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✉ Corresponding Author:

Linda Purnama Sari:

Tel +62 31 594 7151

E-mail: linda@perbanas.ac.id



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The determinants of cash holdings and characteristics of the industrial business cycle in Indonesia

Linda Purnama Sari, Sri Lestari Kurniawati, Dewi Ayu Wulandari

Department of Management, Faculty of Economics, Sekolah Tinggi Ilmu Ekonomi Perbanas Jl. Nginden Semolo 34-36, Surabaya, 60118, Indonesia

Abstract

One of the motives of a business doing cash holdings is the precautionary motive. The company tries to accumulate cash as a precautionary measure to cover unanticipated future necessities. We investigate to determine the factors that can affect company cash holdings that are associated with the characteristics of the industrial business cycle in Indonesia. The sample used is companies that meet the criteria (purposive sampling) and are grouped into different industrial characteristics, such as sensitive industry, defensive industry, growth industry, and cyclical industry. This enables to understand the behavior of cash holdings in a different industry. The analysis technique used is the data panel regression analysis. We find that each type of industry has different characteristics in maintaining its cash balance. For defensive industry and growth industry hold more cash than other industry, because they have strong growth opportunities. In addition, we find that inflation, managerial ownership, leverage, dividend policy, investment opportunities, and firm size have an effect on cash holdings while the operating cycle has no effect on cash holdings.

Abstrak

Salah satu motif sebuah bisnis melakukan cash holdings adalah motif kehati-hatian. Perusahaan mencoba mengakumulasi uang tunai sebagai tindakan pencegahan untuk memenuhi kebutuhan masa depan yang tidak terduga. Kami menguji faktor-faktor yang dapat memengaruhi cash holdings perusahaan yang berhubungan dengan karakteristik siklus bisnis industri di Indonesia. Sampel yang digunakan adalah perusahaan yang memenuhi kriteria (purposive sampling) dan dikelompokkan ke dalam karakteristik industri yang berbeda, seperti industri sensitif, industri defensif, industri pertumbuhan, dan industri siklus. Ini memungkinkan untuk memahami perilaku cash holdings di industri yang berbeda. Teknik analisis yang digunakan adalah analisis regresi panel data. Kami menemukan bahwa setiap jenis industri memiliki karakteristik yang berbeda dalam menjaga saldo kasnya. Untuk industri defensif dan industri pertumbuhan memiliki lebih banyak kas daripada industri lain, karena mereka memiliki peluang pertumbuhan yang kuat. Selain itu, kami menemukan bahwa inflasi, kepemilikan manajerial, leverage, kebijakan dividen, peluang investasi, dan ukuran perusahaan berpengaruh pada cash holdings sementara siklus operasi tidak berpengaruh pada cash holdings.

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1. Introduction

Cash is one of the most liquid components of current assets. Cash can be used immediately to meet the company's operational needs. Increased competition in the business world requires companies to be able to manage their finances appropriately. The availability of sufficient cash in a company is very important. Without cash, the company's activities will be hampered and unable to run smoothly. Therefore, companies must maintain cash holding to meet their needs. Keynes (1936) states that there are four main motives of maintaining cash holding: (1) transaction motives, where companies hold cash with the aim of reducing the costs of liquidating assets when cash is needed in an urgent time; (2) precautionary motive, where companies hold cash to deal with unpredictable situations and conditions that require capital expenditure; (3) tax motives, where companies prefer holding cash to paying dividends because of the high taxes that must be paid by companies; (4) agency motives, where trained managers tend to hold cash rather than distribute it to shareholders. So, when the company has a bad investment opportunity, it can use the cash holding to benefit themselves. Bates, Kahle, & Stulz (2009) argue that firms tend to hold an excessive amount of cash and the theoretical motives seem to be firm characteristics including precautionary, taxes, agency costs and transaction costs.

Effective and efficient cash holdings can be seen from the company's ability to ensure that there is sufficient cash to meet its operational needs. One form of corporate cash management is to hold cash at an optimal point. Holding large amounts of cash will provide benefits in the form of savings in the cost of conversion to cash so that if there is a sudden need for cash, the company can immediately fulfill it, or in other words, the company's liquidity is maintained. However, holding large amounts of cash also has a weakness where the company will lose the opportunity to gain additional profits due to idle funds, which in turn can harm shareholders

because the level of return or profitability is below what it should be. On the one hand, holding a relatively small amount of cash will cause the company to have difficulties in meeting its liquidity. This means that there is a trade-off between liquidity and profitability when a company maintains large or small amounts of cash holdings.

Cash becomes very important when there is a recession in a country's economy. The indicator of economic conditions can be seen in the inflation rate. One of the macro indicators is always in the spotlight for the public, especially business people and investors. The high inflation rate is indicated by an increase in prices of goods in general and resulted in the company and business people having to provide a large enough cash to be able to maintain the company's operational activities.



Figure 1. Inflation and cash holdings 2008-2018 in Indonesia
Source: www.idx.co.id, www.bi.go.id

At the time of the global financial crisis in 2008, the tendency for companies to have cash holdings was relatively small compared to inflation (Figure 1). Several studies have examined the effects of the 2008-2009 financial crisis in the U.S. on corporate cash holdings. Bliss, Cheng, & Denis (2015) find that the shock of the supply of credit during the crisis increased the benefit of holding cash, and the firms reduced disbursing cash to shareholders via dividends and share repurchase to, in effect, create a substitute form of financing. These effects were more

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pronounced among firms with higher leverage and more valuable growth opportunities. Acharya, Almeida, & Campello (2013) find that firms will hold more cash reserves during periods of heightened aggregate volatility to avoid higher spreads and shorter maturities imposed by banks on their undrawn credit lines during the risky period. This means that the global financial crisis in 2008 had a large and continuing impact on the operations of companies throughout the world, including in Indonesia.

Subramaniam et al. (2011) found that diversified firms hold significantly less cash than their focused counterparts. The lower cash holdings among diversified firms to complementary growth opportunities across the different segments of these firms and the availability of active internal capital market. By entering the capital market, companies could still operate in the mindset of a crisis that was happening, something that could not be done by companies that had a small cash balance due to the limited funds they had. Companies with low cash holding levels were unable to last long in times of crisis because they could not operate anymore due to not having enough funds to buy increasingly expensive raw materials.

Miscalculation may result in the company experiencing liquidity problems (Ferreira, Custodio, & Raposo, 2005). This has made lessons for other companies, especially companies in the property and real estate sector in meeting their liquidity needs. Companies must be able to estimate the right level of cash holding so that their operational funding needs can be met without disturbing the company's liquidity. On the other hand, property and real estate companies tend to save assets in the form of non-current assets (fixed assets) such as land and buildings which ultimately make companies in this sector very vulnerable (sensitive) to changes in inflation and interest rates and the impact is on operating cycle which is relatively long because it has to change raw materials (building materials) into a

building that takes a lot of time (Wang, Chen, & Song, 2013). So, the companies must anticipate and find ways to meet the needs of funds by having a relatively long operating cycle.

In contrast to the property sector, the manufacturing sector, especially food and beverages, is more defensive or able to survive despite a change in inflation, given that this sector produces products that become the basic needs for the community (Jones et al., 2008). Despite high inflation, the public will still buy the product, resulting in companies in this sector having fairly stable cash holdings. In addition to having fairly stable cash holdings, the food and beverage sector also has a relatively short business operating a cycle, because when processing raw materials into finished goods, the companies in this sector do not require a long production process. So, the operating cycle is relatively short (Jinkar, 2013).

Inflation can affect the company's financial condition, especially the company's cash position. Research conducted by (Wang, Chen, & Song, 2013) shows that CPI (Consumer Price Index) has an effect on cash holdings, but the operating cycle and cash holdings have a non-linear relationship (U-shape relationship). According to Riordan & Riordan (2009), the small inflation value can accumulate at any time and has the potential to change the company's financial position and the results of operational activities. The operating cycle is very dependent on the type of industry group itself. Jones et al. (2008) divides industrial groups into 4 different industry groups: (1) interest sensitive industry, an industry whose sales and profits are very sensitive to changes in interest rates; (2) defensive industry, an industry whose sales and profits are not affected by changes in economic conditions, such as inflation; (3) growth industry, an industry whose sales growth and profits are faster than other companies, and (4) cyclical industry, an industry whose sales and profits are influenced by business cycles whose sales are more seasonal.

In addition to external factors (inflation), there are several internal factors of the company, such as leverage, firm size, and sales growth, which are also predicted to affect cash holdings. Opler et al. (1999) state that companies tend to hold substantial cash because they have high growth opportunities even though they are riskier and more difficult to enter the capital market. On the other hand, Faulkender (2002) finds that leverage, information asymmetry, corporate age and size, investment opportunities and cash flow change have a positive effect on cash holding. However, Ozkan & Ozkan (2004), Denis & Sibilkov (2009) show that firm size and credit ratings have a negative effect on cash holdings. Kim, Kim, & Woods (2011) show that firm size affects cash holdings, where large companies have easy and inexpensive access to enter the capital market compared to small companies. Thus, large companies do not need to collect large amounts of cash as small companies do to avoid investment opportunities that cannot be taken because of limited funding.

An inverse association between leverage and cash holdings is predicted by the trade-off and pecking order theory. Ozkan & Ozkan (2004) find that a high level of leverage indicates the ability of a company to obtain a loan (credit) to finance its assets. When the cost of debt issuance is more expensive than the cost of cash holding, the company will reduce debt and increase its cash balance. Thus, the higher the level of corporate leverage, the lower the level of cash holdings, and vice versa. Bates, Kahle, & Stulz (2009); Ferreira & Vilela (2004); also shows that leverage has a negative influence on cash holdings, where companies with a high level of leverage have a very high level of dependence on external loans to finance their assets, while companies that have a lower level of leverage indicate that the company's funding comes from own capital. The high level of leverage reflects that the company's financing depends a lot on external funding sources and not on cash so that it will reduce the retained cash balance.

Furthermore, managerial ownership also has an influence on the company's decision to hold its cash balance. Dittmar, Mahrt-Smith, & Servaes (2003) show that managerial ownership has a negative effect on cash holdings, meaning that companies with high managerial ownership tend to have low cash holdings, and vice versa. High managerial ownership will be able to strengthen the position of managers and there is a tendency that they will do opportunistic action, such as using the company's cash assets excessively so that it will reduce the level of cash holdings). Such a condition can disrupt the course of the company's operational activities and make the company's condition unstable.

Firm growth or investment opportunities can also affect a company's cash holdings. Research conducted by Faulkender (2002) shows that firm growth has a positive effect on cash holdings. This means that an increase in the company's growth will increase the opportunity to invest in operations, thus increasing the need for cash holdings.

From the above, it is revealed that not only firm-specific determinants of cash holdings have been analyzed in this study, but the effect of internal and external factors on cash holdings has also been studied. However, a different industry characteristics study on determinants of cash holdings is not made previously and this study is an effort to bridge this gap. Also, differences of theoretical impact on cash holdings are analyzed to this study which is a rare attribute of the above-mentioned studies.

2. Hypotheses Development

Inflation and cash holdings

Inflation is an increase in the prices of goods in general and results in a decline in public purchasing power. Public purchasing power can be seen in the Consumer Price Index (CPI). In addition, periods of inflation influence firms' operating performance, management situation, and need for and supply of cash. Thus, they need to actively or pas-

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sively change their levels of cash holdings. The higher the inflation rate, the lower the purchasing power of the people and this will also affect the company's cash holdings (Opler et al., 1999). In other words, when prices rise, the company's ability to buy materials will decrease (Jones et al., 2008). However, the sales obtained will decrease because people's purchasing power decreases. So, it can be said that inflation has a negative effect on corporate cash holdings. Wang, Chen, & Song (2013) shows that inflation has a negative impact on cash holdings in companies in China. However, this finding is different from the finding of the research conducted by Sutrisno & Gumanti (2016) that when Indonesia was hit by a global financial crisis, there was a tendency for companies to hold their cash more than normal conditions (not crisis). Many companies hold a large amount of cash for precautionary motives in anticipating an unexpected need during a crisis period.

H_1 : inflation has an effect on cash holdings

Leverage and cash holdings

Leverage is the company's ability to utilize and use existing assets that have a fixed burden (debt and or stock). The problem of leverage will always be faced by companies when they bear a number of fixed costs. High leverage will also provide a high risk.

Based on the trade-off theory, Ozkan & Ozkan (2004), in their research, found that leverage has a significant negative effect on cash holdings in companies in the UK, where companies have a high leverage ratio (debt ratio) tend to have lower cash holdings. In addition, Ferreira & Vilela (2004) found that companies with greater leverage have the ability to obtain external funding more easily and inexpensively so that it allows the companies to reduce their cash holdings.

Meanwhile, the pecking order theory (Myers & Majluf, 1984) assumes that financing basically

comes from three sources: firstly retained earnings is considered, then comes the debt and lastly when no other option is left equity is issued which is the last resort. This means that cash holdings are reduced by debt and the amount of cash held by the company is not too large. Opler et al. (1999) states that companies that have used excess cash, either to pay debt arrears or to accumulate cash, tend to have fixed target debt ratios and follow the hierarchy of pecking orders.

H_2 : leverage has an effect on cash holdings

Firm size and cash holdings

Firm size is the size of the company that can be seen based on the total assets owned, the total sales generated or the total market capitalization obtained. The larger the size of the company, the easier it will be for the company to get access to the capital market and money market to get funds. This is supported by the results of research conducted by Opler et al. (1999) that firm size has a positive effect on cash holdings, which means that large companies have better performance than small companies so that large companies have higher cash holdings than smaller companies. In addition, the results of research conducted by Al-Najjar (2013) show that firm size has a positive effect on cash holdings, which means that the larger the size of the company, the greater the cash balance held by the company. This is because large companies tend to invest their funds in different types of investments for the purpose of diversification in the field of company operations. By diversifying, large companies have relatively small probabilities for financial distress. On the contrary, the results of research conducted by Bates, Kahle, & Stulz (2009) show that firm size has a negative effect on cash holdings, where cash holdings increase in small companies compared to large companies. The negative effect of firm size on cash holdings begins to diminish when agency problems arise. So, large companies tend to have higher cash holdings.

H_3 : firm size has an effect on cash holdings

Dividend and cash holdings

Dividends are profits obtained by the company and then distributed to stockholders. Dividends are given after getting approval from the results of the General Meeting of Stockholders (GMS). The dividends distributed by companies can be in cash dividends or stock dividends. Based on the trade-off theory, dividend payment has a negative effect on cash holdings, which means that the greater the amount of dividend paid, the less the company's cash holdings. On the contrary, research conducted by Bates, Kahle, & Stulz (2009) shows that there is an increase in cash holdings in companies that do not pay dividends. This is because the companies are experiencing financial constraints. In order to survive, companies do not distribute dividends and hold more cash.

H_4 : dividend policy has an effect on cash holdings

Managerial ownership and cash holdings

Managerial ownership is the proportion of company stock ownership by directors and managers. Managers who do not have stocks in the company will have a tendency to enrich themselves (managerial opportunities), so they do not pay attention to the interests of the stockholders (owners). Agency theory states that managerial opportunities can cause hoarding of money which can actually be detrimental to stockholders because the rate of return is below what it should be. Large cash holding can also cause problems for stockholders. According to Shleifer & Vishny (1997), high managerial ownership will strengthen the position of the managers and there is a tendency to act opportunistically, such as using company cash assets excessively, thus reducing the level of cash holding. Such a condition can disrupt the course of the company's operational activities and make the company's condition unstable. Research conducted by Dittmar, Mahrt-Smith, & Servaes (2003) shows that manage-

rial ownership has a negative effect on cash holdings, meaning that companies with high managerial ownership tend to have low cash holdings and vice versa.

H_5 : managerial ownership has an effect on cash holdings

Investment opportunities and cash holdings

Myers (1984) states that investment opportunity shows the value of a company as a combination of assets owned as an investment opportunity in the future. Companies with poor investment opportunities are expected to increase cash holdings to ensure the availability of substantial funds. According to agency theory, investment opportunities have a negative influence on cash holdings. This is because managers tend to invest their funds in projects that are considered profitable so that the company's cash holdings are relatively smaller. However, research conducted by Opler et al. (1999) shows that companies with high investment opportunities may face higher costs so that there is a tendency to hold relatively large amounts of cash for the reason of precautionary motive.

For measurement of investment (growth) opportunities, market (price) to book ratio is used. This proxy is commonly found to be positively related to the cash level (Chen & Chuang, 2009). Therefore, cash holdings to be hoarded to finance corporate growth. This finding follows all major theories because high growth firms usually face high information asymmetries and are aiming to avoid underinvestment. Different from the prior study is found by Bigelli & Sánchez-Vidal (2012) who point out growth opportunities do not increase cash holdings in mature and private companies.

H_6 : investment opportunity has an effect on cash holdings

Operating cycle and cash holdings

The operating cycle is the period required by the company when operating its activities to generate revenue. The operating cycle is determined by the characteristics of the company's business. For example, companies with seasonal or cyclical sales will experience a relatively more fluctuating operating cycle than those with stable sales. The shorter the company's operating cycle, the greater the cash holdings and vice versa. This means that the faster the company rotates the cash, the more money will be generated and this will have an effect on the increase in the company's cash holding. Research conducted by Wang, Chen, & Song (2013) shows that operating cycle has an effect on cash holdings, as indicated by the existence of U-shape relationships, where in recession conditions, the operating cycle can increase cash holding, but under normal conditions, the operating cycle can decrease cash holdings.

H₇: operating cycle has an effect on cash holdings

3. Method, Data, and Analysis

This study is quantitative research with an explanatory approach because this study explains the relationships between the independent variables and the dependent variable. Based on the data used, this study is included in the study with pooling data because it uses a combination of time series data and cross-section data. It is said time series data because the retrieval of data uses a long period of time, from 2008 to 2018. In addition, this study is also a cross-section because it uses a different sample at a certain time.

The population used in this study is companies listed on the Indonesia Stock Exchange period 2008-2018. The sample used in this study was determined using a purposive sampling technique that is, selecting the population of companies based on certain criteria. The specific criteria for companies that are sampled are (a) companies listed on the In-

onesia Stock Exchange (excluding the banking and financial services industry), (b) companies that published financial reports in a row during the study period (2008-2018), (c) Companies that had positive equity, (d) Companies that had managerial ownership. There are 27 firms in a cyclical industry, 16 firms in the defensive industry, 13 firms in a growth industry and 31 firms in a sensitive industry. Our data are balanced and collected annually in period 2008-2018. The total observations are 957, 297 for cyclical industry, 176 for defensive industry, 143 for growing industry, and 341 for the sensitive industry.

The reason for choosing the period 2008-2018 was because in 2008 there was a global financial crisis where the impact affected the company's financial data in the period that followed. This is also to see the fluctuation of the inflation rate that occurred during the study period. Meanwhile, the reason for taking manufacturing companies was because this research intended to measure the operating cycle of companies that had inventories in their financial statements.

When viewed from the method of data collection, this research is included in documentation research, in which the data are obtained from documents published by other parties in the form of financial statements of companies listed on the Indonesia Stock Exchange (www.idx.co.id), inflation data from Bank Indonesia official website (www.bi.go.id) and ICMD (Indonesia Capital Market Directory).

The variables used in this study consist of inflation, leverage, firm size, dividend payout ratio, managerial ownership, investment opportunities, operating cycle (as the independent variables) and cash holdings (as the dependent variable). To simplify understanding and avoid misperceptions, the following is a description of operational definitions and measurement of variables presented in Table 1.

The analysis technique used in this study consists of descriptive analysis and hypothesis test analysis. The results of descriptive analysis can provide a general description of the research sample, then the results of this analysis are used as a reinforcement of the argument in hypothesis testing. Hypothesis test analysis in this study is a panel data regression analysis. Panel data regression analysis is a regression analysis with data structures as panel data. In panel data regression there are 3 (three) models, namely pooled OLS model (PLS), fixed effect model (FEM), and random effect model (REM). The testing procedure for choosing which model is the most appropriate as follows.

Chow Test, used to choose between PLS models or FEM models with the following formula:

$$F = \frac{(SSR_1 - SSR_2) / (n-1)}{SSR_2 / (nT - n - k)} \quad (1)$$

Where: n: number of individuals; T: number of period; K: number of parameters in the FEM model (not including intercept); SSR_1 and SSR_2 : sum square residual techniques without dummy variables (PLS) and FEM techniques with dummy variables

If the value of the probability of cross section $F > 0.05$, the chosen model is a common effect or

Table 1. Definition of variable operations and measurement of research variable

Variable	Proxy	Formula	Reference
<i>Cash Holdings</i>	Cash Holdings	Cash Hold = (cash & equivalent/total assets)	Wang, Chen, & Song, (2013)
<i>Macro Indicator</i>	Inflation Rate (%)	Inflation = sum of inflation rate (%) per month/12 month. This data was taken in Bank Indonesia (www.bi.go.id)	Denis & Sibilkov (2009), Wang, Chen, & Song (2013), Sutrisno & Gumanti (2016)
<i>Leverage</i>	Debt to Equity Ratio (DER)	DER = (total debt/total equity)	Faulkender (2002), Ozkan & Ozkan (2002), Ferreira & Vilela (2004)
<i>Firm Size</i>	Ln Total Assets	Firm Size = Ln (total assets)	Bates, Kahle, & Stulz (2009), Kim, Kim, & Woods (2011), Al-Najjar (2013)
<i>Dividend Policy</i>	Dividend Payout Ratio (DPR)	DPR = (DPS/EPS)x100% DPS = Dividend Per Share EPS = Earnings Per Share	Bates, Kahle, & Stulz (2009)
<i>Managerial Ownership</i>	Managerial Ownership (MO)	MO = (shares owned by all board members/total shares outstanding)	Opler et al. (1999), Dittmar, Mahrt-Smith, & Servaes (2003)
<i>Investment Opportunities</i>	Price to Book Value (PBV)	PBV = (market price/book value)	Opler et al. (1999), Chen & Chuang (2009), Rashid & Ashfaq (2017)
<i>Operating Cycle</i>	Cash Conversion Cycle (CCC)	CCC = (ACP + IP) - PDP ACP = Average Collection Period IP = Inventory Period PDP = Payable Deferral Period	Wang, Chen, & Song (2013), Niari & Khaki (2016)

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PLS, but if the probability of cross section $F < 0.05$, the chosen model is the fixed effect. Thus, the Lagrange Multiplier (LM) test, is used to choose between the PLS model or the REM model, with following formula:

$$LM = \frac{nT}{2(T-1)} \left[\frac{\sum_{i=1}^n (\sum_{t=1}^T e_{it})^2}{\sum_{i=1}^n \sum_{t=1}^T e_{it}^2} - 1 \right]^2$$

$$= \frac{nT}{2(T-1)} \left[\frac{\sum_{i=1}^n (T\bar{e}_i)^2}{\sum_{i=1}^n \sum_{t=1}^T e_{it}^2} - 1 \right]^2 \quad (2)$$

Where: n: number of individuals; T: number of periods; e_{it} : is the residual PLS method

LM test is based on the chi-square distribution with free degrees (df) of the number of independent variables. If the LM value is calculated $>$ chi-squared table, the chosen model is random effect or REM, and vice versa if the LM value is calculated $<$ chi-squared table, then the model chosen is the common effect (PLS).

The Hausman Test, is used to choose between the FEM model and the REM model, with the following formula:

$$W = [\hat{\beta} - \hat{\beta}_{GLS}] \hat{\Sigma}^{-1} [\hat{\beta} - \hat{\beta}_{GLS}] \sim \chi^2(k) \quad (3)$$

The Hausman Test statistic follows the distribution of chi-square statistics with free degrees of k , which k is the number of independent variables. If the value > 0.05 , the chosen model is the random effect (REM), but if value < 0.05 , the chosen model is the fixed effect (FEM).

The regression equation model that will be estimated is as follows:

$$CHs = \alpha s \pm \beta 1 DERs \pm \beta 2 FZs \pm \beta 3 DPRs \pm \beta 4 MOs \pm \beta 5 PBVs \pm \beta 6 CCCs \pm \beta 7 INFs + e \quad (4)$$

$$CHg = \alpha g \pm \beta 1 DERg \pm \beta 2 FZg \pm \beta 3 DPRg \pm \beta 4 MOg \pm \beta 5 PBVg \pm \beta 6 CCCg \pm \beta 7 INFg + e \quad (5)$$

$$CHd = \alpha d \pm \beta 1 DERd \pm \beta 2 FZd \pm \beta 3 DPRd \pm \beta 4 MOd \pm \beta 5 PBVd \pm \beta 6 CCCd \pm \beta 7 INFd + e \quad (6)$$

$$CHc = \alpha c \pm \beta 1 DERc \pm \beta 2 FZc \pm \beta 3 DPRc \pm \beta 4 MOc \pm \beta 5 PBVc \pm \beta 6 CCCc \pm \beta 7 INFc + e \quad (7)$$

Where: CH donates dependent variable for Cash Holdings; a donates constanta; b donates coefficient value; and e donates error. In this study, the independent variable are Leverage (DER); Firm Size (FZ); Dividend (DPR); Managerial Ownership (MO); Investment Opportunities (PBV); Operating Cycle (CCC); and Inflation (INF). Panel data regression analysis will be analyzed in four characteristic of the industrial business cycle. They are sensitive industry, growth industry, defensive industry, and cyclical industry; CHs= Cash Holdings on sensitive industry; CHg= Cash Holdings on growth industry; CHd= Cash Holdings on defensive industry; CHc= Cash Holdings on cyclical industry.

Processing panel data regression used software E-views 9. In panel data regression, there is F-test, t-test and test coefficient of determination to test the effect and predict the variation of the independent variables on the dependent variable.

4. Results

This study uses annual financial report data derived from manufacturing publication reports that have been published through the Indonesia Stock Exchange. The object of the research under study firms in a sensitive industry (31), defensive industry (16), growth industry (13) and cyclical industry (27). Based on Table 2 and 3, it can be seen the comparison of each variable according to the industry group.

In Table 2 and 3 it can be seen that the level of leverage (DER) of the cyclical industry is higher than that of other industries. This shows that companies in the cyclical industry use a lot of debt to finance their investment and operational activities. Companies that fall into this category are companies engaged in the automotive and spare parts sectors.

The firm size of growth industry is higher than that other industries. This means that companies in the growth industry have relatively large asset sizes compared to other companies. In addition, the dividend payout ratio (DPR) of the growth industry is also higher than that of other industries. This means that companies that enter the growth industry mostly distribute their profits in the form of dividends to shareholders. Likewise, the investment opportunity (PBV) of the growth industry has a greater value than that of other industries. Compa-

nies included in this category are companies engaged in telecommunications and pharmaceuticals.

Managerial ownership in sensitive industry is relatively higher than that in other industries. This means that many company's shares in the industry are owned by managers and directors. In addition, the operating cycle (CCC) in sensitive industry is relatively longer than that in other industries. This is because the companies included in this category are companies engaged in real estate and property services, where the inventory held, in the form of housing, apartments and condominiums, takes a very long time to build and sell to consumers.

Cash holdings owned by the defensive industry are relatively greater than those obtained by other industries. This shows that companies in the defensive category are very conservative and are careful about their cash needs. Given that this cash

Table 2. Summary of descriptive statistics

Variable	Sensitive Industry				Defensive Industry			
	Min	Max	Mean	SD	Min	Max	Mean	SD
<i>DER (x)</i>	0.04	6.32	0.92	0.71	0.04	15.28	1.26	13.43
<i>Firm Size (Ln TA)</i>	5.73	17.85	15.01	1.78	11.31	18.38	14.67	1.67
<i>DPR (%)</i>	0	75.83	6.23	12.51	0	145.92	13.33	27.25
<i>MO (%)</i>	0	41.2	2.15	6.50	0	25.27	1.29	5.57
<i>PBV (x)</i>	0	8.07	1.34	1.19	0	47.54	4.47	1.15
<i>CCC (days)</i>	-105.83	5022.49	689.03	732.26	-57.34	376.83	80.57	80.66
<i>Inflation (%)</i>	3.21	10.31	5.45	1.95	3.21	10.31	5.45	1.95
<i>Cash Holdings (%)</i>	0.001	38.94	8.84	7.90	0.51	63.04	14.68	13.43
<i>Observation (n)</i>	31				16			

Source: www.idx.co.id

Table 3. Descriptive statistics

Variable	Growth Industry				Cyclical Industry			
	Min	Max	Mean	SD	Min	Max	Mean	SD
<i>DER (x)</i>	0.1	13.54	1.38	2.032	0.09	23.21	1.68	2.37
<i>Firm Size (Ln TA)</i>	11.50	19.14	15.40	1.94	11.83	19.62	14.84	1.51
<i>DPR (%)</i>	0	215.46	28.49	34.68	0	264.23	15.73	30.21
<i>MO (%)</i>	0	23.08	1.22	4.18	0	28.1	2.12	6.02
<i>PBV (x)</i>	0	82.44	7.15	12.92	0.01	39.5	1.73	3.18
<i>CCC (days)</i>	-243.99	1547.45	78.08	157.05	-422	926	92.08	106.86
<i>Inflation (%)</i>	3.21	10.31	5.45	1.95	3.21	10.31	5.45	1.95
<i>Cash Holdings (%)</i>	0.24	47.82	13.51	10.84	0.202	92.76	9.43	10.62
<i>Observation (n)</i>	13				27			

Source: www.idx.co.id

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is used to maintain liquidity and stability rather than the sustainability of the company's operations.

Based on Table 4, the model chosen in the sensitive industry is a random effect model (REM). According to this model, the independent variables contribute 75.06 percent to explain the dependent variable. The independent variable that effects cash holdings is DER, DPR, MO, and PBV, while firm size, CCC, and inflation did not affect cash holdings. DER and MO had a negative and significant effect on cash holdings. On the other side, DPR and PBV had a positive and significant effect on cash holdings.

Based on Table 4, the model chosen in the defensive industry is a fixed-effect model (FEM). Based on this model, the independent variables contribute 75.56 percent to explain the dependent variable. MO had a positive and significant effect on cash holdings, while DER, Firm Size, DPR, PBV, CCC, and inflation did not affect cash holdings.

Based on Table 4, the model chosen in the growth industry is the random effect model (REM). According to this model, the independent variables contribute 9.84 percent to explain the dependent variable. Inflation had a positive and significant effect on cash holdings, while DER, MO, Firm Size, DPR, PBV, and CCC did not affect cash holdings.

Based on Table 4, the model chosen in the cyclical industry is a fixed-effect model (FEM). Based on this model, the independent variables contribute 46.68 percent to explain the dependent variable. The independent variable that effects cash holdings is DER, Firm Size, DPR, and MO, while PBV, CCC, and inflation did not affect cash holdings. DER, Firm Size and MO had a negative and significant effect on cash holdings. On the other side, DPR had a positive and significant effect on cash holdings.

5. Discussion

Based on Table 4, it can be seen that leverage (DER) has a significant negative effect on cash holdings in the sensitive industry and cyclical industry. This means that the higher the level of debt held by the company, the lower the cash holdings. The results of this study are in accordance with the results of research conducted by Zuhlilmi (2015) that leverage has a negative effect on cash holding. This means that high leverage shows the company's strength in gaining access to sources of financing. Companies that have strong debt support in funding their assets do not need to hold a relatively large amount of cash because debt can be a substitute for corporate cash to finance various company activities. According to Kariuki & Namusonge (2015),

Table 4. Results of panel data regression based on industry groups

Independent Variables	Dependent Variable = Cash Holdings (CH)							
	Sensitive Industry		Defensive Industry		Growth Industry		Cyclical Industry	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
<i>Constanta</i>	4.969	0.227	24.037	0.184	20.275	0.355	95.691	0.000
<i>DER</i>	-1.271	0.022*	-0.081	0.844	-0.567	0.184	-1.476	0.000*
<i>Firm Size</i>	0.206	0.399	-0.416	0.720	-0.647	0.642	-5.389	0.000*
<i>DPR</i>	0.059	0.043*	0.025	0.301	0.025	0.139	0.037	0.047*
<i>MO</i>	-0.204	0.021*	0.382	0.001*	-0.089	0.784	-1.168	0.000*
<i>PBV</i>	1.847	0.000*	-0.081	0.492	-0.032	0.644	-0.188	0.281
<i>CCC</i>	0.000	0.821	-0.022	0.079	-0.000	0.969	-0.002	0.677
<i>Inflation</i>	-0.105	0.525	-0.336	0.291	0.665	0.016*	-0.245	0.327
<i>Sign.F</i>		0.00		0.00		0.000		0.000
<i>R-Square</i>		0.789		0.786		0.11714		0.527071
<i>Adj. R-Square</i>		0.750		0.755		0.09835		0.466814

Note: *significant with $\alpha=0.05$

companies with higher debt levels are relatively less able to save cash, because there is tight monitoring from the financial institutions (banks).

Firm size has a significant negative effect on cash holdings in the cyclical industry. This proves that large companies will store relatively small amounts of cash because they assume that the companies will easily get loans. So, they do not need to hold cash in large amounts. The results of this study are in line with the results of research conducted by Kim, Kim, & Woods (2011) that there is a negative influence between firm size and cash holding. Different finding in the growth industry shows that firm size has a positive effect on cash holdings. This is because large companies tend to invest their funds in different types of investments for the purpose of diversification in the field of company operations. By diversifying, large companies have relatively small probabilities dealing with financial distress. In fact, large companies have better funding access to the capital market than smaller companies, so this has an impact on the increasing amount of cash holdings owned by large companies (Al-Najjar, 2013).

Dividend policy (DPR) has a positive effect on cash holdings in sensitive industry and cyclical industry, meaning that the higher the dividends distributed by a company, the greater the cash holding. The results of this study support the pecking order theory where companies need cash to finance their investments after paying dividends. This is in line with the results of research conducted by Wasiuzzaman (2014) that dividend payments have a positive effect on cash holdings. Companies with high cash flows tend to hold a large portion of cash to finance new investments. In addition, according to Ozkan & Ozkan (2004), companies that will pay dividends can store large amounts of cash to avoid the emergence of cash shortages.

Managerial ownership has a negative influence on cash holdings in sensitive industry and cyclical industry groups, meaning that the higher the

managerial ownership, the lower the cash balance held by the company. The results of this study are in accordance with the results of research conducted by Shleifer & Vishny (1997) and Dittmar, Mahrt-Smith, & Servaes (2003) that managerial ownership has a negative effect on cash holdings, meaning that companies with high managerial ownership tend to have low cash holdings, and vice versa. High managerial ownership will be able to strengthen the position of managers and there is a tendency to act opportunistically as for example using the company's cash assets excessively which in turn can reduce the level of cash balance (cash holding). Such a condition can disrupt the course of the company's operational activities and make the company's condition unstable. Conversely, this finding differs from that in the defensive industry, where managerial ownership has a positive effect on cash holdings, meaning that the higher the managerial ownership, the higher the cash balance held by the company. The results of this study are not in accordance with the results of research conducted by Shleifer & Vishny (1997) and Dittmar, Mahrt-Smith, & Servaes (2003). This shows that in the defensive industry, there is a tendency for managers, who at the same time as the shareholders, to act conservatively, thereby increasing cash holdings. This conservative action is taken so that the existing cash is used to support operational activities.

Investment opportunities (PBV) have a positive effect on cash holdings in a sensitive industry, which means that the higher the investment opportunities, the higher the company's cash balance. This shows that when the company has a high investment opportunity, the company will create a relatively large cash reserve to maintain the continuity of its work, especially in the property industry sector which requires relatively large funds compared to other industries. With cash reserves, the company's cash holdings will be high. The results of this study are consistent with the results of re-

search conducted by Kusnadi (2003) that there is a positive influence between investment opportunities and cash holdings. In addition, the results of this study also support the Trade-off Theory, where a company that has high investment opportunities will hold large amounts of cash to protect against transaction costs associated with external capital and opportunity costs on inadequate resources (Jinkar, 2013). However, this finding is different from that in the defensive industry, growth industry and cyclical industry, where investment opportunities (PBV) have a negative effect on cash holdings.

The operating cycle (CCC) has a negative effect on cash holdings in the defensive industry, growth industry, and cyclical industry, meaning that the longer the company's operating cycle, the lower the cash balance held by the company. The results of this study are in accordance with the results of research conducted by Yeboah & Agyei (2012) and Anjum & Malik (2013) that cash conversion cycle has a significant negative effect on cash holdings. An increase in the cash conversion cycle leads to a decrease in the cash balance so that the longer the company's cash conversion cycle, the lower the cash balance owned by the company. Conversely, the shorter the company's cash conversion cycle, the higher the cash balance owned. The results of this study also support the results of research conducted by Wang, Chen, & Song (2013) that as the operating cycle increases, the need for cash holding will decrease.

Furthermore, the variable of inflation has a positive effect on cash holdings in growth industry. this finding is different from the finding of the research conducted by Sutrisno & Gumanti (2016) that when Indonesia was hit by a global financial crisis, there was a tendency for companies to hold their cash more than normal conditions (not crisis). Many companies hold a large amount of cash for precautionary motives in anticipating an unexpected need during a crisis period.

6. Conclusion, Limitations, and Suggestions

Conclusion

This study investigates cash holdings in different industries (sensitive industry, defensive industry, growth industry and cyclical industry) of the manufacturing firms in Indonesia Stock Exchange for the period from 2008-2018. The results indicate that inflation, leverage, firm size, managerial ownership, dividend payout and growth opportunities have significant impact on cash holdings, while operating cycle has no impact on cash holdings. Furthermore, this study show that each type of industry has different characteristics in maintaining its cash balance. For defensive industry and growth industry hold more cash than other industry, because they have strong growth opportunities. The research implication is to explain the selection of predictive models of cash holdings determinants and contributes to the empirical literature of cash management model, particularly in Indonesia.

Limitations and suggestions

This study has limitations that can be taken into consideration for future: (1) the determination of companies that fall into the category of growth industry, defensive industry, sensitive industry or cyclical industry is only based on the grouping, so that the number of selected samples is relatively small and does not represent the real characteristics of the industry, (2) there are still a number of companies that have not yet completed the financial report in the observation year (2008-2018), therefore the number of samples is limited, and (3) the period in this study uses a relatively long period of time from 2008 to 2018, so it is possible that there are corporate policies or corporate actions as well as monetary events that can bias results.

The researcher gives suggestions for the next researchers to: (1) consider another method of cat-

egorizing industries that are classified as growth, defensive, sensitive and cyclical industry groups in order to obtain better results, (2) add various moderating variables (i.e. information asymmetries, country characteristics, different regions, cultural effect) that can influence the optimal cash holdings, (3) consider the length of the period observation to avoid uncertainty condition.

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