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THE DETERMINANTS OF WORKING CAPITAL MANAGEMENT: THE CONTEXTUAL ROLE OF ENTERPRISE SIZE AND ENTERPRISE AGE

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Abstract. *Purpose* – working capital management plays a vital role in determining the continuity of enterprises' business activities. Enterprises should manage their working capital efficiently to avoid excessive working capital investments and at the same time, to maintain their liquidity. This study aims to examine the determinants of working capital management and to test the different effects of the determinants of working capital management based on enterprise size and enterprise age.

Research methodology – the sample consists of 117 manufacturing enterprises listed at the Indonesian Stock Exchange for the years 2010–2017. Panel data regression was used to test the hypothesis.

Findings – the findings reveal that sales growth and economic growth determine working capital management. However, the effects of the determinants of working capital management differ depending on enterprise size and enterprise age. Specifically, economic growth is the only determinant that exhibits different effects on working capital management between different enterprise size and enterprise age subsamples. Meanwhile, besides economic growth, capital expenditure, and operating cash flow are the other enterprise-specific determinants that exhibit different effects on working capital management between the two enterprise age subsamples.

Research limitations – this study only measures enterprise size with total assets. Thus, we advise future studies to complement this proxy with other measures such as market value and the listing size criterion (main board vs development board). Further, it is necessary to analyse the non-linear relationship between leverage and working capital management to explain the positive effect of leverage on working capital management.

Practical implications – the empirical results suggest that manufacturing enterprises must focus more on their sales growth because it affects their ability to manage their working capital efficiently. Besides, younger manufacturing enterprises need to shorten their cash cycles that are longer relative to old enterprises.

Originality/Value – no previous studies have analysed the determinants of working capital management based on enterprise characteristics, especially enterprise size and age. Specifically, in the scientific literature, enterprise size and enterprise age mainly act as the dependent variables.

Keywords: working capital management, sales growth, economic growth, enterprise size, enterprise age.

JEL Classification: G31, G39, C23.

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Introduction

Working capital management is an essential element of enterprises' day-to-day operational activities (Marobhe, 2015) because it determines the continuity of enterprises' business activities (Adamu & Hussaini, 2015). Working capital management is also a crucial issue because working capital is a part of short-term investments (Bhunia, 2010). Efficient working capital management likely avoids enterprises from excessive working capital investments while at the same time, secures their liquidity. Previous studies empirically show that working capital management affects liquidity (Attom, 2016; Adekola, Samy, & Knight, 2017), enterprises' profitability (Deloof, 2003; Tran, Abbott, & Jin-Yap, 2017; Nastiti, Atahau, & Supramono, 2019; A. T. H. Nguyen & T. V. Nguyen, 2018) and enterprise value (Kieschnick, Laplante, & Moussawi, 2013; Wasiuzzaman, 2015; Ahangar & Shah, 2017). Thus, it is understandable that financial managers pay much attention to efficient working capital management (Deloof, 2003; Abuzayed, 2012; Li, Dong, Chen, & Yang, 2014).

To optimise the efficiency of working capital management, it is vital to analyse the determinants of working capital management itself to help financial managers improve their working capital management. Several previous studies demonstrate enterprise-specific and macroeconomic factors that affect working capital management, albeit inconsistently. These enterprise-specific factors include leverage, enterprise growth, size, and age (Gill, Biger, & Mathur, 2010; Zariyawati, Annuar, Taufiq, & Sazali, 2010; Palombini & Nakamura, 2012; Goel, 2015; Wasiuzzaman, 2015; Haron & Nomran, 2016), and capital expenditure and operating cash flow (Appuhami & Department, 2008; Gill et al., 2010; Abbadi & Abbadi, 2013; Ilyas, 2014). However, other studies suggest that age (Koralun-Bereźnicka, 2014; Azami & Tabar, 2016), leverage and capital expenditure (Mansoori & Muhammad, 2012; Fatimatuzzahra & Kusumastuti, 2017) do not affect working capital management. In a similar vein, previous studies also show inconsistent results for the macroeconomic factors. For example, some studies indicate that GDP and inflation affect working capital management (Zariyawati et al., 2010; Mansoori Muhammad, 2012; Salawu & Alao, 2014) while others (Abbadi & Abbadi, 2013; Goel, 2015; Fatimatuzzahra & Kusumastuti, 2017) do not find such effects.

We then argue that previous studies show inconsistent results mainly because they use enterprise-specific characteristics such as enterprise size and age as the determinants of working capital management rather than as the contextual factors that help explain the different effects of the independent variables on working capital management. In other words, the results of the determinants of working capital likely depend on specific enterprise characteristics. We base our arguments on the findings of previous literature that investigates the relationship between financing sources and working capital management. Several previous studies demonstrate that more significant and older enterprises exhibit better financing ability because they can access financing sources more efficiently and with lower costs (Koh, Duran, Dai, & Chang, 2015; Agustini, 2016). On the contrary, smaller and younger enterprises tend to experience financing constraints (Beck & Demirguq-kunt, 2005; Hadlock & Pierce, 2010; Ponikvar, Zajc Kejzar, & Morec, 2013). Thus, when confronted with leverage, enterprise growth, capital expenditure, operating cash flow, and macroeconomic condition problems, smaller and younger enterprises are more likely to manage their working capital

efficiently by shortening their receivable and inventory turnovers than more substantial and older enterprises that are better able to secure financing sources.

This study aims to (1) examine the determinants of working capital management and (2) to test whether there are different effects of the determinants of working capital management based on enterprise size and age in Indonesian manufacturing enterprises. From 2010 to 2017, the proportion of manufacturing enterprises' working capital management to their total assets was 52.62%, where the percentage of account receivables and inventory were 18.57% and 20.01%, respectively. Indonesian manufacturing enterprises play a strategic role in the national economy as indicated by their significant contributions to GDP (20.16%) and export (75.99%). This study contributes to the working capital management literature in at least two aspects. Firstly, this study focuses on the determinants of working capital management, a research issue that is relatively understudied. As suggested by Singh and Kumar (2014) in their review on previous working capital management studies, scholars mainly focus on the relationship between working capital and profitability. Secondly, ours is the first that investigates the different effects of the determinants of working capital management based on enterprise size and age. Previous studies operationalise enterprise size (Gill et al., 2010; Zariyawati et al., 2010; Wasiuzzaman, 2015) and age (Koralun-Bereźnicka, 2014; Goel, 2015) as the independent variables. From the practical point of view, this study contributes by demonstrating the specific areas related to working capital management that need to be optimised further by enterprises regarding their size and age.

1. Literature review

1.1. Working capital management

Working capital management is related to the efficiency of the management of various working capital components (Onaolapo & Kayjola, 2015). Cash conversion cycle (CCC) is the leading efficiency indicator of working capital management (Deloof, 2003; Quayyum, 2011; Padachi, Howorth, & Narasimhan, 2012). CCC measures an enterprise's inventory turnover period, a receivable collection period, and an outstanding payable period. A shorter CCC indicates that more cash is available to finance an enterprise's operations, and a longer CCC may cause enterprises to have a liquidity problem (Ademola, 2014).

Several theories, such as cash conversion cycle theory, operating cycle theory, and pecking order theory explain the behaviour of working capital management. Developed by Richards and Laughlin in 1980, cash conversion theory explains that a cash cycle starts with cash disbursements to acquire raw materials and then followed by sales of goods, the collection of receivables, and finally cash receipts. A shorter cash cycle indicates more efficient working capital management. Several studies have used cash cycles as the indicator of working capital management (Raheman, Afza, & Qayyum, 2010; Abuzayed, 2012; Vural, 2012).

According to operating cycle theory as introduced by Park and Gladson in 1963, enterprises that loosen their credit policies to their customers will likely increase their receivables and accelerate their inventory turnover but at the same time experience cash deficiency that will lead to liquidity risk. While conversion cycle theory analyses the whole aspects of working capital management (current assets and liabilities), operating cycle theory only focuses

on inventory and receivable in analysing working capital management (Aminu & Zainudin, 2015). Another approach is the pecking order theory that was introduced by Myres and Majluf in 1984. This theory is often used to explain enterprises' financing decisions. According to this theory, enterprises should prioritise internal financing over external financing due to its lower cost. Thus, working capital management is closely related to the use of internal funding to satisfy enterprises' needs in working capital.

As it was mentioned above, this study focuses on the determinants of working capital management that have been analysed by previous studies, namely enterprise-specific factors such as leverage, sales growth, capital expenditure, operating cash flow and macroeconomic factors such as economic growth or inflation. As suggested by pecking order theory, highly leveraged enterprises rely less on internal financing and need less capital to finance their daily operations (Singh & Kumar, 2017). These enterprises then tend to invest in less working capital (Salawu & Alao, 2014; Elbadry, 2018) to reduce costs due to receivables, inventories, and short-term liabilities and to fulfil matured obligations (Palombini & Nakamura, 2012). Thus, these enterprises need to manage their working capital more efficiently. By analysing 2,796 publicly listed Brazilian enterprises for the years 2001–2008, Palombini and Nakamura (2012) demonstrate that highly leveraged enterprises exhibit more efficient working capital management as indicated by shorter cash conversion cycles. Thus, we propose the following hypothesis:

H1: Leverage negatively affects the cash conversion cycle.

Enterprise growth likely increases the needs in working capital investments and the ability to shorten cash cycles. By investigating 186 actively traded enterprises at the Nigerian Stock Exchange from the period of 2000–2009, Salawu and Alao (2014) find that increased sales motivate enterprises to invest more working capital in supporting the increased sales. In their analysis of small and medium Indian enterprises, Singh and Kumar (2017) also show similar results. On the contrary, it is also likely that enterprises with high sales growth produce shorter cash conversion cycles that generate more efficient working capital management. This argument is supported by Naser, Nuseibeh, and Al-Hadeya (2013), who study 67 Abu Dhabian enterprises from 2010 to 2011. Their study demonstrates that sales growth is negatively related to the cash conversion cycle. Based on these arguments, the following is the second testable hypothesis:

H2: Sales growth negatively affects the cash conversion cycle.

Capital expenditure measures investments in fixed assets. When experiencing constrained financial conditions, enterprises have the choices of investing in fixed assets or working capital. If they opt for more capital expenditure, they will reduce their working capital investments (Cuong & Nhung, 2017) that shorten their cash cycles. By using 94 publicly listed Singaporean enterprises for eight years since 2003, Mansoori and Muhammad (2012) investigate the determinants of working capital management and reveal that capital expenditure has a negative influence on the efficiency of enterprises' working capital management. Thus, we propose the following hypothesis:

H3: Capital expenditure negatively affects the cash conversion cycle.

Pecking order theory suggests that enterprises prioritise internal financing sources because of the lower cost of capital relative to alternative external financing sources (Myers &

Majluf, 1984). Cash flow generated from operating activities is an internal financing source on which enterprises can rely. Thus, enterprises with more operating cash flow have more significant opportunities to manage more working capital. Further, enterprises do not have to be too aggressive in managing their working capital because of sufficient cash availability (Abbadi & Abbadi, 2013). Enterprises that generate higher cash flow likely increase their investments in working capital that eventually will lengthen their cash cycles (Palombini & Nakamura, 2012). Accordingly, we propose the following hypothesis:

H4: Operating cash flow positively affects the cash conversion cycle.

GDP is often used to measure the economic condition of a country. When the economic situation of a country declines or fluctuates, enterprises tend to increase their working capital to ensure the continuity of their production processes (Marobhe, 2015). However, enterprises often find it difficult to generate cash or to access financing sources (Salawu & Alao, 2014), and they tend to manage their working capital to shorten their cash cycles. For example, Mansoori and Muhammad (2012) find that GDP is negatively related to working capital management. However, by analysing 119 publicly listed Malaysian enterprises for the period of 2000–2009, Zariyawati et al. (2010) demonstrate that GDP positively affects the cash conversion cycle. Economic growth will boost enterprises' growth and enable enterprises to secure more financing sources for their working capital investments. Based on these arguments, the following is our proposed hypothesis:

H5: GDP positively affects the cash conversion cycle.

Samuelson and Nordhaus (2010) define inflation as a situation in which prices of goods and services and production factors of a country tend to increase during a specified period. During the inflation period, enterprises arguably contain the costs of their receivables and inventory investments by accelerating their cash conversion cycles, although they have elastic demand condition. Zariyawati et al. (2010) show the negative relationship between inflation and cash conversion cycle. In their analysis of 127 Pakistani enterprises that are listed at the Karachi stock exchange for the period of 2011–2012, Tahir and Anuar (2016) also reveal similar results. Accordingly, we propose the following hypothesis:

H6: Inflation negatively affects the cash conversion cycle.

This study also investigates whether the effects of the determinants of working capital management differ for different enterprise size. Dang, Li, and Yang (2018) identify three measures of enterprise size that are commonly used in the corporate finance literature: total assets, total sales, and market value of equity. Enterprise size indicates enterprises' reputation and growth (Waluyo, 2017). Larger enterprises arguably exhibit better reputation and growth. Consequently, they have better financing ability than smaller enterprises.

In this respect, smaller enterprises likely have more significant financing constraints than larger enterprises (Beck & Demirguq-kunt, 2005; Hadlock & Pierce, 2010; Ponikvar et al., 2013). Creditors often consider larger enterprises more creditworthy than smaller enterprises because of sufficient collateral (Maina & Ishmail, 2014; Mule, Mukras, & Nzioka, 2015) that cause larger enterprises to enjoy more convenient access to financing sources and lower costs of capital than smaller enterprises (Kurshev & Strebulaev, 2015). Besides, larger enterprises can incur lower charges of capital than smaller enterprises because they disclose more information that reduces information asymmetry and eventually estimated risks (Embong,

Mohd-Saleh, & Hassan, 2012). On the contrary, smaller enterprises exhibit more severe information asymmetry problems and have fewer analyst following (Elbadry, 2018).

Because of more significant financing constraints relative to larger enterprises, smaller enterprises tend to rely on their internal financing sources that are more limited. Thus, smaller enterprises experiencing high leverage, high sales growth, more significant needs for capital expenditure, lower operating cash flow, and worse macroeconomic conditions tend to manage their working capital more efficiently by shortening their cash cycles than larger enterprises. Based on these arguments, the following are the proposed hypotheses related to enterprise size:

H7a-f: Leverage, enterprise growth, capital expenditure, GDP, and inflation affect the cash conversion cycle differently depending on enterprise size.

Similar to the previous arguments related to enterprise size, we also predict that there are different effects of the determinants of working capital management based on enterprise age that refers to the length of an enterprise operates. Two proxies measure enterprise age, namely, the year difference between an enterprise was founded and the current year and the year difference between the year an enterprise went public and the current year (Kieschnick & Moussawi, 2018). In general, empirical studies that investigate the effect of enterprise age compare old and young enterprises (Coad, Holm, Krafft, & Quatraro, 2017). As suggested by Berger and Udell (1998), older enterprises are better able to secure financing sources than their younger counterparts because they can access external financing sources more quickly and with lower costs. Previous studies also indicate the advantages of older enterprises in securing financing sources but with different arguments. For example, more former enterprises are more reputable (Petersen & Rajan, 1994), exhibit lower business failure (Koh et al., 2015), have more experience and better ability to negotiate their debt capital (Matemilola, Bany-Ariffin, Nassir, & Azman-Saini, 2017). These factors enable older enterprises to access financing sources more efficiently and at lower costs. Besides exhibiting superiority in obtaining financing sources, Banõs-Caballero, García-Teruel, and Martínez-Solano (2010) also find that older enterprises generate more cash flow.

On the contrary, younger enterprises exhibit more considerable cash flow uncertainties, higher growth, and cash constraints (Withisuphakorn & Jiraporn, 2016). External stakeholders, such as creditors and suppliers, are arguably more reluctant to interact with new enterprises (Rafiq, Salim, & Smyth, 2016) that hampers new enterprises in accessing financing sources. When facing greater financing constraints, younger enterprises are more likely to rely on internal financing than older enterprises. Thus, younger enterprises experiencing high leverage, high sales growth, more significant needs for capital expenditure, low operating cash flow, and worse macroeconomic conditions tend to shorten their cash cycles. Based on these arguments, we propose the following hypotheses that are related to enterprise age:

H8a-f: Leverage, enterprise growth, capital expenditure, GDP, and inflation affect the cash conversion cycle differently depending on enterprise age.

2. Research methods

This study involves all manufacturing enterprises listed at the Indonesian Stock Exchange (IDX) from 2010 to 2017. After screening for the data availability, our final sample is 117

enterprises and 749 enterprise-year observations. We generate our data from enterprises' official websites, the website of the Indonesian Stock Exchange (http://www.idx.co.id) and Thomson Reuters Eikon.

The research variables consist of the dependent variable (working capital management) and the independent variables (leverage, enterprise growth, capital expenditure, operating cash flow, GDP, and inflation). We proxy working capital management by using cash conversion cycle not only because previous studies mostly rely on this proxy, but also this measure is the direct consequence of enterprises' working capital management (Lazaridis & Tryfonidis, 2006; Tran, Abbott, & Yap, 2015). Further, we operationalise our independent variables as follows. First, we measure leverage with the ratio between total debts to total assets. Next, the proxy for enterprise growth is sales growth that indicates the degree of increased or decreased sales. We then proxy capital expenditure with total investments in fixed assets divided by sales. Further, cash flow generated from routine operational activities is the proxy for operating cash flow and is measured with after-tax net income plus depreciation expenses divided by total assets. For the macroeconomic factors, GDP is the most reliable economic indicator and is estimated with GDP growth while the measurement of inflation relies on consumer price index (CPI).

This study uses enterprise age and enterprise size as the variables that explain the different impacts of the determinants of working capital management. We measure enterprise size with the natural logarithmic value of total assets that are commonly used in previous studies (Gill et al., 2010; Wasiuzzaman & Arumugam, 2013; Goel, 2015; Cuong & Nhung, 2017). Another variable, enterprise age, is measured with operating years. Numerous studies have used this proxy (Ezeoha, 2009; Kieschnick, Laplante, & Moussawi, 2013; Rafiq, Salim, & Smyth, 2016; Isik & Unal, 2017). Specifically, the following are the operationalisation of our variables:

CCC = Cash Conversion Cycle = Account Receivable Period + Inventory Holding Period – Account Payable Period to measure Working Capital Management

Lev = Total Debts/Total Assets

CEP = Capital Expenditure = Total Fixed Assets/Sales

OCF = Operating Cash Flow//Total Assets

SG = Sales Growth = (Sales t – Sales t-1) / Sales t-1

GDP = Gross Domestic Product = change in Ln GDP

CPI = Consumer Price Index

Size = Ln (Total Asset)

Age = Ln (enterprise age)

2.1. Model analysis

This study uses the panel quantitative research design to analyse both cross-sectional and longitudinal data (Gujarati, 2003). Further, to respond to our first research objective, this study empirically estimates the following panel regression model:

$$CCC_{i,t} = \beta_0 + \beta_1 LEV_{i,t} + \beta_2 SG_{i,t} + \beta_3 CEP_{i,t} + \beta_4 OCF_{i,t} + \beta_5 GDP_{i,t} + \beta_6 CPI_{i,t} + \beta_7 Size_{i,t} + \beta_8 AGE_{i,t} + \beta_9 CCC_{i,t-1} + \varepsilon_{i,t},$$

where β_0 is the enterprise-specific intercept, $\beta_{1\text{-}9}$ are regression coefficients, and $\varepsilon_{i,t}$ is the usual error term for enterprise *i* at time *t*.

To estimate the effects of enterprise size and age on the determinants of working capital management, we follow Embong et al. (2012) by classifying these 117 enterprises into two subsamples based on the median values of enterprise age and size. Enterprises with size above (below) the median value of enterprise size are classified as large (small) enterprises. Similarly, enterprises with age above (below) the median value of enterprise age are classified as old (young) enterprises.

This study follows the standard procedures in analysing the data. The descriptive analysis aims to indicate the data distribution. To test these hypotheses, we initially determine the best regression model between Pooled OLS, Fixed Effect, and Random Effects by running the Chow test, Breusch-Pagan LM Test (LM Test) and Hausman Test. Next, to analyse the effects of enterprise size and age, we test the changes in coefficient values and significance for each subsample (large vs small; old vs new). Thus, this study employs five models to test the hypotheses: model 1 for all enterprises, model 2 for large enterprises, model 3 for small enterprises, model 4 for old enterprises, and model 5 for young enterprises.

3. Results and discussion

3.1. Descriptive statistics

As shown by Table 1, the descriptive statistics suggest that Indonesian manufacturing enterprises exhibit relatively long average CCC, especially for small enterprises (155 days). A likely explanation of the findings is that Indonesian manufacturing enterprises operate with a high level of inventories to ensure the continuity of their production processes. Uncertainties regarding the availability of inventories and imported raw materials motivate enterprises

Table 1. Descriptive statistics

	All Enterprises N = 749 Observations		Large N = 371 Observations		Small N = 378 Observations		Old N = 385 Observations		Young N = 364 Observations	
	Mean	S.D	Mean	S.D	Mean	S..D	Mean	S.D	Mean	S..D
CCC	121.36	93.05	89.45	60.12	154.84	108.58	129.15	93.85	112.82	91.55
LEV	28.91	20.22	28.39	18.10	28.20	22.52	27.73	22.04	28.87	18.27
SG	8.76	20.22	10.12	16.38	7.34	23.50	9.37	18.43	8.12	21.96
CEP	1.28	9.27	0.70	0.55	1.86	13.07	0.95	3.90	1.63	12.67
OCF	0.07	0.14	0.08	0.13	0.05	0.15	0.08	0.12	0.06	0.17
GDP	4.57	7.19	4.49	7.72	4.65	7.22	4.57	7.20	4.57	7.20
CPI	4.97	2.18	4.98	2.19	4.96	2.18	4.97	2.18	4.97	2.18
CCC_{t-1}	120.12	90.43	90.11	60.56	151.32	104.77	127.23	90.35	112.44	90.02
SIZE	21.32	1.64	22.57	1.22	20.06	0.83				
AGE	3.46	0.40					3.74	0.22	3.17	0.34

to maintain higher inventories. From the perspective of enterprise age, enterprises in the old subsample exhibit slightly longer CCC (129 days) than young enterprises (113 days). Besides, the leverage level of Indonesian manufacturing enterprises, both for large and small subsamples or old and young subsamples, is relatively low with the overall average value of only 28.91%.

3.2. The determinants of working capital management

Before using panel data regression to test the hypotheses regarding the determinants of working capital management, we initially have to determine which model (common, fixed, or random effect) is suitable for our analysis using Chow test, Hausman test, and Lagrange multiplier. Table 2 demonstrates that overall Chow test and Hausman test suggest that fixed effect is the suitable panel data regression for this research. Specifically, we use a fixed effect robustness model to mitigate the classical assumption problems such as multicollinearity, autocorrelation, and heteroskedasticity and to ensure the robustness of our results.

Based on the results of the panel data regression, Table 3 demonstrates that only sales growth and economic growth are the determinants of working capital management efficiency. Specifically, sales growth negatively affects enterprises' CCC (p-value=0.000 < 0.01), indicating that higher sales growth leads to more efficient working capital management. The results support Naser, Nuseibeh, and Al-Hayeda (2013) who find similar results. Further, GDP positively affects CCC, implying that increased GDP motivates enterprises to invest more in working capital. Our findings are in line with Zariyawati et al. (2010), who find that GDP positively affects working capital management. Economic growth increases the demands of manufacturing enterprises' products. Consequently, enterprises are motivated to invest more in working capital.

It is worth noting that although the effect of leverage is significant (p-value=0.029 < 0.05), but the sign is negative that contradicts our prediction. Thus, greater leverage implies longer enterprises' cash cycles. The findings are not in line with our argument that highly leveraged enterprises tend to shorten their CCC by limiting their investments in receivables and inventories (Salawu & Alao, 2014; Elbadry, 2018). Previous studies (e.g., Palombini & Nakamura, 2012) also demonstrate the negative effect of leverage on CCC. We explain our findings by arguing that Indonesian manufacturing enterprises still exhibit a relatively low leverage level that does not disrupt their needs for short-term investments. If their leverage continues to increase until a certain level that they consider unfavourable, they are likely to

Table 2. Panel data regression test

Test	Model 1		Model 2		Model 3		Model 4		Model 5	
Chow	3.5	Fixed effect	4.3	Fixed effect	3.7	Fixed effect	2.8	Fixed effect	4.5	Fixed effect
Hausman	267.1	Fixed effect	144.4	Fixed effect	112.4	Fixed effect	105.8	Fixed effect	173.1	Fixed effect

Note: Model 1 for all enterprises, model 2 for large enterprises, model 3 for small enterprises, model 4 for old enterprises, and model 5 for young enterprises.

shorten their CCC. Thus, the effect of leverage on CCC is potentially non-linear. Further, we do not find the significant effects of other enterprise-specific factors on working capital management, namely capital expenditure (p-value=0.896 > 0.1) and operating cash flow (p-value=0.520 > 0.1).

They are turning to the macroeconomic factors, although inflation significantly affects working capital management (p-value=0.091 < 0.1), but the effect positive. Thus, our hypothesis is not supported. The findings also do not support previous studies (e.g., Zariyawati et al., 2010; Tahir & Amar, 2016) that show the significant adverse effect of inflation on working capital management. On the contrary, this study indicates that the general increases in prices motivate enterprises to operate with a long cash cycle continuously. We explain our results by proposing that manufacturing enterprises experience only moderate inflation rates that encourage them to continue granting long credit sales terms to increase their sales. This policy eventually causes cash cycles to be longer.

Table 3. Hypothesis testing (regression results)

DV: CCC	Model 1 (All Enterprises)			
IV :	Coefficient	P-Value	Hypothesis	Result
LEV	0.943	0.029 **	H1	Not Supported
SG	–0.634	0.000 ***	H2	Supported
CEP	–1.165	0.896	H3	Not Supported
OCF	28.248	0.520	H4	Not Supported
GDP	0.652	0.008 ***	H5	Supported
CPI	1.597	0.091 *	H6	Not Supported
SIZE	–8.274	0.375	controlled variable	
AGE	41.310	0.179	controlled variable	
CCC_{t-1}	0.274	0.017 **	controlled variable	
R- square	0.475			
F	3.430	0.001 ***		

*significant at 10%, ** significant at 5%, *** significant at 1%.

3.3. The effects of enterprise size and age on the determinants of working capital management

To analyse whether the effects of the independent variables on working capital management differ depending on enterprise age and enterprise size, we divide the sample observations into two subsamples based on their size (early and large) and their age (old and young). Table 4 informs that large and small enterprises exhibit significantly different values for all research variables, except leverage. Meanwhile, old and young enterprises only demonstrate significantly different values for CCC and operating cash flow. Thus, the enterprise-specific characteristics of large and small enterprise subsamples are mainly different, while the young and old subsamples exhibit relatively indifferent enterprise-specific characteristics.

Table 4. Mean comparison and T-Test result

Variables:	Mean		Large and Small Enterprises		Mean		Old and Young Enterprises	
	Large	Small	t-score	P-Value	Old	Young	t-score	P-Value
CCC	89.45	154.84	–9.9135	0.0000 ***	129.15	112.82	2.3601	0.0185 **
LEV	28.39	28.20	0.1139	0.9094	27.73	28.87	–0.7102	0.4779
SG	10.12	7.34	1.8372	0.0667 *	9.37	8.12	0.8284	0.4077
CEP	0.70	1.86	–1.7068	0.0887 *	0.95	1.63	–0.9783	0.3285
OCF	0.08	0.05	2.1628	0.0309 **	0.08	0.06	1.8997	0.0587 *
CCC_{t-1}	90.11	151.32	–9.6517	0.0000 ***	127.23	112.44	2.2015	0.0280 **

*significant at 10%, ** significant at 5%, *** significant at 1%.

Table 5 displays the results of our test that analyses the effects of the determinants of working capital management for each subsample using the t-test. Only CEP and GDP variables exhibit significantly different effects for both large and small enterprise subsamples. Specifically, GDP is significant only for small enterprises the (β = 0.79; p-value = 0.056). Meanwhile, although capital expenditure has a significant effect on small enterprises, the direction is not as predicted (β = 42.47; p-value = 0.062). The analysis reveals rather different results for our enterprise age subsamples. Leverage (β = 1.11; p-value = 0.033), capital expenditure (β = –15; p-value = 0.099, operating cash flow (β = 69.54; p-value = 0.025) and GDP (β = 96.54; p-value = 0.008) exhibit significantly different impacts on working capital management for old and young enterprises. However, the direction of leverage is different from the predicted one.

The findings suggest that only GDP that has different impacts on working capital management for large and small Indonesian manufacturing enterprises. As a macroeconomic indicator, GDP positively affects working capital management only for small enterprises. It is worth noting that capital expenditure has a positive effect on CCC only for small enterprises. The results suggest that although small enterprises are more likely to have financing problems (Beck & Demirguq-kunt, 2005; Hadlock & Pierce, 2010; Ponikvar et al., 2013), but their CCC becomes longer when these enterprises allocate higher capital expenditure. Our descriptive statistics reveal that the average cash cycle is 155 days for small enterprises and only 89 days for large enterprises. The figures do not only imply that small enterprises are less efficient in managing their working capital than large enterprises but may also indicate that small enterprises implement a profit-increasing strategy by loosening their credit policy to increase sales when they raise their capital expenditure.

From the enterprise age perspective, several determinants of working capital management exhibit different impacts for old and young enterprise subsamples. Capital expenditure negatively affects CCC only for old enterprises. The results indicate that although old enterprises are superior in accessing financing sources (Berger & Udell, 1998), they are still motivated to manage their working capital more efficiently when they allocate more significant capital expenditure. Further, operating cash flow positively affects CCC only for young enterprises. The findings confirm Abbadi and Abbadi (2013) and Palombini and Nakamura (2012) who

Table 5. Regression result comparisons

Panel A. Based on Enterprise Size						
Independent Variable	Model 2: Large Enterprise		Model 3: Small Enterprise		Hypothesis	Result
	Coef	P-Value	Coef	P-Value		
LEV	0.96	0.054*	1.41	0.004***	7a	Not Supported
SG	–0.53	0.002***	–0.78	0.004***	7b	Not Supported
CEP	13.94	0.158	42.74	0.062*	7c	Not Supported
OCF	72.65	0.12	67.22	0.173	7d	Not Supported
GDP	0.36	0.312	0.79	0.056*	7e	Supported
CPI	0.34	0.753	2.51	0.148	7f	Not Supported
CCC_{t-1}	0.25	0.024**	0.38	0.004***	controlled variable	
R^2	0.392		0.435			
F	3.28	0.005***	5.66	0.000***		
Panel B. Based on Enterprise Age						
Independent Variable	Model 4: Old Enterprise		Model 5: Young Enterprise			
	Coef	P-Value	Coef	P-Value		
LEV	0.92	0.141	1.11	0.033**	8a	Not Supported
SG	–0.67	0.006***	–0.65	0.011**	8b	Not Supported
CEP	–15.35	0.099*	7.38	0.577	8c	Supported
OCF	–68.13	0.607	69.54	0.025**	8d	Supported
GDP	0.96	0.008***	0.31	0.378	8e	Supported
CPI	1.80	0.150	1.05	0.477	8f	Not Supported
CCC_{t-1}	0.34	0.100	0.23	0.028**	controlled variable	
R^2	0.561		0.4108			
F	4.04	0.001**	4.76	0.000***		

*significant at 10%, ** significant at 5%, *** significant at 1%.

suggest that operating cash flow determines the length of CCC. However, the effect does not exist for old enterprises. We explain our findings by suggesting that the efficiency of old enterprises' working capital management does not necessarily depend on the availability of internal financing sources from their operating cash flow because they have better access to external financing sources at lower cost of capital (Matemilola, Bany-Ariffin, Nassir, & Azman-Saini, 2017; Berger & Udell, 1998). With more significant constraints to external financing sources (Rafiq, Salim, & Smyth, 2016), the availability of operating cash flow is

crucial for young enterprises to manage their working capital efficiently. Young enterprises that manage (fail) to generate higher operating cash flow are likely to increase (decrease) their investments in working capital that eventually will lengthen (shorten) their CCC (Singh & Kumar, 2017). Our results related to the effect of GDP for old enterprises are similar to Zariyawati et al. (2010), who show that GDP is the determinant of working capital management. Economic growth encourages old manufacturing enterprises to invest more in working capital to facilitate sales growth.

Conclusions and implication

This study offers two main contributions. Firstly, this study investigates the determinants of working capital management as a research issue that is relatively understudied. We demonstrate that sales growth and economic growth are the determinants of Indonesian manufacturing enterprises' working capital management. As predicted, higher sales growth will shorten the cash cycle, while higher economic growth lengthens the cash cycle. This study also shows impressive results. Individually, for Indonesian manufacturing enterprises, higher leverage and inflation rate do not motivate enterprises to shorten their cash cycle or to manage their working capital more efficiently. On the contrary, enterprises tend to lengthen their cash cycle when leverage and inflation rate are higher probably because Indonesian manufacturing enterprises emphasise their sales growth.

Secondly, this study tests the different effects of the determining factors on working capital management based on enterprise size and age. We conclude that there are no different effects of the enterprise-specific factors on working capital management between large and small enterprises. However, economic growth as a macroeconomic factor positively affects working capital management only for small enterprises. For enterprise age, several determinants of working capital management (capital expenditure, operating cash flow, and economic growth) exhibit significantly different impacts for old and young enterprise subsamples.

This study suggests that previous studies that demonstrate the effects of economic growth (Zariyawati et al., 2010), capital expenditure (Mansoori & Muhammad, 2012) and operating cash flow (Abbadi & Abbadi, 2013; Palombini & Nakamura, 2012) on working capital management must be interpreted cautiously because the effects of these independent variables depend on enterprise characteristics such as enterprise size and age. For example, economic growth significantly affects working capital management only for small enterprises, but not for larger ones. Similarly, other enterprise-specific factors, such as capital expenditure, only have a significant impact on working capital management for young enterprises. Besides, this study offers several practical implications, such as the crucial role of sales growth for manufacturing enterprises to manage their working capital efficiently. Moreover, young manufacturing enterprises need to shorten their cash cycles because that are relatively longer than older enterprises'.

Although this study contributes to the literature by providing a better understanding of the effects of enterprise size and age on the determinants of working capital management that are relatively understudied in previous research, it is not without limitations. We only measure enterprise size with total assets. Accordingly, we advise future studies to complement this proxy of enterprise size with market value and the listing size criterion (main board

vs development board). Further, it is necessary to analyse the different relationship between leverage and working capital management (such as the non-linear relationship) and the use of different proxies for leverage. Such studies will potentially help explain the positive effect of leverage on CCC.

Disclosure statement

Authors declare that they have no competing financial, professional, or personal interests from other parties.

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