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Working capital management and profitability of listed manufacturing companies in selected African countries

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ABSTRACT

There is a need for manufacturing companies to monitor their working capital for the purpose of ensuring continuity. This study examined the effect of working capital management on the profitability of listed manufacturing companies in selected African countries from 2014 to 2019. The selected countries are Botswana, Ghana, Kenya, Nigeria, South Africa and Zambia. The criteria for selecting these countries were that they must have a functional stock exchange and be a member of the Commonwealth of nations for the sample period. The data were extracted from the respective countries' stock exchanges from 2014 to 2019 and were analyzed using descriptive statistics (to compare performance across countries), a panel unit test, and the panel fully modified least squares method. The findings show that net profit ratio (NPR) varies across the countries based on different practices. The study also discovered that the account receivables period and cash conversion cycle have a positive and significant relationship with financial profitability. Account payment period and inventory management have a positive and insignificant relationship with profitability. The study recommends that emphasis should be placed on the components of working capital policy to ensure survival of the company because of its impact on profitability.

Contribution/Originality: To the best of our knowledge, this is the first paper to provide another perspective on how working capital management affects profitability across African Commonwealth members with the use of the panel fully modified least squares method.

1. INTRODUCTION

The difference between current assets and current liabilities is known as working capital. The financial health of any company is based on efficient working capital management (WCM). Working capital that is too high suggests that the current assets are greater than the current obligations, whereas working capital that is too low indicates that current assets are less than current liabilities (Obadiaru, Oloyede, Omankhanlen, & Asaleye, 2018). Effective working capital management entails the appropriate management of current assets and current liabilities, resulting in a healthy firm (Nwankwo & Osho, 2010). The objective of WCM is to ensure that companies are able to meet their operational costs and also have the ability to meet any short-term needs. In this study, the WCM components considered are account collection period, account payment period, inventory management, and cash conversion cycle. These components of working capital are considered because they deal with company policy, for example, if the policy of the company is too vague, the company will keep their money longer (Obadiaru et al.,

2018). A company's policy will affect its profitability and could lead to the company being short of cash. Also, if the company policy is strict, it may have too much stock in the store. The account payment period policy also affects the availability of cash. The is because if a company pays its supplier quickly, the amount of cash available will reduce, but if the company decides to delay the payment for longer than the suppliers' requirement, the supplier can decide to stop supplying the company, which may lead to a shortage of goods. The policies on account collection period, account payment period, inventory management and cash conversion cycle are all interconnected, and they can all have an effect on a company' profitability.

Profitability is an essential part of an organization's financial risk management since it allows them to quantify the outcomes of their policies and operations in monetary terms. Profitability deals with the return that the company gets from the sale of goods after considering cost of sales and expenses. The necessity to measure an organization's overall financial health has raised the demand for profitability analysis (Mcguire, Sundregen, & Schneeweis, 2017). Also, the high unemployment rate and the low output of the manufacturing sector in developing economies, especially African economies, have raised concerns among policy makers and scholars (Asaleye, Alege, Lawal, Popoola, & Ogundipe, 2020).

In view of this, the objective of this study is to examine the effect of account collection period, account payment period, inventory management and cash conversion cycle on the profitability of listed firms in selected African countries. The study uses leverage, asset turnover, gross domestic product growth and interest rate as control variables, as it contains both management variables and macroeconomic variables.

After the introductory section, Section 2 presents a review of the literature, Section 3 presents the model specification, Section 4 discusses the results, and Section 5 concludes the study.

2. LITERATURE REVIEW

The literature review covers the definitions of the concepts used in this study. Firstly, *accounts receivable management* is defined as the efficacy of a company's credit rules and can have a big impact on how well the company performs overall. Receivables, according to Machiraju (2001), come from the supply of products or the execution of services on credit. They are claims against others for future payment of money, commodities, or services, the value of which is determined by the volume of credit sales and the credit collection procedure. *Accounts payable management* is trade credit and is a haphazard, impromptu source of funding. It does not need any discussions in order to reach an agreement, and it is free of the limits that are typically associated with negotiated sources of money. Credit terms, according to Ngaba (1990), are the conditions under which a school enables students to be in fee arrears. *Inventory management* deals with a firm's worth. To increase a firm's worth, inventory management should be used (Shapiro, 2010). As a result, while drawing up an inventory policy, a company should consider costs, returns, and risks. For many businesses, inventories are a big investment. Normally, the manager would not be in charge of inventory management alone. Instead, other functional divisions will frequently share inventory decision-making responsibility (Arisukwu, Olaosebikan, Asaleye, & Asamu, 2019; Shapiro, 2010). The *cash conversion cycle* is used to assess the liquidity of a firm and is useful because it creates a time dimension measure since it combines both the statements of financial position and income. A shorter cash conversion cycle is better because it indicates that a firm is managing its cashflow effectively (Inegbedion, Sunday, Asaleye, Lawal, & Adebanji, 2020; Ukaegbu, 2014).

Different theories explain the connection among the concepts. Operating cycle theory and agency theory are reviewed in this study because they focus on the components of WCM in relation to profitability. Individuals who own a firm, and everyone else who has an interest in it, such as managers, banks, creditors, family members, and workers, are all covered by agency theory. According to the agency theory, the day-to-day operations of a business are carried out by managers who have been hired as agents by the owners, who are also shareholders. The operating cycle theory is one of the most significant ideas in working capital management. One of the metrics of working capital management efficiency is the operating cycle. It considers the receivables and inventory that are

part of working capital. Traditionally, the cycle starts with the receipt of raw materials and ends with the collection of receivables from debtors of stock sales made using those raw materials.

Empirically, Altaf and Shah (2017) studied working capital management, firm performance and financial constraints. The authors studied 437 firms using the two-step generalized method of moments (GMM) and they established that there is a positive correlation between cash management, firm performance and financial constraints. However, the study did not consider other factors such as contingency, cash conversion circle and account receivables that could affect firm performance and financial constraints. Kiptoo, Kariuki, and Maina (2017) examined the trend in working capital management practices and financial performance of tea processing firms in Kenya. The study used a cross-sectional descriptive research design to examine 54 tea processing firms and showed a positive correlation between the account payable and financial performance. The study only looked at one country, so firms in other countries might be affected by different factors. Such factors may include government policies and the availability of resources, among others. In addition, Oner (2016)studied the relationship between working capital management and firms' profitability. The study used a sample of 110 firms which were analyzed with the use of correlation and regression. The study revealed a negative correlation between the cash conversion cycle and firm profitability and a positive correlation between the account payment period and firm performance. However, the study did not consider other variables of working capital management, such as inventory management and inventory holding period, which have a significant influence on firm profitability.

Yahaya and Bala (2015) investigated the role of working capital management on the financial performance of deposit money banks in Nigeria. The investigation looked at six deposit money banks with the aid of OLS regression. The results revealed a positive correlation between cash receivable and the performance of deposit money banks.Ukaegbu (2014) examined the significance of working capital management in determining firm profitability in developing economies in Africa. The study considered four African countries by adopting a quantitative approach using balanced data from 2005 to 2009. The findings revealed a strong negative relationship between profitability and cash conversion cycle across different industrialization typologies. From the foregoing, investigating the long-run implications of working capital management on profitability is ongoing, especially in developing economies. In view of this, we use the fully modified least squares (FMOLS)method to investigate the impact of working capital on profitability in selected African countries. This is necessary given the steady increase in the unemployment rate and the low output rate in the region (Oloni, Asaleye, Abiodun, & Adeyemi, 2017; Popoola, Alege, Gershon, & Asaleye, 2019).

3. METHODOLOGY

This study employed a quantitative research design to investigate the effect of working capital management on the profitability of listed manufacturing companies in selected African countries that are members of the Commonwealth. The reason for considering Commonwealth countries is because they get support from international bodies to help strengthen governance, build inclusive institutions, and promote human rights. For the purpose of ensuring uniformity in the classification of consumer goods across the selected African countries, the classification based on African financial (2022) was used. The classifications are food and beverages, health services, transport, support services, printing and publishing. The sample size for the study consists only of quoted manufacturing firms that have been listed since 2014 that are still in existence and whose financial reports are accessible for the sample period (2014–2019). Table 1 presents the population and sample size selected for the study.

Table 1. Population and selected companies.

Selected country	Total quoted as manufacturing companies	Total selected companies	Percentage
Botswana	14.0	10.0	71.4
Ghana	16.0	13.0	81.3
Kenya	40.0	21.0	52.5
Nigeria	83.0	53.0	63.9
South Africa	50.0	26.0	52.0
Zambia	18.0	10.0	55.6

The mathematical functions of the models for this study are formulated in Equation 1:

$$NPR_{it} = f(WCM_{it}, LEV_{it}, ATAN_{it}, GDP_{it}, INT_{it}) \quad (1)$$

The model expansions of WCM expressed in mathematical function form are then classified into Equations 2 to 5:

$$NPR_{it} = f(ARP_{it}, LEV_{it}, ATAN_{it}, GDP_{it}, INT_{it}) \quad (2)$$

$$NPR_{it} = f(APP_{it}, LEV_{it}, ATAN_{it}, GDP_{it}, INT_{it}) \quad (3)$$

$$NPR_{it} = f(INVM_{it}, LEV_{it}, ATAN_{it}, GDP_{it}, INT_{it}) \quad (4)$$

$$NPR_{it} = f(CCC_{it}, LEV_{it}, ATAN_{it}, GDP_{it}, INT_{it}) \quad (5)$$

Where WCM is proxied by ARP, APP, INVM and CCC. Equations 2 to 5 are estimated using panel fully modified least squares.

NPR_{it}= Net profit margin.

CCC_{it} = Cash conversion cycle.

ARP_{it} = Accounts receivable period.

APP_{it}= Account payment period.

$INVM_{it}$= Inventory management.

LEV_{it}= Leverage.

$ATRN_{it}$= Asset turnover.

GDP_{it}= Gross domestic product

INT_{it}= Interest rate

α = Intercept

β_1–β_6= Slope coefficients

E_{it} = Error term

Table 2. Variable description and measurement.

Variables	Descriptions	Measurement
Net profit ratio (NPR)	Measures how profit or net income is generated as a percentage of revenue	Profit divided by revenue
Accounts receivable period (ARP)	Measures the time it takes for a company to get money from debtors	Debtors divided by revenue
Account payment period (APP)	Measures the period it takes for a company to pay its suppliers	Creditors divided by cost of sales
Inventory management (INVM)	Measures the number of days the company has the inventory on hand	Inventory divided by cost of sales
Cash conversion cycle (CCC)	Measures the number of days for which a company's cash is tied up in inventories and accounts receivable	Operating cycle minus payables outstanding
Leverage (LEV)	This is the process of using part of a company's debt to fund its assets	Total debt divided by total assets
Asset turnover (ATRN)	This measures how effective management is in generating revenue with the assets at hand	Assets divided by revenue
Gross domestic product (GDP)	This is a microeconomic variable that is used to measure a country's value added through the production of goods and services in a specific time period	Log of gross domestic product per individual country
Interest rate (INT)	This is the amount of interest due per period, as a proportion of the amount lent, deposited, or borrowed	Interest rate per individual country

Table 2 presents the data sources and measurements used in this study. However, before the estimation, a preliminary analysis of the descriptive statistics and correlation and unit root tests were carried on the series; this will help in choosing the most appropriate estimation technique (Asaleye et al., 2020) Based on the outcome of the unit root, we proceed to estimate the equation using FMOLS.

4. RESULTS AND DISCUSSION

4.1. Preliminary Results

The highest average performance was recorded in South Africa (19%), while the lowest average performance was recorded in Nigeria (0.23%) (see Table 3). The highest performances recorded in each country are 97.05% in Botswana, 98.04% in Ghana, 87.22% in Kenya, 198.69% in Nigeria, 172.09% in South Africa and 81.11% in Zambia. The lowest performances recorded are-71.29% in Botswana, -81.84% in Ghana, -159.2% in Kenya, -674.08% in Nigeria, -31.56%in South Africa and -12.91% in Zambia.

Table 3. Descriptive statistics result for individual countries.

Countries	NPR Mean	NPR Max	NPR Min
Botswana	0.065	0.971	-0.713
Ghana	0.019	0.980	-0.818
Kenya	0.013	0.872	-1.59
Nigeria	0.0023	1.99	-6.74
South Africa	0.190	1.72	-0.316
Zambia	0.072	0.811	-0.129

The panel unit root test results for the six individual countries are presented in Table 4. The null hypothesis is there to test for the presence of unit root in the series; this hypothesis is validated using two approaches, namely the LLC(Levin, Lin, & Chu, 2002)unit root test and the Breitung unit root test. These tests were carried out using the 5% significance level.

Evidence from Table 4 shows that all variables are integrated of order one using the 5% significance level. In Botswana, using the LLC unit root test, the variables ARP, GDP, INVM and NPR are stationary at the level form, and using the Breitung unit root, ATRN is stationary at the level form. However, all variables became stationary at the first differencing form from both unit root tests. In Ghana, the Breitungtest shows that APP and ATRN are stationary at the level form, while the LLC test shows that ARP, CCC, GDP, INT, INVM, LEV and NPR are stationary at the level form. Both the LLC and Breitung tests indicate that all the variables are stationary at order one in Ghana. Likewise, in Kenya, all series are stationary using the LLC test, while none is stationary at the level form using the Breitung test. But all series are stationary at the first differencing form from both unit root tests. In Nigeria, all the series are stationary at the level form using the LLC test, while APP, ATRN, CCC, GDP, INT and INVM are stationary at the 10%significance level using the Breitung test. In South Africa, all variables are stationary at the level form using the LLC test, while INT is stationary at level using the Breitung test. But all are stationary from both unit root tests in the first differencing form. In Zambia, all variables are stationary at the level form using LLC, while GDP, INT and NPR are stationary at the 10% significance level when using the Breitung test. However, all series became stationary at first difference.

Since all the series used in this study are integrated of order one, and the cointegration results presented in the Appendix show the presence of cointegrating vectors in all the models, this study can proceed to estimate the long behavior of the model using panel fully modified least squares (FMOLS).

The results of the correlation analysis, which measures the strength of the relationship between the dependent variable and the independent variables for each of the six countries, are presented in Table 5. The dependent variable is NPR and the independent variables are APP, ARP, ATRN, CCC, GDP, INT, INVM and LEV. The

relationship can be positive or negative and strong or weak. A positive relationship shows same direction movement, while a negative relationship shows movement in a different direction.

Evidence across the six countries shows that there is weak correlation among most of the variables. However, in Botswana, NPR and LEV have a 50% correlation; in Ghana, CCC and APP have a 55% correlation; in Kenya, CCC and ARP have a 53% correlation; in South Africa, APP and ATRN have a 55% correlation and APP and INVM have a 54% correlation; and in Zambia, APP and ARP have a 60% correlation and APP and INVM have a 54% correlation.

Table 6 presents the preliminary results for the aggregate model. The analysis comprises of 689 observations. Firstly, the descriptive statistics results show that INVM has the highest mean value of 6.31 and NPR has the lowest mean value of 0.03 among the series. The variable APP has the highest standard deviation of 8.68 and GDP has the lowest standard deviation of 0.52. The correlation analysis results show a weak correlation in all pairs of variables. However, APP and CCC have a 78% correlation, APP and INVM have a 68% correlation, and INVM and CCC have a 76% correlation. The panel stationarity test, using the unit root test by Levin et al. (2002), shows that INT, INVM, LEV and NPR are stationary in the level form at a 10% significance level. Likewise, APP and ARP are stationary in the level form at a 5% significance level, while ATRN is stationary in the level form at a 5% significance level. The Breitung unit root test shows contrary results at the level form of the series. The variables APP, ARP, ATRN, GDP, INT and LEV are all stationary at a 10% significance level. However, all the series become stationary after first differencing using a 5% significance level. Hence, the all the series for the aggregated model are integrated of order one. Based on the outcome of the unit root test and the presence of cointegrating vectors, the study proceeds to estimate the long-run behavior of the aggregate model using panel fully modified least squares (FMOLS).

Table 4. Unit root test results for individual countries.

Botswana									
LLC	**APP**	**ARP**	**ATRN**	**CCC**	**GDP**	**INT**	**INVM**	**LEV**	**NPR**
Level	-0.64	-3.47[c]	-5.80	-0.90	-18.5[c]	-0.78	-4.63[c]	-4.63[c]	-10.3[c]
First diff.	-7.83[c]	-4.29[c]	-7.24	-5.48[c]	-36.7[c]	-2.42[b]	-7.24[c]	-7.24[c]	-30.8[c]
BRG									
Level	-2.08[c]	0.15	-5.13[c]	0.01	0.46	-0.30	1.67	1.67	-0.04
First diff.	-3.23	-2.43	-7.95	-3.67	-2.51	-2.51	3.67	3.67	-2.12
Ghana									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-2.98	-15.9[c]	-3.36	-16.3[c]	-30.7[c]	-1.15	-7.83[c]	-20.2[c]	-10.6
First diff.	-16.6[c]	-18.4[c]	-14.4[c]	-32.2[c]	-19.0[c]	-16.4[c]	-23.1[c]	-26.4[c]	-25.4[c]
BRG									
Level	1.65	1.19	1.90	-0.01	0.65	-0.45	-0.02	0.26	1.69
First diff.	0.97[b]	3.22[b]	-2.63[b]	-0.38[b]	-2.73[c]	2.77[b]	2.32[b]	3.13[b]	3.35[b]
Kenya									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-6.85[c]	-4.24[c]	-24.4[c]	-14.1[c]	-17.2[c]	-30.1[c]	-13.0[c]	-28.2[c]	-12.1[c]
First diff.	-11.2[c]	-10.9[c]	-46.1[c]	-18.0[c]	18.3[c]	-32.6[c]	-15.8[c]	-227.9c	-16.0[c]
BRG									
Level	1.87	3.59	0.30	1.38	1.30	-4.88	-0.72	1.46	2.15
First diff.	2.97[b]	10.7[c]	-3.25[b]	2.27[b]	12.7[c]	-18.7[c]	-2.54[b]	-2.07[b]	4.25[b]
Nigeria									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-23.7	-30.1	-24.8[c]	-17.5[c]	7.77	-20.0	-24.2	-14.5	-20.1
First diff.	-46.4[c]	-21.9[c]	-25.2[c]	-78.2[c]	-81.3[c]	-40.1	-67.1[c]	-22.3	-5.69
BRG									
Level	3.47	1.95	3.29	2.61	7.18	-5.07	3.00	1.50	1.13
First diff.	5.523	6.36	5.19	2.139	-13.1	-7.79	4.29	4.86	5.22
South Africa									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-24.7	-8.91[c]	-6.96[c]	-10.0[c]	-6.83	-5.32	-17.0	-3.88	-7.32
First diff.	-24.3	-11.9	-11.1	-14.0[c]	-10.3	-7.56	-16.2[c]	-123[c]	-9.45
BRG									
Level	-0.666	1.48	1.71	0.49	-1.66	-2.36	0.03	2.18	0.22
First diff.	3.55	-2.73	-4.52	2.93	3.24	3.11	2.53	-1.52	2.14
Zambia									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-6.37	-9.03	-9.94	-13.0[c]	-8.68	-3.48	-7.12	-7.00	-21.2

First diff.	-10.8	-29.2	-21.8[c]	-15.9[c]	-9.50	-27.1	-10.6	-31.8	-39.1
BRG									
Level	1.77	0.12	0.24	1.49	-1.90	-1.70	0.07	1.39	-1.99
First diff.	3.28	2.70	2.67	-2.27	2.55	-4.31	2.36	2.68	3.64
LLC represents the Levin et al. (2002)unit root test/null hypothesis: Unit root (Commo unit root process)									
BRG represents the Breitung unit root/null hypothesis: Unit root (Commo unit root process)									

Note: a, b and c indicate significance at10%, 5% and 1%, respectively.

Table 5. Correlation analysis for the individual countries.

Botswana									
Variable	**APP**	**ARP**	**ATRN**	**CCC**	**GDP**	**INT**	**INVM**	**LEV**	**NPR**
APP	1								
ARP	0.11	1							
ATRN	0.02	0.13	1						
CCC	-0.33	0.26	0.09	1					
GDP	-0.17	-0.28	-0.10	0.15	1				
INT	-0.04	-0.23	-0.06	0.02	0.30	1			
INVM	0.23	-0.05	0.06	0.77	0.17	0.08	1		
LEV	-0.15	0.03	0.02	0.22	0.04	0.28	0.14	1	
NPR	-0.24	0.03	0.07	0.33	0.01	0.18	0.19	0.51	1
Ghana									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	0.04	1							
ATRN	-0.13	0.08	1						
CCC	-0.55	0.25	0.16	1					
GDP	-0.09	-0.15	-0.09	0.11	1				
INT	0.11	0.12	0.06	-0.14	-0.92	1			
INVM	0.59	0.01	-0.02	0.03	0.06	-0.07	1		
LEV	-0.23	-0.03	0.05	0.31	-0.06	0.02	0.06	1	
NPR	-0.47	-0.18	0.17	0.58	0.16	-0.14	0.09	0.34	1
Kenya									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	0.46	1							
ATRN	-0.07	0.01	1						
CCC	0.89	0.53	0.03	1					
GDP	0.15	0.19	0.08	0.14	1				
INT	0.05	-0.03	-0.03	0.10	-0.03	1			

INVM	0.98	0.50	-0.03	0.07	0.15	0.08	1		
LEV	-0.06	-0.07	-0.51	-0.06	0.10	0.02	-0.06	1	
NPR	0.10	0.05	-0.28	0.07	-0.25	-0.10	0.09	0.15	1
Nigeria									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	0.49	1							
ATRN	0.02	0.02	1						
CCC	-0.74	0.10	-0.01	1					
GDP	-0.09	-0.03	-0.08	0.08	1				
INT	-0.13	-0.03	-0.05	0.09	0.73	1			
INVM	0.10	0.18	0.01	0.41	-0.02	-0.07	1		
LEV	-0.37	-0.19	0.03	0.36	0.08	-0.01	0.18	1	
NPR	-0.09	-0.40	0.06	-0.15	-0.05	-0.07	-0.05	0.29	1
South Africa									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	-0.18	1							
ATRN	0.55	-0.45	1						
CCC	-0.81	0.41	-0.72	1					
GDP	-0.19	0.07	-0.12	0.14	1				
INT	-0.17	-0.04	-0.14	0.15	0.83	1			
INVM	0.54	-0.07	0.16	-0.23	-0.17	-0.09	1		
LEV	-0.12	0.48	-0.17	0.40	-0.15	-0.23	0.15	1	
NPR	-0.08	0.20	0.07	0.04	0.18	0.18	-0.14	0.27	1
Zambia									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	0.60	1							
ATRN	0.08	0.05	1						
CCC	-0.71	0.13	-0.01	1					
GDP	0.04	0.13	0.05	0.08	1				
INT	-0.12	-0.10	-0.02	0.40	0.06	1			
INVM	0.54	0.21	-0.05	-0.39	0.04	-0.19	1		
LEV	-0.06	0.07	0.07	0.10	-0.07	0.12	0.21	1	
NPR	0.02	-0.07	0.11	-0.08	-0.02	0.04	0.07	0.19	1

Table 6. Presentation of preliminary result for the aggregate model.

Descriptive statistics results									
Variable	**APP**	**ARP**	**ATRN**	**CCC**	**GDP**	**INT**	**INVM**	**LEV**	**NPR**
Mean	4.82	0.35	1.10	2.16	2.22	0.86	6.63	0.41	0.03
Median	0.32	0.15	1.13	0.06	2.58	0.80	0.22	0.45	0.05
Maximum	19.6	29.6	30.4	1344.6	2.74	1.42	3.30	2.69	1.99
Minimum	-3.36	0.00	-178	-781	1.13	0.04	-769.7	-20.1	-6.74
Std. dev.	8.68	1.29	7.64	6.85	0.52	0.27	14.6	0.87	0.50
Obs.	689	689	689	689	689	689	689	689	689
Correlation analysis results									
	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
APP	1								
ARP	0.41	1							
ATRN	0.03	0.10	1						
CCC	0.79	0.47	0.02	1					
GDP	-0.02	0.04	0.08	-0.01	1				
INT	0.01	-0.03	-0.02	0.02	0.13	1			
INVM	0.68	0.44	0.02	0.77	-0.02	0.01	1		
LEV	-0.06	-0.02	0.01	-0.04	0.04	0.09	-0.05	1	
NPR	0.02	-0.12	0.08	0.02	-0.03	-0.06	0.02	0.17	1
Panel unit root test results									
LLC	APP	ARP	ATRN	CCC	GDP	INT	INVM	LEV	NPR
Level	-19.9[b]	-18.3[b]	-25.2[c]	-15.4[a]	-13.6[a]	-12.7[a]	-13.5[a]	-14.1[a]	-13.9[a]
First diff.	-28.1[c]	-22.7[c]	-38.2[c]	-35.0[c]	-33.7[c]	-36.4[c]	-39.4[c]	-17.2[b]	-18.2[c]
BRG									
Level	2.41[a]	2.45[a]	4.01[a]	3.07	9.71[a]	-3.37[a]	2.77	4.64[a]	2.18
First diff.	3.15[c]	8.27[c]	5.56[b]	5.52[b]	10.0[b]	9.28[c]	3.26[c]	6.25[b]	6.11[b]
LLC represents the Levin et al. (2002) unit root test/null hypothesis: Unit root (Commo unit root process)									
BRG represents the Breitung unit root/null hypothesis: Unit root (Commo unit root process)									

Note: a, b and c indicate significance at10%, 5% and 1%, respectively.

4.2. Long-Run Relationship Results

TablesA1 to A6 in the Appendix present the panel fully modified least squares (FMOLS) for the individual countries.

In models 1, 2, 3 and 4 for Botswana, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant, and LEV and ATRN are positively significant; a 1% change in one of the variables will lead to increases of about 0.04% and 0.12% in the dependent variable (NPR). In model 2, APP and LEV are positive and significant, while ATRN, GDP and INT are not significant. Holding other variables constant, a 1% change in any of the variables will lead to increases of about 1.23% and 0.34% in the dependent variable. In model 3, INVM, GDP and INT are not significant, and LEV and ATRN are significant. A 1% change in LEV and ATRN will lead to increases of about 0.04%and 0.34%in the dependent variable. In model 4, CCC, LEV and ATRN are significant, while GDP and INT are not significant. A percentage increase in CCC, LEV and ATRN will lead to respective increases of about 0.82%, 0.04%, and 0.82%in the dependent variable.

In models 1,2,3 and 4 for Kenya, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant, and LEV and ATRN are significant; a 1% change in one of the variables will lead to increases of about 0.3%and 1.01%in the dependent variable (NPR). In model 2, APP and LEV are positive and significant, while INT is significant but negative. ATRN and GDP are not significant. Holding other variables constant, a 1% change in INT will lead to a reduction of about 0.15% in the dependent variable, while a 1% change in APP and LEV will lead to increases of about 0.09% and 0.22% in the dependent variable. In model 3, INVM and GDP are not significant, LEV and INT are significant, while ATRN is significant at the 10% level. A 1% change in LEV,ATRN and INT will lead to increases of about 0.31%, 0.02 and 1.47% in the dependent variable. In model 4, CCC, LEV and INT are significant, while ATRN and INT are not significant. A 1% increase in CCC and LEV will lead to increases of about 0.15%and 0.15%in the dependent variable, while a 1%change in INT will lead to areduction of about 1.12% in the dependent variable.

In models 1,2,3 and 4 for Ghana, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant, while LEV and ATRN are significant; a 1% change in one of the variables will lead to increases of about 0.99%and 0.15%in the dependent variable (NPR). In model 2, APP and LEV are positive and significant, while INT is significant but negative. ATRN and GDP are not significant. Holding other variables constant, a 1% change in INT will lead to a reduction of about 0.47%in the dependent variable, while a 1% change in APP and LEV will lead to increases of about 0.36%and 0.09%in the dependent variable. In model 3, INVM and GDP are not significant, LEV and INT are significant, and ATRN is significant at 10%. A 1% change in LEV,ATRN and INT will lead to respective increases of about 0.35%, 0.71% and 0.09%in the dependent variable. In model 4, CCC and LEV are significant, while ATRN, GDP and INT are not significant. A 1% in CCC and LEV will lead to increases of about 0.38%and 0.7%in the dependent variable.

In models 1, 2, 3 and 4 for Nigeria, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant. LEV and ATRN are positively significant; a 1% change in one of the variables will lead to increases of about 0.09%and 0.16%in the dependent variable (NPR). In model 2, APP and LEV are positive and significant, while ATRN, GDP and INT are not significant. Holding other variables constant, a 1% change in APP and LEV will lead to increase about 0.1%and 0.2%in the dependent variable. In model 3, INVM, GDP and INT are not significant, while LEV and ATRN are significant. A 1% change in LEV and ATRN will lead to increases of about 0.26%and 0.33%in the dependent variable. In model 4, CCC, LEV and ATRN are significant, while GDP and INT are not significant. A 1% increase in CCC, LEV and ATRN will lead to increases of about 0.18%, 0.39% and 0.33%in the dependent variable.

In models 1,2,3 and 4 for South Africa, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant, while LEV and ATRN are significant; a 1% change in one of the variables will lead to increases of about 0.3%and 1.01%in the dependent variable (NPR). In model 2, APP and LEV are positive and significant,

while INT is significant but negative. ATRN and GDP are not significant. Holding other variables constant, a 1% change in INT will lead to a reduction of about 0.41%in the dependent variable, while a 1% change in APP and LEV will lead to increases of about 1.10%and 0.45%in the dependent variable. In model 3, INVM, ATRN and GDP are not significant. LEV and INT are significant. A 1% change in LEV and INT will lead to increases of about 0.47%and 0.67%in the dependent variable. In model 4, CCC, LEV and GDP are significant, while ATRN and INT are not significant. A 1% increase in CCC, LEV and GDP will lead to increases of about 0.41%, 0.33% and 0.74%in the dependent variable, and a 1%change in INT will lead to a reduction of about 1.12% in the dependent variable.

In models 1,2,3 and 4 for Zambia, NPR is used as the dependent variable. In model 1, ARP, GDP and INT are not significant. LEV and ATRN are significant; a 1% change in LEV and ATRN will lead to increases of about 0.06%and 0.31%in the dependent variable (NPR). In model 2, APP and LEV are positive and significant, while INT is significant but negative. ATRN and GDP are not significant. Holding other variables constant, a 1% change in INT will lead to a reduction of about 0.32% in the dependent variable, while a 1% change in APP and LEV will lead to increases of about 0.24%and 0.06%in the dependent variable. In model 3**,** INVM, ATRN and GDP are not significant, while LEV and INT are significant. A 1% change in LEV and INT will lead to increases of about 0.27%and 0.82%in the dependent variable. In model 4, CCC and LEV are significant, while ATRN, GDP and INT are not significant. A 1% increase in CCC and LEV will lead to increases of about 0.05%and 0.31%in the dependent variable.

In all four models (see Appendix A1–A6), the R-squared and adjusted R-squared show that the goodness of fit is more than 50%. The results show that all eight models have a good fit, with more than 50% of the variations in the independent variables being explained by the variation in the dependent variable.

Table 7 presents the aggregate results of the FMOLS. We have four equations as follows, with the inclusion of ARP, which is referred to as model 1; the inclusion of APP is referred to as model 2; the inclusion of INVM is referred to as model 3; and the inclusion of CCC is referred to as model 4. In models 1,2,3 and 4, NPR is used as dependent variable. In model 1, ATRN, GDP and INT are not significant, while ARP and LEV are significant; a 1% change in ARP and LEV will lead to increases of about 0.07%and 0.36%in the dependent variable (NPR). In model 2, LEV and ATRN are positive and significant, while INT is significant but negative. APP and GDP are not significant. Holding other variables constant, a 1% change in INT will lead to a reduction of about 1%in the dependent variable, while a1% change in LEV and ATRN will lead to increases of about 0.37%and 0.98%in the dependent variable. In model 3, INVM, ATRN and INT are not significant, and LEV and GDP are significant. A 1% change in LEV and GDP will lead to increases of about 0.39%and 0.21%in the dependent variable. In model 4, CCC, LEV and INT are significant, while ATRN and GDP are not significant. INT has a negative relationship with the dependent variable. A 1% change in INT will lead to a reduction of about 1.04% in the dependent variable. Likewise, a 1% increase in CCC and LEV will lead to increases of about 1.75%and 0.39%in the dependent variable. In all eight models, the R-squared and adjusted R-squared show that the goodness of fit is more than 50%, with more than 50%of the variations in the independent variables being explained by the variations in the dependent variable.

Table 7. Panel fully modified least squares (FMOLS) for the aggregate countries.

Dependent variable: NPR (Model 1)					**Dependent variable: NPR (Model 2)**				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	0.07[c]	0.02	4.11	0.00	APP	0.00	0.00	0.59	0.56
LEV	0.36[c]	0.06	5.62	0.00	LEV	0.39[c]	0.07	5.69	0.00
ATRN	0.00	0.08	0.58	0.56	ATRN	0.98[c]	0.24	4.04	0.00
GDP	-0.01	0.03	-0.04	0.97	GDP	-0.02	0.03	-0.49	0.63
INT	-0.12	0.09	-1.41	0.16	INT	-1.00[c]	0.07	-14.89	0.00
R-squared: 0.56		S.E. of regression: 0.49			R-squared: 0.67		S.E. of regression: 0.49		
Adjusted R-squared: 0.53		Long-run variance: 0.35			Adjusted R-squared: 0.67		Long-run variance: 0.38		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	9.49E-05	0.00	0.59	0.56	CCC	1.75[c]	0.20	8.80	0.00
LEV	0.39[c]	0.07	5.7	0.00	LEV	0.39[c]	0.07	5.69	0.00
ATRN	0.00	0.00	0.52	0.60	ATRN	0.00	0.00	0.52	0.60
GDP	0.21[c]	0.04	5.07	0.00	GDP	-0.02	0.03	-0.49	0.63
INT	-0.12	0.09	-1.34	0.18	INT	-1.04[c]	0.07	-14.7	0.00
R-squared: 0.67		S.E. of regression: 0.49			R-squared: 0.67		S.E. of regression: 0.49		
Adjusted R-squared: 0.67		Long-run variance: 0.38			Adjusted R-squared: 0.62		Long-run variance: 0.38		

Note: a, b and c indicate significance at 10%, 5%and 1%, respectively.
Coeff= Coefficient, Std. error= Standard error, t-stat= t-statistic, Prob=Probability, NPR=Net profit ratio, ARP=Accounts receivable period, LEV= Leverage, ATRN = Asset turnover, GDP=Gross domestic product, INT=Interest rate.

4.3. Discussion of Findings

In Table 4, the accounts receivable period (ARP) had a t-value of 4.1064 with a coefficient value of 0.0734 and a significance level of 0.0000. This indicates that the variable (ARP) had a positive and significant effect on the financial performance of the manufacturing companies in the selected African countries. Hence, manufacturing companies should increase their accounts receivable period for customers in order to increase its profitability. This will allow the companies to have money to finance its organizational activities, which will lead to an increase in performance. This result is in line with the findings of Kasozi (2017) and Zhang, Shu, and Shuo (2017) but against the findings of Lamptey, Frimpong, and Morrison (2017) and Hassan, Zubair, Hasnain, and Hussain (2017).

Average payment period (APP) had a t-value of 0.589625, a coefficient value of 0.000169 and a p-value of 0.5557. This indicates that the variable does not influence the financial performance of manufacturing companies in the selected African countries. This finding is in line with the findings of Kasozi (2017) and Zhang et al. (2017) but against the findings of Lamptey et al. (2017) and Hassan et al. (2017).

Inventory management (INVM) had a t-value of 0.589812, with a coefficient of 0.0000949 and a p-value of 0.5556, which indicates a positive and insignificant relationship with the financial performance of manufacturing companies in the selected African countries. This result is in line with the findings of Lamptey et al. (2017) and Hassan et al. (2017) but against the findings of Kasozi (2017) and Zhang et al. (2017). This is in line with the apriori expectation.

Cash conversion cycle (CCC) had a t-value of 8.8047, a coefficient of 1.7536 and a p-value of 0.0000. This indicates a positive and significant relationship with financial performance (NPR) of manufacturing companies in the selected African countries, i.e., CCC positively affects the profitability of manufacturing companies.

5. CONCLUSION

According to the findings, various countries have different financial performance practices; account collection period has a positive and significant relationship with profitability, measured by net profit ratio. This implies that as the receivables period increases, the performance increases and, in turn, attracts more customers. But there is a need for firms to manage their receivable period because they need money to continue operating. The account payment period has a positive and insignificant relationship with profitability, measured by net profit ratio. It indicates that as the payment period increases, the profitability also increases. There may be a need to delay payment but not for so long that the supplier stops the supply of goods. Inventory management has a positive and insignificant relationship with profitability, measured by net profit ratio. There is a need to effectively utilize materials for the purpose of improving profitability. Cash conversion cycle has a positive and significant relationship with financial profitability, measured by net profit ratio.

6. RECOMMENDATION

Based on the findings, it is recommended that companies should base their financial performance practices on the relevant policies within their respective countries; there is a need for management to focus on the component of WCM (such as accounts receivable period, account collection period, inventory management and cash conversion cycle) because of their crucial effects on financial performance.

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Appendix 1. Panel fully modified ordinary least squares (FMOLS) for Botswana.

Dependent variable: NPR (Model 1)					Dependent variable: NPR (Model 2)				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	0.04	0.18	0.21	0.84	APP	1.23[c]	0.24	5.12	0.00
LEV	0.04[C]	0.01	3.09	0.00	LEV	0.04c	0.01	2.96	0.00
ATRN	0.12[C]	0.02	4.91	0.00	ATRN	0.00	0.00	0.45	0.66
GDP	0.02	0.08	0.30	0.77	GDP	0.07	0.08	0.84	0.41
INT	0.04	0.13	0.29	0.77	INT	0.03	0.12	0.27	0.79
R-squared: 0.63		S.E. of regression: 0.23			R-squared: 0.69		S.E. of regression: 0.23		
Adjusted R-squared: 6.19		Long-run variance: 0.06			Adjusted R-squared: 0.62		Long-run variance: 0.06		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	0.05	0.07	0.78	0.44	CCC	0.82[c]	0.12	7.72	0.00
LEV	0.04[c]	0.01	3.10	0.00	LEV	0.04[c]	0.01	2.84	0.00
ATRN	0.34[c]	0.10	63.3	0.00	ATRN	0.82[c]	0.11	7.50	0.00
GDP	0.02	0.07	0.28	0.78	GDP	0.02	0.07	0.26	0.80
INT	0.03	0.12	0.23	0.82	INT	0.04	0.12	0.34	0.73
R-squared: 0.67		S.E. of regression: 0.23			R-squared: 0.64		S.E. of regression: 0.23		
Adjusted R-squared: 0.60		Long-run variance: 0.06			Adjusted R-squared: 0.61		Long-run variance: 0.05		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.

Appendix 2. Panel fully modified ordinary least squares (FMOLS) for Ghana.

Dependent variable: NPR (Model 1)					Dependent variable: NPR (Model 2)				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	-0.01	0.11	-0.90	0.37	APP	0.09[c]	0.03	3.63	0.00
LEV	0.30[c]	0.08	3.50	0.00	LEV	0.22[c]	0.08	2.68	0.00
ATRN	1.01[c]	0.47	2.12	0.04	ATRN	0.01	0.01	1.23	0.22
GDP	0.17	0.18	0.98	0.33	GDP	0.12	0.17	0.74	0.46
INT	-0.30	0.24	-1.26	0.21	INT	-0.15[c]	0.03	-5.53	0.00
R-squared: 0.65		S.E. of regression: 0.22			R-squared: 0.63		S.E. of regression: 0.21		
Adjusted R-squared: 0.599990		Long-run variance: 0.052145			Adjusted R-squared: 0.586081		Long-run variance: 0.048055		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	0.04	0.04	1.02	0.31	CCC	0.15[c]	0.03	5.35	0.00
LEV	0.31[c]	0.09	3.44	0.00	LEV	0.15[b]	0.07	2.09	0.04
ATRN	0.02[a]	0.01	1.71	0.09	ATRN	0.00	0.01	0.80	0.43
GDP	0.18	0.19	0.93	0.36	GDP	0.07	0.15	0.47	0.64
INT	1.47[b]	0.63	2.35	0.02	INT	-1.12[b]	0.47	-2.40	0.02
R-squared: 0.79		S.E. of regression: 0.23			R-squared: 0.67		S.E. of regression: 0.20		
Adjusted R-squared: 0.71		Long-run variance: 0.06			Adjusted R-squared: 0.63		Long-run variance: 0.04		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.

Appendix 3. Panel fully modified ordinaryleast squares (FMOLS) for Kenya.

Dependent variable: NPR (Model 1)					Dependent variable: NPR (Model 2)				
Variable	**Coeff.**	**Std. error**	**t-Stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-Stat.**	**Prob.**
ARP	0.01	0.01	0.54	0.59	APP	0.36[c]	0.14	2.65	0.01
LEV	0.99[c]	0.38	2.58	0.01	LEV	0.09[c]	0.02	5.71	0.00
ATRN	0.15[c]	0.03	5.32	0.00	ATRN	0.01	0.04	0.32	0.75
GDP	-0.16	0.21	-0.76	0.45	GDP	-0.08	0.23	-0.34	0.73
INT	0.20	0.43	0.51	0.61	INT	-0.47[c]	0.14	-3.28	0.00
R-squared: 0.63		S.E. of regression: 0.33			R-squared: 0.75		S.E. of regression: 0.33		
Adjusted R-squared: 0.62		Long-run variance: 0.13			Adjusted R-squared: 0.70		Long-run variance: 0.14		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	0.00	0.00	1.07	0.29	CCC	0.38[c]	0.02	14.7	0.00
LEV	0.35[b]	0.13	2.61	0.01	LEV	0.70[c]	0.22	3.23	0.00
ATRN	0.71[a]	0.39	1.81	0.08	ATRN	0.01	0.04	0.28	0.78
GDP	-0.15	0.23	-0.66	0.51	GDP	-0.06	0.24	-0.26	0.79
INT	0.09[c]	0.02	5.73	0.00	INT	0.00	0.48	0.00	1.00
R-squared: 0.65		S.E. of regression: 0.33			R-squared: 0.54		S.E. of regression: 0.33		
Adjusted R-squared: 0.52		Long-run variance: 0.14			Adjusted R-squared: 0.51		Long-run variance: 0.145		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.

Appendix 4. Panel fully modified ordinary least squares (FMOLS) for Nigeria.

Dependent Variable: NPR (Model 1)					Dependent Variable: NPR (Model 2)				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	0.47	0.05	1.27	0.20	APP	0.10[c]	0.02	-5.38	0.00
LEV	0.09[c]	0.07	8.94	0.00	LEV	0.20[b]	0.09	2.11	0.04
ATRN	0.16	0.07	2.36	0.02	ATRN	0.01	0.01	0.75	0.46
GDP	0.00	0.01	0.20	0.84	GDP	0.06	0.09	0.66	0.51
INT	-0.36	0.21	-1.71	0.09	INT	-0.28	0.26	-1.06	0.29
R-squared: 0.66		S.E. of regression: 0.58			R-squared: 0.67		S.E. of regression: 0.61		
Adjusted R-squared: 0.65		Long-run variance: 0.29			Adjusted R-squared: 0.58		Long-run variance: 0.43		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	-0.08	0.09	-0.95	0.34	CCC	0.18[c]	0.04	5.23	0.00
LEV	0.26[c]	0.087	3.054	0.0025	LEV	0.39[c]	0.08	4.45	0.0000
ATRN	0.33[c]	0.02	15.79	0.0000	ATRN	0.33[c]	0.02	16.30	0.0000
GDP	0.06	0.08	0.718	0.47	GDP	-0.017	0.08	-0.21	0.83
INT	-0.28	0.25	-1.12	0.26	INT	-0.14	0.24	-0.57	0.56
R-squared: 0.68		S.E. of regression: 0.60			R-squared: 0.61		S.E. of regression: 0.591030		
Adjusted R-squared: 0.60		Long-run variance: 0.43			Adjusted R-squared: 0.59		Long-run variance: 0.399012		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.

Appendix 5. Panel fully modified ordinary least squares (FMOLS) for South Africa.

Dependent variable: NPR (Model 1)					**Dependent variable: NPR (Model 2)**				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	2.21	1.50	1.47	0.15	APP	1.10[b]	0.50	2.20	0.03
LEV	0.36[b]	0.15	2.46	0.02	LEV	0.45[c]	0.12	3.58	0.00
ATRN	0.47[c]	0.14	3.39	0.00	ATRN	0.07	0.08	0.89	0.38
GDP	-0.47[a]	0.25	-1.88	0.07	GDP	-0.36	0.25	-1.41	0.16
INT	1.33	0.87	1.52	0.14	INT	-0.41[a]	0.23	-1.81	0.08
R-squared: 0.61		S.E. of regression: 0.40			R-squared: 0.67		S.E. of regression: 0.39		
Adjusted R-squared: 0.59		Long-run variance: 0.21			Adjusted R-squared: 0.62		Long-run variance: 0.21		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	-0.33	0.37	-0.90	0.37	CCC	0.41[b]	0.15	2.68	0.01
LEV	0.47[b]	0.23	2.03	0.05	LEV	-0.34[b]	0.16	-2.06	0.05
ATRN	0.08	0.07	1.18	0.24	ATRN	0.06	0.10	0.59	0.56
GDP	-0.35	0.25	-1.43	0.16	GDP	0.74[c]	0.22	3.34	0.00
INT	0.67[c]	0.09	7.64	0.00	INT	1.40	0.90	1.56	0.13
R-squared: 0.73		S.E. of regression: 0.38			R-squared: 0.76		S.E. of regression: 0.39		
Adjusted R-squared: 0.71		Long-run variance: 0.20			Adjusted R-squared: 0.71		Long-run variance: 0.22		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.

Appendix 6. Panel fully modified ordinary least squares (FMOLS) for Zambia.

Dependent variable: NPR (Model 1)					Dependent variable: NPR (Model 2)				
Variable	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**	**Variable**	**Coeff.**	**Std. error**	**t-stat.**	**Prob.**
ARP	-0.01	0.02	-0.81	0.43	APP	0.24[c]	0.04	5.41	0.00
LEV	0.06[b]	0.02	2.41	0.02	LEV	0.06[b]	0.02	2.52	0.01
ATRN	0.31[b]	0.14	2.19	0.03	ATRN	0.00	0.01	0.70	0.49
GDP	-0.00	0.06	-0.06	0.95	GDP	-0.03	0.07	-0.41	0.69
INT	0.02	0.12	0.18	0.86	INT	-0.32[b]	0.14	-2.29	0.03
R-squared: 0.64		S.E. of regression: 0.16			R-squared: 0.73		S.E. of regression: 0.13		
Adjusted R-squared: 0.61		Long-run variance: 0.03			Adjusted R-squared: 0.70		Long-run variance: 0.03		
Dependent variable: NPR (Model 3)					Dependent variable: NPR (Model 4)				
Variable	Coeff.	Std. error	t-stat.	Prob.	Variable	Coeff.	Std. error	t-stat.	Prob.
INVM	0.08	0.12	0.66	0.52	CCC	0.06[b]	0.02	2.39	0.02
LEV	0.27[c]	0.03	10.8	0.00	LEV	0.31[b]	0.14	2.25	0.03
ATRN	0.00	0.01	0.77	0.45	ATRN	0.00	0.01	0.69	0.49
GDP	-0.04	0.07	-0.56	0.58	GDP	-0.03	0.07	-0.44	0.66
INT	0.82[c]	0.09	9.20	0.00	INT	0.11	0.14	0.80	0.43
R-squared: 0.65		S.E. of regression: 0.13			R-squared: 0.63		S.E. of regression: 0.13		
Adjusted R-squared: 0.61		Long-run variance: 0.03			Adjusted R-squared: 0.61		Long-run variance: 0.032344		

Note: a, b and c indicate significance at 10%, 5% and 1%, respectively.