304-405X(90)90021-Q)
- Iskandar-Datta, M. E., & Jia, Y. (2012). Cross-country analysis of secular cash trends. *Journal of Banking and Finance*, 36(3), 898–912. <https://doi.org/10.1016/j.jbankfin.2011.10.003>
- Jensen, B. M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The Journal of Finance*, 76(2), 323–329. <https://doi.org/10.1111.1458.1715>
- Kim, J., Kim, H., & Woods, D. (2011). Determinants of corporate cash-holding levels: An empirical examination of the restaurant industry. *International Journal of Hospitality Management*, 30(3), 568–574. <https://doi.org/10.1016/j.ijhm.2010.10.004>
- Kwan, J. H., & Lau, W. Y. (2020). Do firm characteristics and industry matter in determining corporate cash holdings? Evidence from hospitality firms. *The Journal of Asian Finance, Economics, and Business*, 7(2), 9–20. <https://doi.org/10.13106/jafeb.2020.vol7.no2.9>
- Lau, W. T., & Mahat, F. B. (2019). Robustness of cash flow value: Investment in ASEAN. *Journal of Asian Finance, Economics, and Business*, 6(2), 247–255. <https://doi.org/10.13106/jafeb.2019.vol6.no2.247>
- Locorotondo, R., Dewaelheyns, N., & Van Hulle, C. (2014). Cash holdings and business group membership. *Journal of Business Research*, 67(3), 316–323. <https://doi.org/10.1016/j.jbusres.2013.01.019>
- Luo, F. (2014). Monetary policy shock, the strength of bank relationship, and corporate cash policy. *International Journal of Economics and Finance*, 6(7), 195–212. <https://doi.org/10.5539/ijef.v6n7p195>
- Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, 5(2), 147–175. [https://doi.org/10.1016/0304-405X\(77\)90015-0](https://doi.org/10.1016/0304-405X(77)90015-0)
- Nguyen, D. C., & Nguyen, C. V. (2020). The impact of operating cash flow in the decision-making of individual investors in Vietnam's stock market. *Journal of Asian Finance, Economics, and Business*, 7(5), 19–029. <https://doi.org/10.13106/jafeb.2020.vol7.no5.019>
- Opler, T., Pinkowitz, L., Stulz, H., & Williamson, R. (1999). The determinants and implications of corporate cash holdings. *Journal of Financial Economics*, 52(1), 3–46. [https://doi.org/10.1016/S0304-405X\(99\)00003-3](https://doi.org/10.1016/S0304-405X(99)00003-3)
- Ozkan, A., & Ozkan, N. (2004). Corporate cash holdings: An empirical investigation of UK companies. *Journal of Banking and Finance*, 28(9), 2103–34. <https://doi.org/10.1016/j.jbankfin.2003.08.003>
- Pinkowitz, L., & Williamson, R. (2001). Bank power and cash holdings: Evidence from Japan. *Review of Financial Studies*, 14(4), 1059–1082. <https://doi.org/10.1093/rfs/14.4.1059>
- Shah., A. (2011). The corporate cash holdings: Determinants and implications. *African Journal of Business Management*, 5(34), 12939–12950. <https://doi.org/10.5897/AJBM11.2635>
- Stein, J. C. (1997). Internal capital markets and the competition for corporate resources. *The Journal of Finance*, 52(1), 111–133. <https://doi.org/10.2307/2329558>
- Yeh, Y., & Woitke, T. (2005). Commitment or entrenchment? Controlling shareholders and board composition. *Journal of Banking & Finance*, 29(7), 1857–1885. <https://doi.org/10.1016/j.jbankfin.2004.07.004>
- Yudaruddin, R. (2019). Determinants of corporate cash holdings: Evidence of the mining sector in Indonesia. *International Journal of Scientific & Technology Research*, 8(10), 1523–1526
- Zaman, A. A. (2012). Cash holdings, market frictions, and monetary policy: An investigation of the increase in cash holdings. *SSRN Journal*, 1–56. <https://doi.org/10.2139/ssrn.2076414>