

LIQUIDITY RISK MANAGEMENT AND CORPORATE VALUE IN THE NIGERIA MANUFACTURING INDUSTRY: AN INSTRUMENTAL VARIABLE REGRESSION APPROACH

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Abstract

This research paper investigated the relationship between liquidity risk management and the corporate value of manufacturing companies in Nigeria. The research sourced for data (using the content analysis technique) from the audited annual financial statements of a sample of 27 listed manufacturing companies. Liquidity risk management was measured using the defensive interval ratio (DIR) and quick asset (QAR) ratios adopted by the companies while book to market (BTM) value was used to measure corporate value. The instrumental variable regression (IVR) was applied through the two stage least squares (TSLS) technique for data analysis. Cash and near cash assets (CAS); accounts receivable (REC); and accounts payable (PAY) were included in the model as 'instrumental variables'. Findings of the research revealed that while defensive interval ratio (DIR) had a positive and statistically significant relationship with corporate value' quick asset ratio (QAR) had negative and non-significant relationship with corporate value. From the findings of the research, it is concluded that the use of liquidity risk a management strategies and methods have varying effects and contributions to corporate value of manufacturing companies in Nigeria. However, this depends on the method adopted and the intensity of application of such methods. The research thus recommends that business organisations must first understand the structure of their liquidity inflows and outflows in order to determine the optimal method that would be suitable for individual organisation. It is also suggested that corporations conduct continual review of their liquidity levels and risk management techniques in order to determine the optimal methods.

Keywords: Corporate value, Liquidity Risk Management, Book to Market Ratio, Quick Ratio, Defensive Interval Ratio.

Introduction

Among the four core functions of the finance manager, liquidity management is unarguably the most critical to the survival of a business organisation. This is because before a company can achieve whatever objectivity it chosers - whether shareholder wealth maximization, market dominance, profitability - it must first survive in the short term. Thus, the short term survival of a business organisation is inexorably linked to its ability to properly manage its short term liquidity needs and obligations. In the context of usage in this paper, liquidity means the ease with which a business organisation can

meet its short-term maturing obligations from the liquid assets currently available to it. Liquidity risk or the inability or lack of requisite liquid assets to meet short term financial obligations can pose an existential threat for a business organisation (Christoffersen, 2012) hence the need for business organisations to manage liquidity and associated risks. Zygmunt (2013) further pointed out that an organisation's financial performance is a function of its ability to manage its liquidity.

Liquidity risk management involves maintaining the appropriate level of liquid

assets in the coffers of the organisation to meet short term obligations as they fall due without incurring substantial losses as a result of having to trade in assets that are less liquid in order to meet such obligations (Ross, 2020). Achieving this simple enough objective may become a nightmare for organisations due to the fluid nature of liquidity positions. An organisation can start the confident that its liquidity position is assured and a single unforeseen transaction during the day may end up putting organisation at risk of default due to liquidity challenges. This could for example as a result of creditor (individual or institution) exercising the right to call in an obligation early, a customer refusing to take delivery or making scheduled payment when due. Holding excess liquid assets in order to forestall the scenario described above may also prove to be costly as such holdings tend to be under-utilized and earning little or no returns.

Thus, liquidity management involves first understanding the structure of the liquidity requirements of the organisation and striking a balance which ensures that the organisation is neither cash-constrained nor overly liquid. Drawing from Bessis (2011), liquidity risk management is intended to reduce exposure to liquidity risk factors by setting liquidity goals for the organisation, identifying risk factor that can impede achieving the goal, determining the right control tools and activities that will help to achieve the liquidity goals, monitoring the outcome of implemented strategies and adjusting where necessary.

According to Bassey, Tobi and Ekwere, (2016) liquidity risk management is or should be a daily activity in an organisation which is intended to provide a systematic and detailed valuation of the "coverage and timing of cash inflows and outflows over preceding periods"

in order to mitigate exposure to risks associated with insufficient cash. To buttress the point on the critical nature of liquidity risk management, Almeida, Campello, Cunha and Weisbach (2014) asserted that "most" chief financial officers (CFOs) consider decisions relating to liquidity risks as the most important decisions they have to make in their daily operations. In this research paper, we evaluate how liquidity risk management strategies and decisions affect the corporate value of manufacturing companies listed on the Nigeria Stock Exchange.

Research Problem

According to Drehmann and Nikolaou (2013) cited in Waitherero, Muchina and Macharia (2021), liquidity risk arises due to an entity's inability to deal with the uncertainties resulting changes in the firm cash flows. As previously stated, liquidity risks can and have in severally documented cases resulted in threat to the existence of corporate organizations. Corporate organisations with liquidity challenges may have no other options but to forego profitable investment projects; borrow funds less competitive and generally more exorbitant rates in comparison to what is available to other organisation. Even more seriously, liquidity problems may result in default, bankruptcy and liquidation. Liquidity risk management becomes imperative to eliminate or mitigate the adverse outcomes for the organisation as a result of liquidity problems. In recognition of the importance of liquidity management, empirical researches on the subject matter abound both in Nigeria and elsewhere.

However, large chunk of the research in Nigeria have tended to focus on banking and other financial industry firms (Ndum, 2021; Adusei, 2021; Bassey, Tobi, & Ekwere, 2016; Adeusi, Akeke, Adebisi, & Oladunjoye, 2014). Others not necessarily focusing on the

banking industry research the topic in relation to financial performance (profitability) metrics such as return on assets, return on equity, net profit margin, return on capital employed and related key performance metrics (Okpala, Ifurueze, & Ofor, 2021); Effiong, & Enya, 2020). An aspect of liquidity risk management that has been explored elsewhere (Wang, 2002; Waitherero, Muchina & Macharia, 2021) which has received very little research interest in Nigeria relates to how the use liquidity risk and its management affects firms' corporate value. However, very little research evidencing the relationship between liquidity management and corporate value in Nigeria. This research is intended to fill this identified gap in research by conducting an evaluation on how liquidity risk management interacts with firm value among manufacturing companies in Nigeria.

Aim and Objectives of the Research

The aim of this research effort is to evaluate the relationship between liquidity risk management and the corporate value of listed manufacturing companies in Nigeria using the instrumental variable regression approach. The above will be achieved using the following specific objectives:

- Evaluate the relationship between defensive interval ratio strategy and the book-to-market value of manufacturing companies in Nigeria
- Evaluate the relationship between quick asset ratio strategy and the book-to-market value of manufacturing companies in Nigeria

Theoretical Underpinning

Business decisions and transactions are made in a dynamic environment fraught with risks. As such, it is necessary that the organisation develop a plan of action for its protection in the event that any of the several

kinds of risk manifests. For example, in the event that the organization experiences a liquidity problem, what plans are in place to counteract such an undesirable situation? The contingency theory provides a means to understand organisational and business decisions especially in risk fraught environments. It proposes that there is no best way to organize, lead or make decisions in an organisation.

Instead, the best course of action at any given time is contingent upon the current situation both within and outside the organisation (Fiedler, 1993). The contingency theory was originally proposed to underscore and understand the dynamism in organisational leadership and decisions, but it has also found application in other aspects of organisational operations including risk management. Thus for example, decisions relating to liquidity risk management is contingent on situation within the organisation - such as - the extent of leveraging used by the organisation at present, the size of the organisation's cash inflow and outflow and the disparity between expected inflows and outflows, its soon to mature financial obligations; and outside the organisation - such as - lending conditions offered by funds providers, cost of borrowing and borrowing policies (if any) in that specific industry.

Mikes and Kaplan (2014) opined that the successful implementation of an efficient effective risk management framework is contingent upon several factors which should be understood before action is taken. Thus, while the assets side of the balance sheet provide the natural source of liquidity in the form of liquid and near cash assets, organisations can also generate liquidity from the liability side of the balance sheet such a short duration loan and advances and credit procurement as advanced by the liability-

based liquidity management doctrine (Anyanwaokoro, 2008). In a nutshell, maintaining a healthy liquidity level in the organisation is contingent on the present situation and not a pre-determined condition that may not hold as a result of the dynamism of the environment.

Liquidity Risk and its Management

In its 2002 report on sound practices for the management of liquidity risk, the International Organization of Securities Commissions (IOSC), defined liquidity risk as the risk to organisations relating to their ability to meet financial commitments or obligations in a timely and cost effective manner while maintaining assets and, for some corporate organisation - the inability to embark on profitable business opportunities and continue as viable business corporations as a result of the lack of access to sufficient cost-effective financial resources. The IOSC (2012) further stated that liquidity risk potentially results whenever the quantity of liquidity (cash and near cash liquid assets) obtained from either sides of the asset and/or liability sides of the balance sheets, is substantially less than the liquidity needs of the organisation. Some identified sources liquidity risk include; market risk - which arises as a result of the inability or difficulty in liquidating financial (securities) assets without losing substantial value. Credit risk - which arises as a result of a debtor failing to meet his/her obligations as and when due and operational risk - which involves the risk of loss resulting from inadequate or failed internal processes, people and system or from external events (IOSC, 2012).

As with most issues, identifying the potential sources of a problem is a good place to start in marshalling a plan for its management. The next step is to determine the parameters that will be used as a red flag

to identify when a potential problem is about to occur. For business organisations, the focal point in identifying liquidity issues is the current (liquid) assets and short term liabilities of the organisation. Applying several ratios, - such as current, quick, cash acid test ratios; defensive interval ratios, cash conversion ratios among numerous other, would give the organisation a good idea about the risks associated with liquidity. The use of target ratios provides a widely accepted method of identifying and the measuring the potential liquidity risks that the organization may face. In addition to simple ratios and models, IOSC (2012) advocates that prudent business organisations implement processes for measuring the liquidity risk to which they are exposed using a robust and consistent methodology. Several techniques can be used - ranging from simple calculations like basic accounting ratios drawn from financial reports and accounts to highly sophisticated modelling. While simple calculations may be suitable for smaller organisations such as SME, larger corporations may require more sophisticated modelling tool and techniques.

The next step in liquidity risk management is risk monitoring which essentially involves keeping a close watch on measurement models and ratios - objective being to identify a potential liquidity risk before it manifests. Red flags may include ratios falling below predetermined levels. For example, an unexpected short fall in expected cash inflow may result in a build-up of matured obligations. Christoffersen (2012) stated that a robust process for liquidity risk management must of necessity include a system of control internal to the organisation that is appropriate for the structure and complexity of transaction in the individual organisation. Through the internal control system, the organisation monitors the

effectiveness of its liquidity management strategies to identify potential problems and take action proactively.

This will require the establishment and implementation of control policies that allows the organisation to act promptly on identified potential liquidity risks (Christoffersen, 2012). Furthermore, the internal control function for liquidity risk management allows for setting limits on identified operations and transactions that have the potential to exacerbate liquidity problems. Finally, there must be a continual review of the liquidity risk management processes and strategies to determine where adjustments may be required and where entire strategies may need to be abandoned if necessary.

Review of Empirical Research

Okpala, Ifurueze, and Ofor (2021) investigated how risk disclosures affect the performance of corporate organisations - with a focus on financial and operational risk management practices and disclosures in Nigeria and Ghana. The research adapted the risk disclosure index developed by the Global reporting Initiative (GRI) which was applied to the audited annual reports of a sample of listed companies in both countries. The research which covered a period of nine years spanning 2012 to 2019 and for which data was analysed using the panel regression technique found that both financial and operational risk management practices as disclosed by the companies in the sample exerted a significant positive effect on return on equity. The findings of the research suggested that the risk management practices of firms in both companies were important in enhancing financial performance. The research thus recommended that risk management disclosure practices be improved to ensure

that stakeholders are properly guided in their financial dealings with these companies.

Focusing their research on liquidity risk and its role in 'augmenting' firm value, Waitherero, Muchina and Macharia (2021) evaluated the interaction between liquidity risk and corporations' value in Kenya. The research obtained data from the published financial reports of a sample of 115 corporations and analyzed using inferential statistics. Findings of the research provided evidence of a positive correlation between liquidity risk and firm value. This implies that companies willing to invest and operate in sectors that are ordinarily perceived as risky tend to have their firm value enhanced as such sectors usually have higher potential (expected) return profile in comparison with other more conservative sectors.

A research in Saudi Arabia by Hacini, Boulenfad and Dahou (2021) on the liquidity risk management and financial performance in the country's banking industry concluded that liquidity risk had a significant negative effect on bank financial performance in Saudi Arabia. However, the research appeared to ignore the aspect relating to liquidity risk management or how it interacted with performance in the Kingdom. The research employed the fixed and random effect models on pooled data on loan to deposit ratio (LTD); cash to deposit ratio (CTD) both of which were used to measure liquidity risk while return on equity was used as a proxy for financial performance. Findings of the research suggested the need to reduce exposure to liquidity risk factors for banks operating in the country.

Ndum (2021) evaluated the effect of liquidity risk on the financial performance of commercial banks in Nigeria. For the purpose of the research, annual inflation was employed as a measure of liquidity risk and analyzed its effect on the financial

performance using data extracted from the annual reports of a sample twenty commercial banks. Employing OLS regression for data analysis, findings of the research indicated that the annual inflation rate does not have a positive effect on commercial banks' financial performance. The research recommended that banks adopt best practices in forecasting liquidity challenges associated with annual inflation rates and take proactive measures to ameliorate the related risks and thus ensure their long term profitability.

Kakar, et. al, (2021) investigated the link between corporate governance and risk management and the performance of commercial banks and how these relationships is moderated by ownership structure in Pakistani banks. Findings of the research revealed that firm characteristics vis-à-vis; firm size, profitability and growth were positively related with value at risk and capital adequacy risk while board size and audit committee size were negatively related with risk factor - value at risk and capital adequacy risk. These findings point to the outcome that corporate governance characteristics have negative perception towards risk thus taking action to reduce risk levels. On the other hand, firm characteristics and performance indicators are accepting of risk and where properly managed enhance bank performance.

In their research on liquidity risk management and its effect on financial performance, Effiong and Enya (2020) focused on the consumers goods manufacturing companies listed on the Nigeria Stock Exchange. The research was aimed at determining the nature of actions used by consumer goods companies to manage their liquidity and how such activities impacted on their financial performance. Data on financial performance and liquidity

risk measurement parameters were collected for the annual reports and subsequently analyzed using OLS multiple regression technique. Findings of the research determined that a significant relationship existed between liquidity risk management and financial performance of manufacturing organisations. The findings suggested the need for said corporations to adopt a clear and well thought out liquidity risk management strategies and ensure that such strategies are properly communicated to investors and functional units within the organisations.

In a research on the Indian Pharmaceutical industry, Yameen, Farhan, and Tabash (2019) provided evidence that current and quick liquidity ratios had a statistically significant positive relationship with the profitability of pharmaceutical companies which was measured in terms of return on assets (ROA). On the other hand, leverage ratio and firm size were negatively related with financial performance in the industry. Findings of the research were based on analysis conducted on data extracted from the annual reports of companies listed on the Bombay Exchange which were analysed using balanced panel OLS technique.

Adeusi, Akeke, Adebisi, and Oladunjoye (2014) evaluated the effect of risk management on the financial performance of deposit money banks in Nigeria. Data from a sample of 10 commercial banks were sourced from their audited annual reports for a 'progressive' 4 years period and analyzed using panel OLS regression technique. Findings of the research indicated a negative relationship between doubtful loans and financial performance while a statistically positive relationship was established in the relationship between capital assets ratio and financial performance. The research

concluded that risk management was significant factor in bank performance.

Ariffin (2012) investigated the relationship between liquidity risk management and the financial performance of corporate organisations in Malaysia. The research adopted the use of risk management disclosure index to measure risk management while financial performance was measured in terms return on assets and return on equity. The research focused on the period of the global financial crisis and determined that liquidity management practices of Islamic banks in country significantly affected their financial performance.

Iqbal (2012) focusing on Islamic banks in Pakistan conducted a comparative study with the intention of determining the risk management practices of Islamic and conventional banks and how it affect the banks. As expected, the findings of the research revealed that non-performing loans had a statistically significant negative relationship with financial performance in terms of return on assets and return on equity and capital adequacy ratio in both Islamic and conventional banks. This finding establishes that non-performing loans as a liquidity risk factor had a negative consequence for both Islamic and conventional banks in Pakistan.

Wang (2002) investigated the relationship between liquidity management and corporate characteristics vis-à-vis; operating performance and firm value of organisations listed in Japan and Taiwan. The research measured liquidity management in terms of cash conversion cycle (CCC) and firm characteristics in terms of return on assets and return in equity (ROE). Findings of the research revealed that cash conversion cycle had a negative relationship with both return on assets and return on equity. In all, the

researcher concluded that aggressive liquidity management in both jurisdictions helped to enhance operating performance and is also associated with higher corporate values notwithstanding the peculiarities in structural characteristics in both countries.

Methodology

The purpose of this research is to evaluate the relationship between liquidity risk management and the corporate value of listed manufacturing companies in Nigeria using the instrumental variable regression approach. Data for the research is sourced from 26 manufacturing companies listed on the Nigeria Stock Exchange. Firms in sample were selected on the basis of availability of published information either on their website(s) or the data portal of the Nigeria Stock Exchange. List of companies in the sample are shown in appendix1. Data collected spanned a period sixteen (16) years from 2004 to 2019. Variables of interest were liquidity management which was measured in terms of quick (asset) ratio (QAR); defensive interval ratio (DIR).

This is also referred to as basic defence interval (BDI) or defensive interval period (DIP). It is a ratio that determines how long an organisation can operate from its cash assets without for access noncurrent assets, or the need to liquidate long-term assets, or other additional financial resources from outside the organisation (Durrah, AbdulRahman, Jamil, & Ghafeer, 2016). It is calculated as current assets divided by the daily operational expenses; and firm value measured as book-to-market ratio (BTM). The book-to-market (BTM) value ratio is used to determine the market value of an organization in comparison to its actual (book) value. It is an important metric for financial analysis and investors predominantly utilized to differentiate between the true value of a publicly-traded

company and speculated value by investors and traders (Donnelly, 2014).

The instrumental variable regression approach was adopted for data analysis in addition to descriptive statistics that was used to describe the basic characteristics of the data. The instrumental variable procedures in regression analyses become necessary where some independent variables are thought or known to be correlated with the error term of the regression model. The procedure for correcting the problem of correlated error terms also referred to as endogeneity involves identifying instruments that are correlated with the independent variables but uncorrelated with the error term (Imbens & Angrist, 1994). Subsequently, then the two stage least squares regression procedure can be applied to obtain a

consistent estimator of the coefficient (instrumental variables) of interest (Russell, J. G. & Davidson, 2009).

The final group of selected instrumental variables are determined through a process of elimination. These were selected from a group of seven (7) variables believed to be correlated with the independent variables and three (3) were subsequently selected and included in the model as 'instruments'. The instrumental variables are: cash and near cash asset (CAS); account receivables (REC); and account payables (PAY). The final model was estimated using the Two Step Least Squares (TSLS). All absolute quantity variables were transformed to their natural log form (before applying TSLS) to ensure variable standardization (Gujarati, 2006).

Data and Results

Table 1: Panel Two-Stage Least Squares Result

Dependent Variable: BTM

Method: Panel Two-Stage Least Squares

Date: 09/21/22 Time: 14:17

Sample (adjusted): 2005 2019

Periods included: 15

Cross-sections included: 27

Total panel (balanced) observations: 405

Instrument specification: C CAS REC PAY DIR(-1)

Constant added to instrument list

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|--------------------|-------------|----------|
| C | -1.181330 | 0.401506 | -2.942252 | 0.0034 |
| DIR | 0.719017 | 0.195317 | 3.681282 | 0.0003 |
| QAR | -0.364195 | 0.218042 | -1.670297 | 0.0956 |
| R-squared | 0.452068 | Mean dependent var | | 0.130905 |
| Adjusted R-squared | 0.419293 | S.D. dependent var | | 0.961357 |
| S.E. of regression | 1.161330 | Sum squared resid | | 542.1724 |
| F-statistic | 10.57297 | Durbin-Watson stat | | 1.677137 |
| Prob(F-statistic) | 0.000033 | Second-Stage SSR | | 354.7204 |
| Instrument rank | 5 | Prob(J-statistic) | | 0.855006 |

Table 1 shows the Panel Two-Stage Least Squares (TSLS) regression results for the

relationship between liquidity risk management measured using the defensive

interval ratio (DIR); quick ratio (QAR) and corporate value of manufacturing companies measured as book-to-market (BTM) ratio. The result also shows that cash and near cash assets (CAS); accounts receivable (REC) and account payable (PAY) were added as instrumental variables to moderate the correlating effect between the repressors and the error time.

The result indicates that there is positive relationship between defensive interval ratio and book to market ratio. With a coefficient of regression (B) value of 0.7190 implying that using the defensive interval ratio as a liquidity risk management measure helps to improve the book to market value (BTM) value of manufacturing companies in Nigeria. The relationship was also statistically significant as the probability of t-statistic value of 0.0003 was much lower than the critical limit of 0.05. Furthermore, the coefficient of regression (B) for the relationship between the ratio of quick (liquid) assets to current liabilities and the corporate value (BTM) of manufacturing companies gave a negative value of -0.3642 which implies that higher quick asset ratio is predicted to lead to deterioration in corporate valuation for manufacturing companies in Nigeria. The relationship is observed to be statistically non-significant considering that probability of t-statistic (Prob.) gave a value of 0.0956. The summary statistics further indicates that about 45.21% of the variations in book-to-market (BTM) ratio are explained by variations in liquidity risk management measures adopted by manufacturing companies in Nigeria. This is evidenced by the adjusted R-Squared value of 0.3797.

Discussion of Findings

This research paper investigated the relationship between liquidity risk management and the corporate value of

manufacturing companies in Nigeria. The research adopted the ex post facto research design and sourced (using the content analysis technique) for data from the audited annual financial statements of a sample of 27 listed manufacturing companies. Liquidity risk management was measured using the defensive interval ratio (DIR) and quick asset ratios (QAR) adopted by the companies while book to market value (BTM) was used to measure corporate value. The instrumental variable regression (IVR) was applied through the two stage least squares (TSLS) technique for data analysis.

Cash and near cash assets (CAS); accounts receivable (REC); and accounts payable (PAY) were included in the model as 'instrumental variables. From the data analysis, it was found that while defensive interval ratio (DIR) as a measure liquidity risk management had a positive and statistically significant relationship with corporate value which was measured using the book-to-market (BTM) value ratio, quick asset ratio (QAR) had negative and non-significant relationship with corporate value. The import of the above is that manufacturing companies need to maintain a close observation of their quick assets levels as it keeping too high will reduce funds available for productive utilization. On the other hand, the present defensive interval ratio strategies adopted for liquidity risk management is adequate but could potentially perform better at improving corporate value if pursued with more vigour.

Thus, the findings show that the relationship between defensive interval ratio and book to market value is statistically significant with the implication that influence of corporate value is moderate. On the other hand, the relationship between quick asset ratio and book to market value is not statistically significant implying that it is generating an inverse response in corporate

value outcome for manufacturing companies much less than defensive interval ratio. In a similar study by Effiong and Enya (2020), they revealed that liquidity management was an important factor in the financial performance of consumer goods companies. Their findings specifically identified cash defensive intervals (defensive interval ratio) as having a positive effect on financial performance - as buttressed by the findings of the present research. They thus suggested that it was necessary for corporate organisations to adopt clear and well thought out liquidity management strategies.

Yameen, Farhan, and Tabash (2019) further provided evidence that current and quick liquidity ratios had a statistically significant positive relationship with the profitability of pharmaceutical companies in India. The above cited researches corroborated the present researchers' finding. However, contradicting the findings of this research are those of Wang (2002) who revealed that liquidity risk management measured using cash conversion cycle (CCC) had a negative relationship with firm performance measured as return on assets and return on equity. Finally, we note that more research findings corroborated the findings of this research more those that contradicted its findings.

Conclusions and Recommendations

From the findings of the research, it is concluded that the use of liquidity risk a management strategies and methods have varying effects and contributions to corporate value of manufacturing companies in Nigeria. However, this depends on the method adopted and the intensity of application of such methods. This is because the uses of liquidity risk management techniques help corporate organisations to constantly keep a close watch on build up or

depletion of liquid assets thus ensuring that optimal cash/liquid assets levels are continually maintained. The research thus recommends that business organisations must first understand the structure of their liquidity inflows and outflows in order to determine the optimal method that would be suitable for individual organisation. It is also suggested that corporations conduct continual review of their liquidity levels and risk management techniques in order to determine the optimal methods to adopt and those to discard - considering the nature of their business - and take proactive actions where a particular strategy is not working or is performing sub-optimally.

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