Working Capital Requirements in Indonesia: Determining Factors, Adjustment Speed, and Financial Constraints

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Abstract. *Working capital behavior has attracted the attention of researchers in relation to company development and the financial environment. This study aims to investigate the determinants and speed of target adjustment of working capital requirements and to examine whether financial constraints lead to differences in target adjustment behavior. The sample consists of 50 public companies in Indonesia for the 2011-2018 period. By applying the GMM system from the dynamic panel model, this study demonstrates that companies have a target level of working capital. Expecially, this study shows that companies that do not experience financial constraints make adjustments to the target, but this does not happen to companies that experience financial constraints. The adjustment behavior of optimal working capital is highly dependent on the company's financial constraints. Moreover, the results show that sales growth, leverage, size, operating cash flow, age, and fixed assets have a significant effect on working capital requirements.*

Keywords: *Working capital requirements; Adjustment speed; Financial constraints*

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INTRODUCTION

Working capital management includes activities carried out by company managers in handling short-term assets and liabilities such as trade receivables, inventories, and trade payables. Why is working capital management important? In the past, it was known that few researchers paid attention to this area of short-term finance (Singh & Kumar, 2014). However, economic problems that began with the 2008 financial crisis have forced managers of many companies to consider the level of investment in working capital as a way to increase profitability (Sagner, 2014). Several surveys conducted by international consulting agencies have also highlighted the importance of working capital to be managed effectively by company managers globally, including in Asia (PwC, 2015, 2017).

A number of empirical studies suggested that working capital decisions have an impact on the company's financial performance (Singh et al., 2017), and there is an optimal level of working capital for profitability (Singhania & Mehta, 2017). However, the optimal level of working capital for performance is influenced by the financial constraints faced by companies (Laghari & Chengang, 2019). The topic of working capital has also emerged in previous research in the context of companies in Indonesia. Setianto and Pratiwi (2019) examined the effect of excess working capital on performance in public companies in Indonesia. Purwoto (2019) described the optimal relationship between working capital management and the profitability of public companies in Indonesia. The results of those two studies on Indonesian companies imply that the greater the working capital deviates from the optimal level, it will lead to a decline in company performance.

A follow-up question that arises here is whether publicly listed companies in Indonesia behave in adjusting to optimal working capital

targets? To the authors' knowledge when starting the study, this research question had not yet been investigated by previous research on Indonesian companies. Using data from Chinese companies, Rehman et al. (2017) showed that the speed with which companies adjust to the target level of working capital is quite slow. As for Indian companies, the results of Chauhan and Banerjee (2018) research illustrated that there is no working capital behavior that follows the target. It seems that there is a peculiarity of the context which may be due to differences in the business and financial environment, therefore a special study is needed regarding the speed of adjustment of working capital in Indonesian companies.

In addition, research on the determinants of working capital management has been carried out by several previous studies in Indonesia. Unfortunately, previous research has not led to similar results and there were even conflicting findings. For example, the effect of leverage on working capital management is found to be significantly negative in Wiguna and Wasistha (2017) but vice versa significantly positive in Nastiti et al. (2019) and insignificant in Fatimatuzzahra and Kusumastuti (2017). Moreover, those three studies on public companies in Indonesia have not investigated the speed of working capital requirements adjustment.

This study aims to examine the determinants of working capital requirements and to investigate the speed of target adjustment in companies listed on the Indonesia Stock Exchange. Specifically, this study answers the following four questions. First, what are the determinants of working capital requirements? The second is whether the companies have a target or optimal working capital? Third, if there is a target level of working capital, how fast will it be adjusted? And fourth is whether financial constraints affect the speed of adjustment?

In recent years, many researchers have increased their attention to investigating topics related to working capital management. This study contributes to initiating an investigation into the speed of target adjustment in working capital level in Indonesian public companies. In particular, it explores a topic that is still very new in the working capital management literature regarding the relationship between target adjustment speed and financial constraints. The findings of Chauhan and Banerjee (2018) imply that even though the optimal working capital might occur, companies in emerging markets may not be able to actively adjust it due to financial constraints. The role of financial constraints in managing working capital in the context of a developing economy also needs further investigation (Laghari & Chengang, 2019). Along with this, financial constraints related to long-term asset investment have recently become the concern of several researchers in public companies in Indonesia (Hidayat et al., 2018; Rinofah, 2016).

LITERATURE REVIEW

Working capital is generally understood as an integration of the net investment in the selected components in current assets and current liabilities, which includes trade receivables, inventories, and accounts payable. Hill et al. (2010) calculated working capital requirements (WCR) as trade receivables plus inventories and then subtract accounts payable, which are then also used by several recent studies as a measure of working capital management (Moussa, 2019; Tsuruta, 2019). The WCR can be seen as commensurate with the measure of cash conversion cycle (CCC) in a number of studies (Chauhan & Banerjee, 2018; Mathuva, 2014) or the net trade cycle (NTC) in several other studies (Baños-Caballero et al., 2013; Laghari & Chengang, 2019). Both CCC and NTC produce a unit measure in days, whereas WCR calculates as a percentage of sales revenue or total assets.

Hill et al. (2010) used the WCR for its comprehensiveness, which can then easily distinguish between a conservative working capital policy and an aggressive working capital policy. In managing working capital, company managers may be faced with the choice of implementing either conservative or aggressive working capital policies (Afrifa &

Padachi, 2016; Altaf & Shah, 2018). A conservative working capital policy can be identified by higher investment in trade receivables and inventories and lower funding from accounts payable. The conservative working capital policy is reflected in the high positive WCR, which indicates the need for additional capital to be financed by the company internally using free cash flow or externally through bank loans and commercial securities. Conversely, an aggressive working capital policy can be recognized by the small investment in trade receivables and inventories relative to the financing of trade payables. The aggressive working capital policy is reflected in the low WCR, which is a negative WCR which indicates that there is short-term capital available that can be used to fund investments in long-term assets.

In his book, Sagner (2014) described a pattern of shifting from traditional to modern views in working capital management. The traditional view considers working capital as a positive component in a company's balance sheet that is useful for the running of the business. In this case, high working capital is needed by companies to drive sales, which in turn can increase profitability (Zakari & Saidu, 2016). On the other hand, one view now considers it a sucker for the company's financial performance. Current assets that do not contribute to financial performance will hamper the running of the company's business, which in this case will hide obsolete inventory that is difficult to sell and bad debts. By minimizing the amount of funds attached to working capital, managers are encouraged to reduce funding costs or to increase available funds for company expansion (Gitman & Zutter, 2012).

Managers must constantly monitor changes in the business environment to ensure that the company maintains an appropriate level of investment in working capital (Atrill, 2020). For this reason, company managers may seek a target or optimal working capital requirement, which balances the benefits and costs of investing in working capital so as to maximize value (Baños-Caballero et al., 2012, 2013). Setianto and Pratiwi (2019) and Purwoto (2019) confirm the importance of optimal working capital levels for performance or profitability in public companies in Indonesia. Based on the trade off view of working capital management, the following research hypothesis is proposed:

H1: Publicly listed companies in Indonesia behave in adjusting the target working capital requirements.

However, according to Chauhan and Banerjee (2018), although the existence of an optimal level of working capital occurs, many companies in developing markets are unable to keep up with it because of the financial constraints faced by these companies. It becomes interesting to trace further to Indonesian companies that are in one of the emerging markets. The ability to adjust working capital through changes in accounts receivable, inventories, and accounts payable may not be the same between companies due to differences in the business environment in obtaining external sources of funds. As described by Baños-Caballero et al. (2013), companies that have better access to external funding will be able to more easily modify their working capital towards optimal or target. In other words, the current adjustment of the WCR to its target depends on the ability of the company and the cost of funds to obtain external funding. This discussion leads to the possibility that financial constraints affect the speed of working capital adjustments. Therefore, the following hypothesis is raised:

H2: The speed of adjusting the target for working capital requirements is higher for companies that are not financially constrained than those with financial constraints.

This section also discusses the determinants of working capital requirements (WCR). First is sales growth. One understanding here is that an increase in trading activity normally will require a greater investment in working capital (Preve & Sarria-Allende, 2010). If so, the positive effect of

sales growth on WCR can be predicted and has been confirmed by several previous studies (Marobhe, 2015; Wasiuzzaman & Arumugam, 2013). On the contrary, several studies have found that sales growth decreases investment in working capital (Baños-Caballero et al., 2010; Moussa, 2019). According to Hill et al. (2010), companies that experience growth will be encouraged to tighten credit policies because they have achieved success in increasing sales, and trade payables have also increased because they are a resource that spontaneously emerges from sales growth. As such, the direction of the expected relationship between sales growth and WCR remains mixed.

H3: Sales growth has a significant effect on working capital requirements.

Second is profitability. A profitable company will have bargaining power with its consumers and suppliers so that it can reduce credit to consumers and increase credit from suppliers (Baños-Caballero et al., 2013), so the relationship between profitability and WCR may be negative. However, a number of empirical studies have found a positive effect of company performance on working capital management (Fatimatuzzahra & Kusumastuti, 2016; Moussa, 2019; Wiguna & Wasistha, 2018). This is because companies that are very fortunate have sufficient money to invest, so these companies may become less concerned with efficient working capital management (Nazir & Afza, 2009).

H4: Profitability has a significant positive effect on working capital requirements.

The third is the company's operating cash flow. Operating cash flow is cash flow obtained from the company's normal operations in producing and selling products (Gitman & Zutter, 2012). Of course, operating cash flow will be positive when cash sales revenue exceeds cash costs. The company's ability to generate internal funding will determine the amount of funds invested in working capital (Mathuva, 2014). Because the high operating cash flow implies the company's ability to fund internally, a positive effect can be expected from operating cash flow on working capital investment and has been confirmed by several previous findings (Hill et al., 2010; Wasiuzzaman & Arumugam, 2013). However, the relationship between operating cash flow and working capital management can be expected to be negative and has been found in a number of previous researchs (Abbadi & Abbadi, 2013; Moussa, 2019). This negative relationship shows that a high operating cash flow rate is the result of efficient working capital management through shortened collection of accounts receivable and extended maturity of liabilities, therefore increasing operating cash flow and reducing demand for the level of working capital (Moussa, 2019).

H5: Operating cash flow has a significant effect on working capital requirements.

The fourth is leverage. According to (Moussa, 2019), companies that have a high debt structure will face greater difficulties when they lack funds for daily business activities, therefore efficient working capital management will help companies avoid the need for external capital funding. When leverage increases, companies become increasingly concerned with working capital investment in order to avoid excessive investment and at the same time minimize funds absorbed in working capital (Kwenda & Holden, 2014). Therefore, a negative relationship can be expected between leverage and WCR. A number of studies have demonstrated this negative association (Abbadi & Abbadi, 2013; Wasiuzzaman & Arumugam, 2013).

H6: Leverage has a significant negative effect on working capital requirements.

The fifth is the age at which the company was founded. On the one hand, older companies are seen as easier to obtain external funding and on better terms so that the cost of funding is lower to be used in the company's

working capital investment (Baños-Caballero et al., 2010). Therefore, it can be expected that there will be a positive relationship between age and working capital management, as has been found by Moussa (2019). On the other hand, when companies grow older, the relationship between companies and their customers and suppliers and the company's experience in handling supplies improves, which therefore enables companies to reduce investment in working capital (Wasiuzzaman & Arumugam, 2013). In this case, the relationship between age and WCR can be expected to be negative.

H7: Age has a significant effect on working capital requirements.

The sixth is the size of the company. Compared to smaller companies, large companies have less probability of failure and tend to be more diversified and have better access to external capital so that they are better able to manage their working capital more efficiently (Wasiuzzaman & Arumugam, 2013). Therefore, the effect of size on WCR can be expected to be negative as has been found in a number of previous studies (Abbadi & Abbadi, 2013; Moussa, 2019). However, the cost of funding invested in current assets is higher in smaller firms so that smaller firms can have less trade receivables and inventory (Baños-Caballero et al., 2010). If so, size could be positively related to WCR, as has been found in several previous studies (Hill et al., 2010; Marobhe, 2015).

H8: Size has a significant effect on working capital requirements.

Finally, the seventh is investment in fixed assets. Baños-Caballero et al. (2010) argued that companies that have large fixed assets may be able to reduce costs when seeking funds to invest in current assets. This argument can be understood because the intangibility of assets will give rise to a bigger information asymmetry problem than tangible assets. This will lead to predictions of a positive relationship between fixed assets and WCR, as also hypothesized in Mathuva (2014). However, the empirical study of Baños-Caballero et al. (2010) and Mathuva (2014) instead found a negative effect of fixed assets on working capital levels. The explanation in this case is that investment in fixed assets must compete over the use of limited funds with investment in working capital (Fazzari & Petersen, 1993) so that it leads to a negative relationship between fixed assets and WCR (Baños-Caballero et al., 2010; Kwenda & Holden, 2014).

H9: Fixed assets have a significant negative effect on working capital requirements.

RESEARCH METHODOLOGY

The main data source of this research came mainly from the annual financial reports in the annual reports submitted by companies listed on the Indonesia Stock Exchange. The time period for the study was between 2011 and 2018, which was between two crisis time points, namely the 2009 global crisis and the 2020 Covid-19 pandemic crisis. To reduce differences in business characteristics, this study took a sample of companies by applying a proportional random sampling method for each of the 8 non-financial sectors that followed the classification of the Indonesia Stock Exchange. This research is about working capital which is more relevant for companies that are not banks or those engaged in other financial fields. The sample size of the companies is set at 50 companies over a period of 8 years. Thus, this study uses a maximum of 50 companies x 8 years = 400 observations. Table 1 shows the distribution of firms in the sample across the eight sectors.

This study measures the working capital requirements (WCR) as the dependent variable by following a number of previous studies (Hill et al., 2010; Tsuruta, 2019), namely:

WCR_{it} is the working capital requirement of the company i at time t, which is calculated by the amount of trade receivables and inventories then deducted by trade payables and then scaled to sales revenue.

The independent variables are sales growth (GROW), profitability (PRO), operating cash flow (OCF), leverage (LEV), age (AGE), size (SIZE), and fixed assets (FA). The seven independent variables are measured as follows:

$GROW_{it}$ is the sales growth of firm i at time t, calculated as the annual percentage change in net sales.

PRO_{it} is the profitability of company i at time t, which is proxied by return on assets (ROA), which is net income divided by total assets

OCF_{it} is the operating cash flow from company i at time t, which is taken directly from the cash flow statement, then scaled against net sales

LEV_{it} is the leverage of firm i at time t, which is calculated by the ratio of total liabilities divided by total assets

AGE_{it} is the number of years the company i was founded at time t.

$SIZE_{it}$ is the size of firm i at time t, which is proxied by the natural logarithm of total assets.

FA_{it} is the fixed assets of company i at time t, which is calculated from the ratio of fixed assets to total assets

Table 1. Distribution of Firms across Industries

Jakarta Stock Industrial Classification (JASICA)	No. of firms	%	No. of obs.	%
1. Agriculture	2	4.00%	16	4.07%
2. Mining	5	10.00%	35	8.91%
3. Basic Industry and Chemicals	8	16.00%	64	16.28%
4. Miscellaneous Industry	5	10.00%	40	10.18%
5. Consumer Goods Industry	5	10.00%	40	10.18%
6. Property, Real Estate and Building Construction	6	12.00%	48	12.21%
7. Infrastructures, Utilities and Transportation	5	10.00%	40	10.18%
9. Trade, Services and Investment	14	28.00%	110	27.99%
Total	50	100.00%	393	100.00%

Notes: The sample does not consist of firms in the sector of 8. Finance.

In addition, this study classified companies as financially constrained and not financially constrained. Unfortunately, identifying companies that are financially constrained or not is a challenge that is not easily resolved because it cannot be directly observed (Kirui & Wawire, 2018).

This study uses a measure of financial constraints by following the research of Hidayat et al. (2018), who have applied it based on the existing literature on public companies in Indonesia. With this reference, this study used the DIV-CF-LEV criteria through three checking stages, namely: dividend policy (DIV), cash flow (CF), and leverage (LEV). The first criterion for a company that is not constrained is to distribute cash dividends, while the constrained company does not distribute cash dividends. Rinofah (2016) has used this single criterion in a sample of publicly traded manufacturing companies in Indonesia. The second stage is carried out by dividing the companies into two groups based on the median ratio of cash flows to total assets. The final third stage is to divide the companies into two groups based on the median ratio of debt to total assets. Companies that have cash flow and debt levels above the median will be candidates for a group of companies with financial constraints. Finally, a company in a certain year was included in the group of companies with financial constraints if it fulfills all three conditions. If the company did not meet one or more of the three requirements, the company was included in the group of companies that are not financially constrained.

The starting step in examining whether Indonesian companies are maintaining their target in working capital requirements is to test whether the WCR has a mean reverting pattern. This kind of visual evidence has been suggested by Opler et al. (1999) in a study of the cash holdings and also conducted by Mathuva (2014) in the cash conversion cycle. This research applies it to the WCR if the companies have a target level, then the WCR should revert to the mean. Using the changes in WCR calculated for each firm over the study time period, the following autoregressive models were estimated using OLS regression:

$$\Delta WCR_{it} = \beta_0 + \beta_1 \Delta WCR_{i,t-1} + \varepsilon_{it} \quad (1)$$

Furthermore, the focus is aimed at estimating standard partial adjustment models for target or optimal WCR adjustment speed as in previous studies (Baños-Caballero et al., 2013; Rehman et al., 2017). Based on the determinants of WCR discussed in the previous section, an initial model was developed as follows:

$$WCR_{it}^{*} = \beta_0 + \beta_1 GROW_{it} + \beta_2 PRO_{it} + \beta_3 OCF_{it} + \beta_4 LEV_{it} + \beta_5 AGE_{it} + \beta_6 SIZE_{it} + \beta_7 FA_{it} + \varepsilon_{it} \quad (2)$$

The asterisk * represents the optimal or target value indicated by the line estimated by the equation. Since adjusting the WCR to the target level takes time to adjust, the relationship in the following equation applies between the current WCM and the previous time:

$$WCR_{it} - WCR_{it-1} = \gamma(WCR_{it}^{*} - WCR_{it-1}) + \delta_{it} \quad (3)$$

In equation (3), γ represents the adjustment coefficient with a range of values ranging between 0 and 1. If γ = 1, then this means companies are continuously at the optimal level or target of the WCR. Meanwhile, if γ = 0, then companies will continue to use the current WCR position. By entering equation (2) into equation (3), the next equation is obtained:

$$WCR_{it} = \beta_0\gamma + (1-\gamma)WCR_{it-1} + \gamma\beta_1 GROW_{it} + \gamma\beta_2 PRO_{it} + \gamma\beta_3 OCF_{it} + \gamma\beta_4 LEV_{it} + \gamma\beta_5 AGE_{it} + \gamma\beta_6 SIZE_{it} + \gamma\beta_7 FA_{it} + \eta_{it} + \lambda_{it} + \upsilon_{it} \quad (4)$$

Finally, equation (4) can be simplified by making ρ = (1 – γ) to get the following equation:

$$WCR_{it} = \alpha + \rho WCR_{it-1} + \delta_1 GROW_{it} + \delta_2 PRO_{it} + \delta_3 OCF_{it} + \delta_4 LEV_{it} + \delta_5 AGE_{it} + \delta_6 SIZE_{it} + \delta_7 FA_{it} + \eta_{it} + \lambda_{it} + \upsilon_{it} \quad (5)$$

Equation (5) models that the current behavior of working capital depends on past behavior, which is why it is good to estimate a dynamic model at the individual level. For this reason, this study uses the generalized method of moments (GMM) by applying the Arellano-Bond dynamic panel-data model (Verbeek, 2017). The model requires zero second-order autocorrelation in first-differenced errors as well as maintaining the validity of the model. This study analyzed the data using the computer statistical program STATA 13.0.

RESULT AND DISCUSSION

Descriptive Statistics and Correlations

Table 2 shows the descriptive statistics calculated for all companies in the sample. The WCR has a mean value of 0.0681 with a standard deviation of 1.9549. On average, companies invest in working capital as much as 6.81 percent of their sales. The WCR statistic for the 10th percentile is -0.0290, the 50th percentile or the median is 0.1320 and the 90th percentile is 0.4584, which shows that WCR values spread quite widely. As a measure of sales growth, GROW has an average value of 0.3175 with a standard deviation of 3.2975. Profitability (PRO) was 4.66 percent, which is close to the median of 3.81 percent. The OCF variable ranges from negative to positive with an average of 0.0280, which means that approximately 2.8 percent of operating cash flows have been generated on net sales. The average leverage (LEV) is 0.5379, which means that companies have an average total liabilities of 53.79 percent of their total assets. Close to the median of 34, the mean age (AGE) is 35.06 years at a standard deviation of 15.1774. As a measure of the size of the company which is calculated using the natural logarithm of total assets, the average SIZE is 27.1334. Calculated as the ratio of fixed assets

to total assets, the variable FA has a mean of 30.12 percent, which ranges from 2.35 percent at the 10th percentile to 63.94 percent at the 90th percentile.

Table 2. Summary Statistics for Overall Firms

Variables	Mean	Std. Dev.	P10	P25	Median	P75	P90
WCR	0.0681	1.9549	-0.0290	0.0499	0.1320	0.2555	0.4584
GROW	0.3175	3.2975	-0.1746	-0.0185	0.0815	0.1876	0.4547
PRO	0.0466	0.1795	-0.0660	0.0019	0.0381	0.0835	0.1540
OCF	0.0280	0.8620	-0.1059	0.0024	0.0617	0.1727	0.3300
LEV	0.5379	0.2915	0.2472	0.3529	0.5095	0.6780	0.8010
AGE	35.0600	15.1774	18.0000	24.0000	34.0000	42.0000	52.5000
SIZE	27.1334	2.3023	24.5239	26.1056	27.3717	28.5920	29.6447
FA	0.3012	0.2229	0.0235	0.0918	0.2781	0.4436	0.6394

As shown in Table 3, WCR has a significant correlation with PRO, OCF, and SIZE at the level of 5 percent or less. The last column contains variance inflation factor (VIF), which is calculated to check the possibility of multicollinearity problems between independent variables. VIF quantifies how much the variance of the estimated regression coefficient increases when the independent variables are correlated. It is usually suggested that when VIF is greater than 5, then multicollinearity is a problem for the regression estimation. The table shows the VIF values ranging from 1.04 to 1.61, which implies that there was no multicollinearity that occurred between all predictors.

Table 3. Correlation Matrix

	WCR	GROW	PRO	OCF	LEV	AGE	SIZE	FA	VIF
WCR	1								
GROW	0.0046	1							1.04
PRO	0.1099*	-0.0556	1						1.20
OCF	0.2312*	-0.0144	0.0999*	1					1.07
LEV	-0.0649	-0.0785	-0.3101*	-0.0409	1				1.16
AGE	0.0319	-0.0602	0.2390*	0.0543	-0.063	1			1.08
SIZE	0.2062*	-0.1455*	0.1140*	0.2560*	0.0609	0.087	1		1.61
FA	0.0071	-0.0649	-0.0523	0.1422*	0.2279*	-0.0199	0.5772*	1	1.58

Notes: * $p < 0.05$

Adjustment Speed of WCR

This section reports the results of testing whether companies have a target for working capital requirements. By calculating the change in WCR for firms in the sample over the period 2011-2018, Figure 1 shows the distribution of the autoregressive coefficient (β_1) of the first order autoregressive model in equation (1). The median of the coefficients is -0.1683 and the mean is -0.1494. The one-sample *t* test for the mean difference is zero resulting in a *t*-stat of -3.813 and a *p*-value of 0.0004, thus significantly rejecting the hypothesis that the mean value of autoregressive coefficients is zero. The negative result of the autoregressive coefficient implies that the level of working capital has a mean reversal. This leads to the possibility of company managers making efforts not to allow levels of working capital to decrease too low or increase too high.

The investigation is then carried out by estimating the regression models for equation (5). Table 4 shows the results of the GMM system estimation for the Arellano-Bond dynamic panel data model using one-step and

two-step approaches. In this case, the model requires a zero-order autocorrelation of zero in first-differenced errors (Verbeek, 2017). The insignificant results of the Abond test on both one-step and two-step approaches lead to decisions that do not reject the null hypothesis that there is no autocorrelation so that it does not violate this assumption. In addition, the Sargan test yields a value of 44.8295 which is not significant in the two-step approach. The Sargan test on this two-step approach leads the decision not to reject H0: overidentifying restrictions are valid, thereby ensuring the robustness of the model. Although the results from the one-step model are not much different, the results from the Sargan test show significant results so that the model is better to estimate at two-step GMM than one-step GMM.

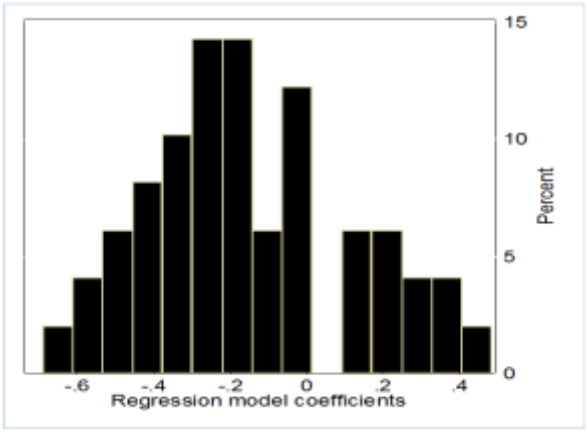

Figure 1: Distribution of Coefficients on Lagged Change in the WCR

Table 4. Determinants of WCR

	Two-step GMM				One-step GMM			
Variables	**Coef.**	**Robust SE**	**z**		**Coef.**	**Robust SE**	**z**	
WCR (L1)	0.1158	0.0298	3.88	***	0.1157	0.0300	3.86	***
GROW	0.0559	0.0073	7.67	***	0.0559	0.0073	7.62	***
PRO	1.1050	1.2150	0.91		1.1044	1.2158	0.91	
OCF	-0.2404	0.0907	-2.65	***	-0.2402	0.0911	-2.64	***
LEV	0.4170	0.2502	1.67	*	0.4193	0.2517	1.67	*
AGE	-0.1029	0.0609	-1.69	*	-0.1032	0.0615	-1.68	*
SIZE	0.5694	0.2861	1.99	**	0.5697	0.2868	1.99	**
FA	-4.9418	1.8087	-2.73	***	-4.9422	1.8090	-2.73	***
Const	-10.5877	5.4826	-1.93	*	-10.6105	5.7005	-1.86	*
Number of obs	382				382			
Number of groups	50				50			
Number of instruments	44				44			
Wald chi2 (*p*-value)	2249.77 (0.0000)				2250.75 (0.0000)			
Abond test, m2 (*p*-value)	-1.0289 (0.3035)				-1.0600 (0.2891)			
Sargan test (*p*-value)	44.8295 (0.1234)				351.1776 (0.0000)			

Notes: Arellano-Bond dynamic panel-data estimation. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The target behavior in working capital needs is expressed through lagged WCR coefficients in Table 4. It can be seen in the two-step GMM column, the WCR (L1) coefficient is 0.1158 and the *z* statistic is 3.88. The lagged WCR coefficient value is positive and statistically significant at the 1% level. These findings suggest that firms follow the target level of working capital requirements, which is consistent with hypothesis H1. Furthermore, this lagged WCR coefficient implies a reversal rate of about 88 percent (obtained from 1-0.12) per year. Note here that the one-step GMM estimation also yields a similar finding.

Determinants of the WCR

Furthermore, the GMM estimation results in Table 4 indicate a significant positive effect at the 1 percent rate of sales growth

(GROW) on WCR, which therefore supports hypothesis H3. However, profitability (PRO) shows no relationship with WCR so it rejects hypothesis H4. In addition, operating cash flow (OCF) shows a negative association with WCR at the 1 percent significance level in both models, which is consistent with hypothesis H5. Meanwhile, leverage (LEV) shows a positive relationship with WCR at a significance level of 10 percent, but in this case it does not support hypothesis H6. There is a negative relationship between firm age (AGE) and WCR at the 10 percent significance level, which supports hypothesis H7. The results also reveal a significant positive relationship between firm size (SIZE) and WCR so that the hypothesis H8 is supported. Finally, a negative and significant relationship is found in the relationship between fixed assets (FA) and WCR, which therefore supports H9. Thus there are six variables from the seven predictor variables found to have a significant effect on working capital requirements.

Financial Constraints and Speed of Adjustment

Table 5 presents the mean values for company characteristics based on financial constraints by applying the DIV-CF-LEV criteria. The table also shows the *t*-stat for the mean difference test between groups of firms with financial constraints and those that are not financially constrained. Compared to companies that are financially constrained, the group of companies that are not financially constrained has a significantly higher average positive cash flow (CF) and significantly less leverage (LEV). Note here that companies with financial constraints also do not distribute dividends (DIV), so this is all in accordance with the DIV-CF-LEV criteria. In addition, the table shows that companies that are not financially constrained have a mean value of positive profitability and operating cash flow which is significantly higher and their age is significantly longer than those of companies with financial constraints.

Tabel 5. Summary Statistics for Unconstrained Firms and Constrained Firms

	Unconstrained Firms		**Constrained Firms**			
Variables	**Obs.**	**Mean**	**Obs.**	**Mean**	***t*-stat diff.**	
CF	329	0.0112	70	-0.0223	3.59	***
LEV	329	0.4856	70	0.7835	-8.42	***
GROW	322	0.3407	70	0.1827	0.36	
PRO	329	0.0662	70	-0.0459	4.87	***
OCF	324	0.0613	69	-0.1322	1.70	*
AGE	329	36.2614	70	29.3714	3.49	***
SIZE	329	27.2172	70	26.7757	1.46	
FA	329	0.2949	70	0.3338	-1.33	

Notes: Two-sample *t* test. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Further attention is paid to testing the speed of adjustment based on financial constraints. Table 6 presents the results of the GMM estimation on the two-step approach of the WCR for both groups of companies with and without financial constraints. For the group of companies that were not financially constrained, the two-step GMM estimate reported a lagged WCR coefficient of 0.3984, which is significant at the 1 percent level. Whereas for the financially constrained group of companies, the two-step GMM estimate reports the lagged WCR coefficient is -0.9411, which because it is negative is inconsistent with reversal behavior. Therefore, the adjustment process towards the target for WCR occurs in companies that are not constrained but it does not occur in companies with financial constraints. These results support the H2 hypothesis. Meanwhile, the one-step GMM estimation also provides similar findings (results not shown in the table). Note here that

estimation using the two-step GMM is preferable to choose because the results of the one-step GMM appear less valid, as indicated by the significant Sargan test results on the one-step GMM but not the two-step approach.

Table 6. GMM Estimation of WCR across Groups of Unconstrained and Constrained Firms

	Unconstrained Firms			Constrained Firms		
Variables	**Coef.**	**z**		**Coef.**	**z**	
WCR (L1)	0.3984	3.60	***	-0.9411	-6.02	***
GROW	0.1669	3.79	***	-0.5116	-0.57	
PRO	1.9110	1.19		0.6364	0.46	
OCF	-1.1759	-6.28	***	1.0604	5.94	***
LEV	2.0786	1.04		0.6393	0.28	
AGE	-0.0737	-2.48	**	-0.0001	0.00	
SIZE	0.8926	1.64		-0.9708	-0.68	
FA	-6.0944	-1.64		2.8702	0.20	
Const	-20.9764	-1.48		24.9520	1.31	
Number of obs	314			68		
Number of groups	50			23		
Number of instruments	44			42		
Wald chi2 (*p*-value)	1868.64 (0.0000)			2072.76 (0.0000)		
Abond test, m2 (*p*-value)	-1.039 (0.2988)			-0.55291 (0.5803)		
Sargan test (*p*-value)	43.91726 (0.1434)			12.27722 (0.9996)		

Notes: Arellano-Bond dynamic panel-data estimation, two-step GMM. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Discussion

The results of this study indicate that the mean value of the WCR is 0.0681, which means that on average the companies in the sample invest in working capital as much as 6.81 percent of their sales. This positive WCR characterizes a conservative working capital management policy, which generally indicates a need for additional funds that companies can fund internally using free cash flow, or externally by seeking lines of credit or issuing commercial securities (Hill et al., 2010). In addition, this study actually calculated the WCR that was scaled against total assets, accounting for an average of 15.86 percent.

Regression estimation using the GMM system shows that sales growth has a significant positive effect on WCR. An increase in trading activity normally will require a larger investment of companies in working capital (Preve & Sarria-Allende, 2010). When a company experiences sales growth, an increase in credit to consumers can be a stimulant and an increase in inventory is needed to anticipate increasing investment in working capital (Wasiuzzaman & Arumugam, 2013). These results confirm the findings of previous research in Tsuruta (2019) and Wasiuzzaman & Arumugam (2013).

However, profitability does not show a significant association with WCR. The results of this study do not agree with the findings of a negative relationship in the studies of Mathuva (2014) and Baños-Caballero et al. (2013). Conversely, the findings of this study also do not support the results of a number of previous studies which showed a positive relationship (Moussa, 2019; Tsuruta, 2019). On the other hand, research by Chauhan & Banerjee (2018) showed the insignificant finding of this relationship as in this study. Using gross profit margin as a proxy for profitability, Hill et al. (2010) also found no significant effect on working capital requirements. This indicates that the profitable company is in a position that is not in tune in determining the level of working capital.

Perhaps in order to maintain the sustainability of their profitability, companies differ in their working capital policies when following the goal of stimulating sales or efficiency in investment.

Operating cash flow was found to have a significant negative effect on WCR in this study. These findings are consistent with the results from the studies of Moussa (2019) and Tsuruta (2019). As has been argued by Moussa (2019), this negative relationship suggests that the high level of operating cash flow is the result of efficient working capital management through shortening the collection of accounts receivable and extending the maturity of trade payables, thereby increasing operating cash flow and reducing demand for working capital levels.

The results of this study indicate that leverage has a positive and significant effect on WCR. The results of this study are inconsistent with a number of previous research findings in Moussa (2019) and Abbadi and Abbadi (2012). However, a positive relationship between leverage and working capital management has been demonstrated by Nastiti et al. (2019) and Gill (2011). One explanation put forward here is that by obtaining debt funding, companies are increasingly able to pay attention to working capital investment. In this regard, Indonesian companies are also seen taking actions to seek debt financing for their working capital needs. For example, PT Waskita Beton Precast Tbk issued bonds amounting to IDR 1.5 trillion at the end of 2019 to be used as investment in the company's working capital (CNBC Indonesia, 2019).

This study shows that company age and WCR are negatively and significantly related, as was found by Moussa (2019) and Wasiuzzaman and Arumugam (2013). Because young companies grow at a faster rate than older companies that are experiencing stable growth, young companies will invest more in working capital in order to maintain sales growth.

A positive and significant relationship between firm size and WCR is shown in this study. These results are in accordance with the findings of previous research (Hill et al., 2010; Tsuruta, 2019). In this case, the cost of funding in current assets is higher in small companies so that small companies have smaller accounts receivable and inventories (Baños-Caballero et al., 2010). This reveals that small companies tend to be less able to find alternatives in working capital funding options, for example through the issuance of commercial securities or obtaining credit lines, thereby reducing the level of working capital (Hill et al., 2010; Moussa, 2019).

The results of this study indicate that fixed assets have a negative and significant effect on WCR. This finding is similar to the results of the study by Kwenda and Holden (2014) and Rehman et al. (2017). Because investment in fixed assets experiences competition with working capital investment in fighting for available capital when the company is experiencing financial difficulties (Fazzari & Petersen, 1993), the company's working capital investment decreases due to the increase in company investment in fixed assets (Mathuva, 2014).

The next focus of this research is on target adjustment behavior in working capital management. This study shows consistent results that companies make adjustments to the target level of working capital requirements. The calculated WCR adjustment speed is about 88 percent (1-0.12) per year. Since the coefficient of adjustment parameters normally ranges between 0 and 1, the 88 percent adjustment rate can be interpreted as either fairly fast or high. Or in other words, this working capital adjustment took about 1.14 years (obtained from 1/0.88) to arrive at the target.

Referring to the descriptions in Baños-Caballero et al. (2013), Mathuva (2014), and Chauhan and Banerjee (2018), if the level of working capital is too large, the costs that arise due to matters related to maintaining high working capital will force companies to shrink it through a number of strategies, such as accelerating collection of receivables from consumers or prolonging credit payments to suppliers. On the other hand, if the level of working capital is too small, this will bring bad consequences to the company, such as loss of

customers and weakening relationships with suppliers. Meanwhile, research on companies in Indonesia by Setianto and Pratiwi (2019) found that excess working capital results in lower performance. Also, Purwoto (2019) showed that additional working capital will increase profitability when the level of working capital is low, but profitability decreases with the addition of working capital when the level of working capital is high. Thus, the results of this study indicate the existence of working capital target adjustment behavior, which therefore can be expected to be optimal for the performance of companies.

Furthermore, companies in the sample are grouped into the financial constraints group. The results of this study indicate that the process of adjusting the target for working capital requirements occurs in companies that are not financially constrained, but do not appear in groups of companies that are financially constrained. The results of this study are in line with Baños-Caballero et al. (2013), namely that companies that have better access to external funding will be better able to modify their working capital policies. The results of this study emphasize that the company's ability to adjust its working capital level towards the target is highly dependent on the financial constraints that Indonesian companies are experiencing. These results also agree with Chauhan and Banerjee (2018), that company managers in developing markets can find it difficult to be able to follow optimal working capital policies because of the financial constraints faced by these companies.

CONCLUSION

The purpose of this study is to analyze the determinants and speed of adjusting the target working capital requirements and to determine whether financial constraints cause differences in target adjustment behavior in public companies in Indonesia. The results show that sales growth, leverage, and size have positive and significant effects on working capital requirements. Meanwhile, operating cash flow, age, and fixed assets have negative and significant effects on working capital requirements.

Especially, this study demonstrates that companies have a target in the level of working capital, and they make adjustments when the level of working capital deviates from the target. The target adjustment speed is estimated to be quite fast. Furthermore, this study shows that groups of companies that are not financially constrained do adjust their target working capital needs, but this does not happen to companies with financial constraints. Thus, the adjustment of optimal working capital requirements is highly dependent on the condition of the company's financial constraints.

This study suggests company managers who are not financially constrained to maintain the achievement of the target level of working capital as a good working capital policy. Meanwhile, for companies that are financially constrained, managers are advised to continue to seek expansion of various options for external funding sources for investment in their working capital. Furthermore, for public policy makers, this study emphasizes the importance of financial markets and financial institutions to operate properly and efficiently for external funding sources for companies in working capital investment.

This study analyzes sample data taken from various types of companies. Further research can examine the speed of adjusting the target working capital requirements by focusing on a particular type of industry. This effort will add to the detailed understanding of the company's working capital behavior.

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