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# FINANCIAL ECONOMICS | RESEARCH ARTICLE Effect of working capital policies on firms' financial performance

Randa Mohammed Shams Addin Al-Mawsheki<sup>1</sup>\*

Abstract: This study focuses on short-term investment and financing decisions influenced by a firm's working capital policy and the effect of working capital policies on the financial performance of manufacturing firms in Malaysia. Working capital policies were measured by working capital financing and investment policies. Working capital investment policy was measured by the ratio of current assets to total assets. Working capital financing policy was categorized as conservative working capital financing policy, aggressive working capital financing policy, and matching working capital financing policy. This study considered matching working capital financing policy, which was not considered in previous empirical studies. The data included 147 firms with 1470 firm-year observations for the period from 2010 to 2019. The results revealed that the current asset to total asset ratio significantly negatively affected firms' financial performance. Meanwhile, a conservative working capital financing policy was positively and significantly related to a firm's financial performance. The finding implies that Malaysian manufacturing firms can increase their operating income by adopting an aggressive working capital investment policy. The finding also implies that Malaysian manufacturing firms can increase their operating income by implementing a conservative working capital financing policy rather than a matching or an aggressive working capital financing policy.

### ABOUT THE AUTHOR

Randa Mohammed Al-Mawsheki is an assistant professor in finance at the Department of Finance and Banking, Taiz University, Yemen. She taught some subjects such as corporate financial management, financial risk management, investment and financing, financial markets, and financial statement analysis. Her research interests include financial economics, corporate finance, investment, and risk management.

### PUBLIC INTEREST STATEMENT

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Regardless of the kind of firm or the nature of business, maximizing the firms' performance is the main goal for all business firms. So, leaders and decision-makers of an organization are concerned about looking for the best policies and procedures that achieve the organization's goals and maximize its value. Working capital is considerably important in all sectors of economic activity due to its direct impact on firm's liquidity and financial performance. This study is interesting because it aims to analyze the effect of working capital policies on the financial performance of manufacturing firms in Malaysia. The manufacturing sector plays an important role in the growth of the Malaysian economy since it is the second largest contributor to the Malaysian GDP after the service sector. Examining the effect of working capital policies on firms' financial performance could help financial managers develop an appropriate working capital strategy that would contribute to further improvements and growth in the Malaysian manufacturing sector.





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#### Subjects: Finance; Corporate Finance; Business, Management and Accounting

# Keywords: Conservative; aggressive; matching; working capital financing policy; Malaysia; manufacturing firms

#### 1. Introduction

Three major decisions are common in corporate finance: capital budgeting, structure, and working capital management decisions. Capital budgeting decisions and capital structure decisions focus on managing long-term financing and investments. Working capital management (WCM) focuses mainly on investments and financing decisions in the short term. Thereby, the role of WCM is crucial in making decisions on the short-term investment processes of an organization and how to meet its financial obligations. WCM is one of the most significant aspects of an organization's financial management that affects its profitability, liquidity, and value.

Managing working capital has a significant impact on the financial performance of firms. Working capital is considered an internal funding resource that provides liquidity to firms to fund their short-term obligations (Aktas et al., 2015; Deloof, 2003; Yazdanfar & Öhman, 2014). Furthermore, working capital is a main source of funding for firms lacking external financing, especially small firms (Ebben & Johnson, 2011). Working capital significantly affects shareholder wealth and firm value (Aktas et al., 2015; Kieschnick et al., 2013; Le, 2019). In crises, one of the most important and decisive decisions adopted by executives is that related to WCM (Engvist et al., 2014; Zimon & Tarighi, 2021). Making appropriate decisions in WCM is a major challenge for executive managers of small and medium enterprises (SMEs), especially during crises, where making incorrect decisions exposes owners to the risk of bankruptcy due to the lack of liquidity (Zimon & Tarighi, 2021). Due to the importance of working capital, firms have been striving to procure the correct amount of working capital to maximize its value and balance the costs and benefits of working capital expenditure (Baños- Caballero et al., 2013). Holding more working capital could result in a high cost of liquidity while holding low working capital could have a high cost of illiquidity (Panda & Nanda, 2018). Thereby, finding the optimum amount of working capital and the appropriate working capital policy (WCP) can be difficult tasks for the managers of firms (Deloof, 2003; Zariyawati et al., 2009).

Previous studies dealt with the issue of WCP from two perspectives. The first perspective is the company's policy controlling the conversion period of some current assets like inventories and receivables and some current liabilities like payables. While the second perspective is the company's policy in controlling the amount of current assets owned by the company and the policy used to finance it. For the first perspective, several previous studies measured the WCP in terms of efficiency through some elements, namely the inventories conversion period, the receivables conversion period, and the accounts payable period, and these elements thus enable the measurement of the cash conversion cycle.

For the second perspective, some previous studies measured the WCP in terms of the amount invested in current assets and the amount of current liabilities used to fund.<sup>1</sup> On this basis, a distinction was made between the working capital investment policy (WCIP), which focuses on the assets side of the company's balance sheet, and the working capital financing policy (WCFP), which focuses on the liabilities side of the balance sheet. The decision on the magnitude of current assets invested refers to the WCIP. Meanwhile, WCFP refers to how a firm finances its current assets either by short-term financing or long-term financing sources (Walker, 1964). From this perspective, some previous empirical studies<sup>2</sup> examined how the extent of aggressiveness or conservatism of firms in the short-term investment and financing decisions affects firms' performance. The current study follows the second perspective and thus aims to investigate the effect of WCP through WCIP and WCFP on firms' financial performance.

WCIP can be categorized into two types: aggressive WCIP and conservative WCIP. An aggressive WCIP means that a firm invests its money more in fixed assets than in current assets, while a conservative WCIP means that a firm spends a tremendous amount of capital on current assets compared to its fixed asset investments (Belt, 1979; Nazir & Afza, 2009; Panda & Nanda, 2018; Weinraub & Visscher, 1998). Choosing the appropriate WCIP is very important, especially for manufacturing firms that tend to have a large amount of current assets such as inventories and receivables due to the nature of manufacturing firms, which need a high level of inventory to maintain their operations. The manufacturing firms try to invest in an optimum level of inventories while considering the time needed to convert raw materials into finished goods and obtain cash to ensure efficient inventory management. Increasing the inventory level may increase inventory holding costs; however, decreasing the inventory level may lead to stock-out situations and higher ordering costs (Bhatia & Srivastava, 2016). Inventory holding costs include, but are not limited to, the costs of warehouse rental, insurance payments, and damaged products due to reduced demand (Kieschnick et al., 2013). Meanwhile, the costs of a stock-out situation include the opportunity costs to make a sale. Ordering costs are related to determining the quantity required, preparing invoices, transportation, and the inspection of goods.

Moreover, the receivable account represents the total unpaid trade credits offered by a firm to its customers. The goal of receivables management is to keep the existing clients and attract new ones to increase sales and improve the performance and shareholder value of a firm (Deloof, 2003). Inventories and receivables are related because manufacturing firms attempt to increase sales of finished goods by offering their customers trade credit, and thereby increase the receivables. However, increasing the level of receivables may lead to a liquidity problem and cause financial distress. Hence, firms must collect the receivables at an appropriate time to enable firms to collect their cash flow and avoid any potential cash inflow difficulties (Zimon, 2021).

The level of current assets represents an essential determinant of the level of liquidity in the short term, which affects a firm's returns. Thereby, a decision to invest in current assets is based on a trade-off between liquidity and profitability. According to Walker (1964), the percentage of investment in current assets to investment in fixed assets reflects the existence of a clear connection between a firm's level of risk and the rate of return expected. Consequently, it is possible to change the risk and expected return level by changing the percentage of working capital (or current assets) to a firm's fixed assets (Walker, 1964). The degree of aggressiveness becomes high if a firm retains few levels of current assets. A large investment in fixed assets could thus positively reflect a firm's profit; however, it increases the possibility of exposure to insolvency and liquidity problems (Nazir & Afza, 2009; Weinraub & Visscher, 1998). A firm follows a conservative working capital investment policy (CWCIP) if it invests an enormous amount of its money in the current assets. Increasing the level of current assets leads to increased liquidity and reduces the possibility of exposure to insolvency and liquidity problems, making the firm's profits low (Nazir & Afza, 2009; Weinraub & Visscher, 1998). Maintaining satisfactory liquidity by maintaining current assets at an optimal level is a primary goal of firms, even if it is difficult to identify the optimal level of current assets (Deloof, 2003; Kwenda & Holden, 2013; Mun & Jang, 2015).

Furthermore, one of the most important financial managers' tasks is to find sufficient funding sources to meet their working capital requirements and to choose the appropriate WCFP. WCFP can be classified into three policies: aggressive, conservative, and moderate, depending on how temporary and permanent current assets are financed (Baker et al., 2017). Current assets are classified into permanent current assets and temporary current assets (Merville & Tavis, 1973). The minimum level of investment in cash, inventories, and receivables necessary to maintain a firm's minimum operating activity and does not change over a year refers to permanent current assets (Merville & Tavis, 1973). Temporary current assets refer to the additional amount over permanent current assets resulting from a change in annual seasonal demands (Kwenda & Holden, 2013; Merville & Tavis, 1973).

An aggressive WCFP means that a company uses short-term debt to finance its temporary and permanent working capital investments. Consequently, an aggressive WCFP leads to an increase in the level of short-term liabilities, leading to an increase in the risk of necessity to pay back in the short term (Walker, 1964). On the other hand, a conservative WCFP means that a firm finances its investment in permanent and temporary working capital with long-term debt. A conservative WCFP thus increases the level of long-term liabilities, leads to long-term liabilities for a firm, and prevents it from the risk of having insufficient cash available to pay on time for its liabilities (Walker, 1964). However, the interest expense on long-term debt exceeds the interest expense on short-term debt, which means that the cost of adopting a conservative WCFP could be more than the cost of adopting an aggressive WCFP (Belt, 1979; Fosberg, 2012; Nazir & Afza, 2009; Weinraub & Visscher, 1998).

The financing of temporary current assets only by short-term liabilities and the financing of permanent current assets only by long-term liabilities indicates a matching WCFP. According to the matching principle, financing temporary assets with short-term liabilities could lower the cost of financing as the financing cost of an asset is estimated over the asset's lifetime, and the cash flows created by the asset are assumed to be sufficient to cover the debt (Jun & Jen, 2005). However, a firm may not meet its short-term financial obligations within a specific timeframe and consequently attempt to refinance its obligations, increasing interest expenses and incurring additional costs for the firm (Fosberg, 2012).

This study aims to investigate the issue relating to the influence of level of current assets and how manufacturing firms finance it on firms' performance by examining the effect of WCIP and WCFP on manufacturing firms' financial performance in Malaysia.

#### 2. Literature review

Theoretically, when a firm uses a large proportion of its current assets in comparison to its total assets, this practice implies that a firm is less vulnerable to solvency and liquidity risks but may generate low profitability in return (García-Teruel & Martínez-Solano, 2007; Walker, 1964; Weinraub & Visscher, 1998). On the other hand, when a firm's level of current assets is low in comparison to its total assets, this level implies that a firm is more exposed to the liquidity risk but may achieve a high level of profitability in return (Walker, 1964; Weinraub & Visscher, 1998). Few empirical studies have been consistent with this theoretical view and found a negative significant relationship between CA/TA and firms' financial performance (see, for example, Vahid et al., 2012). The negative and significant relationship between CA/TA and firms' financial performance leads to recommend the aggressive WCIP. However, the majority of empirical studies have shown different results as they found that more investments in current assets had a positive effect on firm profitability (see, for example, Nazir & Afza, 2009; Mohamad & Saad, 2010; Kaddumi & Ramadan, 2012; Javid & Zita, 2014; Rozari et al., 2015; Shan et al., 2015; Ng et al., 2017; Sudiyatno et al., 2017; Mohamad, 2018; Al-Mawsheki et al., 2019; Farhan et al., 2021). The positive and significant relationship between CA/TA and firms' financial performance found in these studies leads to recommend a conservative WCIP.

Moreover, WCFP is a way of financing a firm's temporary and permanent current assets from long-term or short-term financing sources (Baker et al., 2017; Merville & Tavis, 1973; Panigrahi, 2014). However, based on most previous empirical studies, WCFP is measured by the level of current liabilities to total assets ratio (CL/TA) (see, for example, Farhan et al., 2021; Javid & Zita, 2014; Kaddumi & Ramadan, 2012; Mohamad, 2018; Mohamad & Saad, 2010; Nazir & Afza, 2009; Ng et al., 2017; Rozari et al., 2015; Shan et al., 2015; Sudiyatno et al., 2017; Vahid et al., 2012). Accordingly, the level of current liabilities used by a firm compared to total assets, indicating the aggressive WCFP. In contrast, a relatively low ratio of CL/TA reflects the low level of current liabilities used by a firm conservative WCFP. CL/TA significantly affects firms' financial performance; however, the influence of WCFP on firms'

financial performance, based on previous empirical studies, is inconclusive. Some studies have shown that the relationship between CL/TA and firms' financial performance was significantly positive, indicating that aggressive WCFP was better to be adopted (See, for example, Rozari et al., 2015; Ng et al., 2017). Some other studies have shown that the relationship between CL/ TA and firms' financial performance was significantly negative, indicating that conservative WCFP was better to be adopted (see, for example, Farhan et al., 2021; Kaddumi & Ramadan, 2012; Mohamad, 2018; Mohamad & Saad, 2010; Nazir & Afza, 2009; Shan et al., 2015; Sudiyatno et al., 2017; Vahid et al., 2012). The contradiction in the results of previous studies indicates that the relationship between WCFP and firm's financial performance is still unclear. The contradiction also exists in the results of a single study using different measures of firms' financial performance. For example, Shan et al. (2015) found that there was a negative and significant relationship between CL/TA and ROA but, at the same time, CL/TA had no effect on Tobin's Q. Nazir and Afza (2009) found that conservative WCFP could improve ROA but, at the same time, could destroy market value measured by Tobin's Q. Thus, it can be concluded that decisions related to WCFP can sometimes increase the profitability of firms, but they can also destroy their market value, while some decisions can increase the profitability of firms with no effect on their market value.

Furthermore, there are some shortcomings of the CL/TA as a measure of working capital policy. For example, the CL/TA reflects only the level of current liabilities used to finance total assets but does not reflect how a firm funds its temporary and permanent working capital. Hence, the ratio of CL/TA is not enough to expect WCFP, and it is necessary to indicate the temporary and permanent working capital. WCFP relies on the portion of current assets that must be financed from long-term sources (Belt, 1979). Therefore, the measurement of WCFP should refer to how financing sources (either in the short-term or in the long-term) fund working capital (either permanent or temporary), which cannot be provided by the CL/TA.

The estimation of WCFP by the CL/TA cannot always be apparent because of the missing amount of temporary and permanent working capital in the CL/TA. Based on the estimation of the CL/TA, a firm follows an aggressive WCFP if the CL/TA is relatively high, but the firm follows a conservative WCFP if the CL/TA is relatively low (Mohamad & Saad, 2010; Nazir & Afza, 2009; Weinraub & Visscher, 1998). However, according to Merville and Tavis (1973), working capital investment financing depends on the nature of the commitment. Working capital investments contain two components: funds permanently committed and those temporarily committed (Merville & Tavis, 1973). Hence, it is unnecessary for a low amount of current liabilities compared to the total assets to indicate an aggressive WCFP unless the level of temporary and permanent working capital is considered.

As an illustration, assume that two firms have the same CL/TA, which is relatively high, and at the same time, both firms have the same amount of working capital. Still, they are different in the level of temporary and permanent components. While the first firm has a higher level of permanent working capital (PWC) than temporary working capital (TWC), the second firm has a higher level of TWC than PWC. Due to variations in the amount of permanent and temporary working capital for both firms, it may not be accurate to assume that both firms have adopted an aggressive WCFP even though both firms have the same high CL/TA. It may be true for the first firm to say that it is implementing an aggressive WCFP as it meets the high level of permanent assets with more short-term liabilities. However, the second firm with more temporary working capital may appear to match the maturity of temporary working capital with the maturity of short-term liabilities and, consequently, follows a matching WCFP. The increase in the CL/TA for the second firm is thus the result of increased investment in temporary working capital on short-term liabilities, not just on the amount of current liabilities reflected in the current liabilities to total assets ratio.

The CL/TA measures only two policies of financing working capital: conservative WCFP and aggressive WCFP, but cannot measure the third policy: the matching WCFP. A firm chooses

between the matching WCFP, the aggressive WCFP, and the conservative WCFP based on a riskreturn trade-off (Nazir & Afza, 2009; Weinraub & Visscher, 1998). Risk and return in an aggressive WCFP are higher than risk and return in the conservative WCFP or matching WCFP (Weinraub & Visscher, 1998). Moreover, risk and return in the conservative WCFP are lower than risk and return in the aggressive WCFP or matching WCFP (Weinraub & Visscher, 1998). The matching WCFP is characterized by moderate risk and return (Weinraub & Visscher, 1998). Based on the CL/TA, a high ratio of CL/TA means that a firm uses short-term liabilities more than long-term liabilities to fund its assets, thereby adopting an aggressive WCFP. In return, a firm adopts a conservative WCFP if the ratio of CL/TA is low as the firm tends to finance its investments in assets through a high level of long-term liabilities and a low level of current liabilities. However, there is no indication of the matching WCFP in the CL/TA.

Therefore, this study fills the gap in previous research that only used conservative and aggressive policies while ignoring the matching policy to measure WCFP. For that reason, this study considers the three working capital financing policies: the conservative WCFP, the aggressive WCFP, and the matching WCFP.

#### 3. Methodology

The study analyzes the effect of WCIP and WCFP on the financial performance of Malaysian firms in the manufacturing sector over ten years, from 2010 to 2019. The data were mainly collected from the DataStream database. The manufacturing sub-sectors included in this study were: Automobiles and Parts, Electronic and Electrical Equipment, General Industrials, Beverages, Chemicals, Food Producers, Forestry and Paper, Industrial Engineering, Leisure Goods, Personal Goods, Industrial Metals and Mining, and Pharmaceuticals and Biotechnology. This study excluded firms with missing or incomplete data for any variable during the period of this study. Consequently, this study used balanced panel data involving 147 cross-sectional firms over ten years.

#### 3.1. Sample and models

Operating income (OI) was used to measure the dependent variable in this study. Operating income is the difference between sales and total operating expenses, and total operating income was divided by total sales to calculate OI. Regarding the independent variables, this study followed previous studies and measured WCIP by the ratio of current assets to total assets (CA/TA) (see, for example, Mohamad & Saad, 2010; Nazir & Afza, 2009; Weinraub & Visscher, 1998). When the CA/ TA is relatively low, this level indicates a higher degree of aggressiveness in WCIP, while a relatively high ratio of CA/TA indicates that a firm is more conservative in WCIP.

This study measured WCFP based on how PWC and TWC were financed. The study classified WCFP into three categories: aggressive WCFP, conservative WCFP, and matching WCFP. Firms following the matching WCFP attempt to match the maturity of assets and maturity of funds. Firms following the matching WCFP prefer to fund their permanent working capital through only long-term sources and temporary working capital through only short-term sources.

Firms that adopt the matching WCFP order short-term debts only to meet the financial needs of their temporary working capital. Thereby, in the case of matching WCFP, short-term debts are equal to temporary working capital. If a firm borrowed short-term debts more than its temporary working capital needs, it used the extra amount of short-term debts to fund its permanent assets and adopted an aggressive WCFP. In the meantime, if temporary working capital was more than a firm's short-term debts, the firm did not use enough short-term debts to meet its financing needs for temporary assets. Instead, it used long-term sources to meet its financing needs, indicating a conservative WCFP.

This study estimated temporary and permanent working capital by taking the following steps. Based on (Merville & Tavis, 1973), PWC refers to the minimum amount of working capital that includes a basic level of cash, inventories, and receivables needed to maintain the minimum operating activity of a firm going during a year. Hence, to capture the minimum amount of working capital recorded during a year, quarter data of cash, inventories, and receivables were collected for the target sampled firms during the study period (i.e., 2010–2019) from DataStream. The minimum number obtained from the four quarters in a year (for the three components: cash, inventories, and receivables) was selected as a permanent account. Thereby, the following formula was used to select permanent cash, inventories, and receivables:

- Permanent cash = minimum amount of cash during the four quarters of a year.
- Permanent inventories = minimum amount of inventories during the four quarters of a year.
- Permanent receivable = minimum amount of receivables during the four quarters of a year.

Following that, temporary cash, inventories, and receivables were selected. According to Merville and Tavis (1973) and Kwenda and Holden (2013), a temporary account is an additional amount above the permanent level of an asset. Accordingly, the study used the variance between the maximum and minimum numbers over the four quarters of a year as a temporary account. Thereby, the following formula was used to select temporary cash, inventories, and receivables:

- Temporary cash = maximum amount of cash during the four quarters of a year—minimum amount of cash during the four quarters of a year (permanent cash).
- Temporary inventories = maximum amount of inventories during the four quarters of a year minimum amount of inventories during the four quarters of a year (permanent inventories).
- Temporary receivables = maximum amount of receivables during the four quarters of a year minimum amount of receivables during the four quarters of a year (permanent receivables).

Temporary working capital was then calculated as the sum of these temporary accounts as the following:

• Temporary working capital = temporary cash + temporary inventories + temporary receivables.

After the selection of temporary working capital for the targeted firms, WCFP was estimated by deducting the values of short-term debts from the values of temporary working capital as the following:

• WCFP = temporary working capital—short-term debts

If temporary working capital was equal to the short-term debts of a firm, the firm matched the maturity of assets with the maturity of debts and hence followed a matching working capital financing policy (MWCFP). Meanwhile, if short-term debts were lower than the temporary working capital, more funding would be needed to meet temporary working capital requirements, which were covered by long-term financing sources and consequently indicated a conservative working capital financing policy (CWCFP). But if temporary working capital was less than the short-term debts of a firm, it indicates that the firm used a high level of short-term debts that exceeded the needs of temporary assets and could therefore use it to finance permanent assets, indicating an aggressive working capital financing policy (AWCFP).

#### 3.2. Dummy variables and the study model

This study classified WCFP into three categories: AWCFP, CWCFP, and MWCFP; hence, two dummy variables were needed in the regression models. If the number of categories is equal to the number of dummy variables and the regression is run, the STATA software automatically omits one dummy variable due to perfect collinearity (Gujarati & Porter, 2009; Jann, 2008).

The omitted dummy variable is known as the reference, base, control, benchmark, or comparison category (Gujarati & Porter, 2009). The dummy variables were coded either by 1 or zero in this study.

Table 1. Definitions of the model's variables	
Variable	Definition
OI	Operating income
WCIP	Working capital investment policy
CWCFP	Dummy conservative working capital financing policy
AWCFP	Dummy aggressive working capital financing policy
SIZE	Natural logarithm of total sales
DR	Debt ratio
βΟ	The intercept of the equation.
β1β5	The change coefficient for the variables.
e	Error term.

The dummy variable of CWCFP had the value 1 when the WCFP was positive and had zero otherwise. Similarly, the dummy variable of AWCFP had the value 1 when the WCFP was negative and had zero otherwise. Consequently, the MWCFP was represented when the WCFP was equal to zero. Thus, the MWCFP, in this case, became the reference category because it was coded as all zeros in the regression models. Therefore, the regression models of this study became the following:

### $OI_{it} = \beta_0 + \beta_1 WCIP_{it} + \beta_2 CWCFP_{it} + \beta_3 AWCFP_{it} + \beta_4 DR_{it} + \beta_5 SIZE_{it} + e_i$

Table 1 provides the definitions of the variables after considering the dummy variables. The model was applied for each company (i) and each year (t).

#### 4. Results

The diagnostic tests, which included tests of extreme outliers, multicollinearity, heteroscedasticity, and autocorrelation, were conducted on the model of the study. This study used the boxplot technique to check the existence of outliers. The results of boxplot technique tests showed that some variables (OI, WCFP, and SIZE) had outliers. Accordingly, the OI variable was winsorized at the 3% and 97% levels. However, the SIZE variable was transformed into a logarithm. Meanwhile, the WCFP variable was transformed into dummy variables. In addition, the results of the diagnostic tests showed that multicollinearity problems did not exist in the model. However, the model had problems with heteroscedasticity and autocorrelation. The feasible generalized least square (FGLS) is a good technique to treat heteroscedasticity and autocorrelation problems in a panel data model (Gujarati & Porter, 2009). Accordingly, this study treated the problems of heteroscedasticity and autocorrelation by adopting the FGLS technique. The FGLS technique has been used in some previous studies (see, for example, García-Teruel & Martínez-Solano, 2007).

#### 5.1. Statistical analysis

Table 2 shows the descriptive statistics for the five variables included in this study. The total number of observations was 1470, resulting from 147 Malaysian manufacturing firms between 2010 and 2019. Starting with operating income (OI), representing the dependent variable of this study, the mean of OI was 0.06, which indicated that the operating income represented 6% of the total sale of manufacturing firms on average. The positive value of OI indicated that, on average, the manufacturing firms in Malaysia had a little operating expenses than the total sales. The maximum value of OI for the sample of this study was 0.65, and the minimum value was -3.88. Meanwhile, the minimum value was -3.88, which indicated that some manufacturing firms have higher operating expenses than their total sales. The standard deviation of OI was 0.20, which means that the values of OI could vary by 0.20 on both sides of the mean value of OI.

The mean of working capital investment policy (WCIP) was 0.47, measured by the ratio of current assets to total assets (CA/TA). The mean value of WCIP indicates that almost half of the assets of the

Malaysian manufacturing firms were invested in the form of current assets. The high level of investment in current assets suggested that Malaysian manufacturing firms prefer to invest their assets in the form of current assets rather than fixed assets. Thereby, the firms appeared to be more conservative in managing their working capital. Moreover, the maximum value of WCIP was 0.95, indicating that some firms tended to retain more than 95% of their assets in the form of current assets, reflecting a high level of liquidity. However, the minimum value of WCIP was 0.01, indicating that some firms preferred to invest more in a fixed asset and adopt an aggressive WCIP.

Moreover, Table 2 shows that the mean value of the working capital financing policy (WCFP), reflecting the variance between TWC and short-term debts, was RM –0.12 billion. The negative value of WCFP indicated a large amount of short-term debt that exceeded the level of TWC. The mean value of WCFP indicates that, on average, the Malaysian manufacturing firms tended to finance their TWC and part of their PWC through short-term debts, following an aggressive WCFP. However, the maximum value of WCFP was RM 7.52 billion, indicating a high level of temporary working capital and a low level of short-term debt, reflecting the conservative WCFP of firms. On the other hand, the minimum value of WCFP was RM –3.91 billion, indicating a high level of short-term debts and reflecting the aggressive WCFP.

Moreover, the study found that most firms had an average debt ratio (DR) of 0.18, a minimum of zero, and a maximum of 0.63. Average DR (0.18) shows that 18% of the total assets of manufacturing firms in Malaysia were financed by debt, and 82% of the total assets were financed by other financing sources, such as equities. Additionally, the average size of firms in terms of total sales amounted to RM 1.60 billion. The size of the firms ranged from minimum total sales of RM 0.004 billion to a maximum of RM 47.6 billion, with a standard deviation of about RM 4.38 billion.

#### 5.2. Multivariate analysis

Table 3 summarizes the model results, which were related to the effect of WCFP, WCIP, and the control variables on the dependent variable represented by OI. The findings demonstrated in Table 3 show that WCIP had a negative and strong significant effect on OI at a 1% significance level. The increases or decreases in the ratio of CA/TA (the proxy of WCIP) had a significant effect on OI. The mathematical interpretation of the coefficient is that the increases in the ratio of CA/TA by 1% led to a decrease in OI by 0.079 and vice versa. As shown in Table 3, the significant and negative effect of WCIP on OI implies that the manufacturing firms in Malaysia should manage their current assets efficiently by adopting an aggressive WCIP to enhance their OI. Manufacturing firms should reduce their investment in current assets and increase their investment in fixed assets. The negative and significant relationship between the WCIP and OI found in this study was consistent with the trade-off theory, which supposes that high risk leads to high returns. Firms that use a high level of current assets should maintain a high level of liquidity to avoid liquidity or insolvency risks.

Table 2. Descriptive statistics						
	Mean	St. Dev.	Min	Max		
OI	0.06	0.20	-3.88	0.65		
WCIP	0.47	0.21	0.01	0.95		
WCFP	-0.12	0.52	-3.91	7.52		
DR	0.18	0.15	0	0.63		
SIZE	1.60	4.38	0.004	47.6		

Notes: OI represents operating income. WCIP is measured by the current asset to total asset ratio. WCFP is measured by the variance between temporary working capital and short-term debts (in billions of Malaysian Ringgit). DR is a firm's debt ratio. SIZE is a firm size in terms of the total sales (in billions of Malaysian Ringgit).

Table 3. Results of the model using FGLS regression estimation (when MWCFP is the reference category of WCFP)					
OI	Coef.	St.Err	t-value	p-value	Sig.
WCIP	-0.079	0.012	-6.3	0	***
CWCFP	0.092	0.011	8.13	0	***
AWCFP	0.005	0.007	0.76	0.449	
SIZE	0.031	0.004	8.22	0	***
DR	-0.203	0.02	-10.3	0	***
_cons	-0.033	0.021	-1.59	0.112	
Mean dependent var	0.073	SD dependent var			0.105
Number of obs	1470	Chi-square			307.788
Prob > chi2	1	Akaike crit. (AIC)			-2726.607

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

The second variable considered in this study was WCFP, which included three categories (conservative, aggressive, and matching). It was represented by two dummy variables: CWCFP and AWCFP. The first dummy variable (CWCFP) referred to the conservative WCFP, and the second dummy variable (AWCFP) referred to the aggressive WCFP. Both dummy variables were related to the reference or comparison category, i.e., the matching WCFP (MWCFP). Based on Table 3, the coefficient of the CWCFP, which was 0.092, indicated that firms adopting the CWCFP had a higher OI of 0.092 than firms adopting the MWCFP. Additionally, the p-value of CWCFP was less than 0.05, indicating that the difference between the mean of OI for the firms that adopted the CWCFP and the mean of OI for the firms that adopted the MWCFP was statistically significant. Thus, on average, the firms that followed the CWCFP had more OI of 0.092 than those that followed the MWCFP.

Meanwhile, the coefficient of the second dummy variable (AWCFP) gives the difference in OI for the firms that adopted the AWCFP compared to the OI for the firms that adopted the MWCFP. The results from Table 3 show that the p-value of the AWCFP was more than 0.05, indicating that the difference between the mean of OI for the firms that adopted the AWCFP and the mean of OI for the firms that adopted the MWCFP was not statistically significant. These results imply that Malaysian manufacturing firms can enhance their OI by adopting the CWCFP rather than the MWCFP or the AWCFP. Thus, it could be possible to say that by adopting a CWCFP, the manufacturing firms in Malaysia may improve their operating income.

Furthermore, Table 3 shows a positive and significant relationship between SIZE and OI. Any increase in SIZE by RM1billion (in terms of total sales) leads to an increase in OI by 0.031. These results are consistent with the view that large firms have better performance than small firms. The positive relationship between SIZE and OI means that the large manufacturing firms with an efficient WCM had better OI than the small manufacturing firms in Malaysia.

Additionally, the results demonstrated in Table 3 show a negative and significant relationship between debt ratio as a control variable and OI. The increase of 1% in DR led to a decrease of 0.203 in OI. Thereby, using more debt in the capital structure is not better than using other capital sources, such as equity, which may decrease the OI of manufacturing firms in Malaysia.

The model results do not change if the reference variable for the dummy variables is changed, except for changes in the results of dummy variables, which often change the result of the model's constant (Gujarati & Porter, 2009). For example, if the category variable is the AWCFP and both the MWCFP and the CWCFP are dummy variables, the same findings will be achieved for other variables

in the model. Table 4 presents the model results in the second case when the AWCFP was considered a reference category, and both CWCFP and MWCFP were considered dummy variables. Meanwhile, Table 5 presents the model results in the third case when the CWCFP was considered a reference category and AWCFP and MWCFP were considered dummy variables.

Referring to Tables 4 and 5, the results of all independent variables were the same values in the two cases, except for the results of the dummy variables of WCFP and the constant of the model. The rationale behind this finding is that, logically, the dummy variables represent the simulated data used to express the categories of WCFP. Accordingly, any change in the reference or comparison category chosen for these dummy variables will not change the actual data of the variable (WCFP) but only change the way the outcome of the WCFP is expressed. Thereby, any change resulting from a change in the category variable will be only for the results of the dummy variables and the constant result of the model without any change in the results of other independent variables and, at the same time, without any change in the overall conclusion of the results.

Table 4 shows that, in the first case, when the AWCFP was used as the reference category, the coefficient of the CWCFP was 0.087, indicating that firms that used the CWCFP had a higher mean

category of WCFP)					
OI	Coef.	St.Err	t-value	p-value	Sig.
CATA	-0.079	0.012	-6.3	0	***
CWCFP	0.087	0.011	7.74	0	***
MWCFP	-0.005	0.007	-0.76	0.449	
SIZE	0.031	0.004	8.22	0	***
DR	-0.203	0.02	-10.3	0	***
_cons	-0.028	0.021	-1.36	0.175	
Mean dependent var	0.073	SD dependent var			0.105
Number of obs	1470	Chi-square			307.788
Prob > chi2	1	Akaike crit. (AIC)			-2726.607

Table 4. Results of the model using FGLS regression estimation (when AWCFP is the reference category of WCFP)

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

Table 5. Results of the model using FGLS regression estimation (when CWCFP is the reference category of WCFP)					
OI	Coef.	St.Err	t-value	p-value	Sig.
CATA	-0.079	0.012	-6.3	0	***
AWCFP	-0.087	0.011	7.74	0	***
MWCFP	-0.092	0.011	-8.13	0	***
SIZE	0.031	0.004	8.22	0	***
DR	-0.203	0.02	-10.3	0	***
_cons	0.059	0.023	2.6	0.009	***
Mean dependent var	0.073	SD dependent var			0.105
Number of obs	1470	Chi-square			307.788
Prob > chi2	1	Akaike crit. (AIC)			-2726.607

\*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

OI than firms that used the AWCFP, at around 0.087. Nonetheless, the p-value of the CWCFP was significant, indicating that the difference in mean OI between firms that used CWCFP and firms that used AWCFP was statistically significant. When the AWCFP was used as the category variable, the p-value for CWCFP was significant. As a result of this finding, the CWCFP had a statistically significant effect on OI.

Table 5 showed that the coefficient of the AWCFP was -0.087, and the p-value (0.000) was less than 0.05 in the second case when the CWCFP was the reference category. Thereby, it can be concluded that the mean of OI for the firms that adopted the AWCFP is fewer than the mean of OI for the firms that adopted the CWCFP by 0.087. Similarly, the coefficient of the MWCFP was -0.092, and the p-value (0.000) was less than 0.05. Hence, the mean of OI for the firms that adopted the MWCFP is less than the mean of OI for the firms that adopted the CWCFP by 0.092. These results implied that the Malaysian manufacturing firms could enhance their OI by adopting CWCFP rather than AWCFP or MWCFP.

#### 5. Discussion

The descriptive statistics showed that the manufacturing firms in Malaysia tended to invest more than 47% of the total assets in current assets, indicating that the firms tended to be more conservative in WCIP, on average. This finding corresponds with some studies conducted in the Malaysian context, which found that Malaysian manufacturing firms prefer to invest their assets in the form of current assets rather than in fixed assets. Thereby, the firms appeared to be more conservative in managing their working capital (see Ng et al., 2017; Al-Mawsheki et al., 2019). However, the result of the study's model regarding the effect of WCIP on OI showed a negative and significant effect of WCIP on OI. The negative and significant effect of WCIP on OI indicates that reducing investment in current assets could improve the OI of manufacturing firms in Malaysia. This result is in line with trade-off theory as keeping more quantity of current assets means that the firms prefer to keep liquidity at a safe and sufficient level, which leads to avoiding any liquidity or insolvency risk, but at the same time, prevents achieving potential profitability if this liquidity is invested in such investments. Thereby, the firms should change their conservative WCIP to aggressive WCIP. This result corresponds with previous studies, notably Vahid et al. (2012). However, this result is inconsistent with previous studies conducted by Nazir and Afza (2009), Mohamad and Saad (2010), Kaddumi and Ramadan (2012), Rozari et al. (2015), Shan et al. (2015), Ng et al. (2017), Sudiyatno et al. (2017), Mohamad (2018), Al-Mawsheki et al. (2019), and Farhan et al. (2021).

Moreover, the findings of the descriptive statistics showed that the average WCFP was a negative value. The negative value of WCFP indicated that the manufacturing firms in Malaysia tended to borrow a high level of short-term debt that exceeded their TWC. Thereby, the manufacturing firms in Malaysia used short-term debts to finance their TWC and PWC, indicating that the firms adopted the aggressive WCFP on average. This study measured the WCFP by the difference between short-term debts and TWC, unlike previous studies that used the ratio of CL/TA, which considered only the AWCFP and the CWCFP. Consequently, this study used dummy variables, which expressed the variable of WCFP and considered the three policies of working capital financing: AWCFP, CWCFP, and MWCFP. The results of running the study model, when the MWCFP was the reference variable, showed the difference between the mean of OI for the firms that followed the CWCFP and the mean of OI for the firms that followed the MWCFP was positive and statistically significant. However, the difference between the mean of OI for the firms that followed the AWCFP and the mean of OI for the firms that followed the MWCFP was not statistically significant. Hence, firms that adopted the CWCFP have the highest OI compared to firms that adopted MWCFP. In addition, the results of running the study model, when the AWCFP was the reference variable, showed the difference between the mean of OI for the firms that followed the CWCFP and the mean of OI for the firms that followed the AWCFP was positive and statistically significant. However, the difference between the mean of OI for the firms that followed the MWCFP and the mean of OI for the firms that followed the AWCFP was not

statistically significant. Hence, firms that adopted the CWCFP have the highest OI compared to firms that adopted AWCFP.

Meanwhile, when the CWCFP was the reference variable, the study model results showed the difference between the mean of OI for the firms that followed the AWCFP and the mean of OI for the firms that followed CWCFP was negative and statistically significant. Similarly, the difference between the mean of OI for the firms that followed the MWCFP and the mean of OI for the firms that followed the CWCFP was negative and statistically significant. Hence, firms that adopted the CWCFP have the highest OI compared to firms that adopted AWCFP or MWCFP. These results suggest that Malaysian manufacturing firms that adopted MWCFP or AWCFP should change their policies to the CWCFP to improve their financial performance.

The finding of this study regarding the effect of WCFP on firms' performance was in line with the results of previous empirical studies, which found that the CWCFP led to an increase in the financial performance of firms. These studies obtained a negative relationship between the CL/TA and the financial performance of companies and thereby recommended adopting conservative policies (see, for example, Farhan et al., 2021; Kaddumi & Ramadan, 2012; Mohamad, 2018; Mohamad & Saad, 2010; Nazir & Afza, 2009; Shan et al., 2015; Sudiyatno et al., 2017; Vahid et al., 2012). Meanwhile, the finding of this study contradicted the results of some other empirical studies, which found that the AWCFP had led to an increase in the financial performance of firms. These studies found that companies that have a high ratio of CL/TA have a higher financial performance than companies that have a lower ratio, and therefore, these studies recommended adopting an aggressive policy to finance working capital through reducing long-term financial sources and increasing short-term debt (See for example, Rozari et al., 2015; Ng et al., 2017). However, previous empirical studies used the CL/TA as a measure of WCFP, which did not indicate how to finance temporary or permanent current assets and did not address the MWCFP as the current study did.

#### 6. Conclusion

The present study aimed to investigate the impact of both WCIP and WCFP on firm's financial performance of Malaysian manufacturing firms. WCIP was measured by the ratio of CA/TA. Meanwhile, WCFP was measured by dummy variables in three categories: AWCFP, CWCFP, and MWCFP. Firms' financial performance was represented by operating income (OI). The findings of descriptive statistics showed that, on average, Malaysian manufacturing firms prefer to keep high liquidity by holding a high level of current assets compared to total assets, as the mean of CA/TA was 0.47. Meanwhile, the study's model results showed a negative and significant relationship between CA/TA and OI. The finding suggested that firms that tended to invest more in current assets had lower OI than firms that reduced their investment in current assets and increased their investments in fixed assets.

This study has made significant contributions to the body of knowledge on WCP and firms' financial performance. In terms of WCIP, the majority of previous empirical studies contradict the trade-off theory and conclude that more investment in current assets led to an increase in firms' financial performance (see, for example, Nazir and Afza (2009), Mohamad and Saad (2010), Kaddumi and Ramadan (2012), Rozari et al. (2015), Shan et al. (2015), Ng et al. (2017), Sudiyatno et al. (2017), Mohamad (2018), Al-Mawsheki et al. (2019), and Farhan et al. (2021). However, the results found in this study align with the trade-off theory and conclude that firms that take high risk represented by a low level of current assets' investments improved the firms' financial performance.

In terms of WCFP, the finding showed a significant difference between OI for the firms that followed the CWCFP and OI for the firms that followed the matching or the aggressive WCFP. The data analysis concluded that those businesses whose managers had adopted an aggressive WCFP

or matching WCFP had lower OI. Previous empirical studies have used CL/TA to assess the degree of aggressiveness or conservativeness of WCFP. The current study clarified some of the shortcomings of the CL/TA. Using CL/TA measures only two policies of WCFP since the relative increase in CL/TA indicates the aggressive WCFP and the relative decrease in CL/TA indicates the conservative WCFP. Accordingly, the CL/TA ignores the matching WCFP. In addition, WCFP has been classified into three policies (aggressive, conservative, and matching) based on how a firm finances its temporary and permanent current assets. Meanwhile, the CL/TA as a measure of WCFP does not refer to permanent or temporary assets.

This study measured WCFP based on how a firm finances its temporary and permanent current assets and using dummy variables that considered the three policies of WCFP (aggressive, conservative, and matching). Consequently, this study fills the gap existing in previous empirical studies and considers the matching WCFP, which has not been considered in previous empirical studies. The current study results emphasize that both WCIP and WCFP are indispensable components of the success of manufacturing firms in Malaysia.

#### 7. Implication and future studies

This study provided valuable findings on the significant effect of WCIP and WCFP on the financial performance of manufacturing firms in Malaysia. The results of this study may be helpful for managers who seek to increase the financial performance of their business by working capital. Malaysian manufacturing firms could improve their OI by adopting an aggressive WCIP. Additionally, the results showed that the firms that adopted the CWCFP had a higher mean of OI than the mean of OI for those that adopted the MWCFP and AWCFP. The firms that adopted a CWCFP used more long-term financial sources than short-term debts to finance their working capital. Therefore, the financial managers of the manufacturing firms are recommended to adopt a conservative WCFP by using long-term financial sources rather than short-term debts to finance both temporary working capital and permanent working capital and, therefore, increase firms' financial performance.

This study may motivate other researchers to further investigate the impact of WCP on firms' financial performance. Future studies could extend the study's objectives and include factors that impact the decision to finance working capital. Future studies may include the determinants of choosing between different policies of financing working capital. Furthermore, future studies could mix quantitative approaches in measuring the WCP and qualitative approaches. A good contribution may be made to the body of knowledge by mixing quantitative and qualitative approaches.

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#### Notes

1. Previous studies also used net operating working capital, which is the variance between the sum of accounts receivables and inventories minus account of payable. to measure the WCP (see for example: Aktas et al.,

2015; Baños- Caballero et al., 2013; Kieschnick et al., 2013; Le, 2019).

2. (See for example: Al-Mawsheki et al., 2019; Farhan et al., 2021; Javid & Zita, 2014; Kaddumi & Ramadan, 2012; Mohamad, 2018; Mohamad & Saad, 2010; Nazir & Afza, 2009; Ng et al., 2017; Rozari et al., 2015; Shan et al., 2015; Sudiyatno et al., 2017; Vahid et al., 2012).

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