

Debt Financing, Liquidity, Company Size and Operational Efficiency of Companies Listed at Nairobi Securities Exchange, Kenya

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Abstract

Background: Theoretically, debt financing is expected to have beneficial impacts on operational efficiency as a result of improved cash flow and smoothed operations. However, this is not usually the case and it can be a detriment to operational efficiency due to problems related to moral hazard and agency costs. The purpose of this study was to examine the effect of debt financing, liquidity and company size on the operational efficiency of firms listed at Nairobi Securities Exchange (NSE), in Kenya.

Methods: The research focused on 50 firms listed on the (NSE) as at December 2022 and collected panel data ranging between 2015 and 2022. Descriptive statistical analysis and random effects regression model were used in analysis.

Findings: Debt financing has a significant positive effect on operational efficiency ($\beta = 0.355$, $p < 0.001$), indicating that firms relying more on debt financing tend to have higher operational efficiency. Similarly, liquidity exhibits a significant positive relationship with operational efficiency ($\beta = 0.079$, $p < 0.002$), while company size demonstrated a significant negative association with operational efficiency ($\beta = -0.075$, $p < 0.001$).

Conclusion and Implications: Debt financing has beneficial effects on operational efficiency. Thus, company managers should recognize debt financing as a strategic tool for improving operational efficiency. Similarly, liquidity has the positive and significant effect on operational efficiency. Therefore, the management of companies listed at NSE should regularly assess their liquidity positions and ensure that they have sufficient working capital to meet short-term obligations and capitalize on strategic opportunities. On the contrary, company size, has negative and significant effect on operational efficiency of firms listed at NSE. Thus, larger firms listed at NSE should proactively address the challenges associated with maintaining operational efficiency as they grow in size. Strategies aimed at optimizing operational processes and resource allocation should be implemented to counteract potential diseconomies of scale.

Keywords: Debt Financing, Liquidity, Company Size and Operational Efficiency.

1.0 Introduction

Operational efficiency refers to how effectively a company uses its inputs to produce its desired output (Uyar *et al.*, 2020). This involves selecting the right input combination to produce the desired output in consideration of the economic environment and the scalability of the output (Lee & Johnson, 2013). Operational efficiency not only enhances customer satisfaction and increases value for shareholders (Beracha *et al.*, 2019), but it also has a positive impact on a company's profitability and long-term sustainability (Chiu & Huang, 2019). Efficient companies are able to sustain a competitive advantage and generate good returns on investments (Agostino & Trivieri, 2019). Conversely, operational inefficiency has been associated with suboptimal business decisions and higher perceived risk, resulting in poor performance. Rana *et al.* (2020) showed that operational inefficiency significantly contributes to negative sales growth and employee dissatisfaction, which can lead to a competitive disadvantage for a firm.

Firms utilize debt financing to improve liquidity and alleviate operational bottlenecks (Uyar *et al.*, 2020). Theoretically, debt financing is expected to have beneficial impacts on operational efficiency as a result of improved cash flow and liquidity smoothing operations (Fisman, 2015). The relationship between efficiency and debt financing decisions may depend on the type of debt financing. This is because trade credit, short-term and long-term debts entail different costs and benefits to a firm. Recent studies also show that the nature and maturity of borrowing affect the persistence and strength of the relationship between borrowing and its determinants (Daskalakis, Balios, & Dalla, 2017). However, this is not usually the case and it can be a detriment to operational efficiency due to problems related to moral hazard and agency costs (Lotto, 2018). Moral hazard, information asymmetry and agency costs problems vary with different forms of debts and are pervasive in long-term debts (Bastos & Pindado, 2007).

Firms also mitigate inefficiencies by managing their current assets holdings and that financing decisions integrate risk of refinancing and resource management efficiency. In the presence of excess liquidity, firms may decide to repay outstanding debts instead of extra borrowing (Legesse & Guo, 2021). If funds are needed for investment, where the liquidity is high, managers incline to apply the internal capital instead of using debt financing (Hakeem&Bambale, 2016). Although firms may have borrowing capacity and access for debt capital, managers also consider the liquidity holding before going for long-term borrowing (Pujiatiet *et al.*, 2020).

Liquidity refers to the amount of cash generated by a company's normal business operations (Legesse & Guo, 2021). Pecking order theory asserts that the businesses with high liquidity borrow less funds and that debt increases liquidity in the short-term. Liquid assets provide the companies' with more readily available assets as a different internal source of funding alternative to using debt (Hussein, 2019). Managers prefer to apply the accumulated internal funds for investment opportunities when liquid asset holding, relative to the short-term financial obligations, becomes high (Le& Phan, 2017). Moreover, under the situation where short-term solvency is high and the risks of technical insolvency are low, firms may substitute short-term financing for long-term debt to enhance working capital efficiency (Wang, 2017). However, in cases where their company retains large liquid assets readily available at the discretion of the managers, managers appear to indulge more in excessive spending (Guo *et al.*, 2020). Thus, it is

probable that firms with high liquidity exhibit inefficiency in their investment and operational performance unless managers spending behaviours are monitored by certain control mechanisms. This probability warrants further studies into how debt financing affects operational efficiency under the conditions of low and high liquidity.

Company size refers to the measure of the business organizations in terms of assets and market capitalization (Kalkan *et al.*, 2017). The relationship between company size and operational efficiency is also not straightforward and may vary depending on the specific industry and market conditions. Larger companies generally have more resources at their disposal, including larger workforces, larger production plants, and larger budgets, which can lead to economies of scale, resulting in higher operational efficiency (Vosoughi *et al.*, 2016). In addition, larger firms may have better access to financing and better bargaining power with suppliers, leading to more efficient procurement of raw materials, production processes, and distribution of final products (Lafuente *et al.*, 2020). These factors may result in lower per-unit costs, higher productivity, and ultimately, higher profitability. However, larger firms may also face challenges related to their size, such as increased bureaucracy and slower decision-making processes (Vosoughi *et al.*, 2016; Lafuente *et al.*, 2020). Additionally, smaller firms may have greater flexibility and agility, allowing them to respond more quickly to changes in the market and customer demands (Pham *et al.* 2020). While larger firms may have advantages in terms of economies of scale, smaller firms may have advantages in terms of flexibility and agility (Kalkan *et al.*, 2017).

Empirical studies, such as Legesse and Guo (2020), have demonstrated that firms often employ a mix of short-term and long-term debt financing, influenced by their risk management strategies. High-efficiency firms tend to generate sufficient cash flows, allowing them to rely on short-term financing and trade credit (Agostino & Trivieri, 2019), whereas firms with lower efficiency may utilize long-term borrowing for stability (Legesse & Guo, 2020). The following sub-sections review these dimensions of debt financing vis-à-vis operational efficiency. While operational efficiency is a well-studied variable in the business management literature, the majority of research has focused on its impact on other variables such as company performance, value, and growth. There remains a dearth of literature exploring the factors that affect operational efficiency itself (Cheruiyot, 2017). However, operational efficiency, alongside performance and liquidity, is a crucial determinant of financing decisions within an organization. Companies utilize debt financing to establish financial conditions that facilitate operational effectiveness (Chadha *et al.*, 2015). Conversely, firms with low operational efficiency, often due to low levels of liquidity, may seek external financing to bolster their operations (Calabrese, 2017). Thus, this study aimed at identifying the effect of debt financing, liquidity and company size on operational efficiency of companies listed at NSE.

The operating efficiency of a business in relation to the efficient utilization of the assets is reflected in net profit margin. Although a high return margin reflects better performance, a lower margin does not automatically indicate a lower rate of return on assets turnover (Kariuki, 2021). Companies listed at the NSE have been reporting varying performance every financial year (FY) which is attributed to varied operational efficiency levels among other factors. For instance, fifteen of the 64 companies that traded on the stock exchange reported losses in FY 2020, while

25 of the companies, or 39 percent, recorded falling after-tax profits. Another 23 firms, or a third, declared increased profits (Kibunja & Futoki, 2021).

In Kenya, companies in all the industries have applied several interventions to try to improve their efficiency. Some of the interventions include process improvements, technology upgrades, cost-cutting measures, employee training and development, and strategic reorganization (Guyo, 2014). Yet, according to Capital Markets Authority (2020) several listed firms on the NSE were grappling with liquidity, corporate governance and insolvency challenges. This can lead to delays in payments to suppliers, difficulties in meeting payroll obligations, and reduced ability to invest in growth opportunities v (Abdulla & Tursoy, 2019). Thus, given the performance variation companies provide ideal setting for the investigation of the debt financing, liquidity, company size and operational efficiency nexus. According to Githaiga (2015) debt financing appears to be popular among listed firms in Kenya, which presents the possibility that these firms rely on bank borrowings, trade credit and equity to finance their operations. The study on how debts financing, liquidity and company size impacts on operational efficiency contributes to management practice and consequently the growth and value of companies.

2.0 Methodology

The research studied 50 firms listed at the NSE as at December 2022. The study took into account eight years starting from 2015 to 2022, a period in which there was interest rate capping which influenced access and cost of credit forcing some companies to sort trade credit, and short-term borrowings. The study followed positivism research philosophy and applied quantitative methods of analysis involving descriptive statistical analysis, and random effects regression analysis.

The study hypothesis is that debt financing, liquidity and company size has no statistically significant effect on operational efficiency of firms listed at NSE in Kenya. To test the hypothesis, the following model was utilized.

$$OE_{it} = \alpha + \beta_1 DF_{it} + \beta_2 LQ_{it} + \beta_3 CS_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where; OE_{it} = Operational Efficiency, DF_{it} = Debt financing, LQ_{it} = Liquidity, FS = Company size, α = is the constant term, $\beta_1 \dots \beta_3$ = are the parameters' coefficients and ε_{it} = is the error term (residual).

Table 1 Variable Measurement

Variable	Indicators	Measurement (To be used in Formula analysis)	Formula
Debt Financing (DF)	Trade credit Short-term borrowings Long-term borrowings	It was measured as a sum of total volume of trade credit, volume of short-term borrowings, and volume of long-term borrowings to total assets.	$DF = \frac{\sum_{x \in S} f(x)}{\text{Total Assets}}$ <p>Where; x is the elements in set (S), S are all forms of debts.</p>
Liquidity (LQ)	Operating cash flow ratio	Operating cash flow ratio is a measure of how well a company can pay off its current liabilities with the cash flow generated from its core business operations, hence provides a helpful gauge of firms' liquidity levels.	$LQ = \frac{\text{Operating Cash}}{\text{Current Liabilities}}$
Company size (CS)	Market capitalization	Company size was proxy measured using market capitalization. The market cap value was log transformed for ease of analysis.	CS=Log ₁₀ (Market cap value)
Operational Efficiency (OE)	Operating ratio	The operating ratio shows the efficiency of the company by comparing the total operating expense of a company to net sales. The smaller the ratio, the more efficient the company is at generating revenue vs. total expenses.	OE=(Operating Expenses+ Cost of Goods sold)/(Net Sales)

2.0 Results

3.1 Descriptive Statistical Analysis

Debt financing, liquidity and company size were the independent variables in this study. Table 1 displays the descriptive summary statistics.

Table 1: Descriptive Summary Statistics

Variable	N	mean	Sd	Min	max	skewness	kurtosis
Debt financing	400	0.526	0.378	0.029	1.922	1.136	3.808
Liquidity	400	0.913	0.971	0.006	4.873	1.479	5.149
Company size	400	40.33	165.806	0.100	1452.400	6.385	45.734

Table 1 shows that the mean overall debt financing ratio is 0.526. A debt financing ratio of 0.526 indicates that, on average, 52.6% of the total assets of the companies in the sample are financed through debt. The positive skewness implies that a larger proportion of companies tend to have lower debt financing ratios, while fewer companies have higher debt financing ratios. This distribution pattern suggests that companies, on average, are not heavily relying on debt for financing, and there is a tendency for companies to opt for more conservative debt levels. The overall mean liquidity level of 0.913, suggests that, on average, the sample companies have a reasonable ability to meet their short-term financial obligations with their current assets. A liquidity level close to 1.0 would indicate very high liquidity, meaning the companies have ample current assets to cover their short-term liabilities. The mean market capitalization is Kes 40.330 billion, with a corresponding standard deviation of 165.806 billion which discloses that listed firms vary significantly in size. The skewness value of 6.385 suggests a highly right-skewed distribution, indicating the presence of a few companies with significantly larger market capitalizations compared to the majority of companies.

3.2 Preliminary and Post Estimation Tests Result

Table 2 shows the summary of diagnostics tests conducted to assess whether the assumptions of regression method used were violated.

Table 2: Preliminary and Post-Estimation Tests Results

Test	Results (P.values in parentheses)	Conclusion
Linearity: Correlation	Debt Financing = 0.412(0.000) Liquidity = 0.240(0.001) Company size = -0.211(0.001)	Linear relationship
Hausman test of specification	Coef = 0.508(0.476)	Random effects supported
Normality Jarque-Bera test	Chi(2) (0.4656), P-value = 0.792	Residuals do not deviate from normality.
Stationarity Levin Li Chu	Debt financing= -12.395(0.000) Company size = -7.088(0.000) Liquidity = -7.088 (0.000) Operational efficiency = -5.576 (0.000)	Variables were stationary

Heteroskedasticity Breusch-Pagan/ Weisberg test	Chi2 (1) = 0.940 (0.0145) Cook-	Model was heteroskedastic, hence robust standard errors were employed.
Autocorrelation Wooldridge test for autocorrelation in panel data	F(1, 49) = 0.308(0.596)	No first order autocorrelation.

As shown in Table 2, the tests confirmed a positive linear relationship between debt financing, liquidity company size and operational efficiency. The study established that the residuals were normally distributed and they did not exhibit first-order autocorrelation, while also all the variables were stationary at level. However, the presence of heteroscedasticity required the use of robust standard errors.

3.3 Random Effects Regression Results

The study conducted random effects regression model to establish the effect of debt financing, liquidity and company size on operational efficiency of companies listed at NSE and the results were displayed in Table 3.

Table 3: Random Effects Regression Analysis

Random-effects GLS regression	Number of obs	=	400
Group variable ID	Number of groups	=	50
R-sq:	Within = 0.241	Obs per group:	min= 8
	Between = 0.254		avg =8.0
	Overall = 0.235		max =8
corr (u_i, X)	0 (assumed)	Wald chi2(3)	= 211.989
		Prob > chi2	= 0.0000
(Std Err. adjusted for 50 clusters in ID)			
OE	Coef.	Robust St.Err.	t-value p-value [95% Conf Interval]
Debt Financing	0.355	0.050	7.100 0.001 0.257 0.453
Liquidity	0.079	0.009	8.96 0.002 0.062 0.096
Company size	-0.075	0.017	-4.410 0.001 -0.108 -0.042
Constant	0.856	0.173	4.940 0.000 0.516 1.196

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The findings in Table 3 revealed that debt financing has a significant positive effect on operational efficiency ($\beta = 0.355$, $p < 0.001$), indicating that firms relying more on debt financing tend to have higher operational efficiency. Similarly, liquidity exhibited a significant positive relationship with operational efficiency ($\beta = 0.079$, $p < 0.002$), suggesting that firms with better liquidity positions tend to be more operationally efficient. On the other hand, company size demonstrated a significant negative association with operational efficiency ($\beta = -0.075$, $p < 0.001$), indicating that larger firms may experience challenges in achieving high levels of operational efficiency.

All the variables had significant effect on the operational efficiency of companies listed at the NSE in Kenya. Thus, the joint effect of debt financing, liquidity and company size on the operational efficiency of firms listed at the NSE was statistically significant.

The optimal regression models for the joint effect of debt financing, liquidity and Company size on the operational efficiency of firms listed at the NSE can be stated as follows:

$$OE_{it} = 0.856 + 0.355DF + 0.079LQ - 0.075CS..... (2)$$

4.0 Discussion, Conclusion and Managerial Implications

4.1 Discussion

The joint effect analysis reveals that debt financing and liquidity are beneficial to operational efficiency, while company size is detrimental to operational efficiency of companies listed at the NSE in Kenya. This finding supports the study assertion that debt financing has beneficial effect on operational efficiency as a result of improved cash flow and liquidity smoothening operations. Debt financing provides companies with additional funds that can be used to invest in productive assets, technology, and research and development. Through different types of debt financing, companies expand their operations, improve efficiency, and enhance productivity. This additional capital injection enables companies listed at the NSE to optimize their resources and achieve economies of scale, leading to improved operational efficiency. There is evidence supporting the empirical finding that debt financing has a beneficial effect on operational efficiency. Zhang et al. (2019) found that debt financing positively impacts technological efficiency and productivity of Chinese manufacturing companies. Similarly, Guo et al. (2020) identified an inverted U-shaped association between firm efficiency and financial leverage, indicating that businesses with optimal capital structures exhibit high levels of efficiency. Their study also highlighted the potential of debt financing to enhance efficiency by effectively utilizing free cash and leveraging the firm's resources.

Moreover, the study established that liquidity is a salient variable and beneficial to operational efficiency of companies listed at the NSE in Kenya, even though the effect is not as pronounced as that of debt financing.

This finding suggested that maintaining sufficient levels of liquidity can enhance the overall performance and effectiveness of companies. Having adequate liquidity provides companies with the ability to meet short-term financial obligations, manage cash flows effectively, and navigate unexpected financial challenges. It allows firms to seize investment opportunities, support working capital needs, and ensure smooth operational activities. Some authors also found that liquidity positively improves the operational efficiency of the firm because it escalates the financial distress costs. This is in line with Thomas (2016) finding that high liquidity is likely to cause to arbitrage activity, consequently leading to improved market efficiency. Also, Adam et al. (2018) assessed how company size and liquidity affects the operational efficiency and found that the size of the company negatively affected operational efficiency while liquidity had beneficial effects on firm's operational efficiency.

Furthermore, the finding that company size is detrimental to operational efficiency suggests that larger companies may face challenges in maintaining agility and adaptability. As companies grow in size, they may become more bureaucratic and face increased complexities in decision-making processes. This can hinder operational efficiency by introducing inefficiencies, delays, and difficulties in implementing changes. Smaller companies, on the other hand, may have the advantage of being more agile, flexible, and able to quickly adapt to market dynamics, leading to enhanced operational efficiency. In a similar vein, a study by Ibhagui and Olokoyo (2018) found that larger companies may incur inefficiencies that result in poor performance. Also, Ohman and Yazdanfar (2015) also found that short-term and long-term borrowings are a detriment to profitability, and the relationship is more pronounced in larger firms.

4.2 Conclusion

Basing on the findings, the study concludes that debt financing, liquidity and company size jointly affect the operational efficiency of companies listed at Nairobi Securities Exchange. Debt financing has a beneficial impact on the operational efficiency of companies listed at the Nairobi Securities Exchange (NSE) in Kenya. Through debt financing, companies are able to address financial constraints and allocate resources effectively, which leads to improved operational efficiency. The study validates the agency theory by demonstrating that debt financing enhances operational efficiency through mechanisms such as curbing financial slack and instilling discipline among managers. This not only aligns the interests of various stakeholders but also contributes to more effective resource allocation within the company, ultimately bolstering operational efficiency. The study made conclusion that when firms grow in size, in terms of market capitalization, their operational efficiency is negatively affected. Increase in company size is detrimental to operational efficiency of companies listed at the NSE, even though the effect is small. Thus, as companies become larger their ability to maintain operational efficiency tends to diminish. In other words, larger firms may face challenges in efficiently managing their operations compared to smaller ones, which could be attributed to diseconomies of scale.

Finally, the study concluded that liquidity has positive and significant effect on operational efficiency of companies listed at the NSE. This conclusion supports the principles of the free cash flow theory, where managerial discretion plays a crucial role. Wise decision-making regarding the allocation of liquidity towards investments in technology, training, and process improvement can enhance operational efficiency. Additionally, liquidity risk management contributes to maintaining operational performance, as it allows companies to navigate through challenging times and capitalize on strategic opportunities.

4.3 Managerial Implications

The study concluded that debt financing has beneficial effects on operational efficiency. In light of this finding, company managers should recognize debt financing as a strategic tool for improving operational efficiency. In addition, larger firms listed at NSE should proactively address the challenges associated with maintaining operational efficiency as they grow in size. Strategies aimed at optimizing operational processes and resource allocation should be implemented to counteract potential diseconomies of scale. Additionally, firms of all sizes, whether large or small, should consider debt financing as a strategic tool to enhance their

operational efficiency. This study challenges conventional assumptions about the influence of firm size on the relationship between debt financing and operational efficiency and highlights the universality of debt financing's positive impact.

The study concluded that liquidity has a positive and significant effect on operational efficiency. Therefore, the management of companies listed at NSE should regularly assess their liquidity positions and ensure that they have sufficient working capital to meet short-term obligations and capitalize on strategic opportunities. Companies listed at NSE should conduct regular liquidity assessments, ensuring the adequacy of short-term assets and current ratios to meet obligations and leverage strategic opportunities. They should also adopt strategic working capital management techniques to efficiently balance short-term assets and liabilities, thereby maintaining optimal liquidity levels. Tailoring liquidity management guidelines and best practices to the specific characteristics and challenges faced by companies listed on the Nairobi Securities Exchange (NSE) is crucial. Finally, emphasizing compliance with relevant regulatory constraints is essential to mitigate legal and financial risks associated with liquidity management.

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