



**THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM
PERFORMANCE OF LISTED CONSUMER GOODS
COMPANIES IN SOUTH AFRICA**

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Abstract

Customer protection has become an increasingly central dimension of stakeholder management and sustainable value creation, particularly in emerging markets where regulatory enforcement and information transparency remain inconsistent. This study investigates the relationship between customer protection and firm performance among listed consumer goods companies in South Africa. Specifically, it examines the effects of the Warranty Claims Ratio (WCR) and Revenue Return Ratio (RRR) on firm value, proxied by Tobin's Q. A correlational research design was employed to examine the relationships among the variables using panel data from 20 Johannesburg Stock Exchange (JSE) listed consumer goods firms over the period 2015-2024. The analysis utilized pooled OLS, fixed effects, and random effects regression models to estimate associations, supported by diagnostic and robustness checks to ensure validity and reliability of the findings. The findings reveal that WCR exerts a positive and significant influence on firm value, suggesting that warranty-related commitments signal product quality and long-term reliability. By contrast, RRR shows no statistically significant association with firm value. The study concludes that strategic disclosure of warranty-related information enhances firm value in the consumer goods sector, as warranties convey enduring quality assurances rather than short-term transactional outcomes. Accordingly, investors are encouraged to prioritize warranty terms over return ratios when evaluating firm reliability and long-term performance.

Keywords: Customer protection; corporate value; warranty claims ratio; revenue return ratio; Tobin's Q

1. Introduction

Consumer goods companies are sensitive to a metric that is firm performance in which they are evaluated based on their efficiency in operations, competitiveness in the market, and value creation to shareholders. One of the measures of firm performance. Tobin Q is especially useful since it represents the market value of a company in terms of the replacement cost of assets, reflecting the expectations of investors, strategic decisions,

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and the prospects of future growth (Awaysheh et al., 2024; Adegboyegun et al., 2025; Awotomilusi et al., 2025).

Conventionally, the capital structure, liquidity, leverage, corporate governance, and sustainability initiatives have been established as traditional determinants affecting the performance of firms (Masongweni & Simo-Kengne, 2024; Nxumalo et al., 2025; Madwe, 2026). Nonetheless, there is an increased interest in the customer protection systems, especially warranty claims and revenue return ratios, as key performance determinants. Warranty claims and product returns could be managed efficiently to increase consumer trust, safeguard brand reputation, decrease operational losses, and eventually improve the market valuation (Agag et al., 2023; Awaysheh et al., 2024; Farhad, 2024; Jacobs et al., 2020; Sriono et al., 2024).

Research in different industries indicates that companies that have an active customer protection strategy are more profitable, investor trustful, and have a better long-term performance (Agag et al., 2023; Farhad, 2024; Sriono et al., 2024). Although these advantages exist, there is still little empirical evidence on the specific impact of warranty claims and revenue ratios on the Q of Tobin on South African consumer goods companies, with a severe knowledge gap.

Empirical studies on performance issues in the South African consumer goods industry have shown a variety of literature. Indicatively, Chininga et al. (2024) studied firm-level performance and found that there were enduring inefficiencies in the operational activity to sustainable profitability, as well as Khoza (2025) and Mandipa and Sibindi (2022) who observed mixed trends in profitability and shareholder value in JSE-listed firms despite increasing demand. In terms of governance and financial structure. Adams et al. (2025) and Nxumalo et al. (2025) focused on the negative effects of ineffective governance systems, but Masongweni and Simo-Kengne (2024) and Mensah and Bein (2023) addressed the adverse effect of suboptimal capital structure and poor financial management on firm value.

Moreover, Madwe (2026) and Olaoye et al. (2023) highlighted the impact of weak sustainability practices that affect the long-term corporate performance. In addition to these classic determinants, there is a new body of research on customer protection practices as an important and understudied determinant. Agag et al. (2023) demonstrated that good returns and warranty management improve the performance of a firm and its image in the market, whereas Cotugno and Stefanelli (2023), Lu et al. (2025), and Ndungo et al. (2016) illustrated that poorly handled warranty claims and returns raise the cost of doing business, decrease efficiency, and make investors lose confidence. In contrast, Martin et al. (2017) discovered that well-developed return and warranty management frameworks are indicators of transparency and customer-focus and hence enhance the valuation of firms and their overall corporate performance.

Although the consumer goods industry is strategic to the South African economy, a significant number of listed companies have had a stagnating or even a decreasing financial performance over the past few years. It has been demonstrated that in consumer discretionary and staples markets, earnings and market values have been either relatively stable or stressed, despite the fact that revenues may be increasing.

As an illustration, the key fashion retailer TFG has indicated that the half-year profitability has dropped because of poor consumer demand and margin pressures whereas the SPAR Group full-year diluted headline earnings per share have dropped because of

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

financing cost and tax. On the same note, Truworths International recorded stagnant profits and falling sales in Africa, indicating that the business continues to face challenges in terms of profitability (Khoza, 2025; Olaoye et al., 2023).

Internal financial and governance issues add to this underperformance. The choice of liquidity and leverage has a strong impact on the performance of firms, and the wrong capital structure results in under-optimal returns to the assets (Khoza, 2025; Olaoye et al., 2023). Corporate governance variables also have a major role to play; mixed board structures and inappropriate governance mechanisms have not been successful in boosting profitability or reducing risk (Nxumalo et al., 2025; Madwe, 2026; Mensah and Bein, 2023).

The financial results of sustainability initiatives such as environmental, social, and governance activities are not even, and some of these dimensions do not have a great influence on the performance of firms (Chininga et al., 2024; Masongweni and Simo-Kengne, 2024; Adams et al., 2025). Net operating profit margins, return on assets, and even financial health are further diluted by operational inefficiencies, including poor working capital management (Mandipa & Sibindi, 2022). These results demonstrate a complex market issue: although the market demand is resilient, profitability and value generation in most South African listed consumer goods companies remain a challenge due to the presence of financial, governance, operational, and customer protection inefficiencies. This highlights the importance of an empirical analysis of the protection of customers to the corporate value of the South African listed consumer goods companies. In particular, the paper looks at how warranty claims ratio and revenue return ratio influence corporate value, which is proxied by Tobin's Q.

The reason behind this study is that South African listed consumer goods companies have not achieved the expected level of profitability and market value despite the increasing level of demand despite the fact that the companies operate in a market where the demand level is high. Although previous studies have concentrated on the conventional controls like capital structure and corporate governance, little has been done on the protection measures of customers, such as warranty claims and revenue returns ratios, which, though, may have an impact on firm value.

Sealing this gap, the research analyses the impact of these factors on corporate value in terms of Tobin's Q. This research would add value to the literature by incorporating the element of customer protection in performance analysis, offering empirical support in a relatively unexplored setting of an emerging market and providing practical recommendations to managers and policymakers on how to increase the value of firms by improving the practice of returns and warranty management. This research provides a more in-depth look at how operational activities connected with customer protection affect the perception and market value of investors by using Q as a market-based measure of performance suggested by Tobin.

Moreover, the research provides practical implications on managers and policymakers as they reveal the strategic significance of effective warranty and returns management systems in improving the performance of firms, minimizing operational inefficiencies and increasing stakeholder confidence. Lastly, the research paper adds to policy and regulatory debates, by highlighting the importance of customer-oriented

practices in enhancing transparency, responsibility, and sustainable corporate development in the industry.

2. Literature Review

Conceptual Review

Firm performance represents the established corporate worth of a company, expressed through its ability to generate returns on investment, sustain market competitiveness, and maintain intrinsic asset value (Awaysheh et al., 2024). It is commonly assessed through operational efficiency, market competitiveness, and shareholder value creation, with Tobin's Q emerging as a robust market-based indicator that captures the ratio of market value to the replacement cost of assets. Tobin's Q reflects investor expectations, strategic decision-making, and growth prospects (Adegboyegun et al., 2025; Awaysheh et al., 2024). Recent scholarship, however, emphasizes the growing importance of customer protection practices as overlooked yet strategic determinants of firm value.

Customer protection refers to the coordinated management of firm activities aimed at safeguarding the interests and experiences of product or services users (Cotugno & Stefanelli, 2023). Within this domain, warranty claims and revenue return ratios have gained prominence as operational metrics that directly influence performance. The Warranty Claims Ratio (WCR) measures the proportion of warranty-related expenses relative to revenue (Lu et al., 2025), with lower values indicating product reliability and effective after-sales management, and higher values suggesting product defects or inefficiencies.

The Revenue Return Ratio (RRR) captures the proportion of sales returns relative to total revenue (Agag et al., 2023), where lower values reflect customer satisfaction and strong product-market fit, while higher values signal potential issues with product quality or unmet expectations. Efficient management of warranty claims and product returns enhances consumer trust, safeguards brand reputation, reduces operational losses, and strengthens market valuation (Agag et al., 2023; Jacobs et al., 2020; Sriono et al., 2024). Conversely, poorly managed claims increase costs, reduce efficiency, and erode investor confidence (Lu et al., 2025). Thus, customer protection systems function not only as operational safeguards but also as strategic levers for long-term corporate performance.

Theoretical Review

This research is based on the premise of the stakeholder theory stating that companies can attain high performance levels due to the optimal management of their relationship with key stakeholders, especially customers whose interests are the core aspect of value creation. This research paper is rooted in the stakeholder theory, initially postulated by Freeman (1984) which holds that companies perform better when they manage to properly relate to the most important stakeholders especially customers, whose interests are the focus of value creation (Freeman, 1984).

Within the framework of listed consumer goods companies, warranty claims management and revenue return policies are crucial customer protection practices within the framework of which companies react to customer expectations and protect their interests (Agag et al., 2023). The effective management of product returns and warranty claims promotes better customer satisfaction, trust, and loyalty, which eventually reinforces the brand reputation and builds long-lasting relationships (Jacobs et al., 2020; Sriono et al., 2024). They are not only operationally advantageous but also strategically important

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

because they change the perception of the investors and their valuation in the market, as seen in the Tobin's Q (Awaysheh et al., 2024; Farhad, 2024).

Stakeholder theory also implies that, when the interests of customers are not taken into consideration, they may result in such negative outcomes as the harm of reputation, higher operational expenses, and lower value of the firm. High revenue return ratios and mismanaged warranty claims can be indicators of inefficiencies and low focus on customers, thus undermine investor confidence and influence corporate performance in a negative way (Adegboyegun and Igbekoyi, 2022; Cotugno and Stefanelli, 2023; Lu et al., 2025; Ndungo et al., 2016).

On the other hand, companies with strong and open customer protection measures are responsible and responsive to the needs of stakeholders, which may positively impact corporate reputation and draw investment (Martin et al., 2017). Stakeholder theory is empirically adopted in a number of studies that explain the connection between customer-oriented practices and firm performance. As an example, Agag et al. (2023) used the theory to prove that customer-centric policies, such as returns and service quality, can greatly improve firm performance and market perception.

Likewise, Awaysheh et al. (2024) have used the stakeholder lens to demonstrate that the financial performance of all firms that practice responsible behavior towards customers and other stakeholders is better. Moreover, Sriono et al. (2024) discovered that strategies that are customer-centered, especially those that focus on customer satisfaction and protection, had a positive impact on the long-term corporate value and competitiveness.

In the consumer goods industry, and especially in South Africa, where companies continue to face ongoing issues based on governance, capital structure, and sustainability, the incorporation of customer-oriented practices is even more important to enhance firm performance (Madwe, 2026; Masongweni and Simo-Kengne, 2024; Mensah and Bein, 2023). Therefore, stakeholder theory offers a timely and all-encompassing perspective to analyzing the effect of warranty claims ratio and revenue return ratio on corporate value since it highlights the fact that companies that consider the welfare of the customer have a higher chance of attaining sustainable performance and market valuation. Although it is relevant, stakeholder theory has not been without its share of criticism.

To begin with, critics state that stakeholder theory does not prioritize any of the stakeholders, which makes it hard to balance opposing interests among managers (Martin et al., 2017). Second, it has been accused of being overly normative, as the theory prescripts how firms ought to conduct themselves, but does not always make explicit recommendations as to how best results may be obtained in practice (Lu et al., 2025; Ndungo et al., 2016). Third, other researchers argue that the theory can dilute the emphasis on shareholder value maximization, which can also result in inefficiencies and decision-making conflicts (Olaoye et al., 2023; Khoza, 2025; Chininga et al., 2024).

The stakeholder theory can be applied to the current study to an extensive extent since it offers a holistic approach to the issue of determining the impact of customer protection mechanisms, i.e., warranty claims ratio and revenue return ratio, on corporate value. The theory posits that companies that successfully engage with customers to promote their welfare are more prone to attaining sustainable performance and improved market value, especially in the demanding context of the South African consumer goods

industry, as it highlights the significance of customer welfare (Cotugno & Stefanelli, 2023; Madwe, 2026; Masongweni & Simo-Kengne, 2024).

Empirical Review

Empirical evidence on the relationship between customer protection and firm performance highlights a multidimensional and evolving dynamic, with growing consensus that customer-focused practices are critical to organizational success. Studies such as Angriawan et al. (2023) and Awaysheh et al. (2024) demonstrate that customer protection and customer-oriented strategies significantly enhance performance.

Angriawan et al. (2023) reported a positive link between service innovation, customer equity, and firm outcomes, while Awaysheh et al. (2024) found that consumer education, product safety, and supply chain security practices positively influenced operational results. Similarly, Agag et al. (2023) showed that customer feedback metrics—including satisfaction and service quality—serve as reliable predictors of financial performance and market valuation, underscoring the strategic importance of customer-centric approaches.

Conversely, other studies emphasize the detrimental effects of weak customer protection systems. Cotugno and Stefanelli (2023) revealed that higher volumes of customer complaints reduce profitability and increase firm risk. Lu et al. (2025) observed that customer complaints hinder digital transformation by diverting resources to short-term crisis management. Jin et al. (2022) further demonstrated that customer-related factors, such as high customer concentration, negatively affect corporate performance, though strong managerial capability can mitigate these outcomes.

Beyond customer protection, the broader literature has examined conventional determinants of firm performance, including financial structure, corporate governance, and sustainability practices. Findings remain mixed: studies by Khoza (2025), Nxumalo et al. (2025), Adams et al. (2025), Madwe (2026), and Olaoye et al. (2023) report inconsistent effects of liquidity, leverage, governance, and green reporting on firm outcomes. Likewise, Chininga et al. (2024), Masongweni and Simo-Kengne (2024), and Mandipa and Sibindi (2022) show that while certain aspects of ESG and working capital management positively influence performance, others exert negligible or even adverse effects.

Moreover, the literature related to legal and regulatory studies highlighted the role of consumer protection frameworks in defining firm behaviour and performance outcomes. Hakim and Putra (2025), Farhad (2024), Chawla and Kumar (2022), and Sriono et al. (2024) emphasized that robust legal frameworks in consumer protection, data privacy, and customer rights contributed to increased trust, compliance, and created competitive advantage. These paradigms were especially applicable in the contemporary business context that is marked by digital transformation and heightened regulatory control.

There is increasing information that customer protection has an impact on firm performance, there is less empirical research of the South African consumer goods sector, specifically in relation to performance indicators, namely warranty claims ratio and revenue return ratio. Although previous research has investigated general customer feedback, complaints, or more general governance and financial aspects (Agag et al., 2023; Cotugno & Stefanelli, 2023; Lu et al., 2025; Khoza, 2025; Olaoye et al., 2023), no particular gap exists in the literature on how warranty claims ratio and revenue return ratio directly influence market driven.

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

This study addresses this gap by measuring the relationship between these customer protection measures and corporate value within a sample of JSE-listed consumer goods companies empirically and thus offer insights into whether an efficient warranty and returns management can lead to increased investor confidence, operational efficiency and long-run firm value. In this regard, the research hypothesizes the following:

H₀₁: Warranty Claims Ratio has a significant effect on the firm performance of listed consumer goods firms in South Africa.

H₀₂: Revenue Return Ratio has a significant effect on the firm performance of listed consumer goods firms in South Africa.

3. Methodology

This paper used correlational research design. It was found that the correlational design was adequate since the firm-level aspects and disclosure practices have already been realized and they are presented in financial statements and sustainability reports. The design, in its turn, allows objective and empirical investigation of how the disclosure behaviours and policies of companies on the customers have impacted the corporate value over the years (Kothari, 2014; Sekaran & Bougie, 2020).

All the 20 consumer goods listed firms in the Johannesburg Stock Exchange (JSE) on the date of the study (2024) became the study population. The firms were chosen as they are the most recognizable and controlled consumer-based companies in South Africa and which are involved in food, beverages, tobacco and household goods. With the rather small number of the population, the census sampling technique was considered in order to cover all 20 consumer goods companies mentioned.

The sampling used to collect census was appropriate to cover the whole industry, hence doing away with sampling bias and increasing the external validity of the results. The sample covers every company, thus, covering the change in the level of disclosure, customer protection practices, and value trends of firms in different sub-industries, such as food processing, beverages, and the manufacture of household goods (Yin, 2018). The time frame of the study was ten years, 2015-2024. This time was chosen to give a longitudinal view that would capture the changes in the disclosure practices and customer-oriented policies after major corporate governance and market developments in South Africa.

Model Specification

The conceptual foundation of the study's model specification was derived from a comprehensive review of theoretical and empirical literature on the relationship between firm disclosure and corporate value. Building on these insights, the research adapts the functional model proposed by Hakim and Putra (2025) to empirically examine the nexus between customer protection and firm performance in the South African consumer goods sector. $TOBQ_{it} = \beta_1 \alpha_{it} + \beta_2 WCR_{it} + \beta_3 RER_{it} + \beta_4 FSIZE_{it} + \beta_5 FLEV_{it} + \epsilon_1$; where: $TOBQ$ = Tobin's Q; WCR = Warranty Claims Ratio; RER = Revenue Return Ratio; $FSIZE$ = Firm Size; $FLEV$ = Firm Leverage; α_1 = Intercept; ϵ_1 = Stochastic Error Term; $\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 = The Coefficients of variables investigated.

The *a-priori* expectation is that each coefficient will be positive ($\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$), indicating that the explanatory variables are anticipated to exhibit a positive correlation with the dependent variable, thereby reinforcing the theoretical assumption of disclosure-driven value enhancement.

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Description and Measurements of Variables

Table 1

Description and Measurement of Variables

Variable Type	Variable	Measurement / Proxy	Formula / Description	Data Source	Supporting Literature
Dependent Variable	Firm Performance (CP)	Tobin's Q	(Market Value of Equity + Book Value of Debt) ÷ Total Assets	Firms' Annual Reports; Johannesburg Stock Exchange (JSE) Database	Adams et al., 2025; Adegboyegun et al., 2025)
Independent Variable	Customers' Protection (CP)	Revenue Return Ratio (RER)	Measured as Provision for Sales Returns/ Revenue.	Firms' Annual Reports	Chawla & Kumar, 2022; Farhad, 2024)
		Warranty Claims Ratio (WCR)	Measured as provision for warranty expense/revenue	Firms' Annual Reports	Hakim & Putra, 2025; Jacobs et al., 2020)
Control Variable	Firm Size	Firm Size	Log of total assets	Firms' Annual Reports	Adams et al., 2025 ; Nxumalo et al., 2025)
	Firm Leverage	Firm Leverage	Total debt/ total assets		Khoza, 2025; Madwe, 2026)

Source: Authors' Compilation (2026)

Data Analysis Techniques

Descriptive and inferential statistical tests were used in analyzing the data in this research. To summarize the characteristics of the data, descriptive statistics, mean, median, variance, standard deviation, skewness and kurtosis were used. Since data was structured in a panel format (20 firms across 10 years), the research used panel regression analysis, which comprised of pooled OLS, fixed effects, and random effects, to test the direct and moderating impact of customer protection and voluntary disclosure on corporate value.

The Hausman tests and appropriate information criteria were used to guide the selection of the model to choose the most suitable estimator. In order to overcome the potential endogeneity and econometric biases, pre-estimation diagnostic tests were performed including stationarity tests, tests of multicollinearity (that is, variance inflation factors), heteroskedasticity tests (Breusch-Pagan), autocorrelation tests (Durbin-Watson), and cross-sectional dependence tests, which are especially significant in small-N panels. Robust standard errors were incorporated in post-estimation tests based on Prais-Winsten/PCSE method to ensure the solid coefficient estimates even in small samples and possibly due to the existence of serial correlation.

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

4. Results and Discussion

This section describes the type of variables used, data analysis and study results. These are statistics that summarize the distribution of variables.

Descriptive Statistics

Table 2 shows the descriptive statistics of the study variables, each with 200 observations. The findings indicate that there is a significant variation among variables, and skew and kurtosis are significant in certain situations. The average of firm performance (Tobin's Q) is 0.9502 with a standard deviation of 0.9883 that shows moderate dispersion around the mean. The lowest 0.0000 and highest 4.4047 indicate a broad spectrum in valuation of firms. The skewness (1.7125) is positive, and kurtosis is high (5.5159) thus, indicating the skewness is right skewed with the shape rather peaked and extreme high values.

The mean of Warranty Claims Ratio (WCR) is very low (0.0010) and the standard deviation (0.0040) is very low, indicating that warranty claims are not high among the firms. Nevertheless, the largest value of 0.0347 and very large skew (5.7641) and kurtosis (41.0828) means that most of the firms have zero claims, but there are some observations with the large claims on warranty, which produce large outliers.

Revenue Return Ratio (RER) also shows low average (0.0046) but a comparatively higher standard deviation (0.0377) indicating that there are spikes in returns as compared to revenue. The largest value (0.5096) is quite large relative to the mean, and the extremely large skewness (12.3567) and kurtosis (162.9386) are indicative of extreme positive outliers and a very non-normal distribution.

The mean and standard deviation of Firm Size (FSIZE) are 7.6084 and 4.1197 respectively, indicating significant variations in firm size. The skewness (-1.2431) is negative which signifies that the distribution is skewed to the left, so the firm size distribution is more skewed towards the larger extremes of the size distribution with less firm size at the smaller extremes. Kurtosis (2.6850) is near the normal standard and indicates a fairly moderate distribution.

The average Firm Leverage (FLEV) is 0.3642 and the standard deviation is 0.2586 which shows that there is moderate variance in the debt levels of firms. The minimum (0.0000) and the maximum (1.1977), indicate that there are firms with zero leverage and there are highly leveraged firms. Skew (0.1219) is near zero, which means that the distribution is symmetric, and kurtosis (2.6353) indicates that the distribution is like normal.

While variables like FSIZE and FLEV are relatively stable and near normal distribution, WCR and RER are very skewed with extreme kurtosis, which implies that they have a large number of outliers. This can be of consequence in the subsequent statistical analysis and might necessitate transformation or strong estimation methods.

Table 2

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Tobin's Q	200	0.9502	0.9883	0.0000	4.4047	1.7125	5.5159
WCR	200	0.0010	0.0040	0.0000	0.0347	5.7641	41.0828
RER	200	0.0046	0.0377	0.0000	0.5096	12.3567	162.9386
FSIZE	200	7.6084	4.1197	0.0000	11.1862	-1.2431	2.6850
FLEV	200	0.3642	0.2586	0.0000	1.1977	0.1219	2.6353

Source: Authors' Compilation (2026)

Test of Variables

To ensure the validity and reliability of the study's findings, both pre-estimation and post-estimation diagnostic tests were conducted. Model efficiency was first assessed through pre-estimation procedures, including unit root testing, correlation analysis, and multicollinearity checks. Subsequently, post-estimation diagnostics such as the Hausman test and heteroscedasticity test were applied to confirm the robustness of the regression results.

Pre-estimation Test

Diagnostic tests were conducted to verify that the assumptions underlying the chosen model were satisfied and that the dataset employed was adequate for analysis. These procedures ensured both the appropriateness of the model specification and the reliability of the empirical results.

Panel Unit Root Test of the variables

Table 3 shows the outcome of the panel unit root test in both the LevinLinChu (LLC) and HarrisTzavalis (HT) methods where the stationarity of the variables is to be established. In the case of Tobin, Q, LLC is negative and significantly negative ($p = 0.0000$), which means that there is no stationarity. Likewise, the HT test indicates that the p-value is significant (0.0068), which proves that the Tobin's Q is stationary at level in both tests.

The Warranty Claims Ratio (WCR), however, has mixed results. The test statistics of the LLC test is positive and has a p-value of 1.0000 indicating a non-stationary result. A p-value of 0.0564 is slightly insignificant at the 5% level, which supports the possibility of the WCR being non-stationary in its level form. The Revenue Return Ratio (RER) is evidently at rest since the LLC and HT tests give extremely significant p-values (0.0000). The negative LLC statistics are extremely large, and this point also contributes to high levels of stationarity. Firm Size (FSIZE) also seems to be stationary according to the LLC test ($p = 0.0000$). Nevertheless, the test result of the HT shows high p-value (0.7218), which means non-stationarity. This inconsistency implies that FSIZE can be biased to the method of testing and might need transformation to become robust.

Both tests give a stationary Firm Leverage (FLEV) and the p-values are significant (0.0000 in case of LLC, and 0.0001 in the case of HT) and this implies the absence of a unit root problem. Post-transformation, both WCR and FSIZE settle to a steady state. Transformation WCR presents substantial results in both LLC and HT testing ($p = 0.0000$) indicating that the transformation was effective in eliminating the unit root.

Likewise, transformed FSIZE is highly stationary in both tests with very significant statistics. Overall, the majority of variables (Tobin Q, RER, and FLEV) are at the stationary

**THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM
PERFORMANCE OF LISTED CONSUMER GOODS
COMPANIES IN SOUTH AFRICA**

level, and only WCR and FSIZE are non-stationary and transformed to be stationary. This means that the transformed versions of WCR and FSIZE make more sense to further panel regression analysis.

Table 3

Panel Unit Root Test

Variable	Levin-Lin-Chu unit-root test		Harris-Tzavalis unit-root test	
	T-statistics	P-value	T-Statistics	P-value
Tobin's Q	-13.2242	0.0000	0.5752	0.0068
WCR	4.6447	1.0000	0.6295	0.0564
RER	-95.2403	0.0000	0.0282	0.0000
FSIZE	-270.0000	0.0000	0.7218	0.7218
FLEV	-27.3623	0.0000	0.4969	0.0001
Transformed WCR	-4.3586	0.0000	-0.5212	0.0000
Transformed FSIZE	-850.0000	0.0000	-0.1227	0.0000

Source: Authors' Compilation (2026)

Correlation Analysis

The pairwise correlation table displays the correlation between the study variables, the correlation coefficient and the p-value, as shown in Table 4. The findings give an idea on how strong and directional relationships between the variables are, and what multicollinearity issues may be expected.

The relationship between Warranty Claims Ratio (WCR) and Revenue Return Ratio (RER) is -0.0006 and the p-value is 0.9939, which does not show any significant relationship between the two variables. This implies that the warranty claims and revenue returns are independent of each other in the sampled firms. There is a positive statistically significant relationship between Firm Size (FSIZE) and WCR ($r = 0.2454$, $p = 0.0018$). This means that larger companies are likely to have slightly increased warranty claims, perhaps as a result of increased sales volume or increased exposure to the product.

Nevertheless, FSIZE is weakly and non-significantly correlated with RER ($r = -0.0175$, $p = 0.8159$) and VDS ($r = -0.1214$, $p = 0.1262$), indicating that it is not strongly correlated with these variables. Firm Leverage (FLEV) has a positive and significant relationship with FSIZE ($r = 0.2641$, $p = 0.0003$), which means that bigger firms are more likely to use higher levels of debt financing.

On the other hand, FLEV shows very weak and insignificant relationships with WCR ($r = -0.0093$, $p = 0.9070$), RER ($r = 0.0521$, $p = 0.4635$), and VDS ($r = -0.0024$, $p = 0.9761$). Generally, the correlation coefficients are low implying weak linear correlation among the explanatory variables. Notably, none of the pairs of variables show a high correlation (usually higher than 0.8), which indicates that the issue of severe multicollinearity in the model does not exist. This indicates the appropriateness of the variables in further regression analysis.

Table 4

Pairwise Correlation Analysis

Variable	WCR	RER	VDS	FSIZE	FLEV
WCR	1.0000	1.0000			
RER	-0.0006	1.0000			
	0.9939				
FSIZE	0.2454*	-0.0175	-0.1214	1.0000	
	0.0018	0.8159	0.1262		
FLEV	-0.0093	0.0521	-0.0024	0.2641*	1.0000
	0.9070	0.4635	0.9761	0.0003	

Source: Authors' Computation (2026)

Multicollinearity

Table 5 shows the results of Variance Inflation Factor (VIF) that was used to determine the existence of multicollinearity among the explanatory variables. VIFs of all variables are quite small: Firm size is 1.15, firm leverage is 1.08, warranty claims ratio is 1.07 and revenue return ratio is 1.00. In accordance with this, the values (1/VIF) of tolerance are all high (between 0.8686 and 0.9994) which once again proves the low interdependence between the variables.

The average VIF is 1.08, which is by far lower than the generally accepted value of 10 (or even a more conservative version of 5). This shows that there is no issue of multicollinearity in the model. These findings indicate that the explanatory variables are not very strongly correlated among themselves, and they all provide unique information to the model. This helps the subsequent estimates of regression to become reliable because the coefficients will not be tainted by multicollinearity.

Table 5

Variance Inflation Factor

Variable	VIF	1/VIF
FSIZE	1.15	0.868637
FLEV	1.08	0.924290
WCR	1.07	0.933856
RER	1.00	0.999417
Mean VIF	1.08	

Source: Authors' Compilation (2026)

Post-Estimation Tests

Table 6 shows the summary of the post-estimation diagnostic tests applied to determine the validity and suitability of the panel regression model. The heteroskedasticity test of Breusch Pagan / Cook Weisberg test has a statistically significant value ($p = 0.0008$) which implies that there is heteroskedasticity in the model. This implies that the variance of the error terms is not fixed and this can influence the quality of the estimates and will force the use of robust standard errors. The Shapiro-Wilk test of normality is also very significant ($p = 0.0000$), which means that the residuals are not normally distributed. This non-normality can be explained by the occurrence of outliers or skewed data as was previously suggested in the descriptive statistics.

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

The panel data Wooldridge test of autocorrelation has a p-value of 0.0163, which shows that there is serial correlation. This implies that the error terms are time-correlated, and thus with the standard errors being biased unless appropriately handled. The F-test whether the individual effects (u_i) all equal zero is very significant ($p = 0.0000$) and it is an indication that individual (cross-sectional) effects are significant in the model. This justifies a panel approach of data as opposed to a pooled model of ordinary least squares.

The Hausman test has a non-significant value ($p = 0.9898$) and this implies that the random effects model is favored as compared to the fixed effects model. This implies that the random effects estimator is consistent and efficient as the individual effects are not correlated with the explanatory variables. Lastly, the Breusch and Pagan Lagrangian Multiplier test of random effects is important ($p = 0.0000$) which proved the existence of panel effects and the use of random effects model instead of a pooled regression.

Overall, the diagnostic tests demonstrate that there is heteroskedasticity and autocorrelation, and non-normality of residuals. Nevertheless, the tests also prove that a random effects model should be used to analyze it. Therefore, it is advisable to utilize strong standard errors with a random effects model in order to make sound inference.

Table 6

Summary of Post-Estimation Test Results

Test	T-statistic	P-value
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	11.22	0.0008
Shapiro-Wilk test	4.139	0.0000
Wooldridge test for autocorrelation in panel data	6.949	0.0163
F test that all $u_i = 0$: F (19, 136)	95.03	0.0000
Hausman Test	0.30	0.9898
Breusch and Pagan Lagrangian multiplier test for random effects	460.83	0.0000

Source: Authors' Compilation (2026)

Fixed Effect Model, Random Effect Model, and Ordinary Least Squares Model.

Table 7 shows the regression outcome of pooled OLS, fixed effects, and random effects GLS models and their results on the effects of Warranty Claims Ratio (WCR), Revenue Return Ratio (RER), Firm Size (FSIZE) and Firm Leverage (FLEV) on corporate performance. In all three models, WCR is also positive, implying that the greater the warranty claims the better were the corporate performances. But this relationship is not significant in the pooled OLS ($p = 0.625$), fixed effects ($p = 0.493$) and random effects models ($p = 0.473$). This implies that WCR does not significantly affect the performance of firms. RER in all the three models has a negative coefficient, which means an increase in product returns can lower the performance of firms. However, all relations are statistically insignificant (p-values of 0.683, 0.811 and 0.798, respectively), indicating that RER does not have a significant impact on corporate performance.

FSIZE is also negatively correlated with the corporate performance in all models, which reflects that larger firms might be slightly lower in performance. This effect is, however, not statistically significant (p-values more than 0.05) and hence FSIZE does not explain much in this situation. Conversely, the FLEV has a positive and significant impact on firm performance in all models ($p = 0.000$). This implies that more leveraged firms

ADEKUNLE EMMANUEL ADEGBOYEGUN (PHD)¹, AYOBAYE SALEMCITY (PHD)², SUNDAY RUFUS OLORUNTOBA (PHD)³

would perform better, perhaps because they make good use of the debt financing to maximize returns. The constant term is positive and statistically significant in all the models meaning that there is a level or a threshold of firm performance when the explanatory variables are kept constant.

Concerning model diagnostics, the R-squared values show that the models account for approximately 21 percent of the total variation in the performance of firms. The within R-squared of the fixed and random effects model is about 0.4898 which indicates that almost 49% of the time-varying variation within firms is attributed to the independent variables. F-statistics and Wald chi-square of all models are statistically significant ($p = 0.0000$) which means that all models are statistically significant as a block and explain well.

Overall, the regression outcomes suggest that FLEV is the factor that has the greatest effect on the performance of firms, whereas WCR, RER, and FSIZE do not have statistically significant impacts. Together with previous diagnostic tests using a random effects model, the random effects GLS estimates are said to be the most suitable to interpret.

Table 7

Regression Analysis

FR	Pooled OLS Model			Fixed-effects Model		Random-effects GLS Model			
	Coeff.	t	P>	t		Coeff.	T	P>z	Coeff.
WCR	7.0857	0.49	0.625	2.8682		0.69	0.493	2.9615	0.72
RER	-0.6822	-0.41	0.683	-0.1209		-0.24	0.811	-0.1280	-0.26
FSIZE	-0.0504	-1.28	0.201	-0.0072		-0.54	0.591	-0.0081	-0.61
FLEV	1.7834	6.45	0.000	1.2319		9.97	0.000	1.2440	10.24
Constant	0.2736	2.25	0.026	0.4668		9.64	0.000	0.4625	2.22

Model Diagnostics

	Pooled OLS	Fixed Effects	Random Effects
R-squared (within)	—	0.4898	0.4898
R-squared (between)	—	0.1914	0.1916
R-squared (overall)	0.2133	0.2075	0.2078
F-statistic / Wald χ^2	F(4,227) = 10.50	F = 32.64	$\chi^2 = 136.26$
Prob > F / P-value	0.0000	0.0000	0.0000

Source: Authors' Compilation (2026)

Customers' Protection and Firm Performance

Table 8 gives the outcome of the Prais-Winsten regression including Panel-Corrected Standard Errors (PCSE) that considers the heteroskedasticity and contemporaneous correlation among panels. The model analyzes how the protection measure of the customers is related to corporate performance (measured by Tobin's Q) of the listed consumer goods companies in South Africa. The results show that warranty

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

claims ratio has a positive and statistically significant effect on firm performance ($\beta = 3.9385$, $p = 0.0140$). This means that better customer protection in terms of warranty claims is related to firm value. This positive relationship is also supported by the confidence interval (0.7838 to 7.0933). Revenue return ratio has a positive coefficient ($\beta = 0.0557$), although the impact is not significant ($p = 0.8110$). This means that the returns of products do not affect the firm performance in the sampled firms significantly.

Firm size has a negative and statistically significant correlation with firm performance ($\beta = -0.0165$, $p = 0.0320$). This indicates that bigger companies are likely to have a lower market value, which may be attributed to inefficiencies or decreasing returns to scale. This negative effect is robust as attested by the confidence interval (-0.0315 to -0.0014). The effect of firm leverage on firm performance is very high and significant (FLEV = 1.2104, $p = 0.0000$). It shows that the more leverage a firm has the more likely it performs well, probably because of the strategic deployment of the debt as a means of growth and operations. The constant term is significant and statistically significant ($\beta = 0.3069$, $p = 0.0000$) indicating the level of firm performance when all the explanatory variables are held constant.

Regarding model fit, the R-squared of 0.6043 implies that the independent variables can explain about 60.43 percent of the variation in the Tobin's Q and hence a good explanatory power. The Wald chi-square value (135.85) is significant ($p = 0.0000$) which proves that the model is jointly significant. The results show that customer protection, in the form of warranty claims, and firm leverage are strongly positive in impacting firm performance, and firm size is a negative determinant of corporate performance. Revenue return ratio, however, is not of much importance in explaining firm performance here.

Table 8

Prais-Winsten Regression, Correlated Panels Corrected Standard Errors (PCSEs)

Tobins Q	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
WCR	3.9385	1.6096	2.4500	0.0140	0.7838	7.0933
RER	0.0557	0.2327	0.2400	0.8110	-0.4003	0.5117
FSIZE	-0.0165	0.0077	-2.1400	0.0320	-0.0315	-0.0014
FLEV	1.2104	0.1165	10.3900	0.0000	0.9820	1.4388
_cons	0.3069	0.0675	4.5500	0.0000	0.1746	0.4391
R-squared	0.6043					
Wald chi2(4)	135.85					
P-value	0.0000					

Source: Authors' Compilation (2026)

Discussion

This paper has investigated the nexus between the protection of customers and corporate performance of listed consumer goods companies in South Africa as a core explanatory variable using Warranty Claims Ratio (WCR) and Revenue Return Ratio (RER), Firm Size (FSIZE) and Firm Leverage (FLEV) as control variables. To tackle the problems of heteroskedasticity and autocorrelation in the panel data, the analysis used the Prais-Winsten regression with Panel-Corrected Standard Errors (PCSEs).

Regression analysis revealed that WCR has a statistically significant positive impact on the performance of firms with a coefficient (b) of 3.9385, and a p-value of 0.0140. This implies that companies that proactively respect warranty commitments are more likely to have an increased market value. The observation indicates that warranty performance boosts customer confidence, indicates product dependability as well as corporate fame, and eventually leads to better firm performance.

The favorable and substantial impact of WCR on the Tobin's Q is consistent with the literature that revealed the worth of customer-centric practices in improving the performance of firms. Angriawan et al. (2023) and Awaysheh et al. (2024) demonstrated that innovation in service, customer equity, and consumer protection like product safety and supply chain security positively affected operational efficiency and firm performance.

Likewise, Agag et al. (2023) highlighted that customer feedback systems, the indicator of responsiveness to consumer demand, were positively correlated with financial success and market value, which confirms the idea that a well-organized warranty management is the indicator of reliability, development of trust, and corporate image. This fact underpins the research conclusion of honoring warranties with a significant contribution to the market-based firm's value.

Conversely, revenue return ratio showed a positive nonsignificant impact on the firm performance, and its $\beta = 0.0557$ and $p = 0.8110$. This means that returns on products have no significant effect on the corporate performance in the sampled firms. This can be because of compensating effects, high return rates can be an indicator of a quality problem, but flexible return policies can increase customer satisfaction and loyalty, so the overall effect is neutral.

The statistically nonsignificant relationship between RER and the other variables partly concurs and partially contradicts the existing empirical studies. Although the research established that RER did not have a significant impact on corporate performance, the literature shows inconsistent evidence on returns and protecting customers. On the one hand, Cotugno and Stefanelli (2023) and Lu et al. (2025) implied that customer complaints and returns, which are not managed properly, may destroy profitability, which implies a negative impact.

Conversely, other studies suggest that flexible return policies can result in increased customer satisfaction and loyalty, which leaves a neutral or even positive impact on firm performance (Agag et al., 2023; Angriawan et al., 2023). The absence of a meaningful relationship in this study could be an indication of a counter-balancing effect in which high-return rates are indicative of quality concerns yet is also indicative of consumer trust, which is a context-sensitive effect.

Firm size and firm leverage were used as control variables that added more context. Firm size is negatively correlated with firm performance and statistically significant ($\beta = -0.0165$, $p = 0.0320$), indicating that large firms might lack efficiency, be bureaucratic or suffer diminishing returns to scale. This brings to the fore the fact that a rise in firm size does not necessarily imply improved performance. Firm leverage has a positive significant impact on firm performance ($\beta = 1.2104$, $p = 0.0000$). This implies that companies are good at leveraging debt financing to increase returns, most probably by investing in high returns ventures or exploiting tax shelters. Firm leverage as a control variable emphasizes the role of financial structure as the determinant of corporate performance although it is not the focus of the study.

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

This adverse impact of firm size is in line with the literature that argues that larger firms can experience bureaucratic inefficiencies, diminishing returns, or operational inflexibility, which can counterbalance the scale benefits (Khoza, 2025; Nxumalo et al., 2025). In the meantime, the beneficial and significant impact of firm leverage is consistent with other studies by Olaoye et al. (2023) and Adams et al. (2025), who have shown that the effective utilization of debt financing, such as leveraging tax shields or investing in valuable projects, can contribute to the performance of firms, and financial structure plays a crucial role in sustaining firm value.

The Wald chi-square value ($\beta = 135.85$, $p = 0.0000$) proved that customer protection was a big factor in improving corporate performance. This result is consistent with various empirical studies highlighting the beneficial effect of customer-centric practices on the performance of firms. An example is a study by Agag et al. (2023), which showed that the market valuation and financial performance were greatly enhanced by customer feedback and customer satisfaction measures, and a study by Angriawan et al. (2023), which revealed that service innovation and customer equity had a positive impact on the performance of the firm.

In the same way, Awaysheh et al. (2024) revealed that consumption protection activities, including product safety and supply chain security, provided a positive impact on the operational performance and the overall performance of the firm. These studies reinforce the notion that customer protection is an effective way of creating trust, reliability, and enhancing corporate image, which increases firm value. Other studies, however, opposed such findings by indicating that there were cases where customer protection had less or even negative impacts on performance.

Cotugno and Stefanelli (2023) discovered that increasing consumer complaints decreased the profitability of banks and risk, whereas Lu et al. (2025) revealed that consumer complaints reallocated resources to addressing short-term crisis, neglecting digital transformation and strategic development. Jin et al. (2022) also discovered that customer concentration might have an adverse impact on the performance of firms, which may be balanced by the ability of the managers. Taking together, these conflicting results suggest that though customer protection can promote performance, it might require the quality of implementation, the quality of customer interaction, and management-specific abilities of the firm.

Theoretical and Practical Implications

This study contributes to the literature on corporate governance, customer protection, and firm performance by demonstrating a positive association between warranty claims and firm value. The findings provide empirical support for stakeholder theory, which posits that firms prioritizing customer interests achieve superior long-term outcomes. The results also complement prior research on capital structure, showing that leverage positively influences performance even after accounting for customer protection measures.

Furthermore, the study highlights the nuanced role of firm size, revealing that larger firms do not necessarily outperform smaller ones, thereby offering insights into resource-based and scale-related theories in strategic management. From a practical perspective, the findings underscore the importance of robust customer protection systems—particularly effective warranty management—as a strategic lever for enhancing firm value. Investment

in comprehensive warranty policies can strengthen customer confidence, reinforce brand reputation, and ultimately improve financial outcomes. The positive effect of leverage suggests that carefully managed debt can further enhance performance, offering guidance for financing strategies. Finally, the evidence on firm size cautions managers to prioritize operational efficiency and organizational agility, ensuring competitiveness regardless of scale.

5. Conclusion and Recommendations

The research investigated the correlation between consumer protection and firm performance among listed consumer goods companies in South Africa. Warranty claims ratio was found to significantly influence the performance of the firm, but revenue return ratio was not. Firm size was found to negatively impact control variables whereas firm leverage was found to have a significant and strong impact. The results emphasize that warranty-based customer protection and financial leverage are key performance facilitators of firm performance, and product returns and firm size are of secondary importance. It was found that corporate performance in the consumer goods sector is greatly improved through effective customer protection, especially through warranty claims.

The leverage of the firm is also positively related to performance, whereas the size of the firm can lead to inefficiency and value decrease. There is no statistically significant effect of product returns on performance implying that the effect of product returns can be contextual. The results highlight the strategic value of the simultaneous management of customer relations and financial structures to optimize firm value.

Based on the results of this study, the following recommendations were proposed:

- (i) Firms should invest in comprehensive and transparent warranty policies to build customer trust, enhance product reliability, and improve market valuation.
- (ii) Managers should strategically utilize debt financing to support growth and maximise returns, ensuring that leverage remains a driver of firm value without creating excessive financial risk.

Study Limitations and Future Research

The study has certain limitations even in spite of its contributions. First, it only looks at listed consumer goods companies in South Africa, which might restrict the extrapolation of the results to other industries or countries. Second, the research is based on secondary information, which might not be sufficient to reflect on the qualitative dimensions of customer protection, including quality or customer satisfaction of the service.

Third, the number of proxies analyzed was limited to two (warranty claims ratio and revenue return ratio) that may not capture the entire range of mechanisms that may affect corporate performance. The limitations can be overcome in future studies through multiple sectors, using qualitative measures of customer satisfaction, and examining other aspects of customer protection like after-sales service, warranties of products, or efficiency of handling complaints. The dynamic impacts of customer protection practice on the performance of firms over time are also subject to study in longitudinal studies, which offer more insight on causality and long-term value creation.

THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM PERFORMANCE OF LISTED CONSUMER GOODS COMPANIES IN SOUTH AFRICA

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ADEKUNLE EMMANUEL ADEGBOYEGUN (PHD)¹, AYOBAYE SALEMCITY (PHD)², SUNDAY RUFUS OLORUNTOBA (PHD)³

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**THE NEXUS BETWEEN CUSTOMER PROTECTION AND FIRM
PERFORMANCE OF LISTED CONSUMER GOODS
COMPANIES IN SOUTH AFRICA**

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