

Article

The Impact of Liquidity and Leverage on the Financial Performance of the Johannesburg Stock Exchange-Listed Consumer Goods Firms

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Abstract

Understanding the role of liquidity and leverage is crucial in assessing financial performance, particularly in the consumer goods sector. This study examined the impact of liquidity and leverage on financial performance, using a sample of 13 consumer goods firms listed on the Johannesburg Stock Exchange (JSE) from 2014 to 2024. Despite the present literature on this association, few traceable studies have investigated this phenomenon, and there is a dearth of literature in this sector. The dependent variable for this study was financial performance, and the return on assets (ROA) was employed as a proxy for financial performance. The independent variables employed for this study were liquidity (LIQ), leverage (LEV), and the quadratic term of leverage (LEV2). However, Net profit margin (NPM), inventory turnover (INVT), average collection period (ACP), firm size (FS), and its quadratic term (FS2) were the control variables. The researcher performed the Durbin–Wu–Hausman test, the Breusch–Pagan LM test, redundant fixed effect testing, the Hausman test, and the panel heteroskedasticity LR test before employing the suitable model. After employing the panel least squares (PLS), the fixed effects (FE) model was considered appropriate and efficient for this study. Applying the model, the researcher found a statistically significant and positive impact of LIQ, LEV2, NPM, and FS2 on ROA. Furthermore, a statistically significant and negative impact of ACP on ROA. However, the impact of LEV and FS was negative and statistically insignificant on ROA. Furthermore, the impact of INVT on ROA was statistically positive and insignificant. To improve the financial performance of the firms efficiently, this study recommends that financial managers of consumer goods firms should pay special attention to maintaining and monitoring a healthy liquidity ratio and implement sound working capital management. Furthermore, integrate the strategic liquidity planning into their financial decision-making. The findings highlight that while a moderate level of leverage might not increase financial performance, a strategic increase in debt to a certain optimal level can improve the financial performance of a firm.

Keywords: leverage; liquidity; return on assets; inventory turnover; net profit margin; financial performance



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1. Introduction

The Johannesburg Stock Exchange (JSE) is a South African securities exchange that trades stocks for various companies and sectors (Mwamba et al., 2025). The JSE lists industries such as finance and investment services, infrastructure, and consumer goods.

The consumer goods industry has experienced growth following the COVID-19 pandemic, aligning with the population increase in South Africa (South African Statistics, 2024). This growth is reflected in the number of companies operating domestically. Therefore, attracting investors who are highly interested in consumer goods companies because they can withstand uncertain economic conditions (Fitriyani et al., 2023). Firms in the consumer goods sector are expected to produce products that meet human needs. Some of the products include household, family, or personal use, which are intended to satisfy consumer needs, such as food and clothing (Persaulian et al., 2013).

Therefore, the consumer goods industry plays a vital role in economic development, growth, and the capital market (Joel & Doorasamy, 2024; Maḍra-Sawicka, 2025). According to Joel and Doorasamy (2024), in South Africa's manufacturing industry, the consumer goods sector is the largest and accounts for 25% of market insights. Furthermore, Joel and Doorasamy (2024) highlighted that South Africa's consumer goods sector is one of the most developed markets in Africa. This implies they are well-established and sophisticated, with an international and domestic presence of their products, making them an important player in the African markets. Consumer goods firms are vital for society; thus, these companies must sustain their operations (Purnomo, 2024). The efficient financial management of the consumer goods sector is significantly crucial due to the capital intensity of the industry, narrow profit margins, and sensitivity of the supply chain disruptions. The industry is strongly influenced by the purchasing power of customers and the number of competitors providing a similar product. Such companies must compete to gain market share by offering competitive quality products and effective firm management (Chandra et al., 2024).

To remain competitive and for companies to meet their customers' needs, these firms must improve their financial performance to ensure viability and achieve their goals. Furthermore, firms need to maximise shareholders' wealth. Fitriyani et al. (2023) assert that a firm's success is measured through financial performance and growth, which also influence decision-making for shareholders or owners. Kayani et al. (2025) described the firm's financial performance as a subjective measure of how it generates revenue using its equity and assets from its primary activities. Onyia et al. (2025) assert that financial performance shows how effectively the firm has carried out its financial obligations and maintained profitability. Financial performance provides an impression of the firm's capability to generate income and create value for stakeholders. According to Jumigan (2017), a firm's financial performance reflects how well management has utilised its equity and assets to generate revenues and produce financial statements that can be analysed using financial ratios such as Profitability, liquidity, and leverage ratios. These financial ratios enable management and investors to measure and assess the firm's success in achieving its operational goals. However, Ujunwa and Salami (2021) argue that several risks, including operational risk, liquidity risk, leverage ratio, and capital adequacy risk, influence the financial performance of firms.

According to Eljelly (2004) and Alhassan and Islam (2021), liquidity relates to a company's ability to satisfy its obligations as they become due. Liquidity management involves the firm's strategic plan and controls, which are crucial for ensuring the firm has sufficient liquid assets (Naing, 2024). Consequently, liquidity management protects firms from liquidity shortages in satisfying short-term obligations. The significance of effective liquidity management for firms lies in promoting financial stability and success, thereby preventing insolvency (Isakov, 2024). However, Wuave et al. (2020) posited that the mismatch between short-term debts and current assets can cause liquidity issues, resulting in a liquidity crisis. Assa and Loindong (2023) and Hulu (2024) assessed the impact of liquidity and credit risk on financial performance. Their studies found a positive relationship; however, they focused on financial institutions. Furthermore, Eltweri et al. (2024) evaluated the influence

of liquidity on the financial performance of banks in the United Kingdom (UK). [Joel and Doorasamy \(2024\)](#) assessed the determinants of firm performance in South African food and beverage companies and found capital to be a significant factor influencing firm performance. [Rahmiyati \(2022\)](#) and [Abdullahi et al. \(2020\)](#) found a positive and significant impact of liquidity on ROA. Meanwhile, [Subedi \(2024\)](#) and [Airout et al. \(2023\)](#) found a significant and negative impact of liquidity on ROA. However, [Andriani and Raharja \(2025\)](#) and [Melani et al. \(2019\)](#) found an insignificant relationship between liquidity and ROA.

Financial leverage describes a firm's use of debt to finance its operational activities and growth, which can boost financial performance ([Evianti et al., 2024](#); [Modigliani & Miller, 1958](#)). The leverage ratio is a crucial concern for consumer goods firms, as they aim for an optimal or moderate leverage ratio to withstand and absorb financial shocks and offset any potential loss. Inadequate capital reserves can cause financial instability within a firm, which has a detrimental impact on the firm's capability to satisfy short-term obligations and also its financial performance ([Ibrahim & Aris, 2025](#)). According to [Ujunwa and Salami \(2021\)](#), insufficient capital reserves during economic downturns increase the potential risk of insolvency. Conversely, an adequate leverage ratio can improve investors' confidence and promote firm stability. [Opler and Titman \(1994\)](#) argue that highly leveraged firms, which imply they rely largely on debt to finance their operations and growth, tend to lose market share when compared to their counterparts, which are firms that are more conservative in using debt.

Prior studies, such as [Albalwy \(2024\)](#), [Risal and Campus \(2020\)](#), and [Singh and Bansal \(2016\)](#), found a significant and negative relationship between leverage and ROA. Meanwhile, [Arhinful and Radmehr \(2023\)](#) and [Moussa and El Feidi \(2023\)](#) found a significantly positive relationship between leverage and ROA. However, [Iqbal and Usman \(2018\)](#) and [Putra \(2024\)](#) found an insignificant relationship between leverage and ROA. [Khan et al. \(2020\)](#) and [Dube et al. \(2022\)](#) argue that a positive link between profitability and leverage should be expected.

Prior studies investigated various firm-specific attributes such as dividend policy, capital structure, firm size, and firm age ([Bagana et al., 2024](#)). However, despite discussions on financial performance, the trade-off nexus between liquidity and leverage on financial performance in the sector, particularly in the consumer goods industry within emerging economies such as South Africa, has remained inconclusive and limited. Some studies report a positive and significant relationship between leverage and liquidity on ROA, while others found an insignificant or negative relationship. The significance of liquidity and leverage appears to differ among firms and contexts. Furthermore, prior studies have adopted a broader industry sample, which overlooks sectors like consumer goods where inventory turnover and average collection period affect the financial outcome of the industry. Despite the existing literature, liquidity and leverage in the consumer goods industry remain relatively under-researched. Depending on the indicators used to measure liquidity and solvency, different results may be obtained.

Numerous studies, such as those by [Rodriguez \(2024\)](#) and [Byoun and Rhim \(2005\)](#), have addressed the trade-off and pecking order theories. These theories have been empirically tested and have found both support and contradictory results. Other theories, such as capital structure theory at the industry level or capital structure optimisation for credit rating purposes, have also been empirically examined ([Frank & Goyal, 2009](#)). As a result, there is no clear consensus in the literature as to which capital structure theory is valid in practice or applied by firms.

Against the aforementioned background, this study focused on consumer goods firms listed on the JSE from 2015 to 2024. We deliberately chose the above period based on data availability and to comprehensively capture the firm's performance, liquidity, and leverage

across different economic conditions. The timeframe encompasses the pre-, during, and post-unprecedented global disruptions caused by the COVID-19 pandemic. South Africa is an emerging country that depicts distinctive features that require an investigation of the impact of liquidity and leverage on the financial performance of consumer goods firms listed on the JSE in detail. Therefore, this study aims to fill the gap by investigating the impact of leverage and liquidity on financial performance within the under-researched consumer goods sector.

The present study contributes to the developing debate on financial performance by assessing the liquidity and leverage impact on financial performance in the consumer goods industry of a developing country like South Africa. To protect foreign and local investors, this study empowers them regarding the significance of financial performance in safeguarding their interests. Methodologically, this study employs panel least squares (PLS) regression analysis that integrates the measures of liquidity and leverage ratio. The liquidity and leverage impact have been assessed separately before; however, contradictory conclusions remain amongst authors concerning the correlation with financial performance. Prior studies employed selected measures to proxy liquidity or the leverage ratio. However, this study includes leverage and liquidity to assess their impact on financial performance. This paper seeks to contribute to the dearth of present empirical literature, specifically focusing on liquidity and leverage impact on financial performance. By determining the variables that affect financial performance, financial managers can target and maintain a healthy liquidity and leverage ratio to smooth operational efficiency and improve the firm's financial performance.

The rest of this paper is structured as follows: the literature review that underpins this study is presented first and followed by the applicable methodology in addressing the objectives. Followed by the results and discussion of the findings, and conclusion, and the recommendations.

2. Literature Review and Hypotheses Development

Hussain et al. (2018) and Abdullah and Valentine (2009) advocate for a multi-theory approach since a single theory is not ideal to fully account for the phenomenon. Walls et al. (2012) criticise a single-theory approach that is inadequate to explain the hypotheses, correlations, and research phenomena. Sections 2.1 and 2.2 provide the literature review and hypothesis development.

2.1. Liquidity Ratio and Financial Performance

In 1984, Myers developed the pecking order theory (Myers, 1984). According to the theory, firms prefer internal financing, such as liquid assets and retained earnings, rather than external financing (debt or equity) (Jahanzeb et al., 2013). The preference for internal financing arises due to information asymmetry between investors and managers, where funds require no market valuation and making it more flexible and less costly (López-Gracia & Sogorb-Mira, 2008). According to Gupta (2022), when a firm requires external funding, debt is preferred over equity. When firms limit the issuance of equity or the need for debt, such firms avoid ownership dilution, which portrays a negative market signal. The theory explains the firm's financial decision-making. Therefore, liquidity plays a critical role, where firms with high liquid assets can finance investments and operations without incurring external costs. The theory suggests that firms with higher liquidity are better at exploiting profitable opportunities, thereby improving financial performance (Shyam-Sunder & Myers, 1999).

Keynes (1936) developed the liquidity preference theory in 1936. The theory states that firms prefer liquidity or the ability to convert assets into cash over fewer liquid assets

quickly; therefore, to meet their immediate obligations as they become due, and seize investment opportunities to ensure growth and positively influence financial performance. The scope of the theory extends to corporate finance, and maintaining an appropriate liquidity ratio ensures the firm is safeguarded against financial shocks and helps with smooth operational activities (Wray, 1990). According to Keynes (1937), changes in the liquidity preference of firms significantly affect the rate of interest. This implies that increased interest rates discourage expansions and investments of firms, and raise the cost of borrowing, thereby negatively affecting the firm's performance. Furthermore, higher interest expenses negatively affect net income, which significantly affects the financial performance.

Bagana et al. (2024) investigated the impact of liquidity on the financial performance of manufacturing companies listed on the Nigerian Stock Exchange from 2018 to 2022. This study employed panel analysis and found an insignificant association between the quick ratio and financial performance. However, a significant and positive link between financial performance and current ratio. Rahmiyati (2022) investigated the impact of the current ratio on ROA using 32 listed food and beverage firms on the Indonesian Stock Exchange (ISE) from 2017 to 2020. The findings of this study indicate a positive and significant impact of liquidity on ROA. Sanga et al. (2025) evaluated the influence of liquidity on financial performance using 15 ISE-listed building construction and real estate firms in 2023. This study adopted a multiple regression analysis and found a positive link between liquidity and ROA. Odendo et al. (2023) examined six agricultural firms listed at the Nairobi Stock Exchange from 2015 to 2022. This study employed the panel regression analysis and found a positive and significant nexus between liquidity and ROA. Abdullahi et al. (2020) investigated 6 Nigerian listed manufacturing firms from 2004 to 2018. This study employed the random effect multiple regression analysis and found a positive and significant nexus between liquidity and financial performance. Similarly, Maharjan (2007) and Pradhan and Dahal (2021) found that liquidity had a positive impact on profitability. The positive results are consistent with the pecking order theory expectations between liquidity and financial performance. Furthermore, consistent with the liquidity preference theory, which emphasises the significance of keeping liquid assets to meet unexpected obligations and take advantage of investments, this has a positive influence on firm performance.

Kamau et al. (2021) examined 52 Kenyan insurance firms from 2010 to 2018, employing the random and fixed effect models. This study established a negative but significant correlation between financial performance and liquidity. Djeudja and Kongnyuy (2018) examined 80 Cameroonian small and medium-sized companies and employed the OLS method to analyse the data collected through questionnaires. The investigation discovered a significantly negative association between financial performance and liquidity. Similar results were found by Subedi (2024) when examining insurance firms in Nepal. Also, Airout et al. (2023) assert that other studies found a negative connection between liquidity and financial performance.

However, Andriani and Raharja (2025) evaluated the impact of liquidity on the nexus between capital adequacy ratio (CAR) and the performance of Bank Perkreditan Rakyat in Indonesia and employing multiple linear regression analysis. This study found liquidity had an insignificant effect on the connection between CAR and financial performance. Melani et al. (2019) evaluated the influence of liquidity on the profitability (ROA) of 8 food and beverage companies listed in the ISE from 2015 to 2018. This study employed panel data regression analysis and found that Liquidity had no impact on ROA. However, liquidity and the capital adequacy ratio simultaneously had a positive impact on ROA.

Yahya and Setyono (2024) found that an imbalance in liquidity and capital adequacy ratios may culminate in financial instability of the firm. However, Aerlangga (2025) indicated that a moderating factor like risk management may cause the liquidity ratio not

to have an impact on profitability in the observed period. Based on the empirical and theoretical literature, this paper tests the following hypothesis:

H1. *There is a positive association between liquidity and financial performance.*

2.2. Leverage Ratio and Financial Performance

In 1977, Ross developed the signalling theory (Ross, 1977). The theory states that firms with higher leverage signify a firm's prospects for managers (Ross, 1977). Fitriyani et al. (2023) assert that the theory emerged due to information asymmetry problems. Managers have more knowledge about the firm's operations and prospects than external stakeholders. Therefore, signalling theory explains the significance of firms providing transparent financial statements to stakeholders as a clear signal (Shelda et al., 2025). According to Valentina and Rasyid (2022), financial indicators such as capital adequacy, leverage, and liquidity ratios offer positive signals to stakeholders, ensuring attractiveness and trust in the firms. Shelda et al. (2025) and Cahya et al. (2020) assert the significance of transparent financial reporting to attract investors, as it allows them to assess the firm's performance. Fitriyani et al. (2023) note that the theory posits that firms increasing their debt can demonstrate confidence in their prospects. Brigham and Houston (2018) confirm that additional debt by firms is interpreted by external stakeholders as a positive indication of low business risk. Meanwhile, the signalling theory suggests that firms with resilient prospects may utilise higher levels of debt to signify their quality in the sector (Ross, 1977). However, over-dependence on debt may have negative consequences if investors and other external stakeholders associate it with financial difficulties (Jensen, 1986). Therefore, the signalling effect of leverage suggests a non-linear path, where it may be beneficial up to a certain level.

Modigliani and Miller introduced the Trade Off Theory (TOT) in 1963. The theory articulates how much equity and debt a firm has to ensure symmetry between profits and costs. According to Khoa and Thai (2021), TOT is a notable finance theory that provides significant insights into the nexus between liquidity and leverage to financial performance. The theory suggests that firms should maintain financial stability and liquidity, thus effective utilisation of the assets to generate profits and retain cash for unforeseen expenditures (Agyei et al., 2020). However, Bagana et al. (2024) argued that excessive liquidity might be detrimental and impede the firm from making money.

The firm's optimal capital structure is significantly contingent upon the costs and benefits of financing with debt. The theory presumes tax benefits when a firm relies on debt (Fitriyani et al., 2023). Consequently, firms must carefully compare options to determine their funding strategies. Firms that adjust their capital structure often gravitate towards a target debt ratio that is consistent with the trade-off theory, which highlights the benefits and costs of debt (Hovakimian et al., 2001).

According to Kraus and Litzenberger (1973), financial performance may improve with leverage to an optimal point. However, beyond the optimal point, when debt increases, it may negatively impact firm value, leading to bankruptcy costs, which raises the weighted average cost of capital. Bankruptcy costs are a firm's indicators that the financial and economic conditions are deteriorating (Opler & Titman, 1994). Therefore, TOT supports the non-linear relationship (Kraus & Litzenberger, 1973). Firms with a high leverage ratio rely on debt as a financing strategy for expanding operations. Opler and Titman (1994) found that a firm with a high leverage ratio has a high correlation with poor financial performance. Bui et al. (2021) assert that a firm with a high debt ratio significantly affects its financial performance. This implies that an excessive use of leverage reduces the firm's profitability, which affects its financial performance. However, Yahaya (2025) argues that an increase in a firm's operations will potentially increase revenue, which results in improved financial

performance. TOT is particularly relevant for the South African consumer goods sector, which faces uncertain and dynamic economic conditions, like other sectors. [Inrawan et al. \(2025\)](#) assert that firms must maintain adequate liquidity and financial stability.

According to [Hidayat \(2018\)](#), the leverage ratio is a crucial factor that reveals how much a firm's assets are financed through debt or equity. [Abbasi et al. \(2024\)](#) evaluated how financial leverage affects the financial performance of Tehran Stock Exchange-listed firms from 2013 to 2022. Their sample included 114 firms from different sectors, including financial and non-financial firms. This study employed the Estimated Generalised Least Squares to perform analysis and found a significantly negative correlation between leverage and ROA. [Abid et al. \(2024\)](#) also assessed the impact of leverage on financial performance from the Pakistan Stock Exchange from 2016 to 2023. This study sampled 24 food and personal care products firms and employed the OLS regression analysis and the generalised method of moments (GMM). This study found the correlation between leverage and ROA to be significant and negative.

[Albalwy \(2024\)](#) examined the impact of leverage on corporate finance sampling 126 listed Saudi firms in industrials, materials, and energy from 201 to 2022. This study employed the Hansen threshold regression analysis and found a highly significant and negative relationship between leverage and ROA. [Naz et al. \(2024\)](#) examined the influence of financial flexibility on the financial performance of 19 listed automobile firms in Pakistan from 2013 to 2022. This study employed the GMM and found the link between financial leverage and financial performance to be negative and significant. Similar results were found by [Rahman et al. \(2020\)](#), [Risal and Campus \(2020\)](#), and [Peace and Onyenania \(2025\)](#). The trade-off theory anticipates a negative nexus between leverage and financial performance, which is aligned with the negative results ([Kaluarachchi et al., 2021](#)). However, beyond the optimal point, agency costs and costs of financial distress may rise, so a leverage increase above this point negatively affects ROA. TOT indicates a non-linear relationship between leverage and financial performance, where performance increases with leverage up to a certain point, then decreases as the costs of financial distress outweigh the benefits.

[Rehman \(2013\)](#) states that there is a significant correlation between leverage and the firm's financial performance. [Nurcahya et al. \(2024\)](#) examined the impact of leverage on financial performance, sampling 47 ISE-listed manufacturing firms from 2017 to 2021, using a multiple regression analysis, and found a positive and significant association between leverage and financial performance. [Estiasih et al. \(2024\)](#) evaluated the influence of leverage and financial performance of 12 ISE-listed manufacturing companies in the food and beverage sector from 2017 to 2019. This study employed partial least squares analysis and found a positive link between leverage and financial performance. Furthermore, found no significant link between firm size and financial performance. [Moussa and El Feidi \(2023\)](#) and [Ado et al. \(2021\)](#) found similar positive results between leverage and financial performance. At moderate to low levels of leverage, tax benefits outweigh the costs, therefore, positively affect ROA, which is in line with the TOT theory. The positive results are consistent with the signalling theory expectations between leverage and financial performance.

However, [Putra \(2024\)](#) investigated the influence of leverage on financial performance, sampling 20 ISE-listed firms from 2019 to 2023. This study employed multiple regression analysis and found no significant association between leverage and financial performance. Consistent with [Yahaya \(2025\)](#), who used 153 Nigerian listed firms from 2014 to 2023 and employed the random effects model and found no significant link between leverage and financial performance.

Prior studies show inconclusive results between leverage and financial performance. Some studies found a negative impact, some found a positive impact, and others found

no significant relationship. Furthermore, studies such as [Sadeghian et al. \(2012\)](#) and [Powers and Abor \(2007\)](#) confirmed a non-linear relationship between leverage and financial performance. The studies incorporated the quadratic term of leverage to capture the non-linear relationship between leverage and financial performance. Based on the empirical and theoretical literature, this paper tests the following hypothesis:

H2. *There is a non-linear relationship between leverage and financial performance.*

The empirical and theoretical literature reviewed was derived from different countries and contexts and employed various methodologies. Our findings on the literature vary based on the firm’s economic sector and the measures of the variables. Therefore, depending on the different measures of the selected variables, our results may produce different results. In financial management studies, agency theory is widely recognised. However, we found other theories, such as liquidity preference theory, TOT, pecking order theory, and signalling theory, are also relevant to investigations of the impact of liquidity and leverage ratio on financial performance. Firm’s managers are envisioned to increase the optimal benefits of stakeholders, thus clients, employees, shareholders, and others. As demonstrated by the empirical studies on the impact of leverage and liquidity on the financial performance of the examined firms. The value determined from debt and equity in firms increases significantly due to the added trust layer. JSE-listed firms are subjected to inspections as they are required to publicise their annual audited financial statements.

3. Methodology

This section provides the methodological approaches adopted in this study. It includes the data, sample selection, variables employed in this study, and the model specification.

3.1. Data, Sample, and Variable Description

This paper adopted the quantitative method to examine the impact of liquidity and leverage on the financial performance of JSE-listed consumer goods firms for 10 years from 2015 to 2024. This paper employed the panel regression models to analyse the firms’ annual data. JSE was used to source the listed consumer goods firms. Thereafter, audited financial statements were sourced from the company’s official websites and were used to calculate the financial ratios employed. From the total of 20 consumer goods firms, 13 firms were sampled. Seven firms were excluded from the sample because they were missing more than one audited financial statement. From the total of 13 sampled firms, this study has 130 cross-sectional observations for selected consumer goods firms. The analysed JSE-listed consumer goods firms are listed in [Table 1](#).

Table 1. List of sampled consumer goods firms.

AVI Limited
Anheuser–Busch InBev
Tiger Brands Limited
British American Tobacco
Ocean Group Limited
Astral Foods Limited
Metair Investments Limited
Quantum Foods Holdings
Crookes Brothers Limited
AH-Vest Limited
Compagnie Fin Richemont
RCL Foods Limited
RFG Holdings Limited

Source: Author’s own composition.

Our dependent variable is the financial performance proxied by ROA. ROA is measured by the net income divided by total assets. Liquidity and leverage ratios are the independent variables. Liquidity measures the financial stability of the firms, while financial leverage measures the firm's capital structure (Al-Hawtmah & Shaban, 2023). The current assets to current liabilities ratio measures the liquidity ratio. According to Settembre-Blundo et al. (2021), financial stability has a positive impact on the financial performance of the firms because the firms are prepared to navigate the inevitable implications of economic shocks. The total assets to total equity ratio measures the leverage ratio. A quadratic term for leverage (LEV2) was developed through squaring the leverage ratio variable to test the non-linear relationship between leverage and financial performance. Control variables were inventory turnover (INVT), firm size (FS) and its quadratic term (FS2), Average collection period (ACP), and Net profit margin (NPM). Firm size and leverage are associated with the firm's statement of financial position, particularly in relation to the interest in assets that are efficiently employed to generate income (Khoza et al., 2024). However, NPM and ACP are linked to the statement of financial performance of the firm. Prior studies were used to employ suitable control variables, which found positive results on these variables (Mansor & Kam, 2001; Ozili & Iorember, 2024; Chen & Xu, 2024). INVT is measured by the total cost of goods sold divided by the average inventory. NPM is measured by earnings after tax divided by total sales. ACP is measured by accounts receivable to annual sales multiplied by 365. Makori and Jagongo (2013) assert that ACP indicates the period it takes a firm to recover money or cash from customers. The natural logarithm of total assets measured FS. A quadratic term (FS2) was included to capture the potential nonlinear effects on ROA. It is developed by squaring the original FS variable. Including both FS and FS2 allows the model to test for a non-linear relationship with ROA. The variable description of this study is presented in Table 2.

Table 2. Variable description.

Variables	Description	Measurement	Source
Dependent variable			
Return on assets (ROA)	Indicates how assets are effectively utilised to generate profit.	Net income ÷ Total assets	Golestani and Fallah (2019); Cekrezi (2015); Sifrain (2025)
Independent variables			
Liquidity ratio (LIQ)	Measures a firm's ability to meet short-term obligations.	Current ratio = Current assets ÷ Current liabilities	Fitrilia and Nilwan (2025); Ilham et al. (2024)
Leverage ratio (LEV)	Indicates how much of a firm's assets are financed by equity.	Total assets ÷ Total equity	Pang et al. (2024); Nmorsi et al. (2024)
Quadratic term of leverage (LEV2)	Indicates a non-linear relationship between LEV and ROA.	Squared leverage ratio	Abor (2005); Saeedi and Mahmoodi (2011)
Control variables			
Inventory turnover (INVT)	Indicates how efficiently the firm sells and replaces inventory within a year.	Cost of Goods Sold ÷ Average Inventory	Khanna et al. (2024); Melamed et al. (2022)
Net profit margin (NPM)	Indicates how effectively a firm generates net profit from total sales.	Earnings after tax ÷ total sales	Brigham and Daves (2018)
Average collection period	It indicates the average number of days it takes a firm to collect payments from credit sales.	(Accounts receivable ÷ total sales) × 365	Oh and Kim (2016); Brigham and Daves (2018)
Firm size (FS)	Indicates the size of the firm.	Natural logarithm of total assets	Islam et al. (2023); Swastika (2013)
Quadratic term of Firm size (FS2)	Indicates a non-linear relationship between FS and ROA.	Squared firm size	Zhou et al. (2021); Wang et al. (2013)

Source: Author's own composition.

3.2. Model Specification

The Panel Least Squares (PLS) regression was employed to evaluate the impact of liquidity and leverage on the financial performance of the JSE-listed consumer goods firms. PLS allows intuitive estimation and interpretation of the measures while preventing instability and proliferation challenges related to other models (Arellano & Bover, 1995; Baltagi, 2008).

The panel data approach includes choosing an appropriate estimation method between Ordinary Least Squares (OLS) and Two-Stage Least Squares (2SLS). The Durbin–Wu–Hausman test was performed to determine the potential endogeneity and validity of OLS or if 2SLS is required. Thereafter, the Breusch–Pagan LM test was employed to choose the appropriate model between pooled and random effects. Redundant fixed-effect testing was performed to choose the appropriate model between pooled and fixed effects. Meanwhile, the Hausman test was employed to select between random and fixed effects specifications. The random effect (RE) model assumes that all firms in the panel have the equivalent mean value for the intercept (Arkes, 2023). This implies that heterogeneity is random and contained in the error term. According to Arkes (2023), the fixed effect (FE) model implies that all firms may have different intercepts, and the intercept remains unchanged over time. To that end, this study found that the random effects model was appropriate rather than the fixed or pooled effects model (Arellano & Bond, 1991).

The specification of the general regression model is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 X_{it} + \beta_5 X_{it} + \beta_6 X_{it} + \beta_7 X_{it} + \beta_8 X_{it} + \varepsilon_{it} \quad (1)$$

where

Y_{it} = the dependent variable of the institution's i for the time t .

X = the vector of the explanatory variables.

ε_{it} = the disturbance term.

The general fixed effect model is as follows:

$$ROA_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 LEV_{it} + \beta_3 LEV2_{it} + \beta_4 INVT_{it} + \beta_5 NPM_{it} + \beta_6 ACP_{it} + \beta_7 FS_{it} + \beta_8 FS2_{it} + \varepsilon_{it} \quad (2)$$

where ROA_{it} measures financial performance, represents return on assets, LIQ_{it} is the liquidity ratio, LEV_{it} is the leverage ratio, $LEV2_{it}$ is the quadratic term for the leverage ratio, $INVT_{it}$ is the inventory turnover, NPM_{it} is the net profit margin, ACP_{it} is the average collection period, FS_{it} is the firm size. $FS2_{it}$ is the quadratic term for FS , and ε_{it} is the error term.

Diagnostic tests were conducted before the estimation of Equation (2). The data collected were checked for heteroskedasticity, multicollinearity, and serial correlation to prevent erroneous regression analysis results. Applying the p -value of more than 0.05 implies there is no heteroskedasticity (Hansen, 2022). Therefore, to test for heteroskedasticity, the cross-section and period heteroskedasticity LR tests were performed. A correlation matrix was applied to show any multicollinearity within the variables.

4. Results and Discussion of Findings

This section provides a summary of descriptive statistics, correlation matrix, model selection and diagnostic tests, and econometric models employed in this study.

4.1. Descriptive Statistics and Correlation Analysis

Table 3 presents an overview of the descriptive statistics of the variables employed in the estimation for 13 JSE-listed sampled consumer goods firms.

Table 3. Summary of descriptive statistics.

	ROA	LIQ	LEV	LEV2	INVT	NPM	ACP	FS	FS2
Mean	0.113825	3.916523	1.990914	4.779511	10.67736	0.138400	50.41485	9.408830	93.25436
Median	0.060580	1.778500	1.797000	3.229258	7.891500	0.066700	47.56900	9.765000	95.35585
Maximum	1.308600	94.32000	6.263000	39.22517	35.48400	1.858000	196.5950	13.12000	172.1344
Minimum	−0.197000	0.102400	1.000700	1.001400	1.115000	−3.170000	1.216000	2.416000	5.837056
Std. Dev	0.185582	10.89619	0.906696	5.218033	7.976280	0.426451	24.97627	2.182870	33.54457
Jarque–Bera	1284.352	9176.271	149.8745	1538.168	31.53304	4593.560	607.6310	144.7604	22.67964
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000012
Observations	130	130	130	130	130	130	130	130	130

Source: Author's own composition.

In Table 3, the proxy for financial performance, the mean value for ROA, was 0.114. The minimum for ROA was −0.197, and the maximum was 1.309. The standard deviation was 0.185. The mean value for LIQ was 3.917, with a standard deviation of 10.90. While the maximum for LIQ was 94.32, the minimum was 0.1024. The mean value for LEV was 1.991, with a maximum of 6.263, and a minimum of 1.0007, while the standard deviation was 0.907. The mean value for LEV2 was 4.779, with a maximum of 39.23, and a minimum of 1.0014, while the standard deviation was 5.218. The mean value for INVT was 10.68. The minimum for INVT was 1.115, and the maximum was 35.48, while the standard deviation was 7.976. The mean value for NPM was 0.138, with a standard deviation of 0.426. While the maximum for NPM was 1.858, and the minimum was −3.170. The mean value for ACP was 50.41. The maximum for ACP was 196.60, and the minimum was 1.216. The standard deviation for ACP was 24.98. The standard deviation for FS was 2.183, while the mean was 9.409. The maximum for FS was 13.12, and the minimum was 2.416. The standard deviation for the quadrant term (FS) was indicated as FS2 and was 33.54, with a mean of 93.25. The maximum for FS2 was 172.13, and the minimum was 5.837. Descriptive statistics show that the *p*-values of all the variables are less than 0.05; therefore, we reject the null hypothesis of normality. This implies the variables are not normally distributed. The descriptive statistics were based on 130 observations in total.

Multicollinearity is one of the limitations of multiple regression analysis. Table 4 presents the correlation matrix employed to test the multicollinearity among the variables of this study.

Table 4. Correlation matrix.

	ROA	LIQ	LEV	LEV2	INVT	NPM	ACP	FS	FS2
ROA	1.000000								
LIQ	0.478223 ***	1.000000							
LEV	−0.221385 **	−0.247222 ***	1.000000						
LEV2	−0.145635 *	−0.172681 **	0.962255 ***	1.000000					
INVT	−0.110557	−0.080537	−0.090532	−0.060655	1.000000				
NPM	0.492595 ***	0.382163 ***	−0.123927	−0.065148	−0.166508 *	1.000000			
ACP	−0.275355 ***	−0.224361 **	0.252932 ***	0.227948	−0.144488	−0.225361 ***	1.000000		
FS	0.055854	−0.037442	0.080164	0.056507	0.142750	0.037206	0.090931	1.000000	
FS2	0.040975	−0.067357	0.104543	0.062682	0.055362	0.046548	0.037835	0.973498 ***	1.000000

*, **, *** denote 0.1, 0.05, and 0.01 significance levels, respectively. Number of observations: 130. Source: Author's own composition.

Table 4 presents the results of the correlation analysis. Hansen (2022) indicates that a correlation less than −0.80 or greater than 0.80 is considered strong, indicating the presence of multicollinearity. A statistically significant correlation of 0.962255 between LEV and LEV2, and a statistically significant correlation of 0.973498 between FS and FS2 indicate a potential sign of collinearity between the variables, which is common given their mathematical nexus. The variables are theoretically pertinent in capturing the non-linear

effects; therefore, all the variables are retained. The value of the other variables ranges from -0.27 to 0.49 , showing no collinearity amongst the variables.

4.2. Model Selection and Diagnostic Tests

One of the panel's restrictive attributes is the presumption that all recorded individual firms are homogeneous in a panel, without considering the firms' characteristics and differences. Therefore, this requires that diagnostic tests be performed to ascertain whether the firm's differences affect the PLS results. This is accomplished by performing the Durbin–Wu–Hausman, Breusch–Pagan LM, and the Hausman tests to ascertain the most suitable results on which inferences can be based. Tables 5–9 provide the test results of this study.

Table 5. Endogeneity testing (Durbin–Wu–Hausman).

Variable	Coefficient	Std. Error	t-Statistic	Prob
LIQ _{res}	−0.001207	0.0033582	−0.336917	0.7369
LEV _{res}	0.067890	0.0206602	0.328605	0.7431
LEV2 _{res}	−0.012128	0.035975	−0.337113	0.7367

Source: Author's own composition.

Table 6. Breusch–Pagan LM.

Test	Statistics	d.f.	Prob.
Breusch-Pagan LM	106.8282	78	0.0168
Pesaran scaled LM	2.308099		0.0210
Pesaran CD	−0.296358		0.7670

Source: Author's own composition.

Table 7. Redundant fixed effect testing.

Effect Test	Statistics	d.f.	Prob.
Cross-section F	2.875293	(12.109)	0.0018
Cross-section Chi-sq.	35.757520	12	0.0004

Source: Author's own composition.

Table 8. Hausman Test.

Test Summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	31.705078	8	0.0001

Source: Author's own composition.

Table 9. Panel Heteroskedasticity LR Test.

Test Type	Statistics	d.f.	Prob.
Cross-section Heteroskedasticity LR Test	227.4683	13	0.0000
Period Heteroskedasticity LR Test	97.10540	13	0.0000

Source: Author's own composition.

Table 5 presents the Durbin–Wu–Hausman test to check the endogeneity and validity of the PLS, or if 2SLS is required.

In Table 5, the residuals from the first stage (liquidity and leverage) were developed and added to Equation (2) to test the endogeneity and validity of the PLS. The probabilities of the residuals for LIQ (0.5959), LEV (0.8735), and LEV2 (0.7367) were insignificant. If the probability is greater than 0.05, we fail to reject the null hypothesis that states variables are exogenous and PLS is preferred and appropriate (Arellano & Bond, 1991). Therefore, there is no evidence of endogeneity, and we fail to reject the null hypothesis of exogeneity. PLS is the valid and preferred model.

Table 6 presents the Breusch–Pagan LM test to investigate whether the RE model is more suitable than the Pooled PLS model.

Table 6 presents the Breusch–Pagan LM for panel effect and Pesaran CD for cross-sectional dependence in residuals to test whether RE are better than pooled PLS. The probability of the Pesaran scaled LM and the Breusch–Pagan LM is 0.00210 and 0.0168, respectively. The p -values are less than 0.05, justifying the panel estimator. Therefore, the RE model is more suitable than the pooled PLS. The Pesaran CD test has a p -value of 0.7670 above 0.10, therefore revealing no cross-sectional dependency (Gujarati & Porter, 2009). The test performed validates the model specifications. In Table 7, the redundant fixed effect testing was employed to choose between pooled and fixed specifications of the model.

Table 7 presents the statistical values between fixed and pooled effects. The p -values are highly significant at 0.01; therefore, the null hypothesis of selecting a pooled effect is rejected, FE is consistent and efficient (Arellano & Bond, 1991). In Table 8, the Hausman test is employed to choose between random and fixed specifications of the model.

Table 8 presents the chi-square values between fixed and random effects. The p -value is highly significant at 0.01; therefore, the null hypothesis of selecting a RE is rejected, and FE is consistent and efficient (Arellano & Bond, 1991). Consequently, we base this study's analysis on the FE model. Table 9 presents the panel cross-sectional and period Heteroskedasticity LR test.

In Table 9, the likelihood ratio indicates evidence of heteroskedasticity. The cross-sectional likelihood ratio value is 227.4683 with a p -value less than 0.01. The likelihood of period Heteroskedasticity has a value of 97.10540, and a p -value of less than 0.01. Therefore, we reject the null hypothesis of homoskedasticity, showing that heteroskedasticity is present in the panel data (Gujarati & Porter, 2009). The models were estimated with robust standard errors adjusted for period and cross-section to address heteroskedasticity and autocorrelation, which is common in panel data. The regression analysis was based on the tests of heteroskedasticity. Figure 1 presents a summary of the normality test.

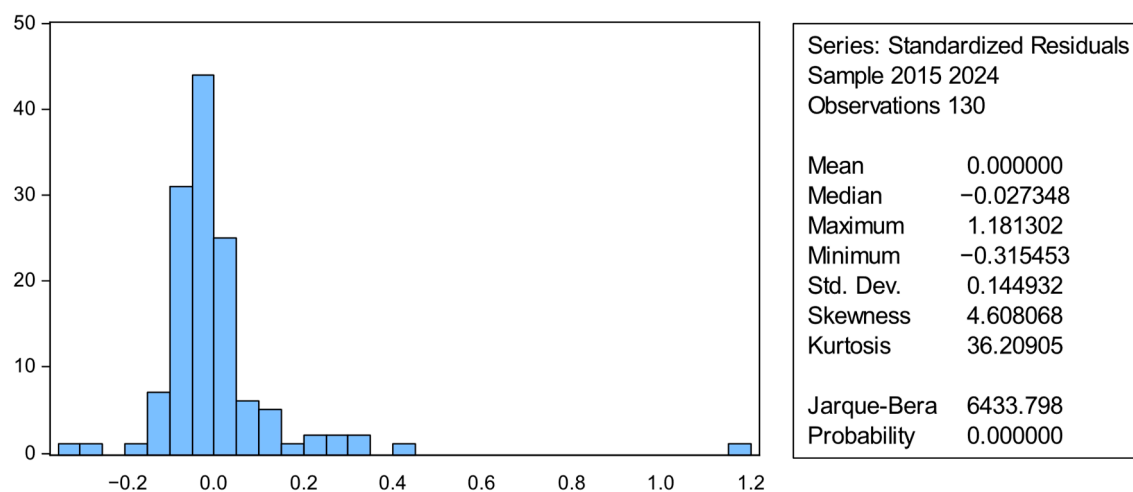


Figure 1. Normality test. Source: Author's own composition.

Figure 1 illustrates that the Jarque–Bera test, based on the FE model, was used to assess the normality of residuals. The Jarque–Bera statistics show 6433.798 with a p -value of 0.0000. Therefore, the results imply the residuals are not normally distributed. The results showed a substantial positive skewness of 4.608068 and excess kurtosis of 36.20905, which suggests a right-skewed distribution. The null hypothesis of normality is therefore rejected. To account for potential distortions in the inference, the subsequent models employed robust standard errors.

4.3. Panel Least Squares (PLS) Regression Results

Table 10 presents a summary of the pooled and fixed-effect models' results. However, based on the Hausman test performed, our main analysis is based on the fixed effects (FE) model.

Table 10. Summary of pooled and random effects models' results.

Pooled Effects Model			Random Effects Model		
Dependent Variable: ROA					
Independent Variable	Coefficient	Standard Error	Independent Variable	Coefficient	Standard Error
C	0.130600 *	0.069247	C	0.124286	0.071354
LIQ	0.004436 ***	0.001062	LIQ	0.004567 ***	0.001096
LEV	−0.100833 *	0.052731	LEV	−0.097688	0.053505
LEV2	0.014924 *	0.006895	LEV2	0.014605 *	0.007051
INVT	−0.002904	0.001693	INVT	−0.003019	0.001694
NPM	0.131041 ***	0.035490	NPM	0.129332 ***	0.036469
ACP	−0.001221 **	0.000513	ACP	−0.001318 **	0.000506
FS	0.036265	0.024282	FS	0.038640	0.024274
FS2	−0.001839	0.001725	FS2	−0.001999	0.001734
R-squared		0.390102	R-squared		0.396785
Adj R-squared		0.349778	Adj R-squared		0.356903
F-statistic		9.674226	F-statistic		9.948972
Prob (F-statistic)		0.000000	Prob (F-statistic)		0.000000
Durbin–Watson stat		1.750583	Durbin–Watson stat		1.730066
Observations		130	Observations		130

*, **, *** denote 0.1, 0.05, and 0.01 significance levels, respectively. Source: Author's own composition.

From the pooled effect model in Table 10, the liquidity ratio (LIQ) has a statistically significant and positive impact on ROA. A percentage increase in LIQ will result in a significant increase of 0.004436 in ROA. However, LEV has a statistically significant negative impact on ROA. A percentage increase in LEV will result in a significant decrease of 0.100833 in ROA. The quadratic term of leverage (LEV2) has a statistically significant and positive impact on ROA. A percentage increase in LEV2 will result in a significant increase of 0.014924 in ROA. INVT has a statistically insignificant negative effect on ROA, which suggests no strong evidence of a relationship in this sample. NPM has a statistically significant and positive impact on ROA. A percentage increase in NPM will significantly bring an increase of 0.131041 in ROA. ACP has a statistically significant and negative impact on ROA. A percentage increase in ACP will significantly bring a decrease of 0.001221 in ROA. FS has a statistically insignificant positive impact on ROA. Meanwhile, FS2, which represents the quadratic term of FS, has a statistically insignificant negative effect on ROA. The results suggest no strong evidence of either linear or non-linear correlation between Fs and ROA.

In the random effect model, LIQ has a statistically significant and positive impact on ROA. A percentage increase in LIQ will result in a significant increase of 0.004567 in

ROA. However, LEV has a statistically insignificant negative impact on ROA. A percentage increase in LEV will result in an insignificant decrease of 0.097688 in ROA. The quadratic term of leverage (LEV2) has a statistically significant and positive impact on ROA. A percentage increase in LEV2 will result in a significant increase of 0.014605 in ROA. INVT has a statistically insignificant negative effect on ROA, suggesting no strong evidence of a relationship between the variables. NPM has a statistically significant and positive impact on ROA. A percentage increase in NPM will significantly bring an increase of 0.131041 in ROA. ACP has a statistically significant and negative impact on ROA. A percentage increase in ACP will significantly bring a decrease of 0.001318 in ROA. FS has a statistically insignificant positive impact on ROA. Meanwhile, FS2, which represents the quadratic term of FS, has a statistically insignificant negative effect on ROA. The results suggest no strong evidence of either a non-linear or linear relationship between FS and ROA.

Based on the Hausman test, the FE model was appropriate and preferred. Therefore, the main findings are based on this model. Table 11 presents the fixed effects model panel data with cross-sectional and time series. The table provides a summary of the fixed effects regression results.

Table 11. Fixed effects model results.

Dependent Variable: ROA		
Independent Variable	Coefficient	Standard Error
C	0.347905 *	0.184706
LIQ	0.000705 *	0.001844
LEV	−0.055025	0.032079
LEV2	0.008520 **	0.003678
INVT	0.001319	0.000890
NPM	0.044425 ***	0.010879
ACP	−0.000286 **	0.000120
FS	−0.042620	0.026910
FS2	0.002127 *	0.001147
R-squared		0.696542
Adj R-squared		0.640862
F-statistic		12.50965
Prob (F-statistic)		0.000000
Durbin–Watson stat		2.186786
Observations		130

*, **, *** denote 0.1, 0.05, and 0.01 significance levels, respectively. Source: Author's own composition.

In Table 11, the liquidity (LIQ) coefficient is statistically significant and positive (0.000705), demonstrating that an increase in liquidity will increase the financial performance measured by ROA by 0.000705. The results are consistent with the results obtained in the pooled and RE regression analysis in Table 10, which also reveals a positive and significant relationship between LIQ and ROA. Moreover, the results are consistent with the pecking order theory and liquidity preference theory, which predict a positive impact of leverage on financial performance. The result implies that firms with higher liquidity are better at meeting their short-term obligations, maintaining efficient operations, and avoiding financial distress, therefore improving their financial performance. The results of this study confirm that the liquidity ratio significantly enhances the financial performance of the companies. These findings are consistent with prior studies by [Shafarin and Aisyah \(2019\)](#), [Odendo et al. \(2023\)](#), and [Sherif \(2025\)](#), who also found a significantly positive link between liquidity and ROA, implying that a change in liquidity will affect the performance of the firm. Conversely, they are inconsistent with [Akenga \(2017\)](#) and [Mehmetaj](#)

and Hajdari (2025), who found a significantly negative association between ROA and LIQ. However, Bari et al. (2021) found an insignificant association between liquidity and ROA.

Leverage (LEV) has a coefficient of -0.055025 , which indicates a statistically insignificant effect on ROA. The results are consistent with the results obtained in the pooled regression analysis in Table 10. The result implies that although leverage may reduce ROA, the impact is statistically insignificant. The results are inconsistent with the TOT, which predicts a non-linear (positive) impact between leverage and financial performance. Moreover, inconsistent with the signalling theory, which predicts a positive relationship between leverage and financial performance. However, the results are consistent with Chauhan et al. (2020), Ahmad et al. (2025), and Yahaya (2025), who found an insignificant link between leverage and financial performance. The quadratic term of leverage (LEV) has a coefficient of 0.008520 , which indicates a statistically significant effect on ROA. The results are consistent with the results obtained in the pooled and FE regression analysis in Table 10. The result implies that leverage significantly increases ROA. The results are consistent with the TOT, which predicts a non-linear (positive) impact between leverage and financial performance. Moreover, consistent with the signalling theory, which predicts a positive relationship between leverage and financial performance. Dsouza et al. (2025) found a positive and statistically significant impact of LEV2 on ROA. The coefficient for INVT is 0.001319 , indicating a statistically positive and insignificant impact of INVT on ROA. The coefficient's positive sign implies that an increased INVT is associated with an increased profitability, which positively affects its ROA. However, the results of the nexus between INVT and ROA are insignificant. Consistent with Farooq (2019), who found no significant link between inventory turnover and financial performance.

The coefficient for Net profit margin (NPM) is statistically significant and positive (0.044425), indicating that a percentage increase in NPM will significantly increase ROA. The results are consistent with those from the pooled and FE regression analysis in Table 10, which also shows a positive and significant relationship between NPM and ROA. This implies that when NPM increases, the firm's profitability also increases based on sales, which ultimately improves ROA. Therefore, the firm is efficient in converting its sales to profits, which efficiently contributes to the firm's ability to generate returns from its assets. The results are consistent with Arwani et al. (2024) and Wati et al. (2024), who found a positive and significant impact of NPM on ROA. However, Utari et al. (2022) and Firdaus and Dara (2020) found no significant association between NPM and ROA.

The average collection period (ACP) is statistically negative. The coefficient of -0.000286 indicates that a higher ACP is associated with a decrease in ROA. The results are inconsistent with the results obtained in the pooled and FE regression analysis in Table 10, which shows a negative and significant relationship between ACP and ROA. The results imply that increasing the ACP negatively affects the financial performance of the firms. However, shortening the collection period will improve the financial performance of the firms. Furthermore, a longer ACP means the firm's money is tied up in its cash receivables, which increases the firm's risk of bad debts and reduces its liquidity. The results are consistent with Mahato and Jagannathan (2016) and Sivakami et al. (2021), who found a significantly negative correlation between ACP and ROA. However, inconsistent with Umenzekwe et al. (2023), who found a significantly positive association between ACP and ROA.

The firm size (FS) has a coefficient of -0.042620 , which implies it is statistically insignificant and negative. However, the quadratic term (FS2) for firm size has a coefficient of 0.002127 , indicating a positive and statistically significant relationship with ROA. A percentage increase in FS2 will increase the ROA of the consumer goods firms. The result suggests that larger firms may generate higher asset returns due to their efficient

utilisation of their assets and strong market positioning. Consistent with [Pervan and Visic \(2012\)](#), [Giraldez-Puig and Berenguer \(2018\)](#), and [Nkasi and Philemon \(2025\)](#), who found a significantly positive correlation between firm size and ROA.

The adjusted R-squared value of 0.640862 and the R-squared value of 0.696542 show that around 64% of the variation in the dependent variable is explained by the independent variables in the selected model. Therefore, the model is fit. The results show the F-statistic of 12.50965, which is highly significant ($p = 0.000$), suggesting the model is a better fit.

5. Conclusions and Recommendations

This study was conducted to assess the impact of liquidity and leverage on the financial performance of the sampled 13 JSE-listed consumer goods firms in South Africa from 2015 to 2024. We used the ROA to proxy financial performance, tested against the selected independent variables, liquidity (LIQ), leverage (LEV), and the quadratic term of leverage (LEV2). Inventory turnover (INVT), average collection period (ACP), net profit margin (NPM), Firm size (FS), and the quadratic term of firm size (FS2) were control variables. The data was pooled from the firms' annual financial statements, and this study employed the PLS to analyse the data. The FE model was appropriate and justified; therefore, we based our results on the model. The result of this study indicates a positive and statistically significant relationship between LIQ and ROA, a positive and statistically significant relationship between LEV2 and ROA, a positive and statistically significant relationship between NPM and ROA, a negative and statistically significant relationship between ACP and ROA, and a positive and statistically significant relationship between FS2 and ROA.

Concerning the hypotheses for this study, the researcher failed to reject hypothesis 1, as the result shows a significant and positive correlation between liquidity and the financial performance of the selected consumer goods companies. Liquidity ratio measures the firm's capacity to satisfy short-term obligations and is essential in preserving financial stability and operational efficiency, which improves financial performance. The positive and statistically significant nexus between LIQ and ROA supports both the liquidity preference theory and the pecking order theory. According to liquidity preference theory ([Keynes, 1936](#)), it posits that to maintain operational flexibility and reduce uncertainty, firms prefer holding liquid assets, which positively affect performance. Similarly, the pecking order theory posits that firms with high liquidity signal stability and financial strength to investors, therefore improving the confidence of shareholders and the financial performance.

For Hypothesis 2, the researcher rejects the null hypothesis, as the results show a statistically insignificant and negative relationship between the leverage ratio and financial performance; meanwhile, the quadratic term of leverage (LEV2) is statistically significant and positive in the selected JSE-listed consumer goods companies. The negative and statistically insignificant nexus between LEV and ROA offers insufficient support for a linear relationship between the variables. However, the positive and statistically significant relationship between LEV2 and ROA supports the existence of a non-linear relationship, consistent with the Signalling theory that a higher debt level signals a stronger future firm performance under specific conditions. Furthermore, in line with the TOT, which suggests that ROA declines as leverage increases but then improves beyond a certain point. The results imply that the firms with lower debt levels may rely on equity financing and therefore operate below the optimal leverage level. Such firms are not utilising the theoretical advantages of debt. However, beyond a certain level of debt, the impact becomes positive, which implies that more leveraged firms can improve their performance through debt. This study is one of the few, or even the only, studies on this topic focusing on South African consumer goods firms listed on the JSE.

Based on our findings, the recommendations are subject to the financial managers of the consumer goods firms listed on the JSE. Financial managers should aim to maintain a healthy liquidity to enhance operational efficiency and improve financial performance, as indicated by the significant positive association between LIQ and ROA. While this study highlights the importance of liquidity over leverage in improving performance, managers should exercise caution with debt usage and prioritise prudent liquidity management. Therefore, we recommend that financial managers regularly monitor liquidity and implement sound working capital management. Moreover, we recommend that financial managers should integrate strategic liquidity planning in their firm's operational and financial decision-making to improve sound financial performance.

There were 20 consumer goods firms listed on the JSE. However, we sampled 13 firms based on the availability of their financial statements. Firms with more than one missing financial statement were excluded from the final sample. Therefore, seven firms were omitted from the sample of this study. The methodological limitation of this study was that PLS was employed over GMM because the sample was relatively small. Furthermore, this study exhibits that the data are not normally distributed. Normality is a significant assumption in linear regression models, ensuring the validity of the statistical tests (Jarque & Bera, 1987). Although robust standard errors were employed to alleviate the issues of reliability, results should therefore be limited to the firms in the consumer goods industry. This implies the findings are more generalizable to firms within the consumer goods industry. However, generalisability in other countries and sectors can be approached with caution. The results are limited to the emerging markets with similar tax and regulation systems. Therefore, the results may not be generalised to firms in developed countries. We acknowledge the availability of other proxies to measure financial performance. However, this study focused solely on ROA. Therefore, future studies could use other financial performance variables such as economic value added (EVA), return on equity (ROE), Tobin's Q, and net profit margin, and perform a comparative analysis of which proxy yields better results. Furthermore, future studies could apply principal component analysis to integrate the financial performance metrics into a single index.

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Abbreviations

The following abbreviations are used in this manuscript:

JSE	Johannesburg Stock Exchange
ROA	Return on Asset
LIQ	Liquidity
LEV	Leverage
NPM	Net Profit Margin
INVT	Inventory Turnover
PLS	Panel Least Squares
UK	United Kingdom
TOT	Trade Off Theory

ISE	Indonesian Stock Exchange
CAR	Capital adequacy ratio
GMM	Generalised Method of Moments
FS	Firm Size
ACP	Average Collection Period
FE	Fixed Effects
RE	Random Effects

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