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Ownership structure and firm performance: Evidence from South African firms on the Johannesburg Stock Exchange

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Orientation: This study investigates the impact of ownership structure on the performance of South African firms listed on the Johannesburg Stock Exchange (JSE), focusing on ownership categories such as institutional, foreign, managerial, government and family ownership.

Research purpose: The aim of this research is to explore how different types of ownership influence firm performance, particularly return on assets, return on equity (ROE) and Tobin's q.

Motivation for the study: Despite the extensive literature on ownership structure and firm performance, there is no consensus in the South African market. This study seeks to address this gap by examining how ownership structure affects firm performance within the context of South African firms.

Research design, approach and method: A quantitative research design is employed, using panel data from 267 non-financial JSE-listed firms from 2004 to 2021. The study applies the system Generalised Method of Moments (GMM) and Sasabuchi-Lind-Mehlum tests to address potential endogeneity and non-linearity in ownership-performance relationships.

Main findings: The findings reveal a non-linear inverse *U*-shaped relationship between foreign ownership and ROE, with an optimal threshold of 39.6%. Managerial ownership positively affects ROE, but negatively impacts Tobin's q. Family ownership is associated with poorer firm performance, particularly in terms of market value.

Practical/managerial implications: The study recommends encouraging foreign ownership up to the optimal threshold and managing entrenchment effects from managerial and family ownership to enhance performance.

Contribution/value-add: This research offers new insights into ownership-performance dynamics in South Africa, with practical implications for firms and policymakers.

Keywords: ownership structure; non-linear; endogeneity; South Africa; system generalised method of moments.

Introduction

The separation of ownership and control in modern corporations is an issue which has dominated corporate finance literature since its introduction by Berle and Means (1932). Publicly listed corporations around the world are owned by a diverse group of shareholders, which include governments, families, foreigners, institutional owners and the executive management of the firm. While managers are tasked with monitoring the daily activities of the firm, their incentives may differ from those of the other shareholders, which gives rise to the agency issue, as theorised by Jensen and Meckling (1976). This potential misalignment of incentives causes shareholders to incur agency costs to mitigate the potential of misappropriation by managers, which potentially has a negative impact on firm performance and shareholder wealth. The literature on the topic has introduced several potential solutions to the agency issue, such as the ownership structure of the firm (Shleifer & Vishny 1986), capital structure (Jensen 1986), board structure (Jensen 1986), managerial compensation plans (Jensen & Murphy 1990), increased market competition (Hart 1983) and the threat of a takeover (Jensen & Warner 1988).

The question of ownership structure has been a crucial indicator of firm success, as owners play a central role in establishing the firm's goals and direction. They are responsible for setting priorities and long-term objectives. Research has shown that the differing owners of a firm have

Note: Additional supporting information may be found in the online version of this article as Online Appendix 1.

the potential to contribute strategic resources, increased knowledge of markets and product offerings, reduced risk exposure and reduced agency conflicts (Naidu, Charteris & Moores-Pitt 2022; Phung & Hoang 2013).

In empirical studies, there is a lack of consensus on the relationship between ownership and performance. While Berle and Means (1932) posited that ownership structure should have a positive impact on firm performance, this is challenged by the seminal work of Demsetz and Lehn (1985), who argue that ownership structure is endogenously determined, meaning it is shaped by the firm's internal characteristics and external environment in ways that are consistent with the goal of value maximisation. Rather than being imposed externally or chosen randomly, the ownership structure evolves as a result of the firm's specific conditions, such as risk, size and industry type. These factors influence firms to select ownership structures that help optimise performance, governance and profitability, making ownership structure a response to the firm's circumstances rather than a purely exogenous factor. Furthermore, the evidence suggests that owners prefer investing in firms with superior performance (Huang & Shiu 2009; Viet 2013).

Studies by Morck, Shleifer and Vishny (1988), and McConnell and Servaes (1990) also theorised that the relationship between ownership and performance is non-monotonic, which implies that while firm value can increase at certain proportions of shareholding, beyond a certain threshold, the positive impact is reversed. Therefore, the relationship between ownership structure and firm performance can be deemed as non-linear, an observation which is supported by Hu and Zhou (2008), Din and Javid (2011), Khan, Mather and Balachandran (2014) and Naidu et al. (2022).

The ownership structure of South African firms reflects many vital facets of the economy, pertaining to macroeconomic and financial stability, transformation and inclusive growth (National Treasury 2017). As such, the ownership structure of Johannesburg Stock Exchange (JSE)-listed firms has become a significant public policy issue (Cameron 2012).

In the years following the fall of apartheid, the South African government attempted to attract more foreign investment into the country to stimulate economic growth. This effort was largely successful, with foreign ownership of the JSE reaching a record 52% level in the years preceding coronavirus disease 2019 (COVID-19). However, this subsequently fell during the pandemic, with foreigners accounting for only 35% of the JSE in 2020 (Brown 2021). While there are no current statistics to support this, anecdotal evidence suggests that this proportion has further declined, with foreign investors selling a net R36 billion of JSE-listed equities in the first half of 2024 (CNBC Africa 2024). In contrast, there are moderate to low levels of ownership registered for managerial and family shareholders on the JSE. Shareholdings by the South African government dominate state-owned enterprises (SOEs), as these organisations are considered vehicles for economic development (Fourie 2014); however, this does not translate to heightened government shareholding on the JSE, as most SOEs are unlisted companies. The South African government also owns the Public Investment Corporation (PIC), which controls over 10% of the JSE arising from share ownership in several listed companies (Komati 2017; PIC 2024).

The relationship between ownership structure and firm performance is therefore particularly interesting in the South African market, where the JSE is characterised by changing ownership through the years. The dominant literature on the topic is based on international markets and fails to offer a definitive resolution to the debate, as it presents diverse findings, including both positive and negative linear associations, as well as *U*-shaped and inverse *U*-shaped non-linear associations between different ownership types and performance. These results are also influenced by the assumptions regarding endogeneity and linearity and are country-specific. Consequently, it is not possible to apply the results from one country to another. Within the South African context, studies examining this relationship, such as the unpublished thesis by Dube (2018), contain limitations as they do not account for potential non-linearity and endogeneity issues. While the Naidu et al.'s (2022) study of JSE-listed companies does account for both endogeneity and non-linearity, this study is focused on foreign ownership and does not evaluate other forms of ownership in the firm.

This study undertakes a comprehensive analysis of the effects of various ownership types (managerial, foreign, institutional, government and family ownership) on the performance of non-financial firms listed on the JSE between 2004 and 2021. Our study provides valuable contributions to the field of ownership and firm performance. Firstly, we contribute to the limited body of research on the relationship between ownership structure and firm performance within the South African context. Secondly, the system Generalised Method of Moments (GMM) is employed to address all sources of endogeneity, countering the biases of previous studies (Schultz, Tan & Walsh 2010; Wintoki, Linck & Netter 2012). Thirdly, as per Naidu et al. (2022), we utilise the Sasabuchi-Lind-Mehlum (SLM) test to investigate non-linear ownership effects, thus overcoming limitations of quadratic tests used in earlier studies (Phung 2015; Wardhana & Tandelilin 2011). Lastly, our findings offer valuable insights for boards in South African firms to better understand the effects of different ownership types and seek shareholding accordingly.

The rest of this study is structured as follows. The 'Literature review' section provides a theoretical and empirical review of the impacts of ownership types on firm performance. The 'Data and methods' section discusses the sample, empirical model and estimation approach. The 'Results and analysis' section outlines the results of the analysis, and the 'Conclusion' section concludes the study by providing a summary of the key outcomes and emphasising their importance.

Literature review

There are two central theories which define the relationship between the different types of ownership and firm performance. These theories are the agency theory and the resource-based theory. The ensuing discussion will therefore focus on the implications of these theories in the context of each ownership type.

Managerial ownership

According to the agency theory, while the shareholders (principals or owners) of a firm strive to attain the objective of firm value maximisation, the managers (agents) pursue the objective of their own utility maximisation (Jensen 1968). These self-interests may include extracting perks from the firm's resources (Morck et al. 1988), empire building (Ongore 2011), suboptimal resource allocation (Khan et al. 2014), and establishing bureaucratic inefficiencies and burdens to further their own agenda (Iwasaki, Ma & Mizobata 2022). As a result of the information asymmetries, shareholders must implement mechanisms such as increased monitoring, debt covenants, and management incentive plans, such as share option schemes, to align the interests of both parties (Fleming, Heaney & McCosker 2005; Komati 2017). The cost of these alternatives, known as agency costs, impacts the firm's bottom line and its ability to maximise shareholder value.

Managerial ownership is recognised as a mechanism that converges the interests of managers and shareholders, as managers will have an incentive to increase the firm's value if they own a stake in the company (Dube 2018). An increase in managerial ownership thus reduces both information asymmetry as well as the agency costs that other shareholders need to incur, as it aligns the incentives of all parties (Shleifer & Vishny 1986). However, high levels of managerial shareholding can induce an entrenchment effect, where managerial owners who own a significant portion of a company's shares aim to cultivate their private interests at the expense of minority shareholders and the other executives in the firm (Naidu et al. 2022; Ongore 2011). These managers may become resistant to external scrutiny, display a lack of accountability and prioritise decisions which ensure their job security and control, even though it may be suboptimal for the other shareholders. The use of share option schemes, which grant managers the exclusive rights to purchase shares of the firm at a pre-determined exercise price, is also proven to cause managers to engage in speculative stock actions that cause short-term volatility in the share price, at the expense of long-term value (Bolton, Scheinkman & Xiong 2006; Naidu et al. 2022).

While studies such as Ongore (2011) and Din et al. (2021) found evidence of a positive relationship between managerial ownership and firm performance for Kenyan and Pakistani firms, respectively, Mohd (2020) found no significant relationship between these two variables in the Malaysian context. The South African evidence is largely negative. Komati (2017) and Dube (2018) utilised a sample of cross-industry data on the JSE, and both studies found evidence of a negative relationship between managerial ownership and firm performance.

While the aforementioned studies represent linear representations of the model, there is a further stream of evidence in the field which tests the relationship using non-linear models. Khan et al. (2014) is one of these studies, and the results produced indicate a *U*-shaped relationship between managerial ownership and firm performance. This implies that managers can be entrenched at low levels of ownership, and this may only be eliminated when they own enough shares to have their interests aligned with the owners. In contrast, Hu and Zhou (2008) and Din and Javid (2011) found a non-linear inverse *U*-shaped relationship between managerial ownership and firm performance. This result suggests that managerial shareholding below the threshold improved firm performance; however, once shareholding surpassed the threshold, firm performance was impaired (Naidu et al. 2023). Hu and Zhou (2008) attributed the positive effect at lower levels to interest alignment and the negative effect at higher levels to entrenchment. The threshold value was estimated to be 75% by Hu and Zhou's (2008) study of the Chinese market, whereas Din and Javid's (2011) study of listed firms in Pakistan estimated a threshold value of 25%.

Foreign ownership

Foreign ownership includes both strategic and institutional investors (National Treasury 2017). This study focuses on foreign strategic investors, defined as those holding at least 10% of a firm's equity (Orlic, Hashi & Hisarciklilar 2018), who are more likely to engage in long-term commitments and play an active operational role to enhance profitability and productivity.

The resource-based theory refers to the competitive advantages that firms obtain from strategic resources that are scarce, inimitable and irreplaceable (Naidu et al. 2022). This theory considers foreign shareholders as important suppliers of scarce resources, such as cutting-edge technologies and advanced managerial capabilities (Swart 2013). This may improve profitability through increased sales and cost reduction because of superior resources (Naidu et al. 2022). In emerging markets, foreign owners have been found to be efficient monitors of the firm (Khanna & Palepu 1999). Foreign investors who risk transferring their funds across borders are also found to be strongly motivated to maximise returns and are likely to demand high corporate governance standards (Iwasaki et al. 2022). However, foreign shareholders are also found to be susceptible to the entrenchment effect under large ownership levels, similar to managerial owners (Phung 2015). Similarly, foreign shareholders can potentially increase information asymmetries, particularly when the target companies are remote and across different time zones (Naidu et al. 2022).

South African studies such as Swart (2013) found that there is no relationship between ownership structure and performance, while Dube (2018) found a positive relationship between foreign ownership and return on assets (ROA), but negative impacts on return on equity (ROE) and Tobin's q. International studies of foreign ownership, which account for non-linearity, such as Greenaway, Guariglia and Yu (2014) and Phung (2015), found evidence of a non-linear, inverse *U*-shaped relationship between foreign ownership and firm performance. The only South African study to date which evaluated nonlinearity in the relationship between foreign ownership and performance was Naidu et al. (2022), and the results found evidence of a positive relationship at low levels of shareholding, up to a level of 40.1%. Anything above this threshold was found to cause negative performance impacts.

Institutional ownership

Institutional ownership is generally large companies which invest on behalf of their clients, such as insurance companies, pension funds and investment funds. These domestic institutional owners are often active in monitoring and enhancing corporate governance strategies and tend to place emphasis on the growth of firms that they are invested in (Iwasaki et al. 2022). According to the agency theory, these investors can therefore reduce information asymmetries and agency costs and thus improve financial performance.

However, these owners can also become entrenched at high ownership levels, in which case they may prioritise their own interest in business negotiations, rather than that of the firm, an issue which is particularly relevant if the institutional investor has existing business relations with the firm (Iwasaki et al. 2022). Further research has shown that as institutional investors vote in terms of their fiduciary responsibilities to their investors, they are more risk-averse and may pressure managers into avoiding projects which are risky in the near-term, but provide opportunities for long-term value creation (Yang 2021).

As such, the literature displays mixed results of a positive association (Komati 2017), a negative association (Dube 2018), a non-linear *U*-shaped relationship (Wardhana & Tandelilin 2011) and an inverse *U*-shaped relationship (Daryaei & Fattahi 2020). While a *U*-shaped relationship (observed in Indonesian firms) indicates that at high levels of ownership, institutional investors attempt to maximise Tobin's q, the inverse *U*-shaped relationship, which was observed in Iran, is attributed to the institutional investors developing a strategic relationship with managers to pursue their interests.

Government ownership

According to the resource-based theory, government owners can also provide firms with competitive advantages, but through political resources, easier access to capital and profitable government contracts (Dube 2018; Habtoor, Hassan & Aljaaidi 2019). Political resources include strong connections to political officials, which may promote the firm's public reputation and legitimacy (Komati 2017). However, unlike other types of owners, government shareholders can be motivated by social and political objectives rather than shareholder wealth, and the agency issue between management and government can be exacerbated, particularly when the state is a majority shareholder (Dube 2018; Iwasaki et al. 2022). From the perspective of agency theory, government shareholders are thus often seen as detrimental to firm performance (Phung 2015).

While studies like Mugobo, Mutize and Aspeling (2016), Al-Matari, Al-Swidi and Fadzil (2013), Le and Buck (2011) observed that government ownership has a positive impact on firm performance, Ongore (2011) found a negative impact in Kenya, and Komati (2017) found no relationship present in South Africa. Evidence of non-linearity in the relationship was also found by Hess, Gunasekarage and Hovey (2010) and Phung (2015).

Family ownership

In family-owned firms, Srivastava and Bhatia (2020) suggest that agency conflicts are reduced in family-owned firms, as families tend to either oversee operations directly or maintain close oversight of management. The resource-based theory also proposes that family firms possess a unique bundle of resources, which includes loyalty, willingness to work long hours and easy development of tacit knowledge (Srivastava & Bhatia 2020; Venter & Farrington 2009). Studies by Rajput and Joshi (2015) and Wang and Shailer (2017) confirm this relationship in their evaluations of the Indian and emerging markets, respectively. However, with family ownership, entrenchment, relational and altruistic aspects surrounding self-control problems, excessive generosity and nepotism can also contribute to agency costs (Srivastava & Bhatia 2020). This hypothesis was confirmed by the study by Al Farooque, Buachoom and Sun (2020), who evaluated the issue in the Thailand market. Studies that accounted for non-linearity with quadratic specifications provided strong evidence of inverse *U*-shaped relationships. For example, in India, Srivastava and Bhatia (2020) observed that the initial positive effect of family ownership began diminishing at approximately 30% for ROA and ROE and 42% for Tobin's q. In the United Kingdom (UK), Poutziouris, Savva and Hadjielias (2015) observed an optimal value of 31% of family ownership, claiming that ownership levels above 31% increased family opportunism, which hinders performance.

Based on the evidence, there is no definitive conclusion as to the impact each ownership category has on firm performance, with the results not only country-specific but also subject to the assumptions made regarding endogeneity.

Research methods and design

Sample

The sample includes all non-financial firms listed on the JSE from 2004 to 2021, covering the implementation of King II,

King III and King IV. This period spans key events such as the 2008–2009 financial crisis and the COVID-19 pandemic, both of which may have impacted ownership structures. Notably, the pandemic saw sharp declines in international investment (Strydom 2022) and several firms delisting from the JSE in 2020 and 2021 (Prinsloo & Henderson 2021; Wilson 2021). The study includes both listed and delisted companies but excludes financial firms because of their distinctive financial reporting standards, asset profiles and regulatory conditions compared to other sectors. The final dataset contains 267 firms, resulting in an unbalanced panel of 3246 annual observations. Financial statement data were sourced from Bloomberg, and ownership data from IRESS and Equity Real Time.

Variable description

Firm performance is quantified using accounting-based measures, such as ROA and ROE, as well as a market-based indicator, namely Tobin's q. Tobin's q is regarded as a forward-looking approach, as it reflects expectations about future earnings, growth and market perceptions of the value of the company (Demsetz & Villalonga 2001). The use of both accounting-based and market-based metrics enhances the validity of a study's results (Dube 2018).

The primary independent variables in the analysis are the five ownership types of focus: managerial, foreign, institutional, government and family ownership. Managerial ownership is measured by the shares held by insiders, including both directors and managers (Din et al. 2021). Foreign ownership is measured by two variables: a dummy variable that accounts for strategic foreign investors who own at least 10% of shares, as per the definition of foreign-owned firms by the International Monetary Fund (IMF) and a continuous variable that measures the percentage of shares owned by all foreigners (institutional and strategic) in the firm. The continuous variable allows for the detection of non-linearity as well as the optimal percentage of foreign shareholding.

Institutional ownership is measured by the percentage of shares held by asset management firms, banks, brokerage houses and insurance companies (Dube 2018). Following Dube (2018), government ownership is measured by the percentage of shares held by the Public Investment Corporation, Government Employees Pension Fund and SOEs such as Transnet, South African Broadcasting Corporation, Eskom, Passenger Rail Agency of South Africa and the Industrial Development Corporation. Lastly, family ownership is measured by both a dummy variable and a continuous variable. The dummy variable captures family trusts holding at least 20% of shares. This follows previous studies in which a company was classified as family-owned if families held more than 20% of the shares (Lodh, Nandy & Chen 2014).

Dummy variables for foreign and family ownership are used in Equation 1, as shareholdings below their minimum values do not align with how these ownership types are conceptually defined. In contrast, managerial, institutional and government ownership are treated as continuous variables, because they are not dependent on predetermined ownership levels.

Various firm-specific control variables are outlined. Firm size is considered because of its potential impact on performance, where larger firms are often more efficient and competitive, yielding better results (Gurbuz & Aybars 2010). Yet, Dube (2018) argued that larger firms may suffer from performance-hampering information asymmetry. Thus, the link between performance and size is unclear. Firm performance may also be impacted by the firm's age. Komati (2017) posits that older firms have superior performance because of experience, suggesting a positive relationship between age and firm performance. The leverage ratio is included, but its impact on performance is uncertain. The signalling theory suggests positive effects as high-quality firms use debt to showcase value, while the pecking order theory predicts negative impacts because of agency costs (Dube 2018).

The fourth control variable is the dividend payout ratio. Distributing dividends diminishes free cash flow, forcing firms to seek external funding for new investments. This, in turn, elevates the level of external monitoring and improves firm performance (Jiraporn, Kim & Kim 2011). To account for macroeconomic factors affecting firm performance, the South African gross domestic product (GDP) growth rate is included as a control variable. Higher GDP boosts consumer purchasing power, demand and profitability, suggesting a positive relationship. Lastly, industry and year dummy variables are included to account for sector-specific traits as per the Industrial Classification Benchmark, and contemporaneous correlations among firm errors, respectively.

Methodology

First of all, to examine the linear impact of ownership structure on firm performance, Equation 1 is estimated:

$$Y_{it} = \alpha + \beta O_{it} + \gamma z_{it} + e_i \quad \text{[Eqn 1]}$$

where $i = 1 \ldots N$ and $t = 1 \ldots 18$; Y_{it} is either ROA, ROE or Tobin's q; O_{it} is the group of ownership variables; z_{it} is the set of control variables and e_{it} is the random error term. Table 1 outlines the measurement of the variables.

To capture potential non-linear effects of ownership types on firm performance, Equation 1 is modified by adding a quadratic term as shown in Equation 2:

$$Y_{it} = \alpha + \beta O_{it} + \lambda (O_{it})^2 + \gamma x_{it} + e_{it} \quad \text{[Eqn 2]}$$

Equation 2 uses the continuous variables of foreign ownership and family ownership as the dummy variables lack the structure required to address non-linearity.

Any significance of the quadratic term λ indicates the existence of a non-linear relationship. A *U*-shaped curve is characterised by a negative slope at lower values that becomes positive at higher values, whereas an inverse *U*-shaped curve initially exhibits a positive slope that turns negative at higher levels. To identify the precise shape of the relationship, the following composite null hypothesis (inverse *U*-shape) and alternative hypothesis (*U*-shape) are tested (Equations 3 and 4):

$$H_0 : \alpha + 2\lambda \ (0_{min}) \geq 0 \ and/or \ \alpha + 2\lambda \ (0_{max}) \leq 0 \quad \text{[Eqn 3]}$$

$$H_1 : \alpha + 2\lambda (O_{min}) < 0 \ and \ \alpha + 2\lambda \ (O_{max}) > 0 \quad \text{[Eqn 4]}$$

The minimum and maximum ownership values used in the hypotheses are based on the data ranges observed for each of the ownership variables. Managerial, institutional and government ownership have minimum values of 0%, while the minimum values for foreign ownership and family ownership are set at 10% and 20%, respectively, as per the definitions of strategic foreign investors and family-owned firms. The output from the test provides Fieller confidence intervals to identify threshold values at which the null hypothesis can be rejected.

Endogeneity is a frequent concern in ownership and firm performance research, which can stem from dynamic endogeneity, simultaneity and unobserved heterogeneity (Schultz et al. 2010). While dynamic endogeneity occurs when past performance determines the firm's current ownership structure and control characteristics, simultaneity occurs when ownership levels are determined concurrently with a firm's performance. Unobserved heterogeneity can arise from firm-specific attributes that may impact the ownership structure, control characteristics and firm performance; however, this is difficult to measure.

If any of the three above-mentioned forms of endogeneity is found in the data, conventional panel models such as the Fixed Effects Model (FEM) may yield biased coefficients (Phung 2015). In such cases, the system GMM model is a reliable alternative, as it delivers unbiased and consistent estimates in the presence of all forms of endogeneity (Schultz et al. 2010). However, in the absence of endogeneity, the FEM specifications deliver more efficient estimates than the GMM (Schultz et al. 2010). This study, therefore, employs three tests of endogeneity, as discussed in the 'Results and analysis' section. If endogeneity is detected, system GMM will be used to estimate Equations 1 and 2. If the endogeneity tests indicate that the variables are exogenous, the FEM is instead adopted.

TABLE 1: Measurement of the variables.

Variables	Measure
Dependent variables	
ROA	The ratio of net income to total assets
ROE	The ratio of net income to the average common stockholder's equity
Tobin's q	The ratio of the market value to the replacement value of assets
Independent variables	
Managerial ownership	The percentage of shares owned by managers and directors
Institutional ownership	The percentage of shares owned by institutions
Foreign ownership dummy	The dummy variable is equal to one if foreigners own 10% or more of the firm's equity and zero otherwise
Foreign ownership	The percentage of shares owned by foreigners
Government ownership	The percentage of shares owned by the government
Family ownership dummy	The dummy variable is equal to one if families own 20% or more of the firm's equity and zero otherwise
Family ownership	The percentage of shares owned by family trusts
Control variables	
Ln (size)	The natural log of net assets
Ln (age)	The natural log of the number of years since the establishment of the firm to the observation date
Leverage	The ratio of long- and short-term debt to total assets
Dividend payout	The ratio of dividends per share to earnings per share
Asset turnover	The ratio of net sales to total assets
GDP growth	The ratio of the change in GDP to the current GDP
Industry dummies	Each dummy variable is equal to one if the firm is in the corresponding industry and zero otherwise
Year dummies	Each dummy variable is equal to one if the observation refers to the corresponding year and zero otherwise

ROA, return on assets; ROE, return on equity; GDP, gross domestic product; Ln, natural logarithm.

Ethical considerations

An application for full ethical approval was made to the Human Research Ethics Committee and an ethics waiver was received on 01 July 2025. The ethics clearance number is HRECNMW25/07/04.

Results and analysis

Descriptive statistics

Table 2 presents the descriptive statistics for the variables.

Consistent with earlier South African studies (Dube 2018; Komati 2017; Zhang 2016), institutional investors represent

TABLE 2: Descriptive statistics.

Variables	Mean	s.d.	Min	Max	Skewness	Kurtosis	*N*
ROA	0.061	0.135	-0.860	1.375	-0.277	14.421	3246
ROE	0.128	0.238	-0.991	1.16	-0.857	7.319	3246
Tobin's q	1.186	1.581	-0.384	10.829	17.3	493.572	3246
Managerial ownership	0.140	0.201	0.000	0.965	1.706	5.229	3246
Foreign ownership	0.181	0.200	0.000	0.997	1.419	4.708	3245
Institutional ownership	0.377	0.252	0.000	0.999	0.376	2.178	3246
Government ownership	0.051	0.076	0.000	0.421	1.549	4.995	3246
Family ownership	0.007	0.042	0.000	0.763	0.002	12.577	3246
Ln (size)	20.556	2.063	1.665	26.155	-0.358	4.876	3244
Ln (age)	3.537	0.996	0.000	7.609	-0.049	4.854	3240
Leverage	0.178	0.211	0.000	7.528	14.049	456.814	3246
Dividend payout	0.234	0.265	0.000	1.52	0.855	2.75	3246
Asset turnover	1.367	0.931	0.000	6.946	1.603	7.0135	3246
GDP growth	0.023	0.035	-0.064	0.056	1.403	12.630	3246

ROA, return on assets; ROE, return on equity; GDP, gross domestic product; s.d., standard deviation; Ln, natural logarithm; Min, minimum; Max, maximum.

This table reports the descriptive statistics for performance measures (ROA, ROE and Tobin's q), ownership types (managerial, foreign, institutional, government and family) and control variables (Ln [size], Ln [age]), leverage, dividend payout, asset turnover and GDP growth) for the period 2004–2021.

the largest shareholder group on the JSE, with an average stake of 37.7%. Foreign ownership ranks second, averaging 18.1% of total shareholding.

Managerial ownership and government ownership constitute an average of 14% and 5.1% of shareholding on the JSE, respectively. Family ownership, in contrast, accounts for a negligible average of only 0.07%, which can likely be attributed to the fact that most family-owned businesses in South Africa are concentrated in unlisted small and medium-sized enterprises rather than on the public exchange (Venter & Farrington 2009). The average ROA and ROE over the sample period are 6% and 12.7%, respectively. These values are lower than Komati's (2017) findings of 9.48% and 15.27% from 2004 to 2014, thus inferring a decline in performance for JSE-listed firms from an accounting perspective. The average Tobin's q of 1.186 suggests that over the sample period, JSE shares are mostly overvalued.

Table 3 displays the correlation matrix for the variables. As expected, ROA and ROE are strongly correlated given their similar computations. Both metrics show weak positive correlations with Tobin's q, indicating that the measures capture distinct aspects of firm performance. All performance indicators exhibit positive correlations with foreign and government ownership, while showing negative correlations with institutional and family ownership. Managerial ownership displays positive correlations with ROA and ROE but negative correlations with Tobin's q.

Endogeneity tests

Given that the existence of at least one source of endogeneity can produce severely biased and invalid results (Schultz et al. 2010), we conduct three endogeneity tests to determine a suitable estimation approach for this study. As per Wintoki et al. (2012), firm age and the industry and year dummy variables are treated as exogenous.

The first test of dynamic endogeneity is implemented by regressing current performance against lagged performance and control variables and assessing the significance of the performance lags (Wintoki et al. 2012). Significant lagged values indicate that past performance impacts current performance. These results are displayed in Appendix 1A-1. In panel A, when four performance lags are incorporated, the initial lag is significant across all performance metrics, while the second lag demonstrates significance for ROA and Tobin's q, and the third lag for ROA and ROE. The fourth lag, however, is insignificant for all performance measures. When the first and second lags are omitted (panel B), the third lag is significant for all performance measures, whereas the fourth lag is significant for ROE only. This implies the existence of dynamic endogeneity, as past performance influences current performance across all four indicators. Furthermore, the significance of later lags (years 3 and 4) when the first and second lags are excluded suggests that, although these later lags hold relevant information, the more recent lags (years 1

TABLE 3: Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) ROA	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-
(2) ROE	0.715	1.000	-	-	-	-	-	-	-	-	-	-	-	-
(3) Tobin's q	0.135	0.215	1.000	-	-	-	-	-	-	-	-	-	-	-
(4) Managerial ownership	0.005	0.028	-0.053	1.000	-	-	-	-	-	-	-	-	-	-
(5) Foreign ownership	0.048	0.063	0.034	-0.309	1.000	-	-	-	-	-	-	-	-	-
(6) Institutional ownership	-0.033	-0.074	-0.048	-0.259	-0.274	1.000	-	-	-	-	-	-	-	-
(7) Government ownership	0.036	0.057	0.041	-0.331	0.243	-0.048	1.000	-	-	-	-	-	-	-
(8) Family ownership	-0.008	-0.008	-0.010	0.026	-0.079	-0.054	-0.062	1.000	-	-	-	-	-	-
(9) Ln (size)	0.145	0.121	0.028	-0.416	0.397	0.012	0.508	-0.067	1.000	-	-	-	-	-
(10) Ln (age)	0.080	0.095	-0.007	-0.250	0.188	0.086	0.287	-0.008	0.380	1.000	-	-	-	-
(11) Leverage	-0.228	-0.089	0.341	-0.026	0.022	-0.005	0.059	0.004	-0.012	0.033	1.000	-	-	-
(12) Dividend payout	0.305	0.360	0.200	-0.106	0.172	-0.034	0.189	-0.044	0.316	0.213	-0.103	1.000	-	-
(13) Asset turnover	0.147	0.299	0.093	0.154	-0.073	-0.055	-0.061	-0.025	-0.172	-0.043	-0.035	0.192	1.000	-
(14) GDP growth	0.116	0.143	0.106	-0.005	-0.044	-0.105	-0.094	-0.038	-0.119	-0.045	-0.050	0.017	0.094	1.000

ROA, return on assets; ROE, return on equity; GDP, gross domestic product; Ln, natural logarithm.
This table reports the correlation coefficients for performance measures, ownership types and control variables for the period 2004–2021.

and 2) already subsume most of this information. Hence, two lags of past performance are considered sufficient to capture dynamic endogeneity and are thus incorporated into Equations 1 and 2.

The second method used is the weak test for exogeneity, which is applied to detect reverse causality (Wintoki et al. 2012). The findings of the weak exogeneity test in Appendix 1A-2 reveal significant reverse causality between the control variables and firm performance. Aside from the GDP growth rate, all control variables are significantly related to past ROA. Similarly, the lag of ROE is significant in explaining most control variables, except for the GDP growth rate and leverage. The lag of Tobin's q is significantly related to all control variables. This suggests that the control variables retain a certain level of endogeneity with firm performance. Managerial ownership and family ownership are the only ownership variables significantly related to past performance. Specifically, managerial ownership shares positive associations with the past values of ROE and ROA, while demonstrating negative relationships with past Tobin's q. This result indicates reverse causality, where past performance, from a year ago, influences the current percentage of managerial shareholding, but not vice versa.

Finally, Wooldridge's (2002) test of strict exogeneity is performed to examine whether past performance affects the future ownership structure. Appendix 1A-3 presents the results of the strict exogeneity test with different subsets of ownership and control variables. In panel A, the future values of managerial ownership (in specifications 1 and 7), foreign ownership (in specification 6) and government ownership (in specification 6) display coefficients that are significantly different from zero, whereas panel B shows that all specifications for the forward values of government ownership are significantly different from zero. Contrastingly, panels C and D do not present any significant future values of ownership variables. Hence, aside from family ownership and institutional ownership, the results of the strict exogeneity test suggest that future realisations of ownership variables are related to current performance and, therefore, cannot be considered strictly exogenous. Moreover, the future values of all control variables are significant in either panel.

Based on the results of the tests of dynamic endogeneity, weak exogeneity and strict exogeneity, all control and ownership variables (except family ownership and institutional ownership) exhibit significance in at least one of the tests, indicating a certain degree of endogeneity with firm performance. Therefore, all variables are treated as endogenous in this study, leading to the adoption of the system GMM for estimation purposes.

Main results

Table 4 presents the regression results for Equations 1 and 2, estimated using the system GMM. Two lags of past performance are included to address the dynamic endogeneity.

Based on the Arellano-Bond autocorrelation test, there is evidence of first-order but not second-order serial correlation in the first differenced residuals, thereby satisfying the exogeneity assumption. The Hansen test also reinforces the exogeneity of the variables.

The role of the control variables in explaining firm performance varies across each measure. In Equation 1, firm size has a significant positive effect on ROA and ROE but a negative effect on Tobin's q. The positive impact suggests that larger firms are more diversified and employ better technology, which may increase profitability (Phung 2015). In contrast, the negative effect can be interpreted as the diseconomies of scale that manifest in the firm's market valuation (Lawson & Osaremwinda 2019). As firms grow, they may experience inefficiencies (diseconomies of scale) that diminish their value.

Dividend payout positively impacts all performance metrics in Equations 1 and 2, consistent with the view that higher

TABLE 4: The impact of ownership and control variables on firm performance.

Variables	Equation 1			Equation 2		
	ROA	ROE	Tobin's q	ROA	ROE	Tobin's q
Intercept	-0.528***	-0.793**	1.379**	-0.575***	-0.421	0.833
Y_{t-1}	0.302***	0.337***	0.635***	0.292***	0.265***	0.604***
Y_{t-2}	0.060*	0.030	0.014	0.052	-0.019	0.011
Managerial ownership	0.059	0.204**	-0.409***	0.316	0.694	-0.408
Foreign ownership	0.024	0.077***	0.047	0.015	0.885***	0.009
Institutional ownership	-0.022	-0.083	-0.013	-0.087	-0.820	-0.487
Government ownership	0.018	0.132	0.327	0.107	1.659	1.482
Family ownership	0.006	0.077	-0.404***	0.007	1.359	-0.535
Managerial ownership²	-	-	-	-0.326	-0.795	-0.113
Foreign ownership²	-	-	-	0.037	-1.116**	0.036
Institutional ownership²	-	-	-	0.134	0.910	0.447
Government ownership²	-	-	-	0.051	-5.650	-2.273
Family ownership²	-	-	-	0.234	-3.142	-2.650
Ln (size)	0.025**	0.031*	-0.059**	0.026**	0.019	-0.022
Ln (age)	-0.015	-0.021	0.024	-0.017	-0.018	-0.021
Leverage	-0.068	0.156	0.172	0.046	-0.150	-0.314
Dividend payout	0.139***	0.295***	0.911***	0.186***	0.246***	0.789***
Asset turnover	0.035**	0.096***	0.064	0.030*	0.085***	-0.045
GDP growth	0.236	2.017	-4.910	1.589	-0.804	-6.502
AR(1) *p*-value	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
AR(2) *p*-value	0.195	0.130	0.307	0.229	0.279	0.332
Hansen J *p*-value	0.568	0.502	0.184	0.787	0.768	0.632

ROA, return on assets; ROE, return on equity; GDP, gross domestic product; AR, autoregressive; Ln, natural logarithm.

This table reports the impact of lagged firm performance (Y_{t-1}), ownership (managerial, foreign, institutional, government and family) and control variables (Ln [size], Ln [age]), dividend payout, asset turnover and GDP growth rate) on current firm performance (ROA, ROE and Tobin's q). Equations (1) and (2) capture a linear and non-linear relationship between ownership types and firm performance, respectively. All regressions are estimated using system GMM with robust standard errors. AR(1) and AR(2) are the respective first and second-order tests for serial correlation in the first-differenced residuals. Hansen J is the test for over-identification of the instruments. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

dividend payouts increase the level of external monitoring and thus improve firm performance (Jiraporn et al. 2011). The asset turnover ratio positively influences both ROA and ROE, indicating that more efficient asset utilisation enhances accounting performance.

As per Equation 1, managerial ownership has a significant positive linear effect on ROE but diminishes Tobin's q. The positive impact can be attributed to the convergence of interest between managers and shareholders, while the negative effect may stem from possible entrenchment and stock liquidity effects, because Tobin's q is related to concurrent liquidity (Fabisik et al. 2018). Specifically, Fabisik et al. (2018) indicate that managerial shareholders may decrease stock liquidity by leveraging insider information and selling only under conditions that are acceptable to them. Similarly, foreign investors, who own at least 10% of shares, positively influence the ROE of JSE-listed firms. Firms with higher ROE typically possess competitive advantages that yield superior investor returns. Thus, as per the resource-based theory, the increase in ROE could result from the transfer of scarce resources by foreign investors to JSE-listed firms, which is not captured by ROA or Tobin's q.

In contrast, family ownership exhibits negative effects on Tobin's q. The negative impacts may arise from entrenchment, where institutional investors enable entrenched managers for personal gain, and family owners make decisions that prioritise family interests over the firm's financial health (Al Farooque et al. 2020). The insignificant effects of institutional ownership on ROA, ROE and Tobin's q reinforce King IV's critique of the lack of involvement by institutional investors (Zhang 2016). Government ownership has no significant impact on firm performance, which may stem from the low level of government shareholding on the JSE because most SOEs, aside from Telkom, are unlisted enterprises.

Equation 2 shows that a non-linear relationship exists between foreign ownership and ROE. Based on the positive linear coefficient of foreign ownership, along with the negative quadratic term, this relationship is characterised as an inverse *U*-shaped pattern.

The SLM test results in Table 5 verify an inverse *U*-shaped relationship between foreign ownership and ROE, evidenced by the positive slope at the minimum level (0.661) and the negative slope (−1.341) at the maximum level of foreign ownership. Moreover, the extreme point (0.396) and the Fieller interval (0.310–0.784) fall within the foreign ownership range (0.1–0.997), thus violating the conditions of a *U*-shape in Equation 3.

TABLE 5: The Sasabuchi-Lind-Mehlum test for an inverse *U*-shaped relationship between foreign ownership and return on equity.

Variables	ROE
Slope at the minimum value of foreign ownership	0.661**
Slope at the maximum value of foreign ownership	-1.341*
U-test statistic	2.09**
Extreme point	0.396
95% Fieller interval	0.310; 0.784

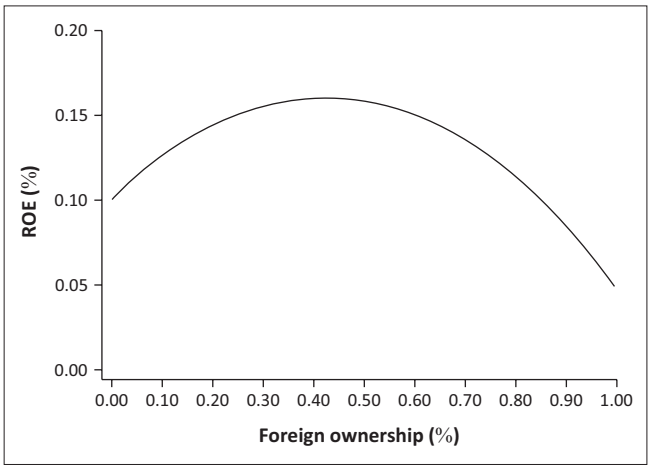
ROE, return on equity.

This table reports the results of the Sasabuchi–Lind–Mehlum (SLM) test for an inverse *U*-shaped relationship between ROE and foreign ownership. A total of 10% is used as the minimum value for foreign ownership in accordance with the International Monetary Fund (IMF) guidelines. * and ** indicate significance at 10% and 5%, respectively.

The extreme point of 0.396 reflects the optimal level of foreign ownership. Accordingly, as foreign ownership rises, the ROE of JSE-listed non-financial companies initially improves, but once foreign ownership exceeds 39.6%, its impact turns negative, as displayed in Figure 1. An inverse *U*-shaped relationship between foreign ownership and firm performance coincides with prior studies (Greenaway et al. 2014; Gurbuz & Aybars 2010; Naidu et al. 2022).

From a theoretical standpoint, the improved firm performance stemming from low levels of foreign ownership can be ascribed to increased monitoring and the supply of scarce resources and expertise by foreign investors (Douma, George & Kabir 2006). Kollamparambil and Jogee (2018) claimed that foreign enterprises in South Africa are deemed more technologically advanced than their domestic counterparts because of foreign investors sharing their technical knowledge and introducing cutting-edge technology. Moreover, South African multinational corporations allocate significant funds to training and developing local staff, frequently bringing in international experts to enhance the skills of local employees.

According to the agency theory, the decline in performance at higher levels of foreign ownership can be ascribed to the entrenchment effect on minority shareholders, which hinders firm performance. Additionally, the poor performance can also be a consequence of the liability of foreignness, which is the additional costs a firm operating in a market overseas incurs that a local firm would not incur (Naidu et al. 2022). Local alliances offer benefits to domestic firms that cannot be achieved by majority foreign-owned firms (Gurbuz & Aybars 2010). In South Africa, domestic owners may have a greater



ROE, return on equity.

FIGURE 1: Inverse *U*-shaped relationship between return on equity and foreign ownership.

understanding of the dynamics of the South African environment, including corporate governance structures, the target market, business practices and the legal and regulatory frameworks. Therefore, when foreign ownership surpasses 39.6% of total shareholding on the JSE, the decline in firm performance may arise from entrenchment and the liability of foreignness. Based on the optimal level of foreign ownership, it is recommended that domestic shareholders comprise at least 61% of the total ownership to retain optimal firm performance and prevent the expropriation of minority local shareholders (Phung 2015).

Conclusion

This study aimed to investigate how different ownership types (managerial, foreign, institutional, government, and family) affect the performance of non-financial firms listed on the JSE. The linear model results indicated a positive association between managerial ownership and ROE, but a negative relation with Tobin's q; and family ownership deteriorated Tobin's q. The positive effects were attributed to minimised agency issues and competitive advantages, whereas the negative effects were primarily linked to entrenchment. Government ownership had no significant impact on firm performance, attributed to the low level of government shareholding in JSE-listed firms.

A non-linear inverse *U*-shaped relationship was found only between foreign ownership and ROE, with an optimal value of 39.6%. Hence, increases in foreign ownership at levels below 39.6% resulted in a higher ROE, primarily because of monitoring and resource transfers from foreign investors. However, exceeding this level negatively impacted ROE, possibly because of entrenchment effects and the liability of foreignness. The positive influence of foreign ownership at lower levels infers that boards of directors should actively seek foreign shareholdings, as these investors offer technical expertise, advanced technology and training that improve firm performance. However, as the current foreign direct investment policy in South Africa does not impose limitations on foreign ownership, the negative impact at higher levels highlights the potential need for a legislative cap on the percentage of foreign ownership permitted in JSE-listed firms.

Regarding institutional investors, the findings indicating their insignificant impact on performance metrics suggest that these investors are not fulfilling their duties as outlined in the Code for Responsible Investment in South Africa (CRISA) and King IV, such as monitoring. Regulatory bodies can establish policies requiring clients and beneficiaries to consider CRISA compliance as a key criterion when evaluating the performance of institutional investors. This can incentivise institutional investors to perform their recommended duties.

This study contributes to the broader literature by providing context-specific evidence from South Africa, a key emerging market with a hybrid institutional environment. The findings highlight how ownership-performance relationships differ from those in developed economies. By identifying the optimal threshold for foreign ownership and highlighting the distinct effects of managerial and family ownership in a developing economy, this research encourages comparative studies that can move the field towards a more unified understanding. By addressing endogeneity and non-linearity, this research offers a robust framework that future cross-country studies can build on to work towards consensus in the ownership-performance debate.

Specifically, future research should incorporate other African countries to make the results more widely applicable. While South Africa shares certain traits with other African countries, its financial system is regarded as the most advanced among African nations (Kvangraven, Koddenbrock & Sylla 2021). Hence, the generalisability of the findings to other African countries is limited. Another limitation of this study is the difficulty in verifying the ownership data used in the analysis because of the limited availability of such data within the South African context and the prevalence of nominee shareholding structures, which limit one's ability to observe the 'true' ownership structure of the firm. Another potential avenue for future research is to explore the effects of interaction terms on the dependent variables. For instance, examining whether the combination of industry type and family ownership, or the interaction between firm age and ownership structure, yields significant effects on firm performance could offer deeper insights into moderating influences.

Additionally, the ownership structure bears significant implications for several firm fundamentals beyond financial performance. Hence, this analysis can be extended to investigating the impact of ownership on capital structures, corporate social responsibility, investment decisions, dividend policies, among others.

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Authors' contributions

D.D.N. was involved in the conceptualisation of the study, developing the main conceptual framework and analytical setup. D.D.N. took the lead in writing the original draft and was responsible for data collection, analysis and the analytical methods and results. F.P. provided supervision, verified the analytical methods and results, and reviewed and edited the manuscript. K.-A.M. also provided supervision and participated in writing, reviewing and editing the manuscript.

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Data availability

The data that support the findings of this study are publicly available from IRESS, Equity RT and Bloomberg Inc.

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