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Accounts payable turnover and firm performance of quoted manufacturing firms in Nigeria

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Abstract
Purpose: The objective of this study is to ascertain the nexus of accounts payable turnover and firm performance of quoted manufacturing firms in Nigeria.
Research methodology: This study adopted an ex-post facto research design. The sample comprised seventy-five non-financial firms quoted on the Nigerian Exchange Group (NGX). The study purposively selected all available non-financial firms during the study period: 2010-2019. This study utilized secondary sources of data, i.e., computed financial ratios from annual financial statements downloaded from the MachameRatios® database. The data were analyzed using multiple regression techniques.
Results: There is a non-significant positive effect of the accounts payable turnover ratio on ROA (p=0.9729) and ROE (p=0.2669); and; a significant negative effect of the accounts payable turnover ratio on Tobin's Q (p=0.0140).
Conlusion: Accounts payable turnover has no significant effect on ROA and ROE but negatively affects Tobin's Q. This highlights its limited impact on accounting returns but notable influence on market value. Strategic management of payables remains essential.
Limitations: The limitation of the study is the failure to account for endogeneity concerns in firm performance studies.
Contribution: The study contributes to the working capital management literature and specifically to the credit management axiom. It also showed a differential effect of APT on various firm performance proxies which have significant implications for managers, e.g., finance officers in corporations that intend to utilize the accounts payable turnover as a strategy to grow the performance of the firm in the short and long term.

Keywords: *Accounts Payable Turnover, Return on Asset, Return on Equity, Tobin's Q*

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1. Introduction

The "short-term debt a corporation owes to its suppliers and creditors" refers to accounts payable. According to the CFI (2023), "it is a liquidity ratio that counts how frequently on average a business settles its debts during an accounting period". Also commonly referred to as payables turnover or creditor's turnover ratio (CFI, 2023). The accounts payable turnover (APT) is an indicator showing the number of 'times a company pays off its accounts payable during a period'. It has remained a dominant and controversial issue in corporate finance and business management literature. According to García-Teruel and Martínez-Solano (2010), companies can utilize accounts payable as a form of internal financing. The APT ratio reveals how efficiently a company pays its immediate suppliers and bills. Nam and Uchida (2019), opined that accounts payable avert a significant reduction in inventory investments.

A high ratio is an indication of a speedy response to payments made to suppliers for credit purchases. The firm may utilize such to meet up with the suppliers' demand or take advantage of early payment discounts. The consequence of such is an improved credit rating for the firm. However, on the other hand, a low ratio shows slower payments to suppliers for credit purchases. This often may be an indication of a declining financial situation or issues with cash flow. This could also be due to favorable credit terms negotiated with suppliers.

In a typical non-financial firm, accounts payable is a vital component of working capital with others such as inventories and accounts receivable (Darun, Roudaki, & Radford, 2015). The management of the accounts payable component is imperative to the realization of the goal of maximizing shareholder wealth for it influences a firm's risk and profitability (Abdeljawad & Dwaikat, 2021; Deloof, 2003; Kieschnick, Laplante, & Moussawi, 2013; Watson & Head, 2010). Accounts payable place a burden on the availability of cash for the running of 'day-to-day business operations' (Sagner, 2010). It is one of the goals of the management to maintain and achieve sustained profitability (Abdeljawad & Dwaikat, 2021). The management must generate sufficient profits at a known risk level and explore avenues for growth and expansion in a bid to maximize shareholders' wealth (Abdeljawad & Dwaikat, 2021; Deloof, 2003). Access to finance is vital to the well-functioning of a business. The accounts payable include trade credit and accrued expenses that provide the needed finance for running the day-to-day operations of the business (Achode & Rotich, 2016). The majority of firms rather prefer cash to credit, however, competitive pressure and market forces have led to trade credits. It is thus inevitable for firms to exist without any form of credit which is in the form of short-term debt owed to its suppliers and creditors. The authors Myers and Majluf (1984) and (Myers, 1984) have argued that firms employ a hierarchy in selecting financing sources, with equity being the least preferred. According to Achode and Rotich (2016), accounts payable are favored over equity concerns because they have lower information costs.

However, a rise in accounts payable will most likely raise the danger of bankruptcy, financial crisis, and agency, in line with the trade-off argument put forward by Kraus and Litzenberger (1973). This may have a detrimental effect on the firm value of the company. Thus, the importance of accounts payable to firm performance has warranted several studies on the need for its proper management in non-financial firms that mainly rely on product sales (Anichebe & Agu, 2013). The management of accounts payable turnover ensures a firm's growth and survival in the long term (Abdeljawad & Dwaikat, 2021).

The non-financial sector is vital to the growth and development of the Nigerian economy. According to Ajayi (2007), non-financial firms account for a significant proportion of local production and consequently the GDP growth rate. The sector comprises companies involved in the production or processing of goods to produce new goods or add value (Adebayo, 2011). However, despite the harsh operating reality of the Nigerian business environment the non-financial sector has thrived positively and impacted the economy. The sector has mainly driven exports and local production in the twenty-first century and is also considered a major source of employment. The current study investigates the effect of accounts payable turnover on the corporate performance of quoted non-financial firms in the Nigerian Exchange Group (NGX). The aftermath of the COVID-19 pandemic led to many firms either shutting down or temporarily closing due to poor production capacity and liquidity problems. More so, globalization and technological advancement have affected the competitive stance of many corporations in the 21st century (Anser & Malik, 2013). This is evidenced by the decline in the PMI in recent times which is an indication of low productivity levels and growth in the sector. Despite the attribution to several external factors, such as high exchange rates, unfavorable business policies, etc., the ability of an organization to manage the internal factors still goes a long way to determining its survival. According to Ben-Caleb (2009), the issue is further compounded by the inadequacies of financial managers of most corporations resulting in high levels of debt, inventory costs, and weak collection periods, all of which adversely affect the profitability of companies. These problems negatively affected the delivery of finished products to customers hindering profitability, such that factories were either temporarily or completely closed (Atseye, Ugwu, & Takon, 2015).

The poor management of working capital impedes the rate of return on invested resources by the firms (Owolabi & Alu, 2012). Prior studies have severally examined the issue of working capital management and corporate performance, the study by Awad and Jayyar (2013) confirms the presence of a two-way causal connection between effective WCM and profitability. The authors further stated that this calls for future research on the nature of such a relationship. This is further supported in the study by Abdeljawad and Dwaikat (2021) using a sample of Palestinian firms. However, in the Nigerian context available evidence suggests that non-financial firms lack definitive credit and operational techniques which are required for survival in the 21st century (Ogbo & Ukpere, 2014). Prior studies have focused mainly on inventory management and firm performance; such as Amahalu (2018), Kareem (2018) in Nigeria; Atnafu and Balda (2018) in Ethiopia; and, Bawa, Asamoah, and Kissi (2018) in Ghana. Despite the importance of inventory management to the success of a firm (Agu, Obi-Anike, & Eke, 2016); however, the management of other elements in the operating cycle is still desirable for improved performance in today's competitive and dynamic business environment. Few studies have focused on the accounts payable turnover in the Nigerian context; this, relative paucity of studies has therefore prompted this current study.

Secondly, the inconsistency of findings from prior studies documenting either positive or negative effects prompts further investigation. The wide variations in results may be attributed to different country-specific contexts, for instance, Shajahan, Vigneswaran, Manikandan, Monisha, and Haridharani (2021) found that accounts payable turnover differed among companies in India and had a positive effect on the net profit ratio. However, Arnaldi, Novak, Roscigno, and Zhang (2021) using empirical data from SMEs in the Czech and Ramachandran and Janakiraman (2009) in India found a negative effect of accounts payable turnover on profitability proxied as EBITDA (EBIT).

The third issue tackled in the present study is the industry selection bias (S. Hussain, Nguyen, Nguyen, Nguyen, & Nguyen, 2021) and the sample inadequacy of prior studies conducted in the Nigerian context. For instance, studies by Kareem (2018) focused on SMEs; Akinlabi (2017) on flour mills companies; Agu et al. (2016), Anichebe and Agu (2013) on three companies; Ogbo and Ukpere (2014) case study of 7up Bottling Company; and, Oliomogbe (2002) case study of Nigeria Breweries and Nigeria Bottling Company Plc. Amahalu (2018), focused on only firms in the brewery sector. The current study includes all non-financial firms because performance measurement in the financial sector is entirely different (Ahmed et al., 2020; A. Hussain et al., 2020). The contribution of the study is to examine the relationship between accounts payable turnover and corporate performance using the totality of non-financial firms quoted on the NGX in the Nigerian context, studies have utilized the survey methodology and fixed, pooled, or random effect regression specifications on a specific sector.

The study's primary goal is to investigate the impact of accounts payable turnover on the performance of quoted non-financial firms on the NGX. The specific objectives of the study include to:

1. Ascertain the effect of the APT ratio on the ROA of quoted non-financial firms.
2. Examine the effect of the APT ratio on the ROE of quoted non-financial firms.
3. Evaluate the effect of the APT ratio on Tobin's Q of quoted non-financial firms.

2. Literature Review

2.1 Conceptual Review

2.1.1 Accounts Payable Turnover

Accounts payable turnover is an indicator showing the number of 'times a company pays off its accounts payable during a period'. According to the CFI (2023) also commonly referred to as payables turnover or creditor's turnover ratio, "it measures a company's liquidity by keeping track of how frequently, on average, it pays its creditors during an accounting period". Accounts payable refers to a short-term debt owed by a company to its suppliers and creditors. The APT ratio is computed as follows: Trade payable or trade creditors divided by the cost of goods sold multiplied by 1/365 [i.e., Net Credit Purchases/Average Accounts Payable]. The APT ratio measures the short-term liquidity of a firm (CFI, 2023).

Prior studies have shown the relative importance of the APT ratio, as a predictor of firm performance. Using empirical data from a sample of SMEs listed on the Alternative Investment Market (AIM), Tauringana and Afrifa (2013), found that accounts payable management were important for the profitability of SMEs than accounts receivable management. Shajahan et al. (2021), indicated that availing a firm of working capital is essential for any business to maintain its inventories, finance credit sales or accounts receivables, and avail cash for business purposes and short-term advances.

The authors further noted that working capital varies among industries. The figure below depicts varying components of the operating cycle, involved in the working capital management of a firm.

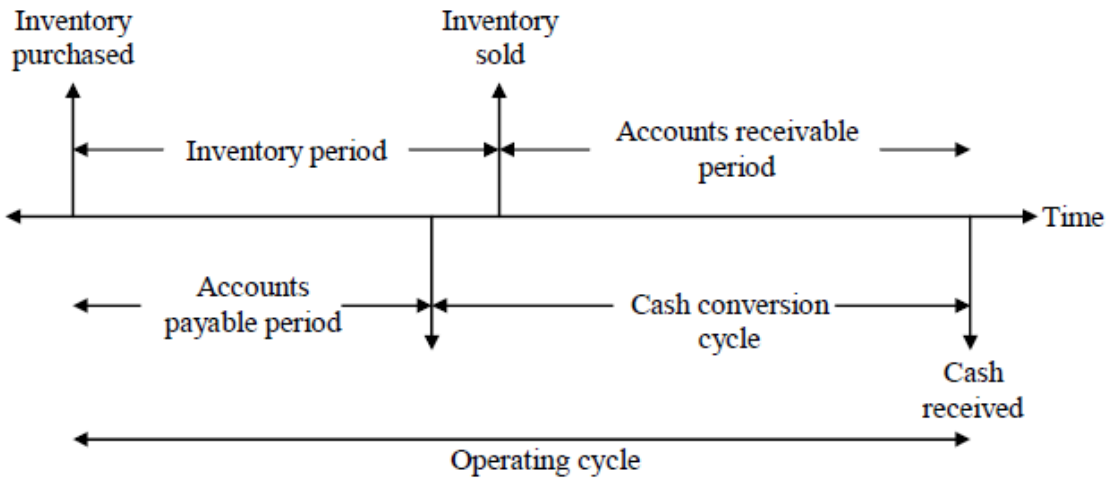

Figure 1: The cash conversion cycle showing the accounts payable period
Source: Jordan, Ross, and Westerfield (2003)

2.1.2 Profitability

Managerial capability to generate profit from its operations is known as profitability (Nishanthini & Nimalathasan, 2013). It is an aspect of firm performance that depicts the correlation between the input and outputs of an organization over some time (Truong, 2009). According to Horton (2021), while profit is an absolute amount, profitability is a relative one. Profitability is "a relative measure, whereas profit is an absolute measure of earning capacity" (Nishanthini & Nimalathasan, 2013). The profitability ratios measure the efficiency of a business and are closely linked to the 'success or failure' of an organization (Horton, 2021). Profitability is a measure of managerial efficiency in using organizational resources to add or create value for the business (Mohamed, 2012). Profitability is affected by both internal and external forces. Internal forces are firm-specific, whereas external forces are industry- and economy-related. Prior studies have utilized several proxies in measuring working capital's impact on a company's performance (Arnaldi et al., 2021). Effective working capital management is a sine qua non for improved profitability and long-term growth of the firm (Peng & Zhou, 2019). The most common profitability measures include such as operating profit, gross profit, return on assets (ROA), return on equity (ROE), Gross Profit Margin (GPM), or Net Profit Margin (NPM).

2.1.3 Accounts Payable Turnover and Firm Performance

Studies have shown mixed findings on the relationship between varying components of the operating cycle and firm performance (Sensini, 2020; Tauringana & Afrifa, 2013; Ukaegbu, 2014). Baños-Caballero, García-Teruel, and Martínez-Solano (2020), found a positive working capital management's effect on profitability. This may be attributed to three factors (Arnaldi et al., 2021): firstly, trade credit extension to customers may create a psychological effect that can increase sales and customer retention. Secondly, holding inventories safeguards a firm from seasonal price fluctuations, thereby reducing the cost of raw materials purchases. Thirdly, trade credits from suppliers enable a firm to utilize available funds for other contingencies and 'obtain loans at implicit interest rates lower than those of banks'

(Alvarez, Sensini, & Vazquez, 2021; Campos et al., 2014; Mueller & Novak, 2014). Ukaegbu (2014) using a sample of firms across different African countries found a negative correlation between profitability and the CCC. Yet, another stream of studies found that investments in working capital beyond an optimal level create additional costs for the firm. These studies posit a non-linear relationship between WCM and profitability (Aktas, Croci, & Petmezas, 2015).

2.1.4 Accounts Payable Turnover and ROA

The accounts payable turnover and ROA nexus have been widely explored in the literature. ROA measures a firm's profits in relation to the total assets used in generating such. It is an indicator of managerial efficiency in generating profits from available assets (Abdeljawad & Dwaikat, 2021). The net profit generated from each Naira of a fund's total assets increases as ROA increases (Shabrina & Hadian, 2021). Studies such as Ukaegbu (2014), find that delaying payments to suppliers can increase the profitability of a firm and create shareholder value. The study by Abdeljawad and Dwaikat (2021) using a sample of 13 industrial firms in Palestine showed that the accounts payable period negatively affects ROA. However, Nguyen, Nguyen, Nguyen, and Do (2021) using empirical data from Vietnam and firms from the food and beverage sector showed a positive non-significant effect of the APT ratio on ROA. *The study by* Achode and Rotich (2016), using a sample of Kenyan firms found a negative effect for some companies and a positive effect on other companies in the study. The effect on net profit was majorly positive in most of the companies included in the analysis. However, in contrast, Shajahan et al. (2021) in India found a positive effect of accounts payable on the net profit ratio in some of the studied companies. Ramachandran and Janakiraman (2009) using a sample of firms in the paper industry found that account payable*s turnover had* a significant negative effect on EBIT.

2.1.5 Accounts Payable Turnover and ROE

The ROE is a profitability and accounting-based measure that has been used in prior studies. As suggested by Hossain, Sultan, and Ahmed (2021), both the ROA and ROE have been used extensively in accounting research to denote firm performance. Studies have shown a relationship between APT and ROE. Abdeljawad and Dwaikat (2021) in Palestine showed that the APT had a negative effect on ROE. However, in contrast, the study by Achode and Rotich (2016), using a sample of Kenyan firms found a positive effect of APT in the majority of the firms included in the sample for the study. This is somewhat consistent with the study by Nguyen et al. (2021) using empirical data from 15 firms listed on the Hanoi Stock Exchange showed a positive non-significant effect of accounts payable turnover ratio on ROE.

2.1.6 Accounts Payable Turnover and Tobin's Q

Previous research has looked at how working capital management affects a company's worth, for instance, Kieschnick et al. (2013) for the United States; Baños-Caballero, García-Teruel, and Martínez-Solano (2014), for the United Kingdom. The study by Baños-Caballero et al. (2020) using a large dataset from 30 countries found evidence to support a positive relationship between net investment in operating working capital and the market valuation of a firm. A relationship that depends on the level of existing investor protection in the country in addition to the financial and economic development. Baños-Caballero et al. (2014) using empirical data from the U.K. found an inverted U-shaped relationship between the net trade cycle and firm value proxied as Tobin's Q. And in contrast, Abuzayed (2012) found a negative non-significant-relationship-between the CCC and Tobin's Q in Jordan.

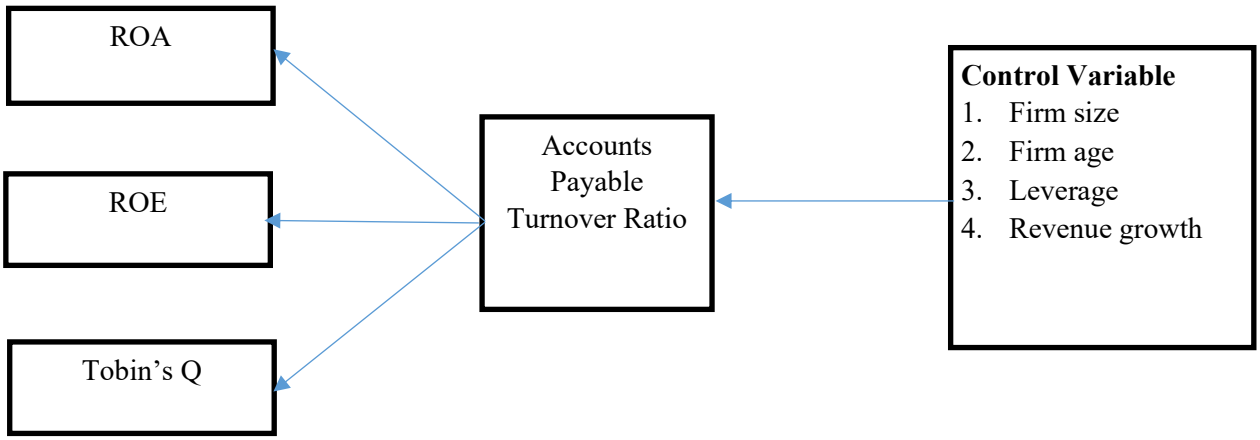

Figure 2: Conceptual model of the study
Source: Author's Conceptualization (2021)

The figure above explores the graphical flow and linkage of the study. The independent variable is the APTR while ROA, ROE, and Tobin's Q are the dependent variables. The main control variables are the firm size, firm age, leverage, and revenue growth proxies utilized in prior studies on working capital management and corporate profitability. The variables of firm size and age were employed as controls for it has been widely used in several corporate governance and organizational studies. The age of a company and firm size influence profitability (Goel & Sharma, 2015; Moussa, 2018). This is also consistent with the study by Yazdanfar and Öhman (2014) using empirical data from a sample of Swedish SMEs. Financial leverage was employed as a control variable, similar to the study by Arnaldi et al. (2021). Lastly, was the inclusion of revenue growth proxy for the firms.

2.2 Theoretical Framework

2.2.1 Liquidity Preference Theory

Liquidity preference theory was developed by economist John Keynes in 1936. According to the theory, when all else is constant, investors prefer liquid investments to illiquid ones and will always demand a premium for investments with longer maturity periods (Too, 2016). The theory postulates that money is the most liquid asset. An asset's liquidity is determined by how quickly it can be turned into cash. When an asset can be quickly turned into cash, it gives the business the ability to carry out day-to-day operations, meet short-term debt commitments, and invest in working capital. According to Mandiefe (2016), three factors-transactional, speculative, and precautionary-determine the demand for liquidity. There are three main reasons to keep money in the most liquid form: (i) the transaction motive, which is to close the gap between income and anticipated expenses; (ii) the precautionary motive, which is to keep money in the most liquid form if one anticipates that interest rates on alternative assets will rise, leading to increased investment returns; and (iii) the speculative motive, which is to satiate the desire to keep money in the most liquid form if one anticipates that investment returns will increase, leading to capital losses (Keynes, 1936).

2.2.2 Pecking Oder Theory

Donaldson first proposed the hypothesis in 1961, and Myers and Majluf revised it in 1984. According to the idea, corporations choose their financing sources in a specific order, favoring internal finance above debt and equity financing except as a last option (Adair & Adaskou, 2015). The management would prefer internal funding to external financing (Wramsby & Österlund, 1993). The majority of firms prefer financing new investments and projects using internal funds before the use of debt (Myers, 1984). According to Myers (1984), more profitable firms are highly likely to use internal financing than other less profitable firms and therefore seek external financing (Myers, 1984). Wramsby and Österlund (1993) opine that internal financing is a cheaper alternative to external funding as it eliminates transaction costs. According to the aforementioned line of reasoning, Myers believes that it may be

challenging to select the best financing structure because equity appears to be at the top and bottom of the "pecking order" depending on the option (Myers, 1984; Myers & Majluf, 1984).

2.3 Empirical Review

This section reviews the scholarly works of several authors from both developed and developing countries: Arnaldi et al. (2021) empirically analyzed the effect of working capital on profitability in a sample of SMEs in the Czech Republic. The sample comprised 105 manufacturing firms, studied from 2014 to 2018. They employed the GMM procedure to analyze the data. The results showed a negative effect of the CCC and APT on profitability measured as EBITDA.

Shajahan et al. (2021) investigated the impact of WCM on the profitability of pharmaceutical firms in India. The sample comprised 10 companies listed on the Bombay Stock Exchange (BSE) and the authors utilized secondary data from 2008 to 2018. They employed multiple regression, two-way ANOVA, and descriptive statistics to analyze the data. The results showed that APT differed among the companies; and, accounts payable had a positive effect on the net profit ratio in some of the studied companies.

Abdeljawad and Dwaikat (2021) examined the effect of working capital management on the profitability of 13 industrial firms in Palestine. The authors utilized secondary data from annual reports over 17 years (from 2002 to 2008) of firms listed on the Palestinian Security Exchange (PSE). They employed multiple regression techniques to analyze the data; and, the results indicated that the CCC had a positive effect on profitability; however, the accounts payable period had a negative effect on ROA and ROE. ACP and ITP had a positive statistically significant effect.

Using empirical data from 15 firms listed on the Hanoi Stock Exchange from 2015 to 2019, the study by Nguyen et al. (2021) evaluated the effect of internal factors on firm performance. The sample was drawn from the food and beverage sector. The study relied on secondary data and interviews. The data was analyzed using the OLS technique, and the results showed a positive non-significant effect of the accounts payable turnover ratio on ROA and ROE. However, the accounts payable turnover ratio had a negative non-significant effect on return on sales.

Hernandez, Migliaro, Suarezm, and Arnaldi (2021), studied the nexus of working capital determinants and profitability in Chile. The sample comprised 123 manufacturing firms in the Santiago metropolitan region. The duration of the study was from 2014 to 2018. The secondary data were analyzed using Generalised Least Squares regression. The results showed that inventory turnover accounts receivable and accounts payable turnover had a negative relationship with the ROA; while the cash conversion cycle also had a negative association with ROA. The study also concludes with a non-linear relationship between working capital elements and corporate profitability.

Baños-Caballero et al. (2020) employed a large sample of 18,753 firms from 30 countries to investigate the relationship between net operating working capital and firm value. The study duration spanned from 1995 to 2013. The data which was retrieved from the COMPUSTAT database was analyzed using multiple regression techniques. The empirical results showed a positive relationship between net investment in operating working capital and the market value of the firm.

Afrifa and Padachi (2016) examined the relationship between WCM and SME profitability on a sample of 160 firms listed on the Alternative Investment Market (AIM). They employed secondary data from 2005 to 2010 and analyzed them using the panel data regression technique. The results showed that there is a concave relationship between working capital management and profitability. Secondly, the deviations from the optimal point cause a decrease in firms' profitability.

Using empirical data from Norway, Lyngstadaas and Berg (2016) examined the effect of working capital management on profitability. They utilized a sample of 21,075 Norwegian SMEs and secondary data spanning the period from 2010 to 2013. The data were analyzed using fixed effects and two-stage

least squares. The results showed an inverse relationship between the cash conversion cycle and corporate profitability.

Mehtap (2016) conducted a study titled 'The impact of working capital management on firm profitability: Empirical evidence from Borsa Istanbul'. The study used panel data methodology. The sample comprised one hundred and ten (110) manufacturing firms listed on Borsa Istanbul. The study relied on secondary data and the duration of the study was from 2005 to 2014. The findings indicated that the cash conversion cycle significantly decreased profitability. While the average payment duration had a substantial positive link with profitability, the average collection period and days of inventory outstanding did not.

Oseifuah (2016) conducted a study titled 'Cash conversion cycle theory and corporate profitability: Evidence from non-financial firms listed on the Johannesburg Stock Exchange'. The study used panel data methodology. The sample comprised seventy-five (75) non-financial firms listed on the Johannesburg Stock Exchange (JSE). The study used financial data obtained from I-Net Bridge and BF McGregor from 2003 to 2012. The results demonstrated a negative correlation between working capital management and return on assets (ROA), as well as a negative correlation between inventory conversion period and ROA, accounts receivable conversion period and ROA, and a positive correlation between accounts payable deferral period and ROA.

Khan et al. (2016) evaluated the impact of CCC on working capital via profitability in Pakistan. Nineteen (19) cement manufacturing companies that are publicly traded on the Karachi Stock Exchange made up the sample. The study used secondary data from 2008 to 2013, from yearly reports and accounts. The data were analyzed using multiple regression analysis. The findings revealed that accounts receivable had a favorable impact on gross profit whereas inventories and accounts payable had a negative impact.

2.4 Gaps in Knowledge

The inadequacies among financial managers in organizations, in the form of high bad debts, high inventory costs, etc., have adversely affected operating performance (Ben-Caleb, 2009). As a result of these, factories are either temporarily or completely shut down (Atseye et al., 2015) given the negative effect on the production runs and delivery of finished goods to customers also given the relatively poor level of computerization, non-determination of stock level, involvement of illiterates and unskilled personnel in inventory management practices of the firms.

The gaps identified in the study, were as follows: *firstly*, there is evidence that most non-financial firms still lack in the application of operation research techniques in Nigeria (Ogbo & Ukpere, 2014), despite several models (both deterministic and stochastic) in use by the non-financial firms (Akinlabi, 2017). This, therefore, calls for the need for its proper evaluation and management. The abundance of studies in Nigeria has mainly focused on the joint effect of WCM components or the CCC; while documenting the effect of accounts payable turnover as an outcome and despite the abundance of studies on accounts payable, there is a wide acknowledgment that findings are inconsistent.

Many studies also focused on profitability ratios, such as ROA, ROE, etc., and a few studies, which include studies by Amahalu (2018), used information from annual reports and accounts to examine the effect of inventory turnover period on growth proxied by sales growth; however, the study was limited to only firms in the brewery sector. Other studies, including Kareem (2018) focused on SMEs using survey methodology. Thus, the literature is filled with studies mainly based on survey methodology and OLS regression techniques. The study is therefore geared to breach these gaps identified.

3. Research Methodology

Ex post facto research design was used for the investigation. Ex post facto research design is a systematic empirical examination where the observer has no direct control over the independent variables since they have already occurred or are inherently unmanageable. The entirety of the factors

a researcher is interested in for a study is referred to as the population. All non-financial enterprises listed on the Nigerian Exchange Group made up the study's population (NGX). Consequently, the population consisted of seventy-five (75) companies listed on the NGX. The number was premised on the classification of such firms as non-financial on the NGX. The study made use of a purposive sampling method; therefore, all non-financial firms were included in the final sample (see Appendix I). The final sample comprised 75 firms quoted on the floor of the NGX.

Table 1. Population of the study

S/No	Sector	No. of firms
1	Agriculture	5
2	Conglomerates	5
3	Consumer Goods	20
4	Construction/Real Estate	9
5	Health Care	10
6	ICT	9
7	Industrial Goods	13
8	Natural Resources	4
	Total	**75**

Source: Nigerian Exchange Group (NGX)

3.2 Sources of Data

The secondary data was retrieved from the annual financial statements of the companies. Companies must maintain and generate financial records that provide a true and fair picture of their financial situation in accordance with Part X1, Chapter One of the Companies and Allied Matters Decree 1990. The validity of such information is in part determined by the requirement that all publicly traded corporations perform an independent external audit of their published financial statements.

3.3 Data Analysis Technique

The Pearson correlation coefficient was used to examine the degree of relationship between the different variables. Multiple regression analysis was further used to investigate the causal relationship between the variables. The panel data method was chosen for the study because it is more effective at examining the dynamics of adjustment and is better able to spot and quantify effects that are inherently indiscernible in pure cross-sectional or pure time-series data. Furthermore, biases brought on by aggregation over organizations or persons are minimized, and many variables can be assessed more precisely at the micro level (Kithii, 2008). The econometric models were analyzed using multiple regression techniques with the aid of E-Views Econometric Software. The fixed effects model's emphasis on disparities "within" businesses. The fixed effects linear regression technique was utilized to test the effect of the explanatory variables on the dependent variables in the study. The following multivariate regressions were employed in the study to analyze the hypotheses:

Implicit form:

RETA = f(PAYA, Firm Size, Leverage, Firm Age, Sales Growth)
ROET = f(PAYA, Firm Size, Leverage, Firm Age, Sales Growth)
TOBQ = f(PAYA, Firm Size, Leverage, Firm Age, Sales Growth)

The mathematical expressions of the above implicit forms are stated below as follows:

Explicit form:

$$RETA_{it} = \alpha + \gamma_1 PAYA_{it} + \gamma_2 FSIZ_{it} + \gamma_3 DETE_{it} + \gamma_4 FIRA_{it} + \gamma_5 REVG_{it} + \mu \quad \ldots\ldots\ldots\ldots 1$$

$$ROET_{it} = \alpha + \lambda_1 PAYA_{it} + \lambda_2 FSIZ_{it} + \lambda_3 DETE_{it} + \lambda_4 FIRA_{it} + \lambda_5 REVG_{it} + \mu \quad \ldots\ldots\ldots\ldots 2$$

$$TOBQ_{it} = \alpha + \beta_1 PAYA_{it} + \beta_2 FSIZ_{it} + \beta_3 DETE_{it} + \beta_4 FIRA_{it} + \beta_5 REVG_{it} + \mu \quad \ldots\ldots\ldots\ldots 3$$

Where:

RETA	=	Return on Asses
ROET	=	Return on Equity
TOBQ	=	Tobin's Q
PAYA	=	Accounts Payable Turnover
FSIZ	=	Firm Size
DETE	=	Debt to Equity Ratio
FIRA	=	Firm Age
REVG	=	Revenue Growth
γ_1 - γ_6	=	coefficients (model 1)
λ_1 - λ_6	=	coefficients (model 2)
β_1 - β_6	=	coefficients (model 3)
α	=	Constant
μ	=	error term

Prior research such as Liviani and Rachman (2021) have also utilized these control variables, i.e., DETE and REVG to study the influence on company value. The study however reported a positive effect of leverage and growth (sales growth) on Tobin's Q of firms listed in IDX. P. C. Oranefo and Egbunike (2023) also employed firm size and firm age to assess the effect of gearing on the operating cash flow of manufacturing firms. The peculiarity of this study is that it was similar to the current study conducted in the Nigerian context. A popular market relative metric that has been employed in many research is Tobin's Q (P. Oranefo & Egbunike, 2022).

Table 2. Description of variables in the study

Proxy	Description	Measurement	Expected sign
RETA	Dependent	This is computed as profit after tax divided by Total assets in percentage	N/A
ROET	Dependent	This is computed as profit after tax divided by Total equity in percentage	N/A
TOBQ	Dependent	Tobin Q in numbers is computed as Market Capitalization + Total Liabilities -Cash flow divided by Total asset	N/A
PAYA	Independent	Average creditors * 365 Credit purchases This is a measure of the average number of days for which trade creditors remain unpaid.	+
REVG	Control	[(current year's revenues/last year's revenues) – 1] x 100%	+
FSIZ	Control	Natural logarithm of total assets	+
DETE	Control	Debt to Equity ratio	-
FIRA	Control	The number of years since incorporation as a natural logarithm	+

Source: Author's Compilation (2022)

3.3.1 Decision Rule

The decision rule is based on the significance level of the estimated p-value from the regression output: reject the null hypothesis if the p-value is less than.05 (of the selected alpha level), and accept it if not.

4. Results and discussions

4.1 Descriptive Statistics

Table 3. Summary statistics of the main independent, dependents, and control variables in the study

	RETA	ROET	TOBQ	PAYA	FSIZ	DETE	FIRA	REVG
Mean	2.688282	110.7903	1.515675	19.02341	7.088158	-2.704079	26.04502	11.59141
Median	3.546300	10.17320	1.034900	15.32110	7.010500	1.299600	28.00000	5.297800
Maximum	176.2669	69701.14	11.29860	77.10540	9.240900	202.9019	55.00000	1354.255
Minimum	-179.9173	-1964.346	0.124100	0.002700	5.092700	-3123.057	2.000000	-90.70160
Std. Dev.	16.63481	2605.298	1.350278	15.37241	0.819377	117.0312	13.39080	70.45392
Skewness	-1.424739	26.13263	3.037659	1.178176	0.176662	-25.95001	-0.230730	12.01869
Kurtosis	46.14926	696.6995	14.55038	3.984852	2.531985	691.4807	1.722897	202.3163
Jarque-Bera	57112.24	14780659	5201.879	199.2028	10.50257	14559193	56.31691	1230975.
Probability	0.000000	0.000000	0.000000	0.000000	0.005241	0.000000	0.000000	0.000000
Sum	1970.511	81209.32	1110.990	13944.16	5195.620	-1982.090	19091.00	8496.501
Sum Sq. Dev.	202556.8	4.97E+09	1334.619	172979.5	491.4490	10025695	131257.5	3633468.
Observations	733	733	733	733	733	733	733	733

Source: E-Views 9

4.2 Correlation Matrix

Table 4. Correlation matrix of the main independent, dependents and control variables in the study

	RETA	ROET	TOBQ	PAYA	FSIZ	DETE	FIRA	REVG
RETA	1.000000							
ROET	-0.048115	1.000000						
GPTM	0.292006	-0.006910						
TOBQ	0.158941	-0.006121	1.000000					
PAYA	-0.012473	-0.025370	-0.085761	1.000000				
FSIZ	0.196603	-0.071533	0.047932	-0.103540	1.000000			
DETE	0.059256	-0.992009	-0.004785	0.029654	0.084552	1.000000		
FIRA	0.039703	-0.016072	0.093476	0.044654	0.110243	0.026050	1.000000	
REVG	0.071728	-0.014368	0.009983	-0.030332	0.052636	0.015511	-0.035671	1.000000

Source: E-Views 9

Table 4 above presents the correlation matrix of the results of the variables utilized in the study. This comprises the Pearson product-moment coefficient of correlation, which indicates the degree of the linear relationship between two or more variables. The matrix showed a negative relationship between the independent variable and all the dependent variables, i.e., RETA, ROET, and TOBQ. However, the positive correlation between RETA and TOBQ is an indication that accounting-based performance is correlated with market valuation; the same was observed for TOBQ. Interestingly, the main independent variable showed a positive correlation with all the control variables in the study, i.e., FSIZ, DETE, FIRA, and REVG. A positive correlation coefficient was found for FSIZ and all the control variables (DETE, FIRA, and REVG). The same was observed for the control variable DETE with FIRA REVG. However, the variable FIRA negatively correlated with REVG, which indicates that the firm age does not necessarily translate to improved revenue growth for the sampled firms.

4.3 Test of Hypotheses

This section analyzes and presents the results of the hypotheses formulated in the study; they are stated and discussed below as follows:

4.3.1 Hypothesis One

H_1: There is a significant effect of the accounts payable turnover ratio on the ROA of quoted non-financial firms.

Table 5. Fixed Effects regression output of hypothesis one

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-28.12337	5.457004	-5.153628	0.0000
PAYA	0.001332	0.039268	0.033922	0.9729
FSIZ	4.095912	0.745569	5.493674	0.0000
DETE	0.006696	0.005162	1.297092	0.1950
FIRA	0.061184	0.046016	1.329617	0.1841
REVG	0.015392	0.008548	1.800653	0.0722
	Effects Specification			
Period fixed (dummy variables)				
R-squared	0.071705	Mean dependent var		2.688282
Adjusted R-squared	0.053605	S.D. dependent var		16.63481
S.E. of regression	16.18282	Akaike info criterion		8.426029
Sum squared resid	188032.4	Schwarz criterion		8.520104
Log likelihood	-3073.140	Hannan-Quinn criter.		8.462317
F-statistic	3.961502	Durbin-Watson stat		0.849717
Prob(F-statistic)	0.000001			

Table 5 provides the empirical results of the multiple regression to examine the effect of accounts payable turnover on the ROA of non-financial firms. The R-squared value was .071, and the adjusted R-squared value was 0.054. This means that the explanatory variables explain approximately 5.4% variation in the dependent variable. The results indicate that the model is statistically significant at $p < .01$, with a low Durbin-Watson value of 0.85. The *t*-statistic of the variable of interest (PAYA) was 0.034 with a *p*-value greater than .05 (p=0.9729). This leads to a rejection of the alternate and acceptance of the null; there is no significant effect of the accounts payable turnover ratio on the ROA of quoted non-financial firms and hence rejects the first hypothesis.

4.3.2 Hypothesis Two

H_2: Accounts payable turnover ratio has a significant effect on the ROE of quoted non-financial firms.

Table 6. Fixed Effects regression output of hypothesis two

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-277.7455	110.2093	-2.520163	0.0119
PAYA	0.881214	0.793048	1.111174	0.2669
FSIZ	38.16385	15.05746	2.534547	0.0115
DETE	-22.10905	0.104254	-212.0689	0.0000
FIRA	1.587832	0.929340	1.708558	0.0880
REVG	0.010438	0.172630	0.060466	0.9518
	Effects Specification			
Period fixed (dummy variables)				
R-squared	0.984564	Mean dependent var		110.7903
Adjusted R-squared	0.984263	S.D. dependent var		2605.298
S.E. of regression	326.8272	Akaike info criterion		14.43699
Sum squared resid	76693901	Schwarz criterion		14.53107
Log likelihood	-5276.157	Hannan-Quinn criter.		14.47328
F-statistic	3271.188	Durbin-Watson stat		1.945458
Prob(F-statistic)	0.000000			

Source: E-Views 9

Table 6 provides the empirical results of the multiple regression to examine the effect of accounts payable turnover on the ROE of non-financial firms. The R-squared value was .985, and the adjusted R-squared value was 0.984. This means that the explanatory variables explain approximately 98.4%

variation in the dependent variable. The results indicate that the model is statistically significant at $p < .01$, with a moderate Durbin-Watson value of 1.95. The *t*-statistic of the variable of interest (PAYA) was 1.111 with a *p*-value greater than .05 (p=0.2669). This leads to a rejection of the alternate and acceptance of the null; there is no significant effect of the accounts payable turnover ratio on the ROE of quoted non-financial firms.

4.3.3 Hypothesis Three

H_3: Accounts payable turnover ratio has a significant effect on Tobin's Q of quoted non-financial firms.

Table 7. Fixed Effects regression output of hypothesis three

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.845643	0.448477	1.885587	0.0598
PAYA	-0.007950	0.003227	-2.463540	0.0140
FSIZ	0.068600	0.061274	1.119565	0.2633
DETE	-6.72E-05	0.000424	-0.158458	0.8741
FIRA	0.012722	0.003782	3.364138	0.0008
REVG	0.000301	0.000702	0.428280	0.6686
	Effects Specification			
Period fixed (dummy variables)				
R-squared	0.048414	Mean dependent var		1.515675
Adjusted R-squared	0.029860	S.D. dependent var		1.350278
S.E. of regression	1.329966	Akaike info criterion		3.428435
Sum squared resid	1270.005	Schwarz criterion		3.522510
Log likelihood	-1241.521	Hannan-Quinn criter.		3.464723
F-statistic	2.609281	Durbin-Watson stat		0.276335
Prob(F-statistic)	0.001070			

Source: E-Views 9

Table 7 provides the empirical results of the multiple regression to examine the effect of accounts payable turnover on Tobin's Q of non-financial firms. The R-squared value was .048, and the adjusted R-squared value was 0.029. This means that the explanatory variables explain approximately 3.0% variation in the dependent variable. The results indicate that the model is statistically significant at $p < .01$, with a low Durbin-Watson value of 0.28. The *t*-statistic of the variable of interest (PAYA) was -2.464 with a *p*-value less than .05 (p=0.014). This leads to a rejection of the null and acceptance of the alternate; there is a significant effect of the accounts payable turnover ratio on Tobin's Q of quoted non-financial firms.

4.4 Discussion of Findings

The study examines the relationship between accounts payable turnover and firm performance profitability of quoted non-financial firms in the Nigerian Exchange Group (NGX).

4.4.1 Discussion of Hypothesis One

The *first* hypothesis revealed a non-significant positive effect of the accounts payable turnover ratio on the ROA of quoted non-financial firms (p=0.9729>.05). This is supported by Shajahan et al. (2021) in India that showed that accounts payable turnover had a positive effect on net profit ratio in some of the studied companies. The results are also consistent with the study by Nguyen et al. (2021) in Vietnam using firms from the food and beverage sector and showed a non-significant positive effect of the accounts payable turnover ratio on ROA. Mehtap (2016) using empirical data from, Turkey found that the average payment period had a significant positive relationship with profitability. The study of Oseifuah (2016) in South Africa using a sample of non-financial firms found a positive relationship between the accounts payable deferral period and ROA. Using empirical data from Nigeria, Owolabi and Alu (2012) on a small sample of 5 firms showed that the creditors' payment period and cash conversion period had a positive non-significant effect on return on total assets.

The results contrast with the studies by Arnaldi et al. (2021) using empirical data from Czech found a negative effect of accounts payable turnover on profitability measured as EBITDA. Abdeljawad and Dwaikat (2021) using empirical data from Palestine also found a negative effect of the accounts payable period on ROA. Hernandez et al. (2021), using a sample of 123 firms in the Santiago metropolitan region, Chile reported a negative relationship between accounts payable turnover and the ROA. Yet others, e.g., Afrifa and Padachi (2016) reported a concave relationship between working capital management and profitability.

4.4.2 Discussion of Hypothesis Two

The *second* hypothesis showed that the accounts payable turnover ratio has a non-significant positive effect on the ROE of quoted non-financial firms ($p=0.2669>.05$). The results are also consistent with the study by Nguyen et al. (2021) in Vietnam using firms from the food and beverage sector and showed a non-significant positive effect of accounts payable turnover ratio on ROE. However, Majeed, Makki, Saleem, and Aziz (2013) found that the average payment period had a positive relationship with ROE and EBIT in Pakistani.

However, in contrast, Abdeljawad and Dwaikat (2021) using empirical data from Palestine industrial firms found a negative effect of the accounts payable period on ROE. The study by Lyngstadaas and Berg (2016) using empirical data from Norway, and a sample of SMEs showed an inverse relationship between the cash conversion cycle and corporate profitability. Too (2016) using a sample of firms listed in the Nairobi Securities Exchange found a significant negative correlation between payables period and profitability. This was also confirmed in the regression results.

4.4.3 Discussion of Hypothesis Three

The *third* hypothesis showed that the accounts payable turnover ratio has a significant negative effect on Tobin's Q of quoted non-financial firms ($p=0.0140<.05$). This is in contrast with Baños-Caballero et al. (2020), using data from several countries found a positive relationship between net investment in operating working capital and market value of a firm. But, this relationship is dependent on the level of investor protection and financial and economic development. However, using empirical data from Africa, Ukaegbu (2014) found evidence to support the fact that delaying payment to suppliers creates shareholders' value. Khan et al. (2016) using empirical data from the cement industry in Pakistan showed that accounts payable had a negative impact on gross profit. Akbar, Akbar, and Draz (2021) using a sample of firms included in the Karachi Meezan Index [KMI-30] in Pakistan and the OLS regression showed a negative effect of the net trade cycle on Tobin's Q. Pais and Gama (2015) using a sample of 6,063 Portuguese small and medium-sized firms (SMEs) showed an inverse relationship between accounts payable turnover days and profitability.

This finding is also consistent with Owolabi and Alu (2012) in Nigeria who conducted a study titled 'Effective working capital management and profitability and found that the inventory conversion period and debtors' collection period had a negative non-significant effect on return on the total asset; while creditors' payment period and cash conversion period had a positive non-significant effect as well. It is however to be noted that most of the studies which support the findings of the current study are studies mainly conducted in Nigeria while contradicting findings were mainly carried out in other parts of Africa and Europe.

5. Conclusion

The study concludes there is a connection between listed non-financial enterprises' accounts payable turnover and their firm performance. Studies done in the past have looked at the connection between accounts payable turnover and various profitability metrics. A large sample of non-financial enterprises listed on the Nigerian Exchange Group (NGX) was examined using a Fixed Effects Model (FEM) in order to meet the study's goal. Tobin's Q, a market-based indicator of business worth and profitability, is included in the study to increase the analysis's breadth and robustness. The empirical results showed a significant negative effect of the accounts payable turnover on g Tobin's Q; while the effect on the

ROA and ROE was non-significant and positive for the non-financial firms quoted on the NGX. Based on these the study makes the following recommendations for managers of specifically non-financial firms in the context of developing economies:

1. The top management and financial managers of non-financial firms should utilize the accounts payable turnover as a strategy to grow the performance of the ROA in the short term but not as a long-term strategy. This can be achieved by a favorable tie with their suppliers to more quickly and easily get trade loans;
2. The management of accounts payable should be prudent to remain profitable for the firm an absence of which may lead to lower gross profit as supplies diminish in the long term.
3. Top management and financial managers should avoid the use of excessive credits for their potential negative effect on the firm value in the long term as investors may react negatively. Thus investors may penalize non-prudent managers for inefficiency in working capital management.

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