Working Capital Financing may be a Mediator of Working Capital Level and Profitability of Manufacturing Firms in Uganda

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Abstract

The objective of this study was to assess the mediating effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda. The positivism paradigm was employed as it is rational and objective and is generally characterized by formulation of and testing of hypotheses. The research design used in this study was a pooled panel data analysis of cross sectional and time series data. A total population of 169 manufacturing firms was considered and data was obtained from 38 firms and response rate was 33%. A records survey sheet was used to collect secondary data. Since some firms had missing data, such firms were deleted thereby reducing the response rate to 27%. Stratified and simple random sampling was used on audited financial statements. Results showed that the correlation of working capital financing and profitability was positive though not statistically significant and results also revealed a weak, negative and not statistically significant relationship between working capital financing and working capital level. Results from the regression analyses were assessed by the use of Baron and Kenny (1986) four steps and showed that working capital financing could not mediate the relationship and therefore the null hypothesis was supported. It can be concluded that according to the study working capital financing is not a true mediator of working capital level and firm profitability. Manufacturers should also bear in mind that a well-financed firm nay not necessarily translates into high profits; the management of operations may have to come into play regarding finances.

Keywords: Working Capital, Working Capital Financing, Manufacturing Firms, Conservative Financing Approach, and Aggressive Financing Approach

INTRODUCTION

Working Capital Financing Approaches

Manufacturing firms are a viable part of the Ugandan economy and make up 40% of her total industrial sector. Manufacturing firms are estimated to contribute over 20% of GDP (Uganda Small Scale Industry Association, 2014). Working capital (WC) involves the total resources needed by the firm to finance its daily activities (Nkwankwo & Osho, 2010) and therefore meaningful financing decisions, require assets to be divided into non – current assets, permanent current assets and fluctuating current assets.

The sector is dominated by multinational firms and the existence of these multinational firms is largely attributed to the government of Uganda's privatization program. This sector is currently with a lot of problems that have hindered its growth which include, power supply, increase in overhead costs for production activities, competitive imports and increased level of poverty which affect the purchasing power of local market. In an

effort to determine whether there existed differences in working capital financing (WCF) among firms, Weinraub and Visscher (1998) developed a concept of aggressive, conservative and moderate approaches to financing.

The conservative financing approach is a technique by which the firm opts to use more of long-term finance sources and less from short-term sources for its WC. When it chooses to adopt a conservative policy, it is just a trivial part of the circulating current assets (CA), which is funded by the short-term financial sources. Al – mawalla (2012) established that a conservative policy contains a notable influence on the firms' value and profitability. In contrast, the aggressive financing strategy is where a firm primarily finances the circulating CA and majority of its permanent CA using short term financing and a small part of its permanent CA are financed by long term financing (Meszek & Polewski, 2006). Such a firm that adopts the use of short-term financial sources more than long-term financial sources will suffer a low cost against a high risk of cash and inventory shortage. Between the conservative and aggressive WC financing strategies lies what is termed as moderate financing strategy. It is termed moderate because those who adopt it use long term source to finance permanent current assets and short term source to finance fluctuating CA.

Theoretical Foundation

A theoretical frame work avails the base for conducting the study and interpreting the results (Turner et al., 2013). Working Capital Financing is based on the Net Trade Cycle (NTC) Theory which theory was initiated by Shin and Soenen (1998). This theory is presented in percentages in relation to the turn over and shows sales period the firm has to finance which improves financial management of a firm. The study was anchored on this theory because it is relevant to the study in that it depicts sales period to be financed in relation to firm size and takes into consideration short term assets. Weinraub and Visscher, (1998) argue that finance approach of a firm is of fundamental importance and has an effect on profitability and liquidity.

Empirical Literature Review

A relationship between conservative and aggressive WC financing strategies was examined by Afza and Nazir, (2007) on 17 industrial groups with 263 as sample on public companies quoted on Karachi Stock Exchange (KSE). They used cross sectional data for a six-year period (1998 – 2003) in conjunction with ANOVA and Least Significant Difference (LSD) tests. Their findings were that, a significant difference existed between WC investment and WC financing. The rank order correlation confirmed that differences were stable for the six years. Finally, OLS analysis revealed a negative association between profitability of firms and the extent of assertiveness and strategies regarding investment and financing of working capital.

According to Moyer et al., (2003), working capital comprises 50 - 60 % in retailing and whole sale industries which is a large portion of firms and the 40% is considered to be in manufacturing. As a strategy, the firms could increase funds for expansion by downsizing financing costs. They also discovered that cash levels are of paramount importance to the liquidity position of a firm and this helps the firm out of financial commitments and saves it from bankruptcy.

Mediating effect of Working Capital financing approaches on the relationship between Working Capital Level and Profitability

Mediation occurs when an effect on a variable is through another variable (the mediator). According to Baron and Kenny (1986), for mediation to take place; (1) the predictor variable should significantly affect the outcome variable, (2) the outcome variable should significantly affect the mediating variable and (3) the mediator should significantly influence the outcome variable. The variations in the predictor variable significantly explain the variations in the mediator variable whose variations in turn should significantly explain changes in the outcome variable (Jose, 2013).

To examine the mediating effect of working capital financing approaches on the relationship between WCL (measured using Cash position ration) and profitability, the author adopted Baron and Kenny (1986) four steps of mediation and examined the mediating effect of working capital financing on the relationship of WCL and firm profitability as follows;

Step II: WCF_{it} =
$$\beta_0 + \beta_1$$
WCL_{it} + \mathcal{E}_{it} (3)

The second step of the mediating analysis was carried out to evaluate the association between working capital financing the intervening variable as the outcome variable and working capital level as the predictor variable. These two are regressed against each other, leaving out firm profitability which stands as the outcome variable in the study. Working capital financing is regressed on WCL and therefore working capital financing is the outcome variable while WCL is the predictor variable. If no relationship exists between predictor variable and mediator then, relationship between working capital level and profitability cannot be mediated. The regression of the mediator on the predictor should be significant

Step IV:
$$P_{it} = \beta_0 + \beta_1 WCL_{it} + \beta_2 WCF_{it} + \mathcal{E}_{it}$$
(5)

The fourth step is the final in assessment of the mediation effect on the relationship between working capital level (measured using CPR) and firm profitability. Where firm profitability and WCL are defined in step I and step II, the model confirms that the mediator is a significant predictor of the outcome variable while controlling for the independent variable. This entailed a multiple regression analysis with working capital level, working capital financing and profitability.

METHODOLOGY

The methodology employed in the study lays emphasis on research design, study population, sample size and sampling technique, reliability and validity together with diagnostic tests. The study employed a pooled panel data analysis of cross sectional and time series approach. Cross sectional studies have been found to be robust in relationship studies given their ability to capture the characteristics of a population in their free occurrence (O' Sullivan & Abela, 2007). Time series referred to the five-year period of the study and the descriptive aspect was used to discover the relationship between working capital level, working capital financing and profitability.

Descriptive Statistics

Descriptive statistics help to describe relevant aspects of a phenomenon by showing the average, standard deviation, minimum and maximum values of the variables of interest.

Table 1: Working Capital Financing Dimensions – Units Ug Shs (000,000)

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WCF Dimensions	N	Minimum	Maximum	Mean	SD
Total Assets (TA)	89	920	435,840	59,593	85,672
Total Current	89	217	116,377	14,463	18,656
Liabilities (TCL)					

The results in Table 1 are presented in UG Shs and showed that TA had a mean of 59.6b with a minimum of 920m, a maximum of 435.8b together with a SD of 85.7b. The values for total Assets suggest that manufacturing firms invest heavily in assets especially the productive machinery. The minimum value is a reflection that all manufacturing firms in Uganda have injected much in the business. The Total Current Liabilities had a mean of 14.5b with a minimum of 217m, a maximum of 116.4b and a SD of 18.7b. The results show that all manufacturing firms in Uganda use TCL as a source of finance but when the figures are compared to the total assets, it can be concluded that some firms get external financing as well.

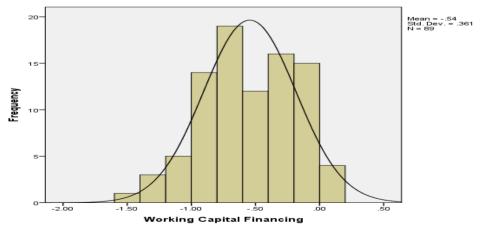


Figure 1: Testing for Normality on Working Capital Financing Approaches after Data Transformation

Figure 1 demonstrates the superimposed curve with most of the data falling under the bell – shaped curve. The highest scores in the middle with low scores at the end implying that Working Capital Financing was fairly normally distributed. After data transformation, WCF depicted the normality function to some degree and this was further confirmed by Table 2 with a statistic close to one and a p- value of .589 which is higher than .05.

Table 2: Tests of Normality of the Study Variables using Shapiro – Wilk test after Data Transformation

Variables	Shapiro-Wilk			
	Statistic	df	Sig.	
Cash Position Ratio	.966	89	.205	
Days Sales Outstanding	.868	89	.450	
Days Inventory Outstanding	.819	89	.102	
Working Capital Financing	.965	89	.589	
Return on Assets	.976	89	.105	

Correlation Analysis

To investigate the relationship between the study variables, Pearson correlation coefficient was used. The linear association of the two scale variables is measured by Pearson correlation coefficient (Field, 2009). The direction and strength of the relationship among the study variables of manufacturing firms in Uganda which were WCF, DIO, DSO, CPR, Firm Size and profitability (ROA) was revealed by the correlation analysis.

Table 3: Pearson Product-Moment Correlations between Return on Assets, Firm Size, Working capital financing, Cash Position Ratio, Days Sales Outstanding (DSO) and Days Inventory Outstanding (DIO)

Scale	1	2	3	4	5	6
1. Return on Assets	1	.143	.030	087		390**
2. Working Capital Financing		1	343**	.108	.083	437**
3. Cash Position Ratio			1	070	.117	.043
4. Days Sales Outstanding				1	$.234^{*}$.311**
5. Days Inventory Outstanding					1	.099
6. Firm Size						1

^{**.} Correlation is significant at the 0.01 level (2-tailed).

The study revealed that the correlation between the log transformed ROA (profitability) and WCF is positive, weak though non – statistically significant (r = .143, p > .01) as shown in Table 3 suggesting that as WCF increases, profitability increases in the same direction.

Regression Analysis

The objective of the study was to assess the mediating effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda. The study predicted that working capital financing approaches has no statistically significant intervening effect on the relationship between working capital level and profitability of manufacturing firms in Uganda. Multiple regression analysis was used to assess the relationship and the following hypothesis was tested.

^{*.} Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 1: The intervening effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda is not significant.

The method of Baron and Kenny (1986) was applied to assess the intervening effect of WCF on the relationship between WCL and Profitability. In order to test intervening effect, first there is need to predict the outcome of the outcome variable (profitability) from the predictor variables (WCL), ignoring the mediator (step 1). Generally, the model should be significant (p < .05). Secondly regression analysis between WCL (measured using CPR) and mediator (WCF) ignoring the dependent variable is performed and the model should be statistically significant. In step 3, regression analysis was performed between outcome variable and mediator (WCF) ignoring the predictor variable. The fourth step of the intervention analysis was performed to assess the relationship between ROA (dependent variable), WCF (intervening variable) and CPR (independent variable). Cash position ratio represented the WCL in mediation as DSO and DIO focus on the level of cash.

Table 4: Model Goodness of fit with Return on Assets as dependent variable and Working Capital Level (CPR) as predictor

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate				
1	$.030^{a}$.001	011	.03685				
a. Predictor	a. Predictors: (Constant), Cash Position Ratio							

In step 1 of the mediation model, regression analysis was performed to assess the association between Profitability (ROA) and WCL (measured using CPR) ignoring the mediator (WCF). The model was not statistically significant (p-value >.05) as shown in Table 5. The regression model produced R^2 = .001, F (1, 87) = .079, p > .05. The model reveals a weak non-statistically significant relationship between working capital level (CPR) and profitability of manufacturing firms in Uganda. Working Capital Level accounted for only 0.1% of the variance in profitability. This implies WCL is not a significant predictor of profitability.

Table 5: Model Overall Significance with Return on Assets as dependent variable and Working Capital Level as predictor

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Mod	del	Sum of Squares	df	Mean Square	F	Sig.
	Regression	.000	1	.000	.079	.779 ^b
1	Residual	.118	87	.001		
	Total	.118	88			

a. Dependent Variable: Return on Assets

The analysis from the model had F value of .079 at p > .05, the findings were not sufficient to support the influence of WCL on profitability implying that WCL is not a significant predictor of profitability.

Table 6: Regression coefficients with Returns on Assets as dependent variable and Cash Position Ratio

Model		Unstandardize	d Coefficients	T	Sig.
		В	Std. Error		
1	(Constant)	.060	.007	8.469	.000
1	Cash Position Ratio	.001	.004	.281	.779

b. Predictors: (Constant), Cash Position Ratio

The study findings indicate CPR is not a significant predicator of profitability as shown in Table 6. The regression coefficient (β) value of CPR was .001 and significance level (p-value) of .779. In modelling for the effect of WCL on Profitability, the equation below was used:

$$P_{it} = \beta_0 + \beta_1 CPR_{it} + \epsilon_{it}$$

$$P_{it} = .060 + .001CPR + \epsilon_{it}$$

In step 2 of the mediation model, multiple regression was made to check the association between WCL (independent variable) and the intervening variable (WCF) excluding the outcome variable.

Table 7: Model of Goodness of fit with Working Capital Financing as dependent variable and Working Capital Level (CPR) as predictor

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate				
1	.343ª	.118	.107	.34151				
a. Predicto	a. Predictors: (Constant), Cash Position Ratio							

The regression model produced $R^2 = .118$, F(1, 87) = 11.585, p < .05. The model reveals a statistically significant relationship between working capital financing (mediator) and WCL (independent variable). This is an indication that CPR is a significant predictor of WCF. Cash Position Ratio accounted for only 11.8% of the variance in WCF. Research findings reveal that the strength of the relationship between CPR and WCF was statistically significant (p < .05).

Table 8: Model of Overall Significance with Working Capital Financing as dependent variable and CPR as predictor

Mod	lel	Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.351	1	1.351	11.585	.001 ^b
1	Residual	10.147	87	.117		
	Total	11.498	88			

a. Dependent Variable: Working Capital Financing

The analysis from the model had F value of 11.585, a p < .05 and as such the findings were sufficient to support the influence of CPR on WCF implying that CPR is a significant predictor of WCF as shown in Table 8.

Table 9: Regression coefficients with Working Capital Financing as dependent variable and Working Capital Level as predictor

Model		Unstandardized	Unstandardized Coefficients		Sig.
		В	Std. Error		
1	(Constant)	732	.066	-11.108	.000
1	Cash Position Ratio	141	.041	-3.404	.001

Dependent Variable: Working Capital Financing

The regression coefficient (β) value of CPR was -0.141 (p-value<.05). In modelling for the effect of CPR on WCF the equation below was used:

WCF_{it} =
$$\beta_0 + \beta_1 \text{CPR}_{it} + \varepsilon_{it}$$

WCF_{it} = $-.732 - 0.141 \text{CPR}_{it} + \varepsilon_{it}$

In step 3 of the mediation model, the simple regression was performed to assess the association between WCF (intervening variable) and ROA (Profitability).

b. Predictors: (Constant), Cash Position Ratio

Table 10: Model Goodness of fit with Profitability (ROA) as dependent variable

and Working Capital Financing as predictor

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1Working Capital Financing	.143ª	.021	.009	.03649

The regression model produced $R^2 = .021$, F(1, 87) = 1.827, p > .05. The model reveals a weak non-statistically significant relationship between working capital financing (WCF) and ROA (profitability) of manufacturing firms in Uganda. This is shown in Table 10 and Working Capital Level accounted for only 2.1% of the variance in profitability.

Table 11: Model Overall Significance with Return on Assets as dependent variable and Working Capital Financing as predictor

Mode	el	Sum of Squares	df	Mean Square	F	Sig.
	Regression	.002	1	.002	1.827	.180 ^b
1	Residual	.116	87	.001		
	Total	.118	88			

a. Dependent Variable: Return on Assets

The analysis from the model had F value of 1.827, a p > .05, the findings were not sufficient to support the influence of WCF on profitability implying that WCF is not a significant predictor of Profitability.

Table 12: Model Regression coefficient with Return on Assets as dependent variable and Working Capital Financing as predictor

Model		Unstandardize	Unstandardized Coefficients		
		В	Std. Error		
	(Constant)	.066	.007	9.469	.000
1	Working Capital Financing	.015	.011	1.352	.180

a. Dependent Variable: Return on Assets

The study findings indicate that WCF is not a significant predictor of Profitability. The regression coefficient (β) value of WCF was .015 and the strength of the relationship between WCF and ROA was not statistically significant (p > .05). In modelling for the effect of WCF on Profitability the equation below was used:

$$P_{it} = \beta_0 + \beta_1 WCF_{it} + \varepsilon_{it}$$

 $P_{it} = .066 + .015WCF_{it} + \epsilon_{it}$

The fourth step of the intervention analysis was performed to assess the relationship between ROA (dependent variable), WCF (intervening variable) and working capital level (CPR). The model reveals a non-statistically significant relationship between working capital level, working capital financing (WCF) and ROA (profitability) of manufacturing firms in Uganda. Working Capital Level and WCF jointly accounted for only 2.8% of the variance in ROA as in Table 13.

b. Predictors: (Constant), Working Capital Financing

Table 13: Model Goodness of fit with Profitability (ROA) as dependent variable and Working Capital Level and Working Capital Financing as predictors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.166ª	.028	.005	.03657

a. Predictors: (Constant), Working Capital Financing, Cash Position Ratio

The regression model produced $R^2 = .028$, F(2, 86) = 1.224, p > .05. The model reveals a non – statistically significant relationship among CPR, WCF and ROA (profitability). Working Capital Level together with Working Capital Financing accounted for 2.8% of the profitability. The research findings indicate that CPR and WCF are not significant predictors of Profitability.

Table 14: Model Overall Significance with Return on Assets as dependent variable and Working Capital Level and Working Capital Financing as predictors

Mod	lel	Sum of Squares	df	Mean Square	F	Sig.
	Regression	.003	2	.002	1.224	.299 ^b
1	Residual	.115	86	.001		
	Total	.118	88			

a. Dependent Variable: Return on Assets

The analysis from the model had F value of 1.224, a p > .05, the findings were not sufficient to support the influence of WCL (represented by CPR) together with WCF on profitability implying that WCL and WCF are not significant predictors of profitability.

Table 15: Model Regression coefficient with Return on Assets as dependent variable and Working Capital Level (CPR) and Working Capital Financing as predictors

Pres	100015				
Model		Unstandardized		t	Sig.
		Coefficients			
		В	B Std. Error		
	(Constant)	.073	.011	6.668	.000
1	Cash Position Ratio	.004	.005	.793	.430
	Working Capital Financing	.018	.011	1.539	.127

a. Dependent Variable: Return on Assets

The regression coefficient (β) value of CPR was .004 (p > .05). The regression coefficient (β) value of WCF was .018 (p > .05). In modelling, for the effect of working capital level (CPR) and WCF on Profitability, the equation below was used:

$$P_{it} = \beta_0 + \beta_1 CPR_{it} + \beta_2 WCF_{it} + \varepsilon_{it}$$

$$P_{it} = .073 + .004CPR_{it} + .018WCF_{it} + \epsilon_{it}$$

Intervention occurs if independent variable (WCL) predicts ROA and the model (model 1) is statistically significant, WCL predicts WCF and the model (model 2) is statistically significant, WCF predicts ROA and the model (model 3) is statistically significant and the joint effect of WCL and WCF on ROA is statistically not significant (model 4). It was hypothesized that there was no intervening effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda and therefore the null hypothesis $(\rm H_2)$ was supported.

b. Predictors: (Constant), Working Capital Financing, Cash Position Ratio

DISCUSSION

Mediating effect of Working Capital financing approaches on the relationship between Working Capital Level and Profitability

The specific objective of the study was to assess the effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda. It was hypothesized that mediating effect of working capital financing approaches on the relationship between working capital level and profitability was not significant.

Under the regression analysis, the study set out to determine the mediating effect of WCF on the relationship between WCL and firm profitability and this was approached statistically. Mediation occurs when an effect on a variable is through another variable (mediator) Baron & Kenny (1986). For mediation to take place three conditions must be met thus; (1) the independent variable must significantly affect the dependent variable, (2) the dependent variable also significantly affects the mediating variable and (3) the mediator should have a significant effect on the independent variable. None of the conditions was met as the current study exhibited insignificant relationships. The first step in mediation involved regressing profitability on working capital level and the constructs of WCL were cash level, accounts receivable level and inventory level. The first condition of mediation was not met as WCL and profitability were not statistically significant.

The second step of mediation was regressing WCF on to WCL and this had results that were statistically significant and thus condition two was met. According to Weinraub and Visscher (1998), the approach of finance of a firm is crucial and has an effect on profitability. And this is consistent with the current study which states that WCF has a positive relationship though not statistically significant.

Basically, three approaches exist for working capital financing. They are as follows; the conservative financing approach is a technique by which the firm decides to use more of long term source of finance and less of short term means finance to finance its working capital. This is an extreme method of financing working capital. This approach commits a higher percentage of capital in liquid assets as opposed to productive assets (Al – Shubiri, 2011). This decision means that the firm's finance is going to suffer a high interest (that is foregoing low cost finance); this will create an adverse effect on the firm's profit despite the avoidance of liquidity problems. The firm will primarily fund all its permanent current assets and most of its fluctuating current assets using long-term source of finance. When it chooses to adopt a conservative policy, it is only a small percentage of its fluctuating CA that is financed by short-term source of finance. The Ugandan manufacturing firms are discouraged from obtaining long term finance because of the high interest rates and as a result the conservative strategy may not be appropriate. The results are not consistent with Al - mawalla (2012) who discovered that a conservative policy had a positive effect on the profitability and value of the company.

In contrast, the aggressive financing strategy is where a firm primarily finances all its fluctuating CA and most of its permanent CA using short term source of finance and only a small proportion of its permanent CA are financed by long term source of finance. Aggressive WCF strategy can enhance firm performance without affecting

performance negatively (Panda & Nanda, 2017). Such a firm that adopts the use of short term finance more than long term source of finance, will incur less cost but against a high risk of cash and inventory shortage. Between the conservative and aggressive WC financing strategies lies what is termed as moderate strategy. It is termed moderate because those who adopt it use long term source to finance permanent current assets and short term source to finance fluctuating CA. The approach opted for to finance WC by a firm is therefore very important since it will have an impact on its profitability and liquidity (Weinraub & Visscher, 1998), this is not consistent with the current study. The financing approach used in the manufacturing firms in Uganda is dependent on the policies of a particular firm.

Step three involved regressing profitability on working capital financing. Working capital financing was the independent variable and profitability the dependent variable and findings from the study indicated a non - significant relationship. This implies that any change in WCF, there would be a small or no change in profitability. The fourth step in assessing the mediation effect on the relationship between WCL and profitability entailed a multiple regression analysis with WCL, WCF and profitability and the relationship was not significant. Since all the four steps of Baron and Kenny (1986) were not upheld, then WCF was not a mediating variable of the relationship between WCL and profitability. The objective was to assess the mediating effect of working capital financing approaches on the relationship between working capital level and firm profitability of manufacturing firms in Uganda. The null hypothesis was that the intervening effect of working capital financing approaches on the relationship between working capital level and profitability of manufacturing firms in Uganda is not significant. The null hypothesis (H₁) was therefore supported.

CONCLUSION AND RECOMMENDATION

It can be concluded that according to the study working capital financing is not a true mediator of working capital level and firm profitability. Manufacturers should also bear in mind that a well-financed firm nay not necessarily translates into high profits, the management of operations may have to come into play regarding finances. It is recommended that researchers examine the relevancy of working capital financing and its influence on firm profitability in other developing countries.

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