Vanishing Acts: An Econometric Exploration of Firm Delistings in South Africa

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Abstract

This paper studies firm delistings from the Johannesburg Stock Exchange (JSE) using a comprehensive multi-method framework that combines cross-country benchmarking, firm-level econometric analysis, machine learning techniques and qualitative evidence from market participants. Using exchange-level data from 1993 – 2015 and firm-level data from 2002 – 2024, we document that the JSE exhibits negative net listing rates relative to global peers, driven primarily by weak new listing activity rather than delistings. Delistings are found to be more frequent on the JSE in count terms, concentrated among smaller firms, implying a muted impact when measured by market capitalisation.

We estimate delisting probabilities using probit and logit models, complemented by LASSO and Random Forest methods. Delistings are found to be associated with smaller size, younger age, lower profitability, and reduced leverage, as well as adverse domestic macroeconomic conditions and global financial spillovers. Qualitative evidence highlights rising compliance costs, declining research coverage, weak growth prospects, and heightened policy uncertainty as key structural frictions.

Overall, the results indicate that contraction of the JSE reflects a combination of firm-level factors and macroeconomic headwinds rather than value destruction. The findings underscore the importance of broader economic conditions in sustaining public equity markets in emerging economies.

Keywords

Firm delistings; net listings; market structure; Johannesburg Stock Exchange; macroeconomic uncertainty; capital markets

JEL codes

G14; G18; G38; O16

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ABBREVIATIONS

AME	average marginal effect
BBE	black economic empowerment
B-BBEE	broad-based black economic empowerment
CAPM	Capital Asset Pricing Model
CAR	cumulative abnormal return
CDF	cumulative distribution function
CIPC	Companies and Intellectual Property Commission
EPU	economic policy uncertainty
FRED	Federal Reserve Bank of St. Louis
GDP	domestic gross domestic product
GFC	global financial crisis
GNI	gross national income
HI	high income
HHI	Herfindahl-Hirschman Index
IPO	initial public offering
JSE	Johannesburg Stock Exchange
LASSO	Least Absolute Shrinkage and Selection Operator
LSE	London Stock Exchange
MDA	mean decrease in accuracy
MDG	mean decrease in Gini
MiFID II	Markets in Financial Instruments Directive II
M&A	mergers and acquisitions
Non-HI	non-high income
OOB	out of bag
OTC	over the counter
P/B	price-to-book
P/E	price-to-earnings
RF	Random Forest
ROA	return on assets
SARB	South African Reserve Bank
SMEs	small and medium enterprises
TBV	turnover by volume
US	United States
WFE	World Federation of Exchanges

1 EXECUTIVE SUMMARY

This study examines listing and delisting dynamics on the Johannesburg Stock Exchange (JSE), Africa's largest bourse. The comparative sample spans 1993 – 2015, the longest period over which sufficiently consistent cross-exchange reporting was maintained without losing substantial peer exchanges. For firm-level econometric analysis, a more comprehensive dataset covering 2002 – 2024 is employed. The study uses a multi-method empirical framework combining (i) cross-country descriptive benchmarking using both firm counts and market-capitalisation-weighted measures, (ii) econometric modelling of delisting probabilities using probit, logit, and (iii) machine learning applications such as LASSO and Random Forest, and (iv) qualitative evidence from senior industry practitioners and market participants.

A central descriptive finding is that, over the period 1993 – 2015, the JSE exhibited higher average annual delisting rates and persistently negative net listings relative to most global peers. However, these aggregate outcomes are strongly influenced by a pronounced spike in listing and delisting activity during the mid-1990s to early-2000s, a period associated with market liberalisation, rapid inward listings and subsequent regulatory and financial clean-up cycles. A further insight is that weak initial public offering formation, rather than elevated delistings alone, increasingly drive negative net listings. This structural decline in new listings has received less attention but represents a central constraint on market deepening. The JSE's experience is not unique and should be interpreted with a broader global context of changing capital-raising preferences and growing private market depth.

To the best of our knowledge, this study provides the first systematic comparison of JSE listing dynamics against a global benchmark using both count and market capitalisation measures. Another central result is that, while the JSE records a higher number of delistings than high-income exchanges, the market capitalisation share of these delistings is smaller. This implies that JSE delistings are disproportionately concentrated among smaller firms, whereas delistings in high-income markets often involve larger, more systematically significant firms. The distinction underscores that the JSE's contraction is broad-based but less concentrated in value terms, relative to global market exchanges. In addition, the JSE has consistently experienced negative net listing rates over the past three decades, with more firms delisting than new firms listing. However, when scaled by market capitalisation, the magnitude of the JSE's underperformance relative to global exchanges is less severe. This highlights that while

the JSE faces structural challenges in maintaining a healthy pipeline of new listings, the aggregate market value lost through delistings has not been disproportionately large.

The econometric results indicate that delistings are driven by a combination of firm-level attributes, namely smaller size, younger age, lower profitability, and reduced leverage; as well as macroeconomic conditions, including subdued gross domestic product (GDP) growth, exchange rate volatility, and spillovers from United States economic indicators. Strategic exits are found to often occur during recovery phases, suggesting procyclical patterns in delisting behaviour. The econometric results offer detailed evidence on these determinants. The probit model indicates that older firms with higher market capitalisation, profitability (return on assets), and leverage are significantly less likely to delist. Macroeconomic indicators reveal that stronger South African GDP growth and a stable exchange rate reduce delisting probabilities, while robust US GDP growth and a flatter United States yield curve increase them. These findings are reinforced by average marginal effects, which underscore the economic significance of global financial conditions and domestic firm resilience. The logit model corroborates these patterns, amplifying the effects of core predictors and affirming the influence of cross-border macro-financial linkages. The Least Absolute Shrinkage and Selection Operator model, employed for variable selection, eliminates less informative variables and isolates a concise set of key predictors, namely, firm age, size, return on assets, South African GDP, the rand/dollar exchange rate, United States GDP, United States yield curve slope, and South African economic policy uncertainty, thus validating the robustness of the core determinants and addressing potential multicollinearity.

Machine learning results from the Random Forest model further validate these insights. Market capitalisation ranks highest followed by turnover by volume, valuation metrics (price-to-book, price-to-earnings, dividend yield, return on assets, firm age, and leverage. Macroeconomic variables such as the rand/dollar exchange rate and United States yield slope hold moderate importance, reinforcing the dominant role of firm fundamentals and liquidity-related characteristics.

Qualitative evidence from industry participants corroborates these results and highlights deeper structural constraints. Respondents consistently cite South Africa's prolonged growth stagnation, infrastructure deterioration, political risk, and governance instability as core impediments that have raised the cost of equity, particularly for small- and mid-cap firms. Investor sentiment is argued to remain fragile, as evidenced by weak leading indicators

(including building plans, poverty reduction efforts, and exchange volatility), while the JSE's role as a capital-raising platform has diminished. The constraints of Regulation 28 on domestic equity exposure are said to have diverted savings offshore, exacerbating funding gaps for emerging firms. Private equity and cross-border mergers and acquisitions increasingly exploit undervaluation opportunities, enabling corporate restructurings outside the public eye. The industry participants also argue that the JSE's regulatory orientation, an unprofitable sponsorship model, declining sell-side research (post-Financial Instruments Directive II), and mounting compliance burdens – particularly those tied to broad-based black economic empowerment rules and labour laws – have disproportionately affected smaller firms and diverted managerial attention from core operations. Political and fiscal uncertainties are argued to further elevate risk premiums, tilting preferences toward private equity.

Our findings have several policy implications. Revitalising the JSE's capital allocation function is essential to support investment, employment, and growth. Regulatory reforms aimed at reducing compliance burdens, streamlining governance, and simplifying black economic empowerment reporting could lower listing costs and restore the viability of small-cap participation. Broader structural interventions that are addressing infrastructure deficits, political risk, and barriers to entrepreneurship are necessary to reduce equity risk premia and spur new business formation. Strengthening the JSE's sponsorship and research ecosystem and positioning it as a regional hub through technological modernisation and cross-border integration could enhance competitiveness. In the absence of such reforms, the JSE risks prolonged contraction, reduced diversification, and suppressed innovation; thus undermining inclusive economic growth and job creation. Targeted action could reverse this trajectory, positioning the JSE as a revitalised platform for capital formation and long-term development.

The contribution of this study lies in the inclusion of international evidence by systematically benchmarking the JSE against global peers across both count and market capitalisation measures. In so doing, we isolate South Africa's structural weaknesses from cyclical or sample-specific patterns. Our findings underscore that revitalising the listing environment ultimately hinges on the trajectory of the domestic economy. While exchange-level reforms (reduced compliance costs and recalibrated prudential rules) are important, they remain second-order relative to macroeconomic fundamentals. A domestic policy regime that restores growth, investment, and confidence is the primary condition for deepening capital markets. In this sense, listings and corporate expansions will follow broader economic revival, not precede it.

2 INTRODUCTION

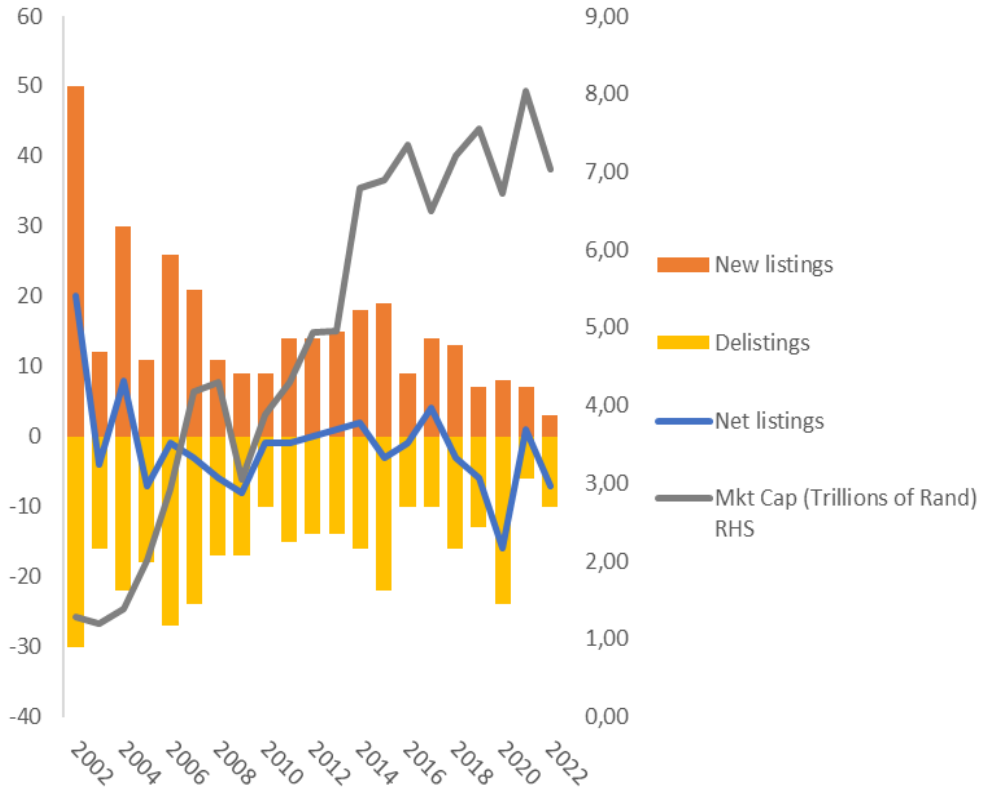
Stock markets serve as vital intermediaries between the real economy and financial markets, channelling capital toward productive investment opportunities and facilitating the efficient allocation of financial resources. Their contribution to economic development is well documented, including the provision of capital for business expansion, entrepreneurship (Sohl, 1999), job creation (Dudley and Hubbard, 2004), wealth accumulation (Faccio, McConnell, and Stolin, 2003), innovation (Moshirian et al., 2021; Wies and Moorman, 2015), and global financial integration (Claessens and Schmukler, 2007). Doidge, Karolyi, and Stulz (2004) argue that stock exchange listings enhance firm valuations by improving access to capital (Lins, Strickland, and Zenner, 2005), lowering the cost of capital (Karolyi, 1998), increasing liquidity (Brennan and Subrahmanyam, 1996), and strengthening firm performance (Schoubben and Van Hulle, 2006).

However, despite these benefits, a growing body of literature has documented a global rise in stock market delistings, particularly in advanced economies (Sanger and Peterson, 1990; Witmer, 2006; Thomsen and Vinten, 2007; Pour and Lasfer, 2013; Martinez and Serve, 2017; Balios et al., 2015; Bergh et al., 2020). Macey, O'Hara, and Pompilio (2008) estimate that over 9 000 firms delisted from US exchanges between 1995 and the mid-2000s, with approximately half of these removals being involuntary. Chaplinsky and Ramchand (2008) analyse one of the most extensive datasets on cross-border listings and exits, spanning more than four decades and 1 330 firms, identifying both firm-specific and market-driven reasons for voluntary and involuntary delistings. Their subsequent work (2012), alongside Bessler et al. (2012; 2023), confirms that delisting trends in developed markets such as the US and Germany are shaped by a combination of financial underperformance, market liquidity constraints, and rising compliance burdens. The available literature suggests that delistings have become a structural feature of global equity markets and are influenced by both microeconomic and macro-financial factors, including firm fundamentals, market liquidity, regulatory costs, and broader economic uncertainty (Martinez and Serve, 2017).

While delisting trends in developed economies are well documented, significantly less is known about how these dynamics play out in emerging markets. The Johannesburg Stock Exchange (JSE), established in 1887, is Africa's largest and most sophisticated stock exchange and ranked 19th globally by market capitalisation in 2023. Operating across five asset classes, the JSE plays a central role in connecting issuers and investors, with the Equity Market

remaining its largest and most active segment. In recent years, however, concern has mounted regarding the sustained wave of delistings from the JSE. Although delistings are not unique to South Africa, emerging evidence suggests that the drivers and implications may differ from those observed in more developed jurisdictions. While developed markets have continued to register positive net listing rates, South Africa has experienced marginally negative net listing rates over comparable time periods, highlighting a divergence that warrants closer investigation.

Figure 1: Market capitalisation, delistings and new listings for the JSE, 2002 – 2022



Source: Eikon Datastream & Author's own calculations.
Notes: Shows the market capitalisation of the JSE from 2002 to 2022. Also shown are annual new listings, delistings, and derived net listings. For the time period shown, net listings – the difference between new listings and delistings – are mostly negative. To improve graphical presentation of the data, 2002 new listings are capped at 50, but the true number is 167.

Given these patterns, global trends in listing activity cannot be assumed to apply uniformly to South Africa or other emerging markets. The South African case reflects distinct challenges in market structure, investor sentiment, and regulatory context that merit targeted analysis. Stock exchanges remain crucial for providing growth capital to established firms, yet our understanding of the growth dynamics and structural weaknesses underpinning the JSE remains limited. Although firm listings have received considerable scholarly attention, the delisting process, particularly in emerging market contexts, remains under-explored.

This study addresses this gap by offering a comprehensive analysis of delisting activity on the JSE using a multi-method approach. We combine a comparative cross-country analysis, econometric modelling, and qualitative insights from market practitioners to investigate the key drivers and consequences of firm exits from the exchange. In doing so, the study not only identifies the firm-specific and macroeconomic determinants of delisting in South Africa but also contextualises these within broader global capital market trends. This integrative framework offers a nuanced understanding of how domestic conditions, regulatory regimes, and international spillovers intersect to shape delisting outcomes, contributing to both academic literature and policy discourse on capital market development in emerging economies.

3 LITERATURE REVIEW

Stock exchanges facilitate the allocation of capital, serving as a conduit between firms seeking to raise equity on the capital demand side, and investors seeking risk-aligned opportunities to deploy their capital on the supply side (Lo, 2013; Asker et al., 2015). The attractiveness of an exchange, both from a firm's and an investor's perspective, hinges on several key factors, including liquidity, trading volume, market visibility, and the regulatory environment. Firms are drawn to exchanges that offer access to a broad investor base, enhanced visibility, and the potential for higher market valuations, yet must weigh these benefits against the costs and risks of public listing. These include high compliance costs, increased scrutiny, regulatory obligations, and loss of management control (Jensen and Meckling, 2019; Baker et al., 2002; Wang and Zhou, 2014). For investors, exchanges with higher liquidity and market depth offer improved execution and portfolio diversification opportunities (Christie et al., 1994; Domowitz et al., 2001).

Despite the inherent advantages of being listed, recent years have witnessed a notable trend in delistings as firms either voluntarily choose to exit public markets or are involuntarily removed for failing to meet listing requirements imposed by exchanges (Macey et al., 2008). Understanding the drivers of these delistings, not only for listing and trading competitiveness, but also in the context of economic, political, and regulatory factors, is important for understanding the latest delisting and reduced new listing trends. This review seeks to explore the multifaceted factors influencing the decision to delist and the broader implications for firms, investors, and the market as a whole.

The Johannesburg Stock Exchange (JSE, 2022) observes that, in the South African market, the cyclical pattern of new listings reached its peak during the tech bubble and just before the global financial crisis. The JSE attributes the prevailing trends in delistings to several factors, including adverse business sentiment, policy uncertainty, insufficient structural reforms, and sluggish economic growth.

The ability to raise equity capital, as opposed to debt, can be particularly appealing to firms looking to avoid the burden of interest payments and restrictive covenants associated with debt financing. Firms considering listing on an exchange are therefore tasked with balancing their need for capital with the cost of financing given the tax advantage of debt alongside the costs of financial distress (Schneller, 1980). In exploring the reasons behind a firm's decision to go public, Pagano et al. (1998) found that firms reduce their leverage significantly after going public while also improving governance as listing imposes greater transparency and accountability on firms. Pour and Lasfer (2013) also argued that firms come to public equity markets in order to balance their capital structure after overleveraging. They tested if young, risky and high growth firms listed on the London Stock Exchange (LSE) delist voluntarily because they are unable to raise equity, create growth, shareholder value, profitability and raise trading volume. They found that firms that are unable to raise further equity capital are more likely to opt for voluntary delisting. This is consistent with the findings of Auret and Britten (2008), who analysed the change in operating performance of 391 firms listed on the JSE between 1990 and 2003. Their study revealed a decline in investment expenditure and leverage following an initial public offering (IPO), suggesting that firms list primarily to rebalance their capital structure rather than to finance corporate growth. However, they also argued that the post-IPO performance decline could be attributed to increased agency costs stemming from a more dispersed ownership structure.

Hence, equity financing, while less restrictive than debt financing, comes with dilution of ownership and potential loss of control and confidentiality (Means, 2017). As argued by La Porta et al. (2000), strong investor protection is an important manifestation of security against political interference and is associated with effective corporate governance and efficient allocation of capital. Lo (2013) supported this view, finding in their examination of legal regulation and shareholder protection within a competitive model of stock exchanges that robust legal standards tend to attract, rather than deter, listings. Sanusi (2018) further cited

Coffee (2001) and Klein (2005) who found that firms and investors are attracted to stock exchanges with strong regulatory standards and better shareholder protection.

Mangena and Chamisa (2008) analysed 81 firms suspended from the JSE between 1995 and 2005, focusing on the role of corporate governance mechanisms in predicting suspension. Their findings revealed that suspended firms have weaker corporate governance structures compared to their active counterparts. Specifically, they identified a negative relationship between the proportion of non-executive directors and the likelihood of suspension, suggesting that stronger independent oversight reduces the risk of suspension. Additionally, firms with concentrated block-share ownership are more prone to suspension. The presence of an audit committee is also negatively associated with suspension, indicating its importance in governance. However, the study found no significant link between board size and suspension risk.

Firms' decisions to issue equity are closely tied to their capital structure dynamics and also play a role in mitigating financing constraints. Myers and Majluf (1984) highlighted that equity issuance is often a last resort due to information asymmetries, yet it is necessary when internal funds are insufficient to support growth. For delisting firms, however, this mechanism may be less viable. Evidence from Pagano et al. (1998) and Frank and Goyal (2003) suggested that firms that are unable to raise sufficient equity capital to rebalance their capital structure or reduce debt dependence are more likely to exit public markets. Additionally, Baker and Wurgler (2002) argued that unfavourable market conditions often limit equity issuance, pushing firms toward voluntary delistings. This aligns with DeAngelo et al. (2010), who found that firms in later lifecycle stages or with constrained market access increasingly forgo public equity financing. Given these dynamics, the net proceeds a company receives from the issuance of common and preferred stock relative to total assets serve as a critical indicator of its ability to leverage public markets for financing. Firms with limited equity issuance relative to their asset base may struggle to maintain adequate liquidity or manage leverage effectively, increasing the likelihood of voluntary or involuntary delisting. This metric, therefore, provides valuable insight into a firm's financial health and its capacity to meet the demands of remaining listed.

Trading volume is another common determinant of delistings in the literature, as it signals both liquidity and market depth. Higher trading volumes attract firms to an exchange by offering greater market visibility and better access to capital; while for investors, it denotes

liquidity, enabling quicker execution of orders, and more efficient price discovery (Lo, 2013). Markets with higher trading volumes also tend to have lower bid-ask spreads, stronger investor protection, and improved information disclosure (Wang and Zhou, 2014). In contrast, exchanges with declining trading volumes lose their appeal, prompting firms to delist in favour of more liquid and competitive markets. In a study of the Athens Stock Exchange from 2004 to 2012, Balios et al. (2015) estimated the likelihood of firms remaining listed, voluntarily delisting, or being involuntarily delisted due to failure to meet the exchange's financial requirements. Their findings indicated that companies with poor liquidity and low trading activity face a significantly higher probability of delisting, whether voluntary or forced.

Earlier research by Bradfield et al. (1988) and van Rensburg and Robertson (2003) identified thin-trading effects on the JSE as they observed low trading volumes during the periods of their studies. Since then, many studies have incorporated liquidity as a key factor in the cross-section of returns on the JSE. Liu (2006) argued that liquidity should be treated as a multidimensional concept, encompassing trading costs, trading quantity, price impact, and trading speed. McKane and Britten (2018) further examined the existence of a liquidity premium on the JSE from 2000 to 2015. Their findings suggested that Liu's (2006) Liquidity-Augmented Capital Asset Pricing Model (CAPM) outperforms the traditional CAPM in explaining the cross-section of returns on the JSE, underscoring the centrality of liquidity as a priced risk factor on the JSE.

Firm health and financial performance serve as critical barometers of a company's operational efficiency, profitability, and long-term viability in public markets. These indicators not only shape investor perceptions but also determine a firm's ability to access capital and navigate economic pressures. Building on foundational theories, Myers and Majluf (1984) posited that asymmetric information influences firms' financing decisions, often favouring internal funds or debt over equity issuance to avoid signalling undervaluation. Complementing this, Pagano et al. (1998) demonstrated that firms exhibiting robust financial metrics, such as strong return on assets (ROA) – their proxy for profitability – are more adept at utilising public listings for expansion, whereas those with weaker performance encounter escalating costs and scrutiny, heightening delisting risks. Recent empirical evidence from the JSE reinforced this linkage, finding that deteriorating financial performance, including subdued profitability and liquidity strains, significantly elevates delisting probabilities, especially for small- to mid-cap firms (Nikani & Holland, 2022).

A firm's maturity and its position within the corporate life cycle are central to understanding strategic decisions related to public market participation. Firms at different stages of their lifecycle experience varying levels of growth opportunities, capital needs, and pressures from investors. DeAngelo et al. (2010) showed that younger firms often utilise public equity markets to support rapid growth, while mature firms with stable cash flows and limited expansion opportunities may reassess the value of maintaining a public listing. This reassessment can often lead to voluntary delisting as the costs and constraints of public status outweigh the benefits.

Firm age, as a proxy for maturity, plays a crucial role in these decisions. Pagano et al. (1998) found that younger firms are more reliant on external equity financing due to growth demands, while older firms transition toward internal funding and debt as they stabilise. The lifecycle stage also influences other strategic actions, such as dual or cross listings and mergers and acquisitions (M&A), both of which have significant implications for delistings. Coffee (2003) argued that cross listings are often pursued by firms seeking broader market access and enhanced liquidity but also introduce additional regulatory and compliance burdens. For mature firms with reduced growth needs, the costs of maintaining additional listings can outweigh the benefits, making delisting from one or more exchanges an attractive option.

Mergers and acquisitions are another critical consideration, particularly for firms at the consolidation stage of their lifecycle who appear attractive as target firms integrating into acquiring entities. De la Bruslerie and Caby (2023) demonstrated that the decision to delist following an M&A transaction is influenced by factors such as cumulative abnormal returns (CARs) at the time of the M&A announcement, ownership structures, and leverage ratios. Higher CARs, which signal greater value creation prospects, are positively associated with delisting decisions, as controlling shareholders seek to appropriate private benefits while avoiding the scrutiny of public markets. Additionally, pre-existing ownership by a controlling shareholder reduces the likelihood of delisting, as these firms are more likely to maintain their public status. Conversely, firms with high debt levels are more prone to delisting, as they rely less on equity markets for funding. Additionally, Karolyi (2006) highlighted that cross-border M&A often prompt firms to simplify their operational structures, which can include delisting from secondary exchanges.

In the context of delistings, these factors collectively underscore the importance of lifecycle positioning. Metrics such as firm age, dual-listing status, and involvement in M&A provide a

nuanced understanding of a firm's strategic motivations for exiting public markets. The interplay of these variables highlights the complex decision-making processes that influence the likelihood of delisting across different stages of corporate maturity.

Another key attraction for firms to list and remain on an exchange lies in the enhanced visibility it provides, offering access to larger markets, increased analyst coverage, media attention, and an overall boost to the firm's reputation and market standing (Baker et al. 2002; Lo, 2013). Mola et al. (2010) examined how the loss of analyst coverage impacts investor recognition, trading volume, liquidity, institutional ownership, and ultimately a firm's likelihood of delisting. Using data on firms listed on the NYSE, AMEX, and Nasdaq between 1983 and 2004, the authors found that firms that lost all analyst coverage for at least one calendar year were 11 percent more likely to delist within the following year compared to their peers with coverage. These firms also experienced significant declines in liquidity and institutional ownership. Similarly, Chaplinsky and Ramchand (2012) analysed the influence of analyst coverage, among other factors, on foreign firms listed on US exchanges between 1962 and 2006. Their findings underscored the pivotal role of analyst coverage in preserving visibility and investor recognition, with firms experiencing a reduction in coverage more likely to delist. Specifically, in a sub-sample of foreign firms which delisted from US exchanges between 2000 and 2004, 60 percent were found to lack analyst coverage.

Regulatory shifts have further amplified these structural dynamics, most notably through the implementation of the European Union's Markets in Financial Instruments Directive II (MiFID II) in 2018. This reform required the unbundling of research payments from trade execution fees, fundamentally altering the economics of sell-side research provision. In the wake of MiFID II, analyst coverage declined markedly, especially for small- and mid-cap firms, resulting in reduced market visibility, deteriorating liquidity, and increased delisting risk due to diminished investor engagement. Fang et al. (2020) showed that 334 European firms lost analyst coverage entirely following the directive's enactment, with the affected firms exhibiting heightened illiquidity and greater dependence on in-house investor relations to bridge the informational gap. Consistent with these findings, Guo and Mota (2021) reported an average 7.67 percent decline in analyst coverage relative to pre-MiFID II levels, with survey responses indicating that over 50 percent of sell-side analysts observed reduced coverage for small and medium enterprises (SMEs). These trends have raised concerns over market transparency,

price discovery, and the reputational viability of listed firms, particularly those outside the large-cap universe.

High compliance costs and the inability to raise capital at competitive rates also have been found to be a significant determinant of delisting. According to Chaplinsky and Ramchand (2012) firms delist when the expected costs of listing exceed the expected benefits such as investor recognition, liquidity and capital raising opportunities. Firms facing elevated trading costs may struggle to attract sufficient liquidity, which in turn raises the cost of equity capital. Furthermore, the costs associated with maintaining a listing, including the certification of financial statements and adherence to stringent accounting and regulatory requirements, can become prohibitive. These obligations not only increase direct expenses but also demand significant management attention and resources. This is supported by Li et al. (2024) who argued that maintaining listings on stock exchanges distracts management from fundamental operations. In South Africa, the 2013 Broad-Based Black Economic Empowerment Amendment Act (B-BBEE) strengthened the compliance requirements for JSE-listed firms, mandating them to undergo verification and report adherence to specific audit-related obligations as part of the legislation (Egu and Chiloane-Tsoka, 2023).

For many firms, the combination of high trading costs and the burdens of compliance can outweigh the advantages of public listing (Chemmanur and Fulghieri, 2006; Macey et al., 2008; Li et al., 2024). The costs and adverse effects associated with involuntary delistings on Nasdaq from 2000 to 2009 were examined by Li et al. (2024). Their study found firms that actively traded before receiving a delisting notice experienced significant declines in trading volume, visibility, and long-term investments following the notice. The authors suggested that for smaller firms burdened by high compliance costs but with limited liquidity needs, over-the-counter (OTC) markets may provide a lower-cost and viable secondary trading option.

In a consultation paper published in May 2022, the JSE acknowledged several legislative and regulatory challenges beyond its control as a Listings Authority that have diminished the incentives for companies to list or remain listed on the exchange (JSE, 2022). Among the key issues identified were outdated legislation, the prevailing economic climate, and inconsistent application of legal and regulatory requirements. Additionally, the JSE highlighted the administrative burden posed by extensive disclosure and reporting obligations, which further discourages firms from seeking capital in the public market.

Monetary policy has two primary goals identified as price stability and sustainable economic growth, with monetary policy shocks found to have large and significant effects on investor sentiment and stock markets, especially in bear markets (Kurov, 2010). According to Tobin (1978), a tightening of monetary policy resulting from an increase in inflation lowers the present value of future earning flows and depresses equity markets. Monetary policy and macroeconomic factors therefore have the potential to influence delistings on an exchange. Tightening monetary policy, particularly rising interest rates and inflation, directly impacts a firm's cost of capital and borrowing capabilities. Inflationary pressures compound these challenges by eroding profitability and increasing operational costs, pushing firms to reconsider the benefits of maintaining a public listing in such adverse conditions. These pressures have been found to intensify across sectors. Ehrmann and Fratzscher (2004) found cyclical sectors such as technology, communications, and cyclical consumer goods to react two to three times stronger to monetary policy than less cyclical sectors. They also found that firms with low cash flows, poor credit ratings, low debt to capital ratios, high price-earnings ratios, and high Tobin's Q to react twice as much to monetary policy.

Macroeconomic uncertainties, such as elevated economic policy uncertainty (EPU) and rising unemployment rates, further exacerbate the risk of delistings. An increase in the EPU index, for example, can negatively impact stock returns as investor confidence weakens, making it difficult for firms to raise capital. Uncertainty in the broader economic environment leads to reduced trading volumes and deteriorates investor sentiment, increasing the likelihood of firms exiting public markets (Al-Thaqeb and Algharabali, 2019; Nowzohour and Stracca, 2020). In contrast, firms operating in favourable economic environments are better able to meet capital needs, maintain liquidity, and withstand short-term market fluctuations.

Delistings, while influenced by common factors such as firm size, profitability, and ownership structures as outlined in the sections above, also exhibit distinct patterns and drivers in advanced versus emerging economies. This may be due to differences in market maturity, regulatory environments, and investor bases. In developed markets, the most comprehensive study to date is by Bessler et al. (2023), who investigated delistings from the Prime Standard, the highest regulated stock market segment at the German Stock Exchange. Over the period 2003 to 2025, the study examined 518 firms, of which 243 delisted, including 107 that downlisted to less regulated market segments, and 136 that exited public markets. They found that small, less profitable firms with low liquidity have a higher probability of delisting a highly

regulated market. The main determinants of delistings identified are, therefore, low growth opportunities, poor stock liquidity, smaller firm size, weak profitability, and high audit fees. These factors, linked to the cost benefit trade-offs of high regulatory compliance, suggest that firms with fewer public market needs or high relative costs of listing tend to either downlist or delist. The study also highlighted the role of ownership structures, finding that firms with concentrated ownership are more likely to delist, reflecting governance-related motives. The use of variables such as Tobin's Q, firm size, return on assets, leverage, equity issuance, firm age, and liquidity offered direct comparability to other delisting studies, including those in emerging markets, which are more sparse in the literature.

Malik et al. (2014) investigated involuntary delistings on the Shanghai Stock Exchange and Shenzhen Stock Exchange from 1999 to 2012, encompassing 81 delistings. The study employed a logistic regression model to evaluate the role of corporate governance characteristics as predictors of delisting. Seven governance variables were analysed including shareholder activism, board activity, audit committee presence, board size, board independence, ownership concentration, and insider ownership.

The results highlighted significant differences between delisting and surviving firms. Shareholder activism declined consistently among delisting firms, signalling a lack of engagement from shareholders. Board activity increased prior to delisting, likely reflecting heightened responses to adverse performance. The presence of audit committees was generally low and had no significant preventive effect on delistings, suggesting weaker governance mechanisms in the Chinese context. Board size declined among delisting firms, while board independence increased but remained insignificant in distinguishing delisting and surviving firms.

Ownership concentration and insider ownership emerged as the most critical variables. Delisting firms exhibited declining ownership concentration and insider ownership, contrasting with surviving firms where these metrics were stable or increasing. Both variables were negatively associated with delisting probability, implying that concentrated ownership and insider stakes improved governance and reduced delisting risk. The study highlighted that governance variables, particularly ownership characteristics, are central to understanding delistings in emerging markets.

In another emerging market, Moreira et al. (2022) investigated delistings on the Brazilian B3 stock exchange between 2013 and 2018, analysing 126 cancellations of registration. Using logistic regression, the authors identified several determinants of delistings, focusing on key factors like ownership structure, liquidity, cash availability, dividends, growth, size, and indebtedness.

The findings revealed that delistings are significantly associated with greater ownership concentration, suggesting that controlling shareholders prefer private ownership to avoid public market scrutiny. Lower liquidity and reduced growth prospects also emerged as major determinants, with less liquid stocks and weak growth decreasing the attractiveness of firms remaining publicly traded. Cash availability is another critical factor; firms with high cash reserves were more likely to delist as they could fund operations without relying on external capital. In particular, lower growth and greater cash availability were found to be the most influential accounting variables in delisting decisions, as these factors reduced the need for the capital-raising advantages of public markets, enabling firms to rely on self-financing instead. Size also played a role, with larger, more mature firms showing a higher propensity to delist, contrasting with findings in other regions where smaller firms were more likely to go private.

More recently, Azavedo et al. (2024) examined voluntary delistings across 26 countries between 1990 and 2020, analysing 26 090 firms and categorising delistings into voluntary, involuntary, and M&A-related events. The dataset included 832 voluntary delistings, with the countries segmented into 15 developed markets and emerging markets. South Africa was not included in the study. Using a competing risk hazard model, the authors classified the determinants of delistings into agency motives, economic motives, and factors within and external to the firm, highlighting distinctions between developed and emerging markets.

Agency-related variables included insider ownership, expropriation penalties, and dividend payouts. The findings revealed that insider ownership is positively associated with voluntary delistings, as concentrated ownership enabled controlling shareholders to avoid public scrutiny and achieve private benefits. Expropriation penalties, representing the regulatory costs of opportunistic behaviour, further incentivised delistings, with firms in jurisdictions with stricter penalties more likely to exit public markets. Conversely, higher dividend payouts reduce the likelihood of delistings as they mitigate agency conflicts by distributing cash to shareholders, aligning management and investor interests.

Economic motives include firm growth rates, business risk, and listing expenses. Firms with lower growth rates and higher business risk are significantly more likely to delist, reflecting the declining advantages of public listing for firms facing financial instability or weak prospects. High listing expenses, including compliance and audit costs, also play a critical role in driving delistings, as the cost benefit trade-off shift against remaining public for firms with constrained resources.

Internal firm-level determinants encompassed governance structures and financial health indicators, while external factors included macroeconomic and regulatory environments. Within firms, governance structures such as higher insider ownership, reinforced delisting decisions. Externally, policy uncertainty and regulatory unpredictability emerged as critical drivers. These external shocks exacerbated business risk and reduced firm growth, thereby accelerating delisting trends.

The study revealed that voluntary delistings in developed markets are primarily driven by governance and agency-related considerations, reflecting stronger regulatory frameworks and investor protections. In contrast, delistings in emerging markets are more reactive to external macroeconomic shocks and financial instability. Across both market types, high listing expenses, lower growth rates, and increased business risk consistently influence delistings, though the relative importance of these factors varies by region.

Delistings from the JSE attract growing scholarly attention due to their implications for market depth, liquidity, and capital formation in emerging economies. Recent research identifies a complex interplay of firm-specific fundamentals, governance practices, and macroeconomic conditions as determinants of exit decisions.

Makuvaza et al. (2025) aimed to assess the role of intermediate financial distress events and business cycles in stock market delistings on the JSE. They reconceptualised delisting not as a discrete binary outcome but as a multi-state transition process, capturing the nuanced progression from financial health to distress and eventual market exit. Using an extended Cox proportional hazards model with competing risks, the authors incorporated intermediate distress states, measured by consecutive periods of cumulative income losses, to model the hazard of delisting. Their findings revealed that firms with prolonged or repeated episodes of financial distress face a statistically significant and increasing hazard of delisting, even after controlling for macroeconomic shocks and sectoral effects.

Lansdell et al. (2025) provided a complementary perspective through a comprehensive panel probit framework, analysing a panel of 302 companies that delisted from the JSE between 2010 and 2023. Their model spans 72 explanatory variables across financial (e.g., liquidity ratios, profitability margins), non-financial (e.g., board structure, ownership concentration), and macroeconomic domains (e.g., inflation, credit spreads), offering one of the most granular risk profiling exercises for JSE-listed firms to date. They found that delisting outcomes are shaped by a nuanced interaction of firm-specific fundamentals and broader macroeconomic forces. Strong financial health serves as a critical buffer against delisting risk, while sound corporate governance structures and a diversified shareholder base reinforce transparency and investor trust. At the macroeconomic level, procyclical dynamics such as higher gross domestic product (GDP) growth may elevate delisting risk by intensifying market competition, whereas inflation may have a mitigating effect by allowing firms to preserve margins. Additional macro-level factors, such as interest rates, access to credit, labour market conditions, and electricity reliability also emerge as key determinants influencing firms' continued presence on the exchange.

Finally, Nikani and Holland (2022) delved into the legal and transaction-specific drivers of voluntary delistings executed via schemes of arrangement, a route that became increasingly prevalent between 2012 and 2021. Their dataset, covering both approved and aborted scheme-based delisting attempts, identifies rising transaction costs, escalating compliance obligations, and limited analyst and media coverage as primary contributors to firms' strategic retreat from public markets. The study placed special emphasis on visibility constraints, particularly for small- and mid-cap firms with market capitalisations below R10 billion, which are disproportionately impacted by South Africa's onerous disclosure regulations and limited institutional investor interest. These findings challenge the often-held assumption that voluntary delistings signal managerial opportunism or strategic buyouts. Instead, they suggest that for many issuers, particularly in capital-constrained segments of the market, the public listing regime has become economically unsustainable. Nikani and Holland (2022) conclude that deep-seated structural reforms, ranging from reduced regulatory friction to improved post-listing support mechanisms, are imperative to revitalise the JSE's appeal for growth-oriented and SME firms.

Collectively, these studies reveal that delistings on the JSE cannot be reduced to a single causal mechanism but rather reflect a confluence of firm-level fragilities, governance inefficiencies,

and macroeconomic headwinds. They also point to a structural challenge: the exchange's evolving bias towards larger, more established firms, which exacerbates market concentration and erodes opportunities for small-to-medium companies.

The existing literature has made significant strides in unpacking the determinants of stock market delistings, with robust empirical evidence linking firm-level fundamentals, governance structures, liquidity constraints, compliance burdens, and macroeconomic volatility to the decision to exit public markets. These insights, drawn from both developed and emerging market contexts, offer a rich conceptual framework that underscores the multidimensional nature of delistings. Yet, despite the growing attention to the JSE, a critical empirical gap remains in systematically reconciling the firm-specific and macro-financial drivers of delistings within a unified analytical framework.

While prior studies have focused on selected dimensions such as financial distress (Makuvaza et al. 2025), multifactor firm characteristics (Lansdell et al. 2025), or structural cost impediments (Nikani and Holland, 2022), these analyses were often fragmented and methodologically narrow.

Notably absent is a study that simultaneously evaluates the predictive power and relative importance of a broad set of determinants using multiple complementary econometric and machine learning methods, or one that systematically contrasts the JSE's delisting experience with that of global peers.

This paper addresses this gap by providing the first comprehensive, multi-method investigation of delistings from the JSE over a two-decade period, spanning firm-level data and both South African and US macroeconomic indicators. Employing a suite of empirical techniques, including probit, logit, Least Absolute Shrinkage and Selection Operator (LASSO), and Random Forest classification, we benchmark the JSE's delisting trends against international patterns and interrogate the heterogeneous effects of firm age, size, profitability, governance, ownership concentration, and economic conditions. Importantly, we triangulate these quantitative findings with qualitative insights derived from structured interviews with industry participants, allowing us to capture motivations and frictions that are not readily observable in firm-level data.

By doing so, this study contributes to the literature in three key ways: First, it seeks to empirically compare the JSE's delisting rate relative to samples of the major global exchanges over time. Second, it highlights the pro-cyclicality of delistings in emerging markets, with implications for policy interventions during recovery periods. Third, it integrates methodological innovation with practical relevance by combining statistical rigor with both quantitatively and qualitatively measured practitioner insights – in a bid to offer actionable guidance to regulators, issuers, and policymakers seeking to revitalise the exchange and address the erosion of its listed base.

In sum, our study not only advances the empirical frontier of delisting research in emerging markets but also lays the groundwork for a deeper understanding of how exchange-level dynamics, firm-level frictions, and systemic economic conditions coalesce to shape listing outcomes marked by structural asymmetries and policy uncertainty.

Taken together, the evidence of rising market concentration and shifting sectoral exit patterns underscores the need for a systematic assessment of firm- and market-level determinants of delisting. The next section outlines the data sources and methodological framework employed for this analysis.

4 Data and Methodology Overview

This study draws on multiple datasets to capture both firm-level and market-level dynamics of delistings on the JSE. Three primary sources underpin the analysis: Firstly, exchange-level data on listings, delistings, and net listings from the World Federation of Exchanges, providing global comparability over time; secondly, firm-level financial and trading data from JSE records and LSEG Eikon, supplemented by Companies and Intellectual Property Commission (CIPC) filings and annual reports to address gaps for delisted firms; and finally, macroeconomic indicators sourced from the South African Reserve Bank (SARB), the Federal Reserve Bank of St. Louis (FRED), and the Economic Policy Uncertainty Index (Baker et al., 2016). In addition, the study incorporates qualitative survey evidence and structured interviews to contextualise quantitative patterns and identify structural drivers of delistings. Together, these data sources allow us to integrate global benchmarking with a detailed examination of firm-level behaviour and policy context.

The key dependent variable across all models is a binary indicator for delisting, equal to 1 in the year a firm delists and 0 otherwise. Right-censoring is applied to firms still listed at the sample end. Firm identifiers were harmonised across datasets to address survivorship bias and name changes. The final dataset spans 2003 – 2024, enabling analysis across multiple economic cycles.

Building on this data, we employ a multi-faceted econometric framework to identify the determinants of delisting. Traditional binary outcome models (logit and probit) establish a baseline, while the LASSO regression extends the analysis by addressing multicollinearity and enabling variable selection. Finally, ensemble learning methods (Random Forest) allow for flexible modelling of non-linear relationships and interactions, strengthening predictive accuracy. This progressive sequencing, from parametric to machine-learning approaches, ensures both inference and robustness in the assessment of delisting drivers.

5 DELISTINGS ON THE JSE: A GLOBAL COMPARATIVE ANALYSIS

The comparative analysis in this section draws on panel data from the World Federation of Exchanges (WFE), spanning 20 exchanges (11 high income, 9 non-high income) over the period 1993 to 2015. The dataset reports annual counts of new listings, delistings, and total firms by exchange, as well as market capitalisation aggregates. This structure enables both count-based and market capitalisation-weighted measures of listing dynamics. We exploit the World Bank's income-group classification to create two sub-samples – high income and non-high-income exchanges – which serve as benchmarks for the JSE. These features make the WFE dataset uniquely suited for cross-market comparative analysis of listing activity and its macro-structural drivers.

The analysis employs three key measures to capture listing dynamics on public stock exchanges, which serve as critical channels for capital allocation. This is particularly relevant in South Africa, where the exchange has remained relatively large and liquid, consistently ranking among the world's top 20 over an extended period.

A distinctive feature of our approach is that we analyse the full listing range of outcomes – namely delistings, new listings, and net new listings. In turn, these measures are estimated in both count and market capitalisation-weighted form. This goes beyond earlier studies that model JSE delisting risk in isolation by explicitly incorporating replacement through new

listings and separating composition from scale. The construction of these complementary indicators – together with the high-income and non-high-income benchmarks – allows us to locate the JSE's experience in a global context and to distinguish periods of genuine shrinkage from periods of compositional change.

The first measure of delisting is to simply take the absolute count of delistings, defined by a binary indicator that equals 1 if a firm delists in a given year and 0 otherwise. Aggregating these across firms provides an annual count of delistings. To standardise this measure, a delisting rate is calculated by dividing the annual delisting count by the total number of listed firms. While useful, this raw count and rate fail to account for offsetting new listings, limiting their interpretive power when considered in isolation. This measure provides context on market scale, churn, and economic indicators, akin to labour market dynamics.

Let $C_{i,t-1}$ equal the number of firms listed on a given stock exchange in the period $t-1$, where subscripts i and t represent firms and time respectively. New listings or joiners are denoted by $J_{i,t}$ and delistings or leavers are denoted by $D_{i,t}$. Combining these yields the total sum of *k* firms listings at time *t* as the $\sum_{i=1}^{k} L_{i,t}$, formally given by

$$\sum_{i=1}^{k} L_{it} = \sum_{i=1}^{k} C_{it-1} + \left(\sum_{i=1}^{k} J_{it} - \sum_{i=1}^{k} D_{it} \right) \quad (1)$$

Building on equation (1), the total number of listed firms at time t can be expressed as the sum of listed firms in period t–1 and the net difference between new listings and delistings in period t. This difference, referred to as "net new listings," is a key indicator of exchange-level activity.

We begin by defining, $D_{i,t}$, the count of delistings P_t, as a fundamental benchmark for tracking market exits. A simple ratio:

$$P_t = \frac{D_{i,t}}{L_{i,t}}, \quad (1a)$$

captures the share of delisting firms relative to total listed firms in year t.

However, this measure treats all firms equally and fails to reflect variations in firm size. To address this, we introduce a market capitalisation-adjusted delisting ratio:

$$P_t^{MC} = \frac{D_{i,t}^{MC}}{L_{i,t}^{MC}} \tag{1b}$$

where P_t^{MC} represent the market capitalisation of delisting firms and total listed firms, respectively. This adjustment allows for a more meaningful comparison across firms and periods with heterogeneous market structures. Analogous measures are constructed for new listings. The unadjusted ratio is given by:

$$G_t = \frac{J_{i,t}}{L_{i,t}} \tag{1c}$$

where J_t i denotes the number of new listings in year t, and its capitalisation-adjusted counterpart:

$$G_t^{MC} = \frac{J_{i,t}^{MC}}{L_{i,t}^{MC}} \tag{1d}$$

captures the share of market capitalisation attributable to new entrants. Net new listings, the net balance of new listings and delistings, are defined as:

$$N_t = \frac{(J_{i,t} - D_{i,t})}{L_{i,t}} \text{ or } (G_t - P_t) \tag{1e}$$

and in capitalisation-weighted form:

$$N_t^{MC} = \left(\frac{J_{i,t}^{MC} - D_{i,t}^{MC}}{L_{i,t}^{MC}}\right) or\ (G_t^{MC} - P_t^{MC}) \tag{1f}$$

Using the above measures, we examine the JSE's delisting patterns within a global context, comparing its trends with those of high-income (HI) and non-high-income (Non-HI) exchanges from 1993 to 2015. The World Bank classifies economies into income groups – low, lower-middle, upper-middle, and high-income based on gross national income (GNI) per capita. The analysis employs the three complementary measures of delisting, new listing and net listing rates, incorporating both count-based and market capitalisation-based indicators as previously explained. The comparison spans 20 exchanges, including 11[1] HI and nine[2] non-HI exchanges,

[1] The 11 HI exchanges include Bolsa de Comercio de Santiago (Chile), Euronext Dublin (Ireland), Euronext Oslo (Norway), Hong Kong Exchanges and Clearing (China), Korea Exchange (South Korea), Ljubljana Stock Exchange (Slovenia), Luxembourg Stock Exchange (Luxembourg), Singapore Exchange (Singapore), Tel Aviv Stock Exchange (Israel), Vienna Stock Exchange (Austria), Warsaw Stock Exchange (Poland).

[2] The nine non-HI exchanges include the Johannesburg Stock Exchange (South Africa), Philippine Stock Exchange (Philippines), Bolsa de Valores de Lima (Peru), Bolsa Mexicana de Valores (Mexico), Bolsa y Mercados Argentinos (Argentina), Borsa Istanbul (Turkey), Bursa Malaysia (Malaysia), Indonesia Stock Exchange (Indonesia), and the Stock Exchange of Thailand (Thailand).

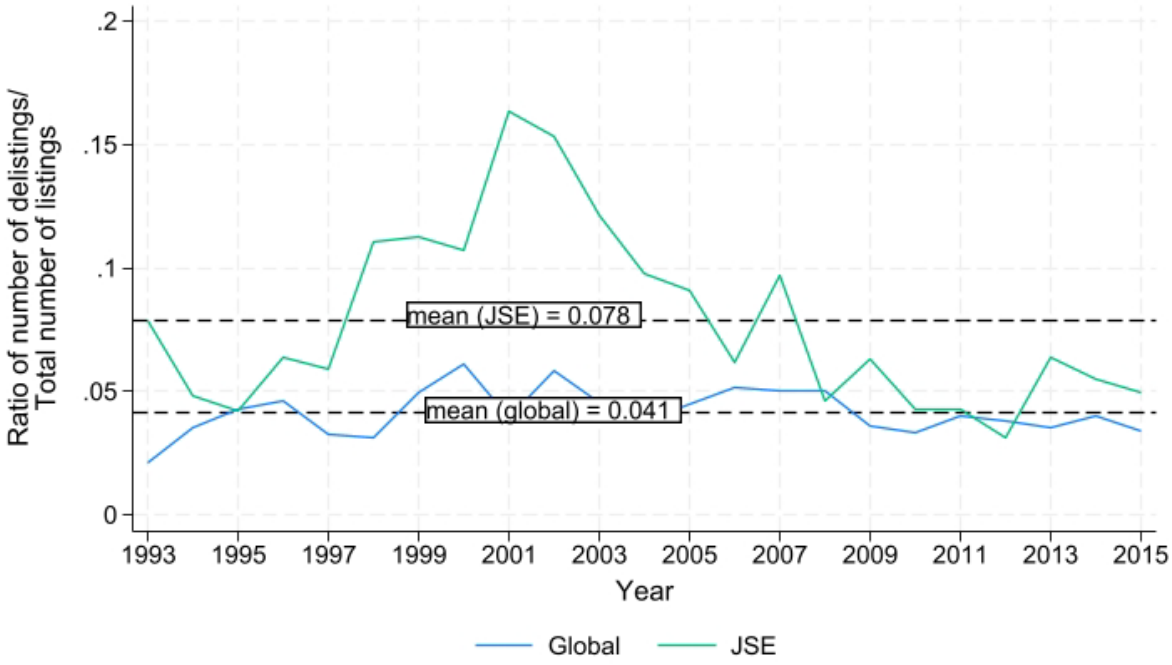
allowing for a nuanced analysis of how the JSE's delisting patterns reflect its market structure, regulatory environment and market liquidity.

A time series comparison of delisting rates between a specific exchange and global exchanges provides valuable insights into both market-specific dynamics and broader market trends. This section investigates the JSE relative to global exchanges to discern high-level differences between markets. Through comparing a single exchange's delisting rate to global averages, we can identify unique local factors affecting delistings, assess the market's relative performance, and understand how local and global economic events impact market composition differently.

The ratio of delistings to total listings serves as a key indicator of market health, structural changes (depth and breadth) and relative market stability. Figure 2 presents a comparison of delisting rates between the JSE and global exchanges from 1993 to 2015[3], with the two horizontal lines representing the mean delisting rate for the JSE and global exchanges. The data in this figure corresponds to equation *1a* above, namely $P_t = \frac{D_t}{L_t}$ and represents a count of the number of firm delistings to total firm listings, presented as a ratio. The mean delisting rate for the JSE (0.078) is significantly higher than global exchanges (0.041). This indicates that, on average, the JSE had a delisting rate of 7.8 percent, nearly double the global mean of 4.1 percent. The JSE exhibits greater volatility than the global exchanges, with distinct periods of heightened activity. For instance, delisting rates peak above 15 percent in 2001 before declining sharply and stabilising closer to global averages post-2008. In contrast, global delisting rates fluctuate steadily between 3 percent and 6 percent over the period. This stability suggests that global exchanges demonstrated greater resilience to global financial events compared to the JSE, which appears more sensitive to local economic conditions and market dynamics.

[3] Eleven countries are classified as high-income, and nine countries are middle-income.

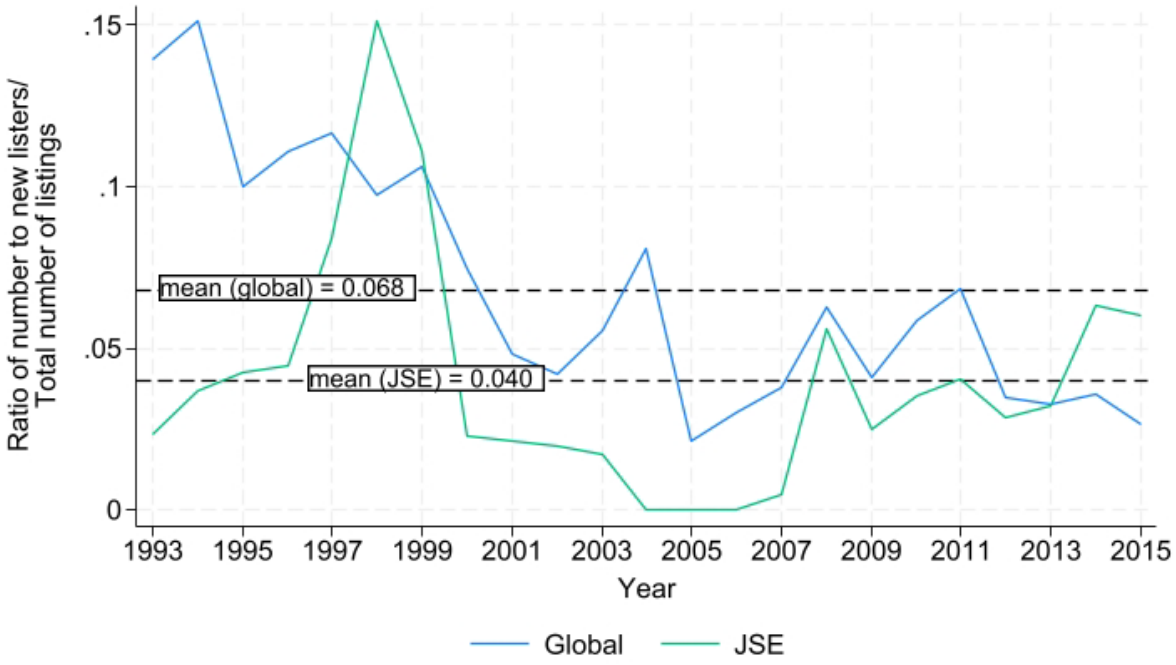
Figure 2: Ratio of number of delistings to total listings, JSE and global exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

Figure 3 complements Figure 2 by showcasing the ratio of new listings to total listings, providing insight into market inflows. The global mean for new listings is 0.07, compared to 0.04 for the JSE. This highlights a disparity as the JSE not only had a higher delisting count rate (7.8 percent) but also a lower new listing rate (4 percent) compared to global exchanges. Global markets show a better balance, with new listings (6.8 percent) exceeding delistings (4.1 percent), maintaining overall market growth.

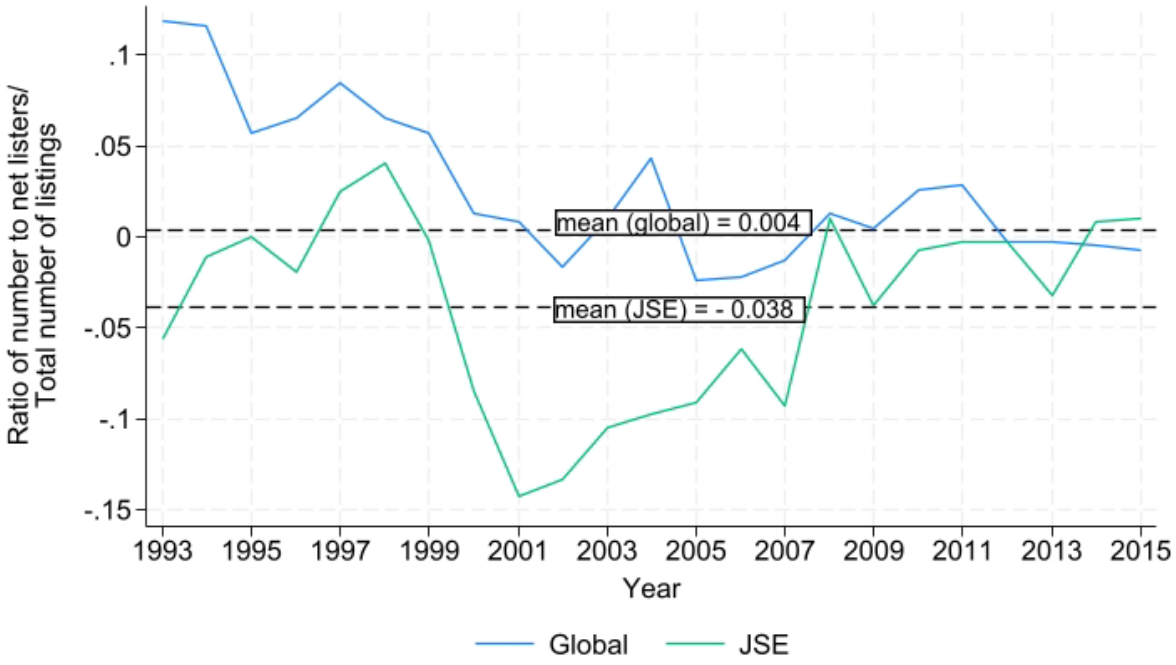
Figure 3: Ratio of number of new listings to total listings: JSE and global exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

The late 1990s show high listing activity for the JSE and global exchanges. On average, global exchanges demonstrate more churn in the simple count of new listings relative to the JSE post-2000, while also showing a consistent decline in the listing rate over the entire period. Figure 4 integrates these findings, presenting net listings (new listings minus delistings) as a ratio of total listings in count form. The JSE demonstrates pronounced volatility, with sharp declines in net listings between 1997 and 2001, reaching almost -15 percent. Although there is a gradual recovery post 2001, the JSE's net listing count rate remains negative and below global averages, indicative of market contraction. Similar to the previous figures, the JSE net listing rate stabilises from 2008 onward but remains below the global exchange average.

Figure 4: Ratio of number of net listings to total listings: JSE and global exchanges, 1993 – 2015



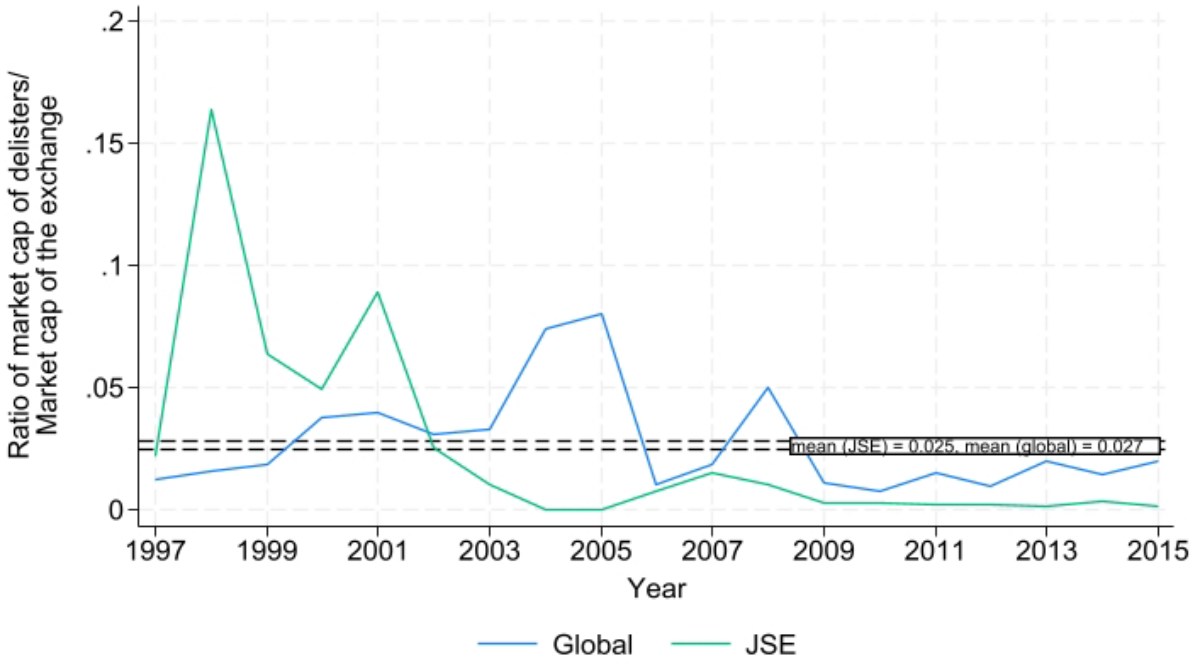
Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

The global exchanges displayed a net-positive net new listings count rate prior to 2000 and remained closer to zero in later years. The long-term positive global exchange average net listing rate of 0.4 percent suggests low and very slow growth in net new listings over the 22-year period. The negative JSE net listing rate of -4 percent is 10 times below that of the mean global rate and ultimately is indicative of market contraction as the count of delistings on average exceeding that of new listings over the period. Overall, Figure 4 is early and important comparative evidence of the challenges faced by the JSE in maintaining market size relative to global exchanges, and improved stability post global financial crisis[4] (GFC).

The previous section highlights important patterns and trends in the data and shows how the JSE differs from global exchanges along the three delisting measures. While count measures provide valuable context, they do not account for firm size, potentially overstating the impact of smaller firms. Figure 5 addresses this by comparing the market capitalisation of delisting firms to total market capitalisation.

[4] "Post-global financial crisis" and "post-2008" are used interchangeably.

Figure 5: Ratio of market capitalisation of delistings to total market capitalisation: JSE and global exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

Figure 5 shows the ratio of the market capitalisation of delisting firms to total listings for the JSE and global exchanges. Relative to Figure 2, this figure shows much more extreme spikes, particularly for global exchanges around 2000 and 2001.[5] The unadjusted delisting rate showed more moderate fluctuations for the JSE with a peak of approximately 15 percent. The 2001 peak in Figure 2 is not observable in Figure 4, with different years showing spikes in the data.

Figure 5 highlights the importance of scale when controlling for market capitalisation: notably, the JSE's mean delisting rate by market capitalisation (0.025) is slightly lower than the global rate (0.027). This suggests that while the JSE experiences more delistings in count terms, the economic impact is less severe due to the relatively smaller size of delisting firms.

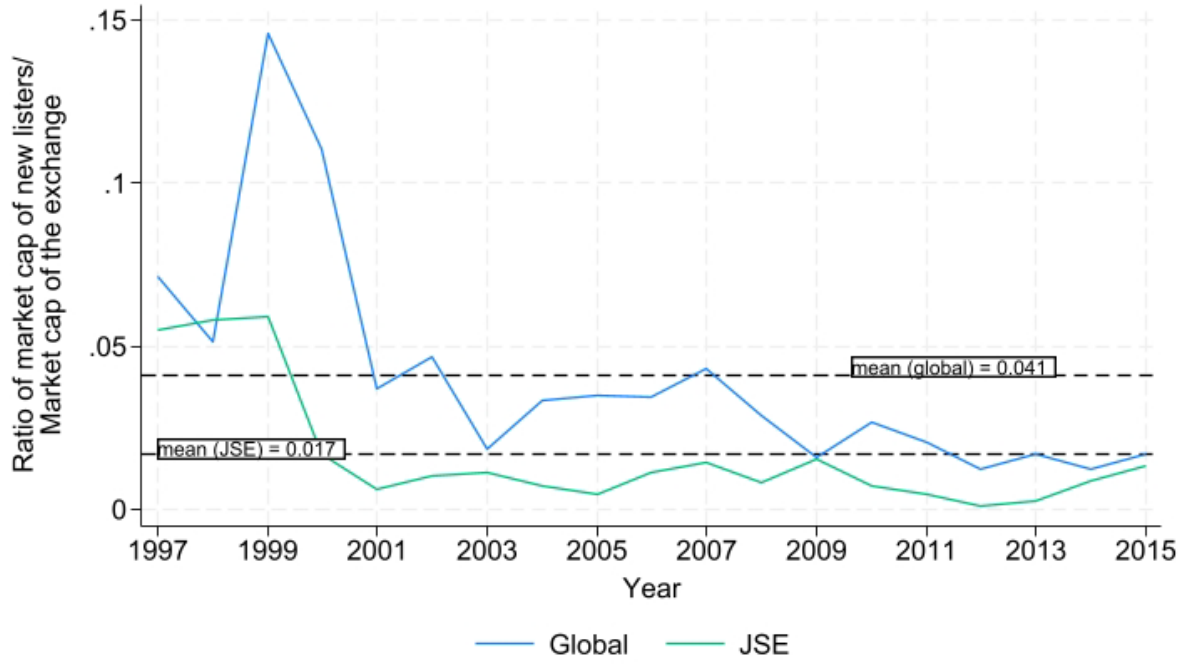
The adjusted measure highlights important trends: the JSE's early (pre-2000) delistings had a higher economic impact, whereas post-2008 delistings had a diminished market capitalisation effect, reflecting a shift in market structure and firm composition.

[5] This is likely associated with the dotcom bubble.

The higher, more volatile delisting rate for the JSE may reflect economic instability, including challenges such as slower GDP growth, and political uncertainty. It could also indicate that regulatory and compliance costs on the JSE are higher or more burdensome, particularly for smaller firms, prompting them to delist.

This analysis is extended to new listings in Figure 6 below, which shows the ratio of the market capitalisation of new listings to total market capitalisation. The core result shown is that the average new listing value for the global sample (0.041) is at least 1.7 times greater than the JSE mean new listing level (0.071). New listings are also thus higher when using the market cap measure as opposed to a simple count measure. Interestingly, the ratio of difference between the JSE and global exchanges in new listings when using the count or market cap measures is very similar. Hence the JSE underperforms in attracting new listings across the board, suggesting structural market or economic conditions rather than firm size distribution. This may emphasise the need for policies to improve the attractiveness of the JSE for new firms, potentially by addressing regulatory, economic, or liquidity constraints.

Figure 6: Ratio of market capitalisation of new listings to total market capitalisation: JSE and global exchanges, 1993 – 2015

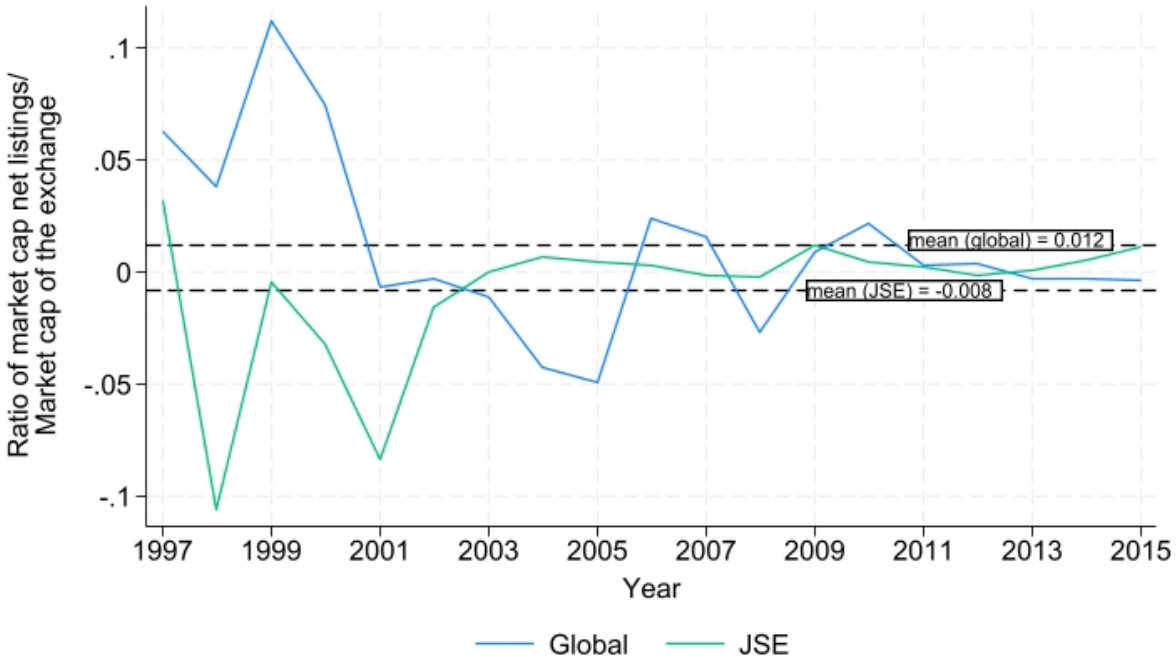


Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

The global exchange spike in 2000 suggests that large value firms were listing at that time but flattening out for the rest of the period. In contrast, the data suggests that at the same time smaller, less valuable firms were listing on the JSE, with the market cap-adjusted new listings rate in general below that of the global sample over the period. Figure 6 sheds light on two important ideas. First, global markets appear to be more successful in attracting large new listings, even at a market cap level than the JSE, which is consistent with the simple count measure as well. Second, the JSE's new listings interestingly tend to be relatively smaller at a market cap level compared to the global norm, suggesting more listing opportunities for relatively smaller companies on the JSE. This average difference, however, has narrowed in the most recent years across the sample period.

The final index measure combines the market capitalisation of delisting firms and new listings to create the market capitalisation of net new listings to total market capitalisation, shown in Figure 7. Perhaps representing our core initial result here, our data suggests that the average net new listings by market capitalisation were 0.012 for the global sample but, crucially, -0.008 for the JSE. Put differently, for the JSE on a market cap measure of net new listings, there was a net outflow of capital over the period. In contrast there was a new inflow across all global exchanges.

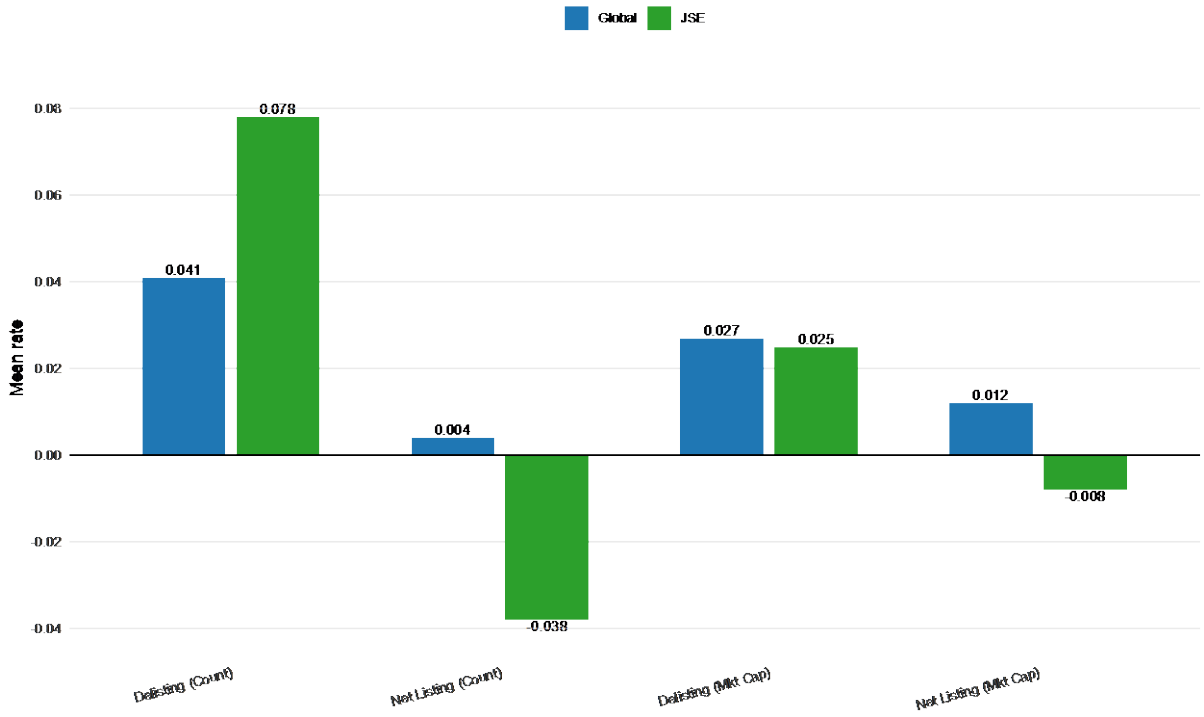
Figure 7: Ratio of market capitalisation of net listings to total market capitalisation: JSE and global exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

In addition, the global exchanges and the JSE both exhibited more extreme swings in the pre-2001 period, with milder but negative changes post-2001. The adjusted market capitalisation measure for the JSE importantly displays less volatility than the count-based measure displayed in Figure 4. This would suggest that for a comprehensive assessment of delistings, it is essential to consider both the simple ratio of delistings and the market capitalisation-weighted measure. Finally, the data does suggest that in the post-2007 period, there has been some convergence between the JSE and the global exchanges, with the possibility that the JSE trends are now more consistent with global patterns. More recent updated data would confirm this stronger correlation.

Figure 8: Count and market capitalisation average delisting rates: The JSE and global exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

The comparative summarised evidence in Figure 8 yields three core results. First, across all measures – whether delisting rates (count) or net listing rates (count or market capitalisation) – the JSE underperforms relative to the global sample. Second, the magnitude of underperformance is less severe when expressed in market capitalisation, with the JSE's mean delisting market cap actually lower than the global sample (0.025 vs 0.027). This indicates that while delistings occur more frequency on the JSE, the firms exiting tend to be smaller on average, meaning the aggregate market value lost through delistings is not disproportionately higher than the global benchmark. Third, there is pronounced time variation around these means, with the bulk of the volatility concentrated in the pre-2005 period. Thereafter, listing dynamics for both the JSE and the global benchmark plateau, with fewer extreme swings in either direction.

To delve deeper into the data, we break out the global exchanges into two groups, high-income and non-high-income exchanges. This is to identify any potential differences between these country groupings that may be overlooked when all countries are grouped together under global exchanges. This disaggregation is novel in the South African context. To the best

of our knowledge, prior studies benchmarked the JSE only against a global average. By distinguishing high-income and non-high-income peers, we provide a more nuanced comparative baseline that reveals whether the JSE's trajectory aligns more closely with mature or emerging-market exchanges.

Delisting Measures: The JSE and High-Income Exchanges Compared

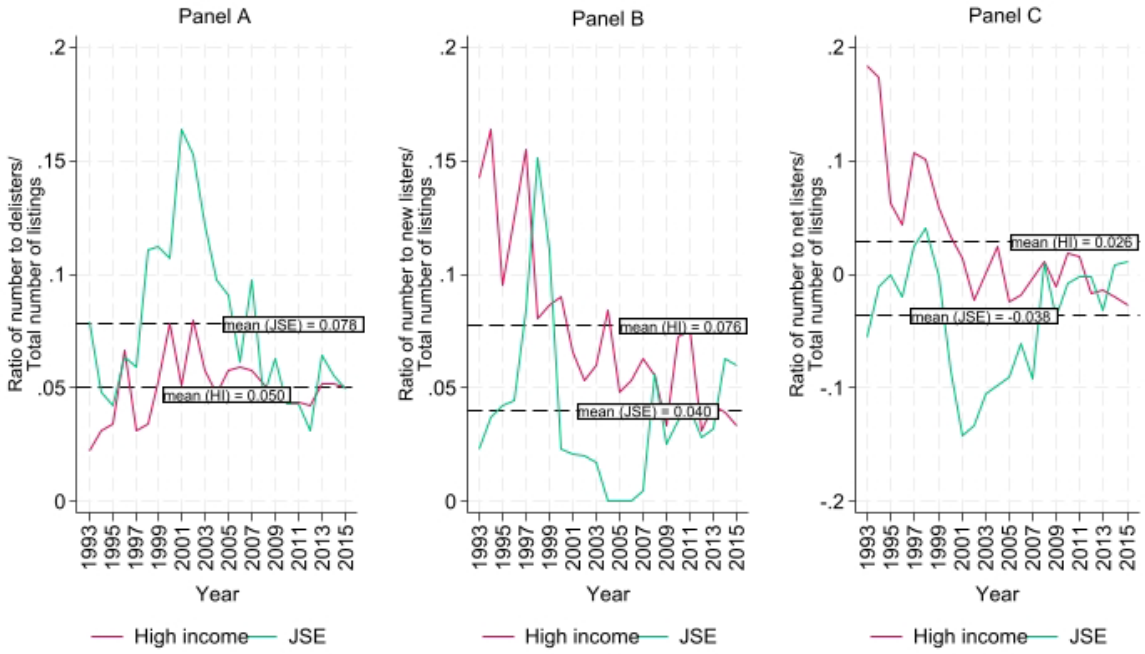
There are 11 exchanges included in the high-income (HI) country grouping. The US dominates as two of the US exchanges[6] account for approximately half of the world market capitalisation.

Figure 8 (Panels A-C) shows the ratio of delisting, net listing and net new listings patterns for the JSE and HI exchanges. Across all three categories, the JSE performs worse than the HI exchanges. The JSE mean delisting rate at 7.8 percent is 1.5 times higher than HI exchanges delisting rate of 5 percent. On average, the JSE delisting trend is more volatile than the high-income country average, with significant deviation pre-2008. However, the high-income country means delisting rate over time is higher than the global average, which is indicative that high-income countries account for a larger share of the global delisting trend and that the JSE shares some similarities with high-income markets. Market maturity plays an important role (Demirgüç-Kunt & Levine, 1996). In this instance, high-income countries do appear to have higher delisting rates, driven possibly by the push to deliver short-term results to shareholders (Doidge, Karolyi & Stulz, 2004) and the presence of mature industries offering fewer and slower growth opportunities due to firms' life cycles (Gao, Ritter & Zhu, 2013).

New listing rates for high-income countries differ from the global exchange and JSE means. Panel (B) in Figure 9 shows the ratio of the number of new listings to total listings for the JSE and HI countries. On average, HI exchanges have a new listing rate 1.9 times higher than the JSE but with higher volatility in new listing rates. While the figure suggests materially higher volatility in JSE listing dynamics, we are constrained to presenting descriptive trends as the WFE dataset provides annual aggregates that limit precise volatility estimates.

[6] NASDAQ and S&P500.

Figure 9: Ratio of number of delistings, new listings and net new listings to total listings: JSE and high-income country exchanges, 1993 – 2015

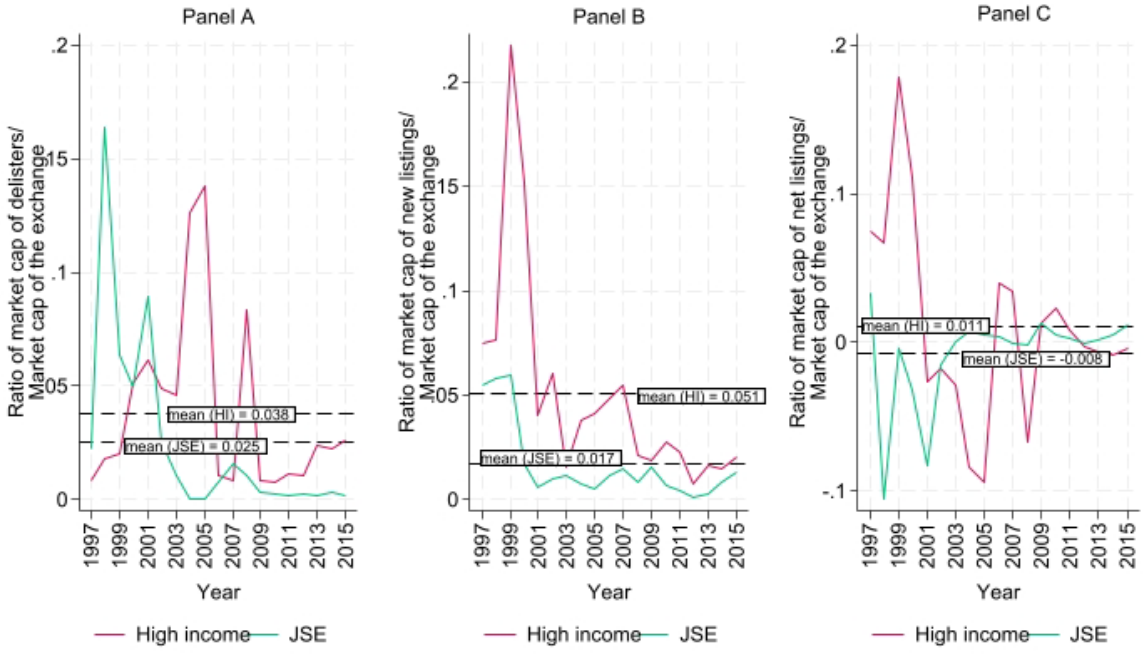


Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: 11 countries are classified as high-income.

A natural extension of this work would be to compile firm-level panel data to compute formal measures of dispersion across exchanges. Both the JSE and HI exchanges show more intense listing patterns between 1993 and 2000 but still significant divergence in listing patterns. Overall, HI exchanges consistently attract more new listings, with market maturity supporting higher levels of new listing activity. However, this graph highlights that the JSE displays characteristics of an emerging market with more extreme cycles. The regulatory and economic environment matters for listing activity with economic conditions impacting differently across market types.

Panel (C) in Figure 9 shows net new listing rates for high-income exchanges, providing a more detailed understanding of net new listing dynamics. At the aggregate level, HI exchanges maintain a mean net new listing rate over the period of 2.6 percent, relative to the global exchange mean compared to the JSE mean net new listing rate of negative 3.8 percent. The JSE is tracking 68 percent behind HI exchanges where net new listings are concerned.

Figure 10: Ratio of market capitalisation of delistings, new listings and net new listings to total listings: JSE and high-income country exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: 11 countries are classified as high-income.

Figure 10 shows the ratio of market capitalisation of delistings, new listings and net new listings to total listings for the JSE and HI exchanges. There is one stand out in Figure 10: The mean market capitalisation of JSE delisting firms is lower relative to HI exchanges, showing that firms' delistings from the JSE are small in size relative to the overall market. While these firms may be large in number, their overall proportion of total market capitalisation is smaller compared to HI exchanges. An additional point to note in Figure 10, Panel (A) is the significantly higher HI exchange-adjusted delisting rate relative to the JSE. On a market capitalisation adjusted weighting, HI exchanges experienced very high volatility since 2000 while the JSE trend was much more stable.

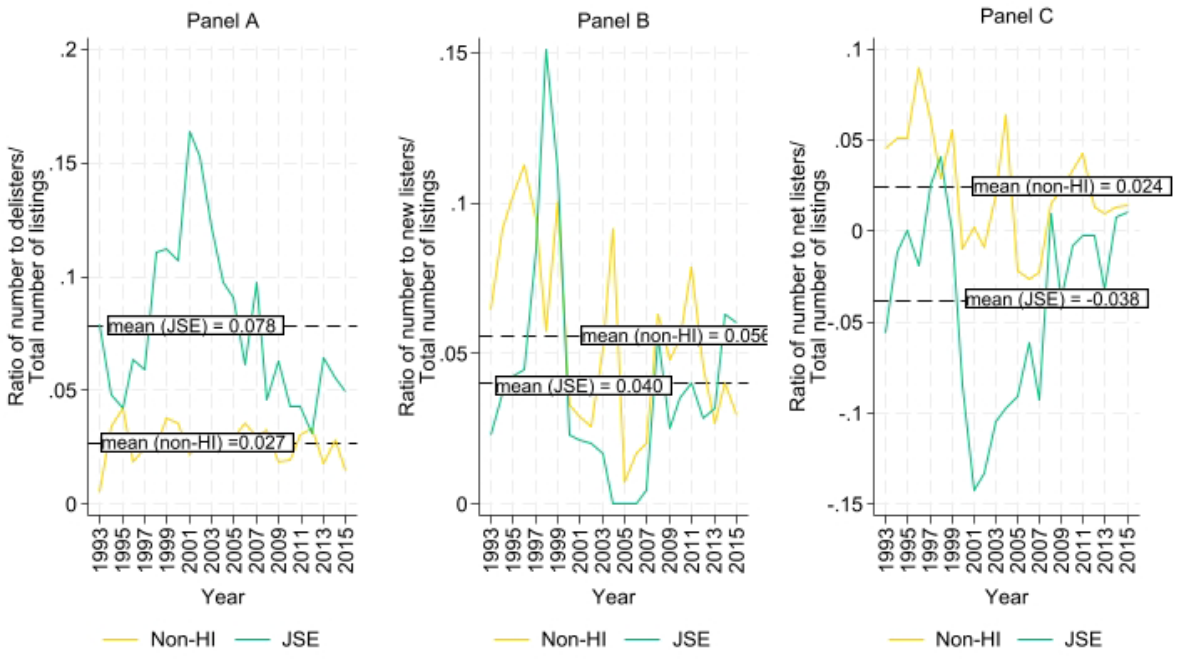
Three results stand out. First, on count measures the JSE performs consistently worse than high-income peers on both delistings and net listings, although the gap narrows in the post-2005 period. Second, when expressed in market capitalisation terms, the JSE performs somewhat better, as its delisting firms tend to be smaller relative to total market value. Third, on net listings, high-income exchanges outperform across both count and market cap measures, highlighting their continued ability to attract new firms and retain market dynamism, an attribute less evident on the JSE.

Delisting Measures: The JSE and Non-High-Income Exchanges Compared

The JSE performs worse than the non-high-income (NHI) exchanges across delisting, new listing, and net listing rates. On average, the JSE's delisting rate is higher and more volatile, particularly in the pre-2005 period. NHI exchanges sustain higher new listing rates and, consequently, record less negative net listing rates over the sample period. The JSE's relative underperformance is therefore evident even against peers at a similar stage of market development.

Figure 11 shows the ratio of the number of delistings, new listings, and net new listings to the total listings for the JSE and NHI exchanges.

Figure 11: Ratio of number of delistings, new listings and net new listings to total listings: JSE and non-high-income country exchanges, 1993 – 2015

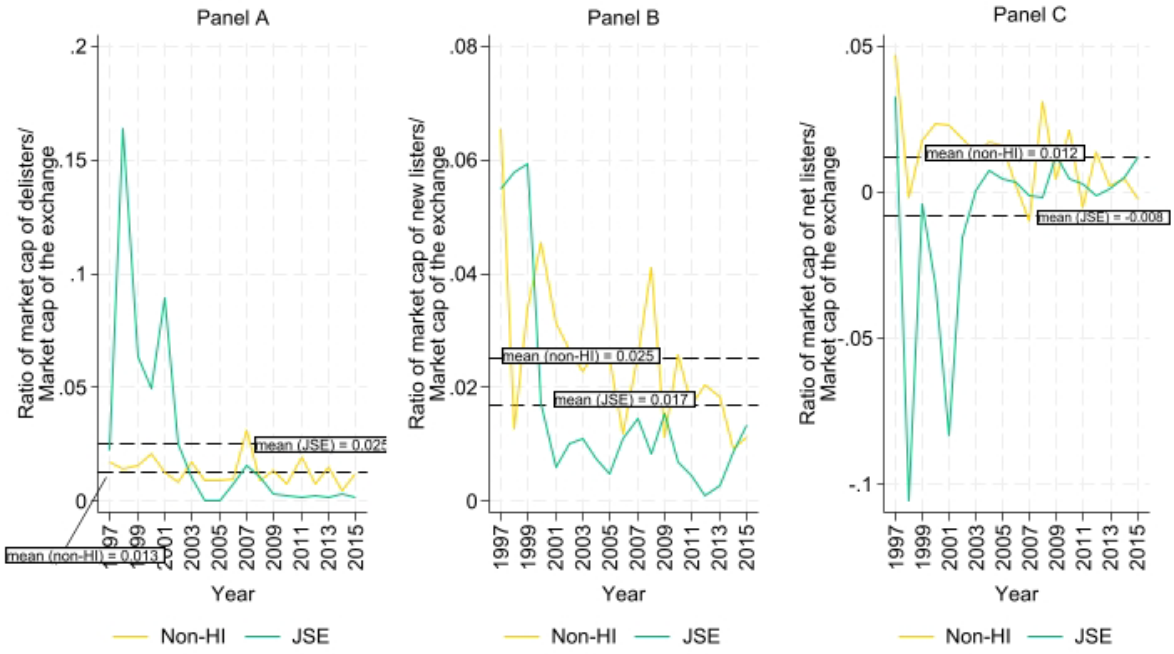


Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: Nine countries are classified as non-high income.

The mean delisting rate for the JSE is about three times higher than non-HI exchanges, indicating that a higher proportion of firms are delisting per year. The mean delisting rate for non-HI exchanges is 2.7 percent relative to the JSE of 0.078. The low but stable rate indicates that other non-HI exchanges are more successful at maintaining listings, even when controlling for level of economic development.

Relative to the JSE, non-HI exchanges maintain a new listing rate 1.4 times that of the JSE, resulting in a higher net new listing rate for NHI exchanges. Between 2000 and 2008, the JSE maintained a decidedly low new listing rate that displays less volatility than NHI exchanges. The net new listings rate for the JSE is strictly lower than non-HI exchanges for the entire study period, dropping below 5 percent per year between 1999 and 2008. The effects of this negative net new listing rate are still observed today.

Figure 12: Ratio of market capitalisation of delistings, new listings and net new listings to total market capitalisation: JSE and non-high-income country exchanges, 1993 – 2015



Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: Nine countries are classified as high income.

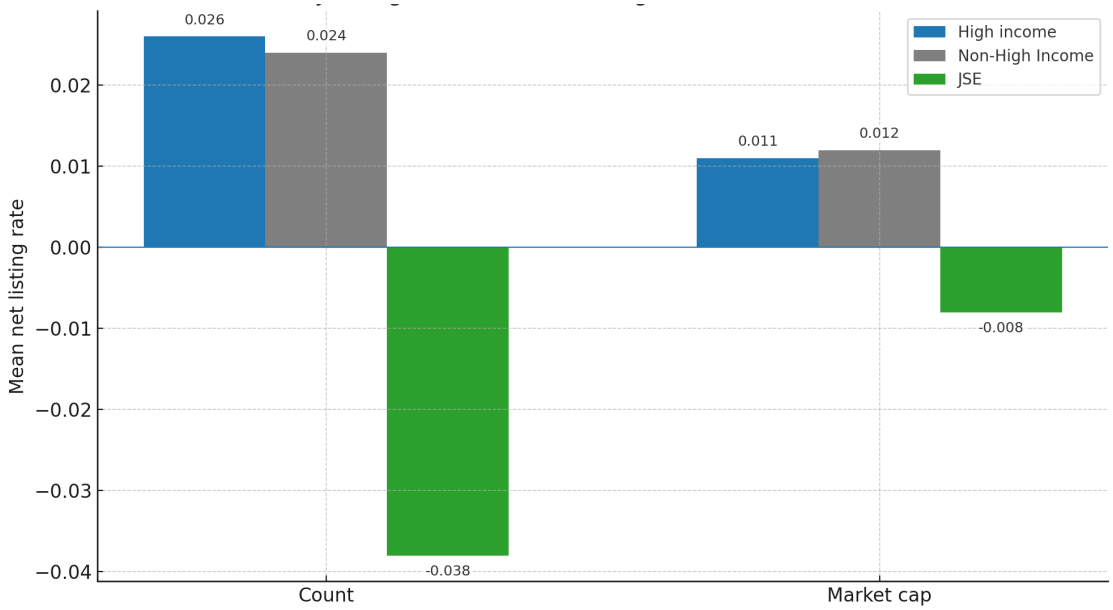
Figure 12 shows the market capitalisation of delistings, new listings and net new listings for the JSE and non-HI exchanges. Controlling for market capitalisation shows the importance of accounting for firm size. The mean JSE-adjusted delisting rate is almost double that of non-HI exchanges. The adjusted non-HI delisting pattern is relatively stable, while the JSE shows extreme volatility pre-2000. The JSE new listing rate is only 68 percent of that of non-HI exchanges and does not exceed two percent from 2000. The market capitalisation adjusted net new listings rate for the non-HI exchanges is marginally positive and relatively stable over the period compared to the negative measure for the JSE – with the non-HI sample revealing a highly volatile but on average positive net new listing rate over the period.

Across all measures – delisting rates, net listing rates, and both count- and market capitalisation-weighted ratios – the JSE underperforms relative to non-high-income peers. The performance gap is especially marked on count-based measures, where the JSE consistently records higher delisting intensity and more negative net listing outcomes.

On market capitalisation measures, the differences are narrower, reflecting the relatively smaller size of firms delisting from the JSE. This implies that while the exchange loses a higher number of firms, their aggregate weight in market value is less significant compared with non-HI peers. Nonetheless, even after this adjustment, the JSE's net listing rate remains negative, underscoring the persistent erosion of domestic listed equity.

Since 2005, both the JSE and the non-HI sample appear more stable, but the JSE's trend remains persistently below zero. Taken together, the evidence suggests that the JSE's structural weakness lies not only in elevated delisting intensity but also in its limited ability to attract new listings of sufficient scale to offset exits, setting it apart even from peers at a similar stage of market development.

Figure 13: Count and market capitalisation mean net listing rate for the JSE, high-income and non-high-income exchanges, 1993 – 2024



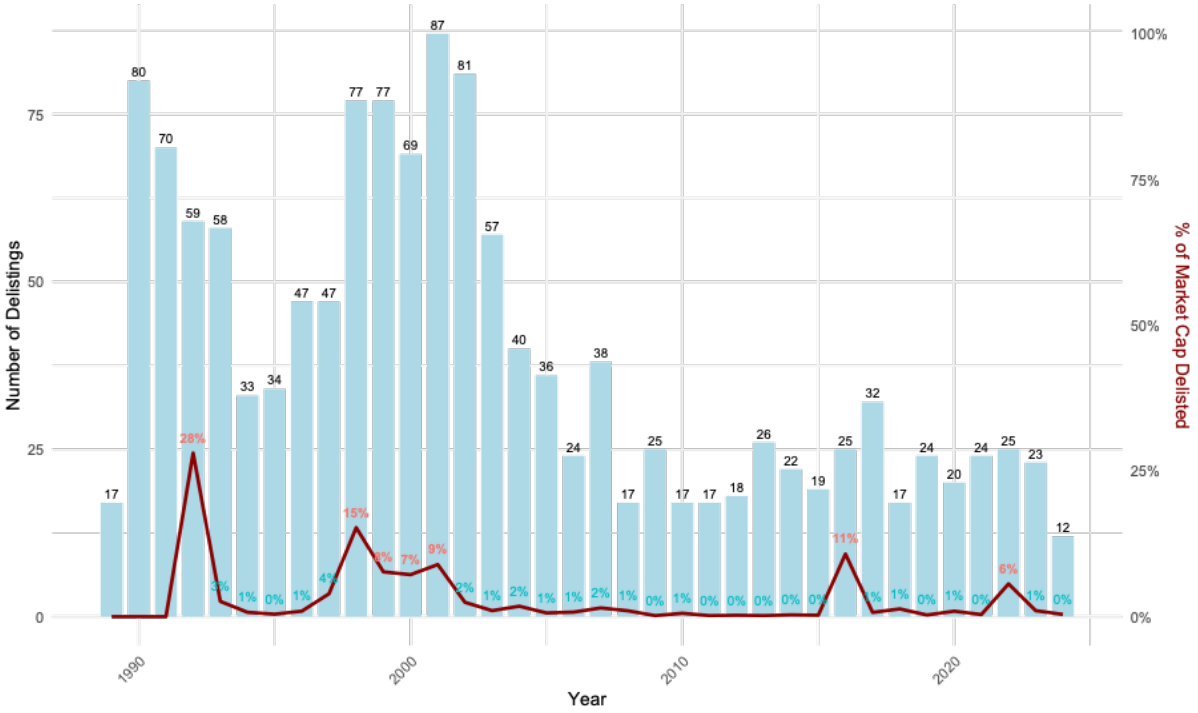
Source: World Federation of Exchanges (2024). Authors' own calculations.
Note: For market data, the number of exchanges is 20 in total, where 11 are classified as high-income countries and nine are middle-income countries.

To conclude, Figure 13 presents the average net listing rate by count and market cap across the JSE, HI and non-HI exchanges over the sample period 1993 to 2024. The results point to a consistent pattern of underperformance by the JSE. By count, the JSE records a negative mean net listing rate of -3.8 percent in sharp contrast to the positive rates of 2.6 percent and 2.4 percent observed for HI and non-HI exchanges, respectively. This indicates that on average, more firms have exited the JSE than entered over the last three decades. When scaled by market capitalisation, however, the JSE's net listing rate (-0.8 percent) is more closely aligned with the other exchanges, reflecting that firms leaving the exchange are typically smaller in size. Collectively, these findings underscore the structural challenge facing the JSE in sustaining a robust pipeline of listings, while also suggesting that aggregate market impact of delistings is less pronounced once firm size is taken into account.

6 DELISTINGS AND NET LISTINGS ON THE JSE: A DESCRIPTIVE OVERVIEW

Having examined international benchmarks, we now turn to a descriptive analysis of delisting and listing dynamics specific to the JSE. This section draws on comprehensive JSE firm-level data, obtained directly from the JSE, and spanning 1989 – 2024, enabling a more granular view of the frequency, scale, reasons, and sectoral distribution of exits. The objective is to complement the global comparisons by situating the JSE within its own historical trajectory.

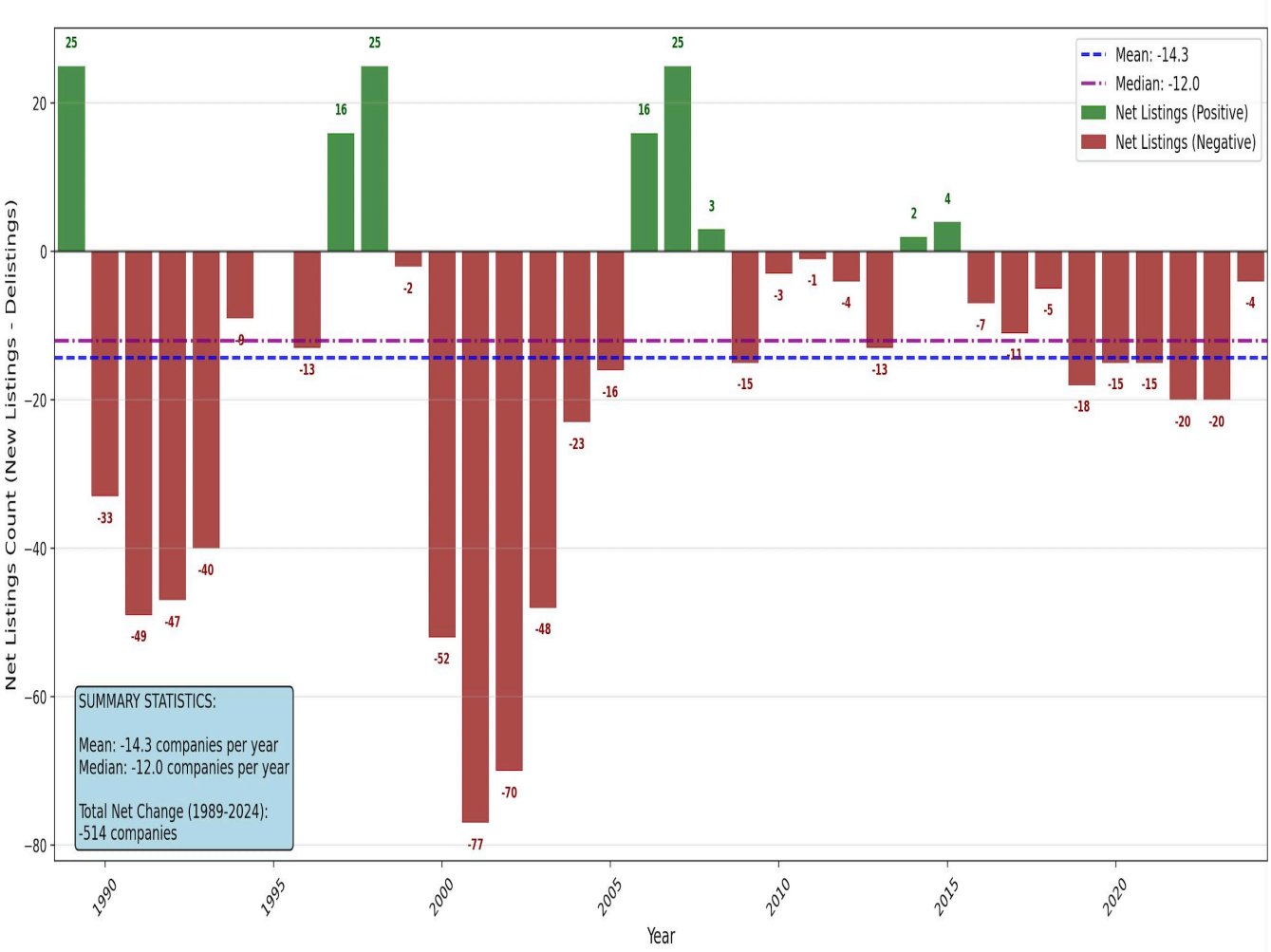
Figure 14: JSE delistings: Number of firms and market capitalisation impact, 1989 – 2024



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Note: The figure reports the annual number of firm delistings from the JSE (left axis, blue bars) and the proportion of market capitalisation affected (right axis, red line).

From Figure 14 we see that delisting counts peaked in the late 1990s with over 80 exits, but the proportion of market capitalisation affected remained modest, generally below 15 percent except for sharp spikes in 1990 (28 percent) and 2008 (11 percent). Between 1989 and 2003 the JSE recorded an average of 61 delistings per year, compared with just 23 annually after 2004, implying that post-2004 delisting intensity fell to roughly a third of its earlier level. Over the full period, the mean delisting count was 37 firms per year. On a market capitalisation basis, the average share of value lost to delistings was 4.7 percent in 1989 – 2003, declining to 1.5 percent after 2004, with a long-run average of 3.1 percent. Delisting activity was particularly concentrated in 2000, when 87 firms exited, while the largest value effect was in 1991, when delistings removed 28 percent of market capitalisation.

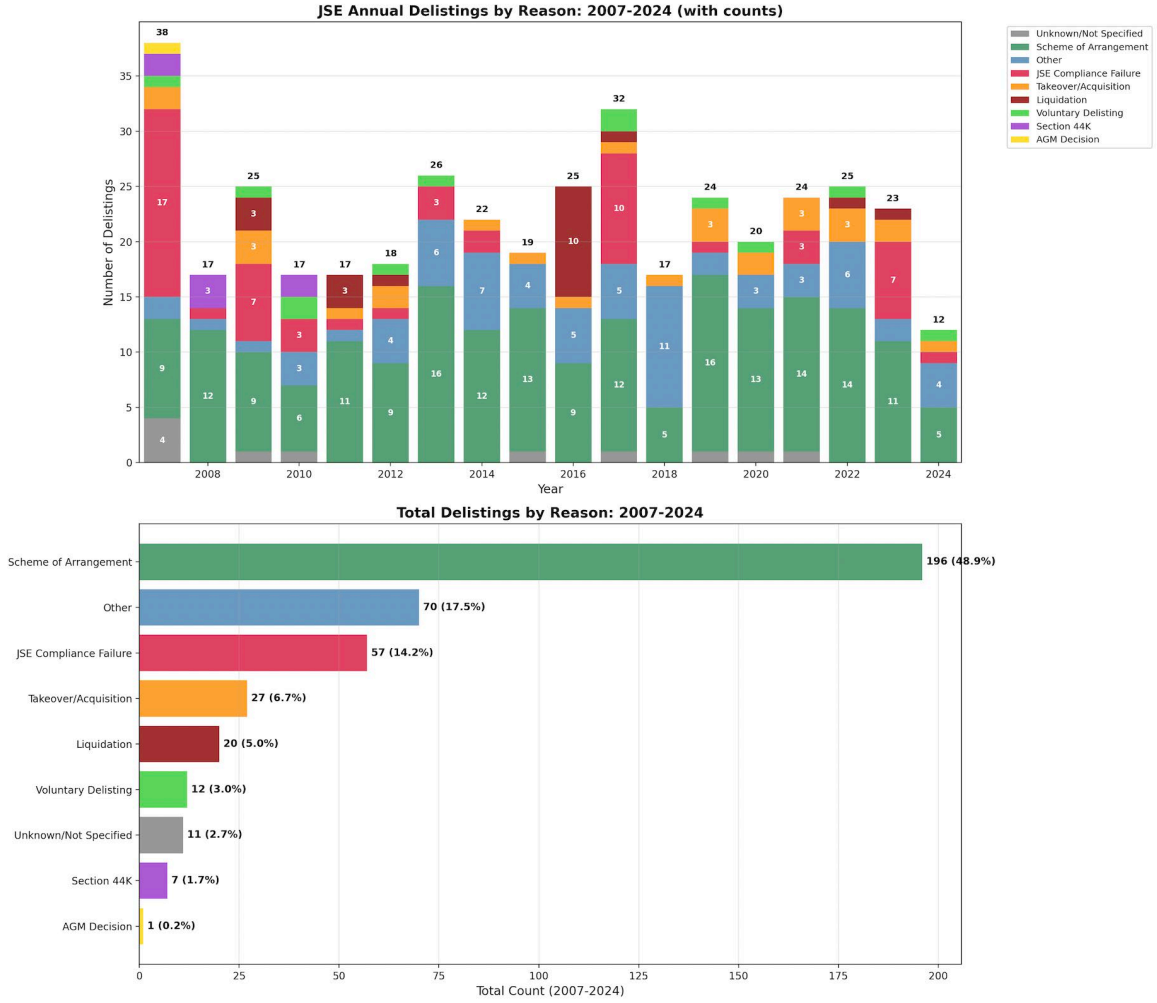
Figure 15: JSE net listings by count, 1989 – 2024



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Notes: The figure shows the annual net number of new listings on the JSE (green = positive, red = negative). The dashed line indicates the mean net change over the full period.

As seen with the global comparisons, the early 2000s marked an inflection point in listing dynamics. This is reinforced by the JSE's net listing trajectory in Figure 15. Over the full period, the JSE recorded a cumulative net decline of 514 companies, averaging -14.3 firms per year (median -12). The contraction was concentrated in the pre-2005 period, when net listings fell by 413 firms at an average rate of -24 per year. Post-2005, the pace of attrition slowed to an average of -5 firms per year, with 101 firms lost in total. In aggregate, 80 percent of all net exits occurred before 2005. This mirrors the global evidence, where both delisting and net listing activity stabilised after the early 2000s, marking a structural shift in listing dynamics across markets.

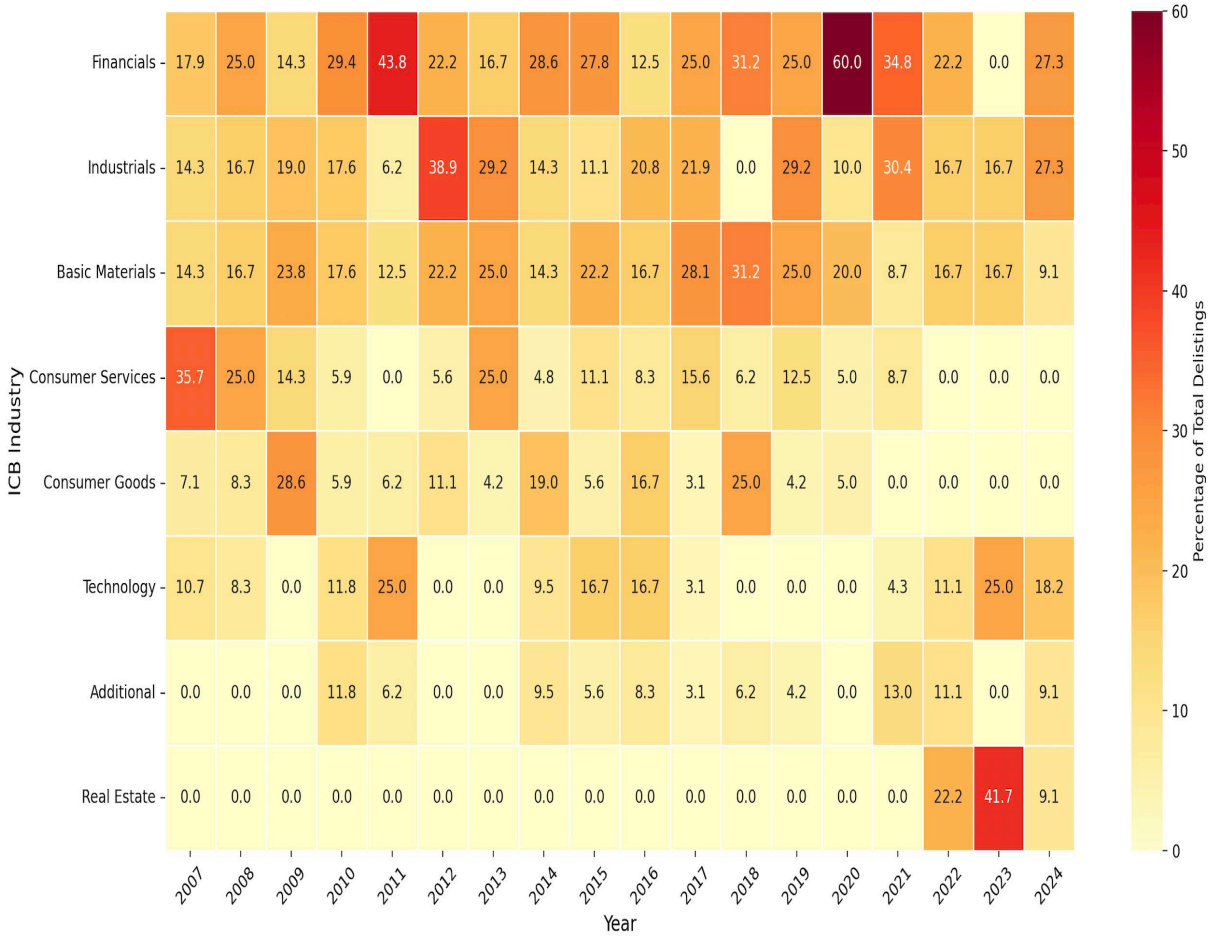
Figure 16: JSE delistings by reason, 2007 – 2024



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Notes: The figure disaggregates JSE delistings by reason, including Schemes of Arrangement, compliance failures, takeovers, liquidations, voluntary exits, and other categories.

Delisting reasons are available only from 2007 onwards and are not included in the econometric analysis. Figure 16 shows that Schemes of Arrangement dominate, accounting for 196 cases (48.9 percent) over the period, with peak years in 2013 and 2019 (16 each) and again in 2021 – 2022 (14 each). 'Other' exits, including suspensions and administrative removals, comprise the second-largest category at 17.5 percent (70 cases), peaking in 2018. JSE compliance failures account for 57 exits (14.2 percent), with spikes in 2007, 2017, and 2023. Distress-related exits are less prominent: liquidations represent 5 percent of cases and voluntary exits 3 percent. The distribution highlights that the majority of JSE delistings are linked to restructuring and corporate actions, with compliance failures and distress playing a more limited role.

Figure 17: JSE delistings by sector, 2007 – 2024 (percentage distribution)

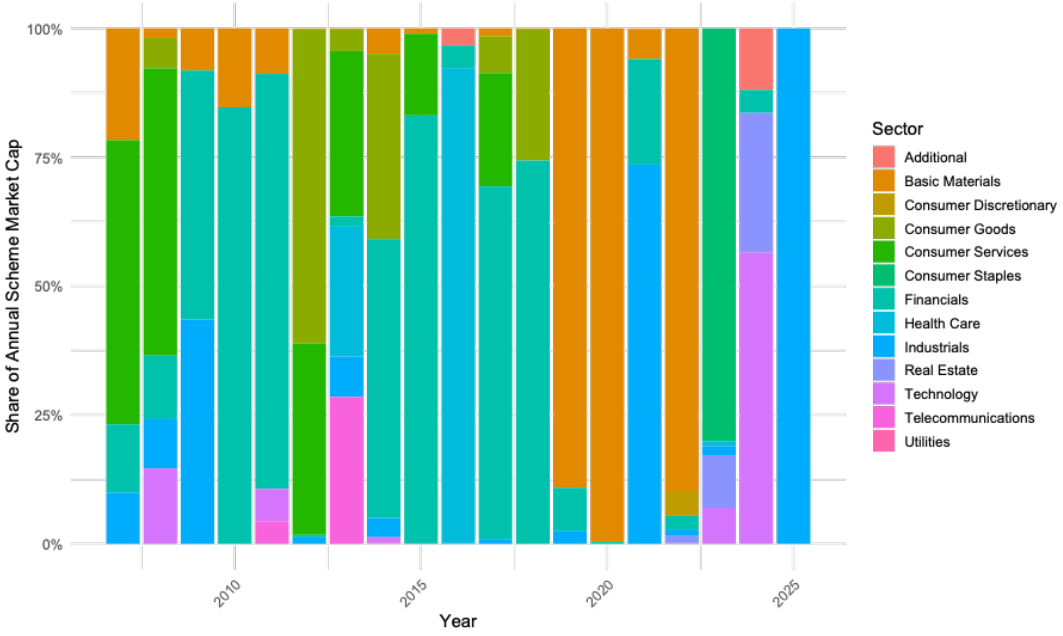


Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Notes: The figure reports the share of JSE delistings by ICB industry classification, expressed as a percentage of total annual exits.

As highlighted in Figure 17, across 2007 – 2024, Financials, Industrials, and Basic Materials account for close to 60 percent of all exits (231 out of 401 firms). Financials dominate overall, peaking at 60 percent in 2020. Basic Materials rise after 2015, reaching a peak in 2018. Industrials show a sharp concentration in 2012 at 39 percent. Consumer Services, which represented 36 percent of delistings in 2007, decline steadily and disappear entirely in the last three years. Real Estate emerges more recently, reaching 42 percent of delistings in 2023. These patterns show a clear post-2015 shift, with exits clustering in Financials, Basic Materials, and Real Estate.

Mining Exits Amidst Policy Pressure

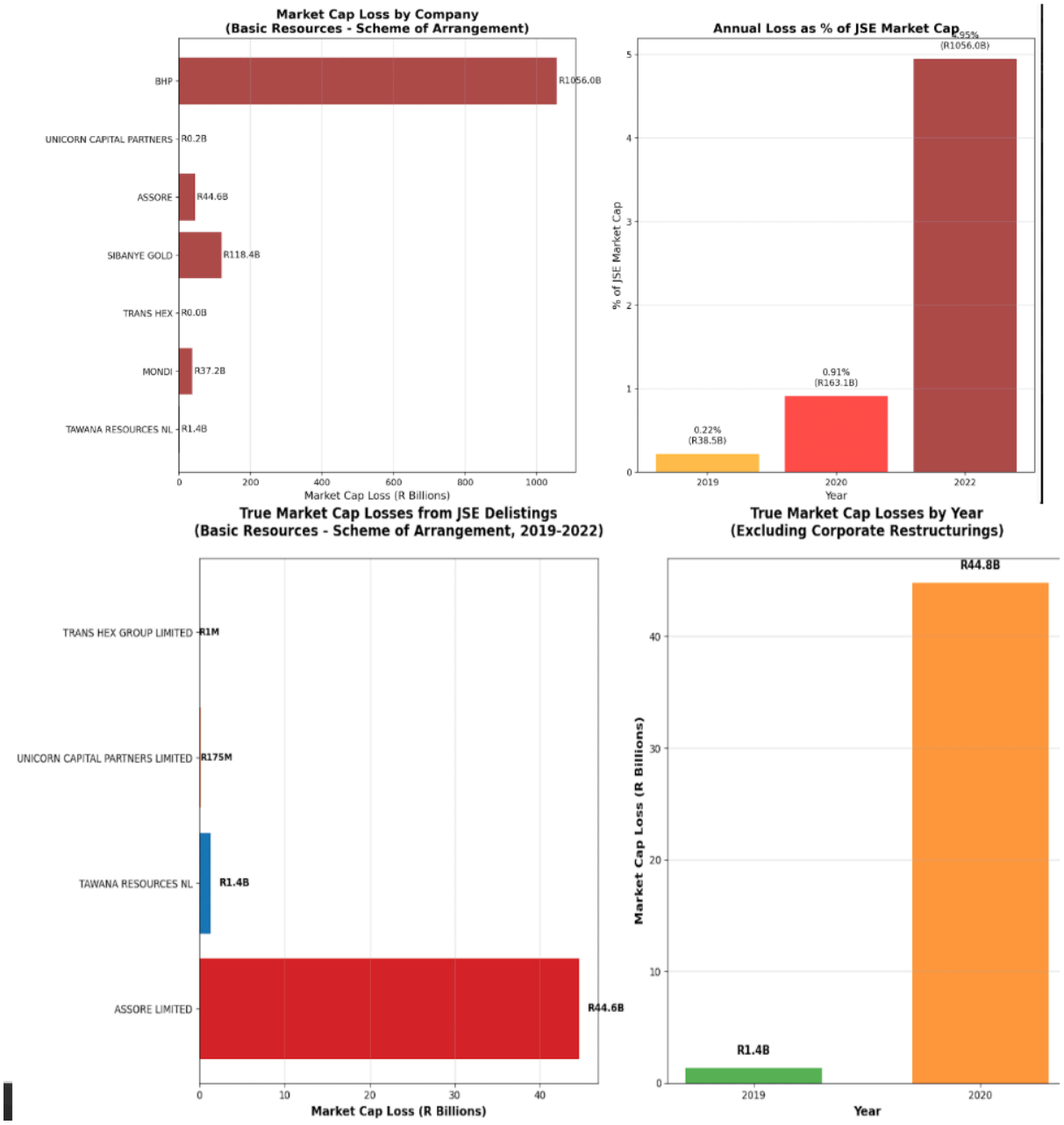
Figure 18: Sector share of market capitalisation in Scheme of Arrangement delistings, 2007 – 2024



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Note: The figure shows the share of annual market capitalisation accounted for by Schemes of Arrangement delistings by sector.

As shown in Figure 18, the market capitalisation associated with Scheme of Arrangement delistings is unevenly distributed across sectors, with Basic Materials dominating value-weighted exits, marking a structural shift in the composition of JSE delistings. Schemes of Arrangement have been the preferred route for large mining and resource companies, accounting for the bulk of sector-driven exits. This concentration coincides temporally with the implementation of Mining Charter III in 2018, which introduced stricter transformation targets and increased compliance requirements. Consistent with this timing, an acceleration in large capitalisation, dual-listed mining exits is observed after 2018.

Figure 19: Market capitalisation losses from Basic Materials delistings, 2019 – 2022



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.
Note: The figure reports value-weighted losses from Schemes of Arrangement delistings in Basic Materials firms.

However, as shown in Figure 19, the initial estimate of R1.26 trillion in market capitalisation losses (6.5 percent of JSE market cap) is overstated, as it includes restructurings by dual-listed firms such as BHP and Mondi, as well as reclassification cases such as Sibanye. Excluding these adjustments, the true loss from actual mining exits in 2019 – 2022 is R46.1 billion, equal to 0.24 percent of JSE market capitalisation. Losses are concentrated in a handful of firms, with Assore accounting for R44.6 billion, alongside a few smaller junior miners.

Market Concentration on JSE

The Herfindahl-Hirschman Index (HHI) is a widely used measure of market concentration. The HHI estimates the sum of the squares of market shares for all firms in a given market and is formally measured as:

$$\mathrm{HHI}_t = \sum_{i=1}^{N} \left(\frac{\mathrm{MarketCap}_{i,t}}{\sum_{j=1}^{N} \mathrm{MarketCap}_{j,t}} \times 100 \right)^2 \quad (1)$$

where each firm's market share is expressed as a percentage, then squared. The squared shares are then summed across all firms to get the HHI for a given year. The HHI is a widely used measure of market concentration and is calculated here using market capitalisation rather than sales, an approach that, to the best of our knowledge, has been employed in only one other published study to date.[7]

In the context of this study, the HHI offers an effective tool for assessing how delisting trends may be in part influenced by or indeed result in rising levels of market concentration. As the JSE experiences a higher concentration of market capitalisation in select sectors, smaller firms often face heightened challenges in maintaining listing status. This is partly due to the decreasing availability of capital and the regulatory mandates directing institutional investors toward larger-cap stocks, further entrenching the dominance of large players. Thus, as market concentration increases, delistings may be reinforced by a "crowding out" effect, where firms with smaller market caps struggle to attract investment. In turn, an outcome of rising delistings – or declining new listings – could indeed be an increase in HHI levels. Given these dynamics, we advocate for using market capitalisation rather than sales as the key metric for examining sector-level concentration.[8]

A methodological clarification is necessary: the HHI can be expressed either on a 0 – 1 000 or 0 – 10 000 scale depending on how market shares are expressed. Figures 20 and 21 adopt

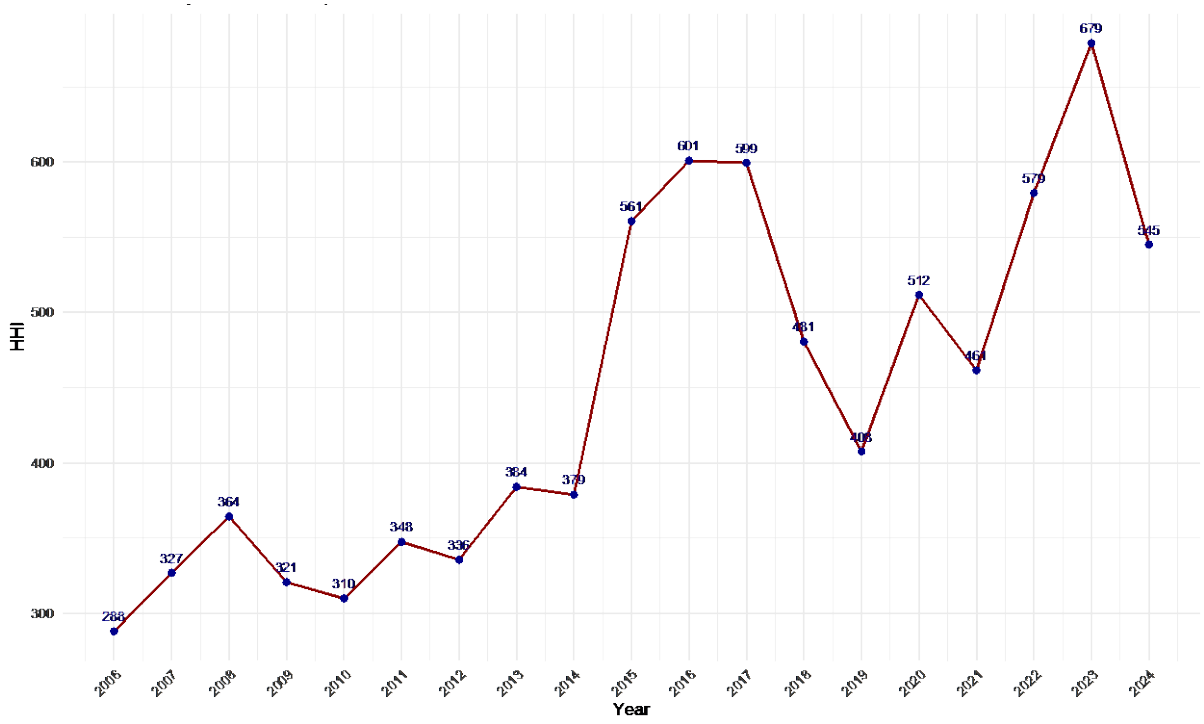
[7] Nawrocki and Carter (2010). This paper examined industry competitiveness across 13 US sectors from 1971 to 2001, finding that declines in competition (higher HHI) generally enhanced returns for the largest firms in nine of the industries but also elevated their relative risk, with notable firm-specific outcomes such as Microsoft's gains from reduced competition and performance setbacks for AT&T and IBM following increased industry rivalry.

[8] Market cap provides a more direct reflection of a firm's position in terms of investor attention, liquidity, and long-term viability on the exchange, making it a more appropriate proxy for understanding the underlying forces at play in delisting patterns.

different scales, with Figure 20 presented out of 1 000 and Figure 21 out of 10 000 to better illustrate differential concentration dynamics at the sector level.

Figure 20 below plots the evolution of the Herfindahl-Hirschman Index (HHI) for the JSE from 2006 to 2024. In our analysis, market capitalisation serves as a superior proxy for firm size and market power as it directly captures investor valuations, liquidity, and long-term viability while sidestepping the accounting distortions inherent in sales data.

Figure 20: Herfindahl-Hirschman Index (HHI) for the JSE, 2006 – 2024

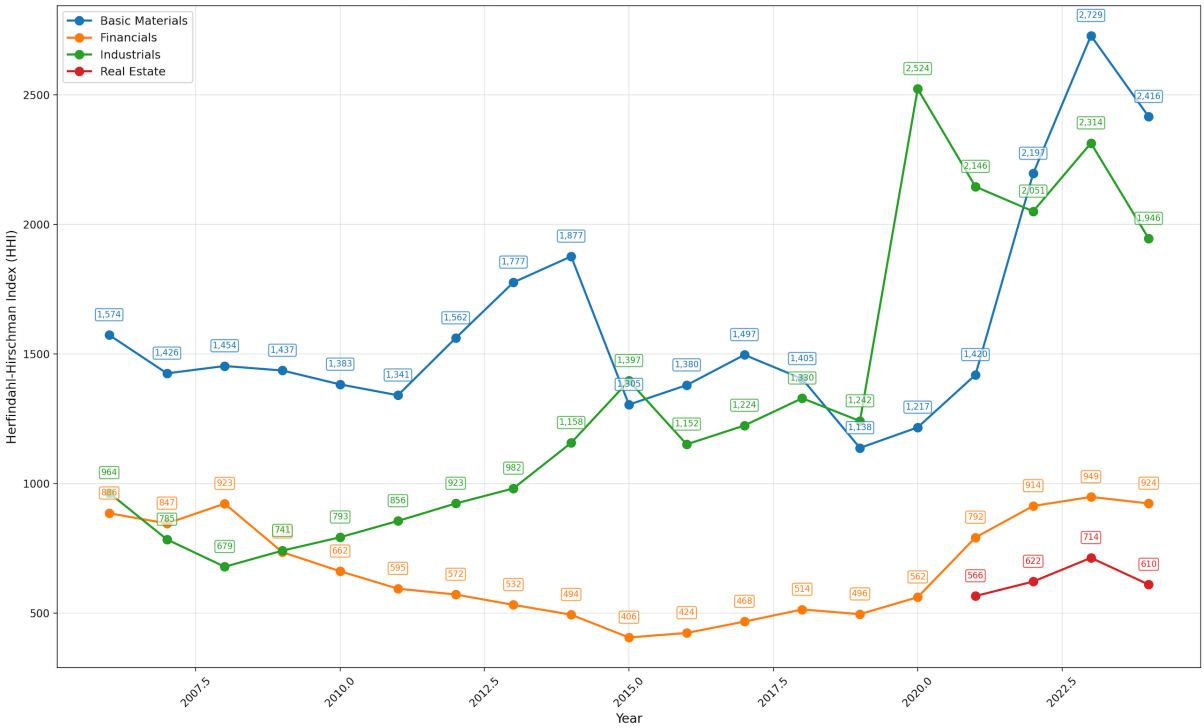


Source: Johannesburg Stock Exchange (2025). Authors' own calculations.

Between 2006 and 2024, the JSE's HHI increased by 89.3 percent. Over the long term, the JSE's HHI remained low and stable through the mid-1990s, reflecting a competitive landscape with dispersed market shares, before a sharp rise commencing around 1997 that signalled growing dominance by large-cap firms amid economic shifts and consolidations. This upward trajectory persisted with fluctuations, peaking near 700 in 2023, indicative of intensified concentration. Focusing on the 2020 – 2024 period, the HHI dipped from approximately 520 in 2020 to a trough near 450 in 2021, potentially due to pandemic-induced market volatility and new listings, before surging to a high around 680 in 2023, suggesting a period of significant consolidation where fewer companies commanded greater shares. By 2024, however, the index declined to about 550, hinting at emerging competition, new entrants, or redistributions

that tempered dominance. In the context of delistings on the JSE, these dynamics underscore a "crowding out" effect: as the HHI rises, smaller firms face acute challenges in securing capital and complying with regulations that favour large-cap stocks, exacerbating delisting trends through diminished investor attention and liquidity. This concentration–delisting nexus highlights broader structural shifts, wherein institutional flows increasingly entrench large players, reinforcing the imperative for policymakers to monitor such patterns to sustain market diversity.

Figure 21: HHI by industry on the JSE, 2006 – 2024



Source: Johannesburg Stock Exchange (2025). Authors' own calculations.

Figure 21 presents the evolution of the HHI for the Basic Materials sector, revealing a sharp rise in market concentration from 2020 to 2023. This skewing reflects the dominance of a handful of very large firms in mining and related industries, which disproportionately elevate the HHI relative to more fragmented sectors. Industrials display a similar, though less pronounced, pattern of concentration driven by sector leaders. This increase suggests accelerated consolidation whereby smaller firms were either absorbed or crowded out by dominant incumbents. The crowding-out hypothesis is further supported by the mechanics of delisting pressure: as larger firms concentrate market cap and liquidity, smaller peers may face diminished investor attention, reduced access to capital, and declining trading volumes,

thereby exacerbating their vulnerability to exit. Although the modest decline in the HHI in 2024 could hint at stabilisation or the entrance of new listings, the aggregate level of concentration remains historically elevated. Importantly, the use of market capitalisation rather than revenue to compute HHI better aligns with investor preferences and market pricing, offering a more robust lens for assessing delisting risk. These findings underscore how regulatory reforms and market structure interact to generate sector-specific delisting waves with potentially long-lasting consequences for exchange composition and investor diversity.

The HHI shows a clear upward trend in market concentration on the JSE between 2006 and 2024, providing novel evidence relative to international studies. This rise in concentration is both a cause and a consequence of delistings: persistent high delistings and low net listings reduce the pool of listed firms, while increasing concentration also reflects the disproportionate loss of smaller-cap companies. This result is important for understanding structural shifts in the JSE, though it is not included in our econometric regressions due to concerns about endogeneity.

The narrative link between concentration and delistings is powerful. Rising HHI reflects not only the growth of dominant firms but also the exit of smaller ones. Persistent delistings reduce the breadth of the listed universe, which mechanically raises concentration, while concentration itself reinforces the crowding-out of smaller firms by reducing investor attention, liquidity, and access to capital. This feedback loop underscores the structural nature of South Africa's listing problem. Finally, situating the JSE within a global context is instructive. The S&P 500 has likewise exhibited rising concentration, with the HHI reaching record levels in 2024 as a handful of mega-cap technology firms, including Nvidia, Apple, and Microsoft, came to dominate index performance (Salmon, 2024). This parallel indicates that heightened concentration is not unique to South Africa but part of a broader international pattern of capital gravitating toward dominant firms. What distinguishes the JSE, however, is the concurrent decline in new listings, which limits the replenishment of smaller-cap firms and intensifies the concentration–delisting dynamic.

7 DETERMINANTS OF DELISTING FROM THE JSE: AN ECONOMETRIC ASSESSMENT

This section investigates the determinants of delistings on the JSE using firm-level, macroeconomic, and global explanatory factors. The analysis integrates parametric and non-parametric methods to provide a comprehensive assessment of the drivers of delistings.

The dataset spans 2003 – 2024 and draws on multiple sources, summarised in Table 1. Official JSE records supplied listing and delisting histories, which were matched to firm identifiers in LSEG Eikon for financial and market data. Historical firm reports, CIPC filings, and annual reports were used to address survivorship bias and to validate delisting dates. Macroeconomic indicators were sourced from the South African Reserve Bank (SARB), the Federal Reserve Bank of St. Louis (FRED), and the World Federation of Exchanges (WFE). Measures of uncertainty and sentiment were drawn from the RMB/BER Business Confidence Index and the Economic Policy Uncertainty Index developed by Baker et al. (2016). The dependent variable is a binary indicator equal to 1 if a firm delisted in year t, and 0 otherwise, with right-censoring applied to firms that remained listed at the sample end.

The explanatory variables are grouped into four blocks:

- **Firm-specific factors:** These include firm size (market capitalisation), profitability (ROA), leverage, age, and turnover (liquidity). These variables capture the financial health and resilience of firms, with weaker fundamentals expected to increase the likelihood of delisting.
- **Domestic macroeconomic factors:** Variables such as South Africa's GDP growth, interest rates, inflation, and the rand/dollar exchange rate reflect local business cycle conditions and macroeconomic shocks that can raise or lower the probability of exit.
- **Global macro factors:** US GDP growth, the US 10-year Treasury yield level, and the yield curve slope capture global funding conditions and international risk sentiment that may spill over into the JSE.
- **Sentiment:** The RMB/BER Business Confidence Index and the World Policy Uncertainty Index for South Africa capture forward-looking measures of uncertainty and sentiment that influence investor expectations and firm exit decisions.

Table 1: Data – variable description

Variable Category	Variable Name	Description and Construction	Eikon Code/Source	Transformation
Firm Specific Factors	Firm age	Age of firm in years (logarithmised)	-	Log
	Market capitalisation	Market capitalisation in USD (logarithmised)	MV	Log
	Return on assets (ROA)	Net income divided by total assets	ROA	IHS
	Dividend yield	Dividends per share divided by share price	DY	None
	Debt/Equity	Total debt relative to total equity	WC08231	None
	Price/Earnings ratio	Share price divided by earnings per share	PE	None
	Price/Book	Market price per share divided by book value per share	PTBV	None
	Turnover by volume	Number of shares traded (expressed in thousands, logarithmised)	VO	Log
Domestic Macroeconomic Factors	SA GDP growth	South Africa's real GDP growth rate	SARB/FRED	None
	SA inflation	South African inflation rate	SARB	None
	USD/ZAR	Rand/dollar exchange rate	SARB	None
	SA interest rate	South African benchmark interest rate	SARB	None
Global Macroeconomic Factors	US GDP growth	USA's real GDP growth rate	FRED	None
	US level	Yield on 10-year US Treasury	Datastream	None
	US slope	Spread between 10-year and 3-month US Treasury	Datastream	None
Sentiment	RMB/BER BCI	South African Business Confidence Index	SARB	None
	EPU South Africa	South Africa World Uncertainty Index	worlduncertaintyindex.com	None

It is important to note that some variables were deliberately excluded. HHI was not included as it is endogenous, reflecting both cause and effect of delistings. Similarly, Schemes of Arrangement were excluded, as they represent a delisting mechanism rather than an independent determinant of exit.

We estimate the probability of firm delisting using binary response models. The general specification is given by equation (1), where the dependent variable takes the value 1 if firm I delists in year t, and 0 otherwise.

$$\text{Delisting}_{i,t} = \beta_0 + \beta_1 \text{Size}_{i,t-1} + \beta_2 \text{RoA}_{i,t-1} + \beta_3 \text{Leverage}_{i,t-1} + \beta_4 \text{FirmAge}_{i,t-1} + \beta_5 \text{Turnover}_{i,t-1} + \beta_6 \text{SAGDP}_{t-1} + \beta_7 \text{USGDP}_{t-1} + \beta_8 \text{SAInterestRate}_{t-1} + \beta_9 \text{SAInflation}_{t-1} + \beta_{10} \text{USDZ AR}_{t-1} + \beta_{11} \text{RMB}_{\text{BERBCI}\ t-1} + \beta_{12} \text{EPU}_{t-1} + \beta_{13} \text{USLevel}_{t-1} + \beta_{14} \text{USSlope}_{t-1} + \epsilon_{i,t} \quad (1)$$

These variables are described in Table 1, with transformations applied where appropriate (e.g., logarithms of firm size and turnover).

The empirical strategy proceeds from parametric to non-parametric approaches, progressively relaxing model assumptions. Four complementary methods are employed:

Discrete Choice Models (Logit and Probit)

Binary response models estimate the unconditional probability of delisting as a function of firm and macro variables. Lagged explanatory variables are used, with year and industry fixed effects included to control for time- and sector-specific shocks. Results are reported as average marginal effects (AMEs), providing interpretable measures of how each covariate shifts delisting probabilities.

Refinement with LASSO

To address multicollinearity and select the most predictive variables, the Least Absolute Shrinkage and Selection Operator (LASSO) is applied to penalised logistic models. This approach shrinks irrelevant coefficients towards zero and produces a streamlined core set of predictors.

Robustness Testing with Random Forest

Random Forest (RF) is employed as a non-parametric ensemble method. RF captures non-linear relationships and interaction effects that may be missed by traditional models, ranking variable importance using Mean Decrease Accuracy and Gini indices.

Triangulated Insights

By combining parametric and machine learning approaches, the framework enhances reliability. Traditional econometric models identify structural drivers, while machine learning highlights predictive performance and complex interdependencies.

This tiered approach, from maximum likelihood estimation to penalised regression and supervised learning, ensures robustness while accommodating both linear and non-linear effects.

The analysis employs four complementary approaches: binary choice models (logit and probit), regularisation (LASSO), and ensemble learning (Random Forest) for the following econometric model:

$$\text{Delisting}_{i,t} = \beta_0 + \beta_1 \text{Size}_{i,t-1} + \beta_2 \text{RoA}_{i,t-1} + \beta_3 \text{Leverage}_{i,t-1} + \beta_4 \text{FirmAge}_{i,t-1} + \beta_5 \text{Turnover}_{i,t-1} + \beta_6 \text{SAGDP}_{t-1} + \beta_7 \text{USGDP}_{t-1} + \beta_8 \text{SAInterestRate}_{t-1} + \beta_9 \text{SAInflation}_{t-1} + \beta_{10} \text{USDZ AR}_{t-1} + \beta_{11} \text{RMB}_{\text{BERBCI}\ t-1} + \beta_{12} \text{EPU}_{t-1} + \beta_{13} \text{USLevel}_{t-1} + \beta_{14} \text{USSlope}_{t-1} + \epsilon_{i,t} \quad (1)$$

Binary choice models estimate the probability of delisting based on firm characteristics. Logit uses a logistic cumulative distribution function (CDF), while probit uses a normal CDF; both are suitable for limited dependent variables and provide interpretable marginal effects. The logit and probit models are therefore binary response models that examine the unconditional likelihood of delisting, defined as:

$$P\left(Delisting_{i,t} = 1 \middle| X_{i,t-1}\right) = \theta\left(X_{i,t-1}\beta\right) \quad (2)$$

where θ is the cumulative distribution function of the standard normal distribution in the probit model, and the logistic distribution in the logit model. $X_{i,t-1}$ is a vector of lagged explanatory variables and β are the coefficients to be estimated. We ultimately estimate two primary specifications. We include year-fixed effects to control for differences over time. We also control for industry to control for differences between industries. Estimates are reported as marginal effects, providing a more intuitive interpretation of how each covariate influences delisting probabilities.

To address potential multicollinearity and overfitting, we estimate a penalised logistic model using the Least Absolute Shrinkage and Selection Operator (LASSO). LASSO performs variable selection and regularisation for high-dimensional data, shrinking irrelevant coefficients to zero. The model solves the penalised likelihood optimisation problem:

$$\underset{\beta}{\text{minimise}} \left\{ -\ell(\beta) + \lambda \sum_{j=1}^{p} |\beta_j| \right\} \tag{3}$$

where $\ell(\beta)$ denotes the log-likelihood function of the logistic model, and λ is the regularisation parameter governing the degree of shrinkage. The optimal λ is selected via 10-fold cross-validation to balance model fit and parsimony.

As a robustness check and to examine non-linearities and complex interactions, we employ the Random Forest algorithm, an ensemble learning technique that aggregates predictions from multiple decorrelated decision trees (Breiman, 2001). RF is particularly robust to overfitting and provides variable importance metrics that help identify the most influential predictors of delisting.

The general idea is that each tree is trained on a bootstrap sample of the data, and at each split, a random subset of predictors is considered. The final prediction is made via majority vote across trees. The RF classification rule is:

$$\hat{Y} = \text{ majority vote } \{T_1(X), T_2(X), \ldots, T_B(X)\}, \tag{4}$$

where $T_B(X)$ is the prediction from the Bth tree trained on bootstrapped data. Importance scores are derived from out-of-bag error estimates and permutation-based measures.

8 RESULTS

To identify the firm-level and macro-financial determinants of delistings on the JSE, we estimate a pooled cross-sectional probit, where the dependent variable is a binary indicator equal to one if a firm delists in a given year. This specification allows for the modelling of latent delisting propensity as a function of observable characteristics, with the resulting coefficients interpreted in terms of their influence on the underlying probability of delisting. In line with standard practice and to mitigate reverse causality concerns, all independent variables enter the model in lagged form (t-1). This structure ensures that firm and macroeconomic characteristics are predetermined with respect to the delisting outcome, strengthening the causal interpretation of the estimated effects.

The model includes a comprehensive set of firm-level covariates covering firm age, market capitalisation (proxy for size), profitability, leverage, valuation ratios, dividend yield, and turnover by volume (proxy for liquidity). The inclusion of these variables is guided by theory outlined in Section 3. To complement the probit coefficient estimates, we also compute average marginal effects (AMEs) for each variable. These provide a more interpretable measure of economic significance, reflecting the average change in delisting probability associated with a one-unit change in each covariate, holding other variables constant. The results from this specification, presented next, serve as a benchmark for comparison with alternative models estimated subsequently.

Table 2 reports coefficient estimates, significance levels and interpretative commentary for each regressor in the probit model. The results underscore several statistically significant drivers of delisting. Larger firms, as proxied by higher market capitalisation, exhibit a lower likelihood of delisting with an estimate of -0.045 and p-value of 0.054. This negative and very weakly significant coefficient suggests that size affords firms a degree of resilience or inertia that reduces the propensity to exit the exchange. This may reflect economies of scale, broader access to capital, or enhanced visibility and reputation in public markets.

Profitability, measured by return on assets (ROA), is negatively associated with delisting (estimate = -0.037, p = 0.066). This coefficient is significant at the 10 percent level, indicating that more profitable firms are less likely to delist. This result reinforces the notion that delisting is often associated with weaker operating performance.

Table 2: Determinants of delisting from the JSE: Probit estimates, 2002 – 2024

DV: Listed = 0, Delisting = 1	
Variable	**Estimate**
Market capitalisation (size)	-0.045**
Return on assets (ROA)	-0.037*
Debt/Equity	-0.033*
Firm age	-0.086**
Dividend yield	-0.001
Price/Earnings	-0.003*
Price/Book	-0.001
Turnover by volume	-0.021
SA GDP growth	-0.233***
SA inflation	0.038
SA interest rate	-0.042
USD/ZAR exchange rate	-0.14***
SA business confidence	0.261
SA policy uncertainty	0.202
US GDP growth	0.235***
US yield curve level	-0.018
US yield curve slope	-0.136***

*Notes: Coefficient estimates are from probit regressions of delisting on firm-level and macroeconomic variables. Robust standard errors are used. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.*

The coefficient on debt-to-equity (-0.033, p = 0.055) is also significant at the 10 percent level. While this may seem counterintuitive, given that high leverage is typically associated with financial distress, it may instead reflect more active capital structuring and a commitment to remaining listed. In particular, firms with higher leverage may benefit from monitoring by debt markets or better access to financing, reducing the likelihood of exit relative to firms relying solely on equity funding.

Firm age is observed in the model with a negative and statistically significant coefficient (-0.086, p = 0.031), indicating that older firms are less likely to delist. This may reflect the accumulation of market reputation, institutional knowledge, or long-standing stakeholder relationships, all of which reduce the appeal or necessity of exiting the public market.

In contrast, dividend yield, price-to-book, turnover by volume, and SA inflation do not exhibit statistically significant effects. The price-to-earnings ratio has a negative coefficient (-0.003) and is statistically significant at the 10 percent level ($p = 0.087$). This suggests that firms with higher market valuations relative to earnings are somewhat less likely to delist, possibly because strong valuations signal favourable investor sentiment or growth potential.

South African GDP growth enters with a negative and statistically significant coefficient of -0.233 ($p = 0.014$), indicating that stronger domestic economic conditions reduce the likelihood of firm exit. This likely reflects a more supportive macroeconomic environment for listed firms, including higher investor confidence and greater financial market stability.

The coefficient on the rand/dollar exchange rate is negative and highly significant (-0.140, $p < 0.001$), implying that a stronger rand (i.e., a lower USD/ZAR rate) reduces delisting risk. Beyond the mechanical effect of currency strength on valuations and capital flows, rand movements also serve as a broader signal of economic confidence and investment certainty. A stronger rand is typically associated with improved investor sentiment, reduced macroeconomic uncertainty, and greater capital inflows, which collectively lower the likelihood of firm exit. Conversely, rand weakness can amplify perceptions of risk and uncertainty, raising delisting pressures.

Neither the South African Business Confidence Index nor the South African Economic Policy Uncertainty Index displays a statistically significant relationship with delisting probabilities. The RMB/BER Business Confidence Index enters the model with a positive coefficient (0.261, $p = 0.387$), while the coefficient for the Economic Policy Uncertainty Index is also positive (0.202, $p = 0.325$). These insignificant results suggest that delisting behaviour among South African firms may not over the full period of review – and on average – be reactive to short-term shifts in sentiment or perceived policy unpredictability. Rather, structural firm-specific characteristics and broader macro-financial variables appear to be more salient predictors of delisting. This absence of a strong link with domestic sentiment indicators reinforces the notion that the decision to delist is often strategic and longer-term in nature, rather than simply a response to transient business confidence or uncertainty shocks.

US macroeconomic variables also play an important role. US GDP growth is positively and significantly associated with delisting (0.235, $p = 0.008$), suggesting that improved US economic conditions may draw capital or managerial attention away from the South African market,

increasing the relative appeal of delisting. Finally, the slope of the US yield curve is negative and significant (-0.136, p = 0.007), indicating that a flatter curve, often interpreted as a signal of weaker future global growth, reduces delisting risk. This may reflect defensive behaviour by firms that opt to remain listed during periods of heightened global uncertainty.

Collectively, these results highlight the complex interplay between firm fundamentals, local macroeconomic indicators, and global financial signals in shaping delisting behaviour. The presence of both firm-level and external drivers supports the hypothesis that delistings cannot be attributed solely to distress but are also shaped by strategic responses to changing economic conditions.

Table 3: Determinants of delisting from the JSE: Probit average marginal effects (AME), 2002 – 2024

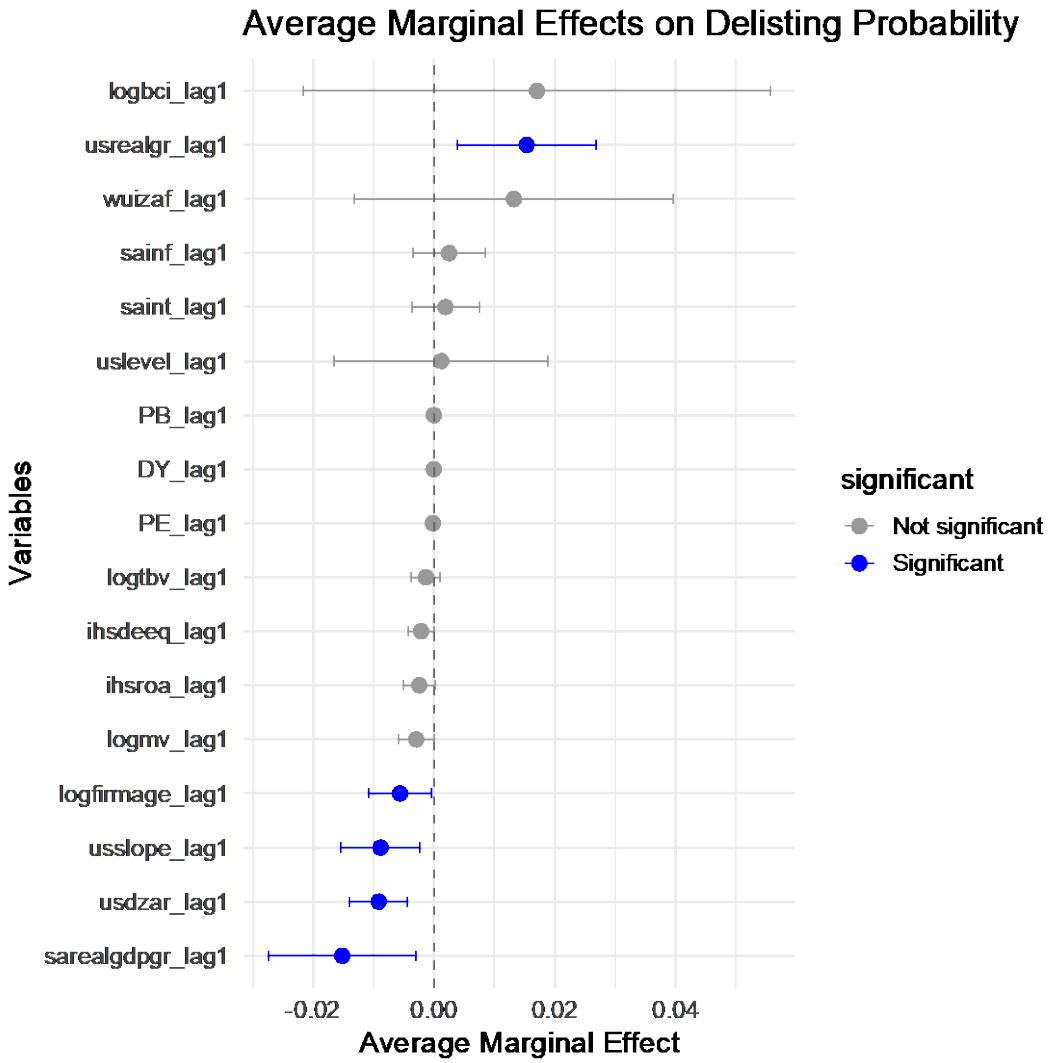
Variable	Average Marginal Effect
Dividend yield	-0.0
Debt/Equity	-0.002*
Return on assets (ROA)	-0.002*
SA business confidence (RMB/BER BCI)	0.004
Firm age	-0.006**
Market capitalisation (size)	-0.003*
Turnover by volume	-0.002
Price/Book	-0.0
Price/Earnings ratio	-0.0*
SA inflation	0.0
SA interest rate	0.001
SA GDP growth	-0.015**
USD/ZAR exchange rate	-0.009***
US yield curve level	0.001
US GDP growth	0.015***
US yield curve slope	-0.009***
SA policy uncertainty	0.013

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3 reports the average marginal effects from the probit model, offering a clearer interpretation of how a one-unit change in each covariate affects the probability of a firm

delisting, holding all else constant. The accompanying figure below visualises these effects with confidence intervals, highlighting statistically significant variables in blue.

Figure 22: Average marginal effects of firm-level and macroeconomic variables on the probability of delisting (probit model, 2002 – 2024)



The most prominent finding is the role of US macroeconomic indicators in shaping delisting behaviour. Specifically, US GDP growth exhibits a positive and statistically significant marginal effect (AME = 0.015, p = 0.009), suggesting that stronger US economic conditions are associated with a higher probability of South African firms delisting. This may reflect relative capital reallocation or managerial shifts in strategic focus toward more favourable global environments.

Similarly, the slope of the US yield curve is negative and significant (AME = -0.009, p = 0.008), implying that a flatter yield curve, often interpreted as a predictor of global economic

slowdown, decreases the probability of delisting. Firms may view delisting as less advantageous in uncertain or deteriorating global conditions, opting instead to retain public access to capital markets.

The USD/ZAR exchange rate emerges as highly significant (AME = -0.009, $p < 0.001$). A stronger rand (i.e., lower USD/ZAR) reduces the likelihood of delisting, potentially due to improved import terms, favourable investor sentiment, or enhanced competitiveness of South African assets. This reinforces the role of exchange rate dynamics in influencing capital market participation decisions.

At the domestic level, South African GDP growth significantly reduces the probability of delisting (AME = -0.015, $p = 0.015$). This aligns with expectations: stronger economic growth improves firm performance and investor confidence, diminishing the appeal of delisting.

Firm-specific characteristics also matter. Firm age is negatively associated with delisting and is statistically significant (AME = -0.006, $p = 0.032$), suggesting that older firms are more likely to remain listed. Longevity may reflect organisational resilience, established reputations, and a deeper embedding in capital market ecosystems. Similarly, market capitalisation (AME = -0.003, $p = 0.055$) and leverage (debt-to-equity) (AME = -0.002, $p = 0.056$) show borderline significance, with larger and more leveraged firms less likely to delist. These findings may indicate a commitment to public market presence or greater institutional scrutiny that discourages exit.

Return on assets (ROA) is significant at the 10 percent level (AME = -0.002, $p = 0.067$), supporting the interpretation that more profitable firms are less inclined to delist. The price-to-earnings ratio is weakly significant (AME ≈ -0.000, $p = 0.088$), consistent with the notion that firms with higher valuations are marginally more likely to remain listed.

Other firm-level variables, including dividend yield, price-to-book ratio, and turnover by volume, do not display significant marginal effects, suggesting limited predictive power for these ratios in this context.

On the policy and sentiment side, South African Business Confidence (RMB/BER BCI) and South African Economic Policy Uncertainty (EPU) show no statistically significant marginal effects (AMEs = 0.004 and 0.013, respectively; $p > 0.3$). While their coefficients are in the expected direction, higher business confidence marginally increases listing stability, and higher

EPU slightly raises delisting risk, these effects are imprecisely estimated. This could be due to the aggregation of macro sentiment into quarterly measures, or to the multifaceted channels through which policy uncertainty and business confidence influence firm-level decisions.

In summary, the AME results and visualisation confirm that delisting is driven by a combination of global and local macroeconomic forces, along with firm-specific characteristics. Global indicators such as US growth, yield curve dynamics, and exchange rate movements appear to exert strong, significant effects. Meanwhile, domestic firm fundamentals (such as age, size, and profitability) and GDP growth remain salient but are nuanced by statistical precision. The results reiterate that delisting behaviour in South Africa is shaped not only by firm distress but also by broader strategic responses to shifting economic and financial environments.

Logit Model: Robustness Check

To verify the robustness of the probit results, we also estimated a logit specification using the same set of explanatory variables. The logit model offers an alternative functional form for the error distribution but in practice yields very similar results to the probit model.

The results, reported in Appendix 1, are qualitatively consistent with those from the probit specification: the signs, magnitudes, and statistical significance of the key coefficients remain stable. This confirms that the determinants of delisting identified in the probit model are not sensitive to the choice of binary response specification.

Given this close alignment, we focus our interpretation on the probit average marginal effects presented above, while treating the logit estimates as a robustness check.

The LASSO Model

To complement the probit and logit estimations and isolate the most-influential predictors of delisting, we next implement a Least Absolute Shrinkage and Selection Operator (LASSO) model. Unlike traditional maximum likelihood models, which estimate all coefficients regardless of their relevance, the LASSO performs embedded variable selection by shrinking less informative coefficients toward zero (Tibshirani, 1996; Hastie, Tibshirani & Friedman, 2009). This feature allows it to address two key limitations: mitigating multicollinearity and improving predictive accuracy in high-dimensional settings.

The LASSO approach is particularly useful in high-dimensional settings or when there is uncertainty about which covariates are most important. In the current context, while the

probit and logit models provide full sample marginal effects and significance tests, they do not offer a principled approach to variable selection. This makes it difficult to distinguish between marginal predictors and those with robust, standalone explanatory power. The LASSO model addresses this gap by penalising the absolute magnitude of the coefficients via an L_1 penalty, thereby forcing some estimates to exactly zero and highlighting the most salient predictors of delisting.

In this study, the LASSO is implemented within a logistic regression framework suitable for binary outcomes. The estimation draws on a balanced panel of 4 968 firm-year (non-missing) observations, and 17 lagged predictor variables. All covariates are numeric and standardised prior to estimation. The use of lagged independent variables helps to mitigate potential endogeneity concerns by ensuring that predictors precede the delisting outcome temporally. This LASSO framework enables us to distil the high-dimensional predictor space into a concise subset of variables with the strongest predictive content, offering a more robust and interpretable model of delisting behaviour.

Table 4: Determinants of delisting from JSE, LASSO approach: 2002 – 2024

Group	Variable	Coefficient
Key Predictors (> 0.08)		
	Firm age	-0.163
	Return on assets (ROA)	-0.089
	Market capitalisation (size)	-0.083
Moderate Predictors (0.04–0.08)		
	Price/Earnings	-0.057
	US GDP growth	0.049
	SA GDP growth	-0.047
	SA policy uncertainty	0.039
Low / Negligible Predictors (< 0.04)		
	USD/ZAR exchange rate	-0.010
	SA interest rate	0.009
	SA inflation	0.006
	SA business confidence	0.006
	Dividend yield	-0.002
	Price/Book	-0.001
	Turnover by volume	-0.000

Table 4 reports the coefficient estimates from the LASSO model, based on the 2002 – 2024 sample of JSE firms. While LASSO does not produce conventional measures such as p-values in the same way as maximum likelihood models, predictive strength can be inferred from the

magnitude of the absolute coefficients. We therefore rank variables by absolute coefficient size to distinguish between key, moderate, and negligible predictors of delisting.

The results of the LASSO model in Table 4 offer a parsimonious and disciplined view of the drivers of delisting. Unlike the probit and logit models, which retain all variables regardless of their predictive contribution, the LASSO framework imposes an L_1 penalty that shrinks less informative coefficients toward zero. This regularisation approach addresses multicollinearity and mitigates the risk of overfitting, yielding a more robust model capable of generalising beyond the estimation sample.

Among firm-specific factors, market capitalisation (size) exhibits a coefficient of -0.083, indicating that larger firms are less prone to delisting, likely due to greater financial resilience and investor confidence. Return on assets (ROA), with a coefficient of -0.089, underscores the protective effect of profitability, consistent with earlier findings that more profitable firms are less likely to exit public markets. The debt-to-equity ratio (-0.073) similarly reinforces that lower leverage is associated with lower delisting risk, highlighting the precarious position of highly indebted firms. Firm age emerges as a particularly influential factor (-0.163), implying that older, more established firms benefit from operational maturity and credibility that safeguard against market exit.

Several valuation and trading-related indicators were retained in the model, though their magnitudes are relatively small. The price-to-earnings ratio (-0.057) suggests that firms with high market valuation relative to earnings face somewhat greater delisting risk, possibly due to volatility in investor sentiment. Dividend yield (-0.002), price-to-book (-0.001), and turnover by volume (-0.000) are effectively negligible, indicating that these conventional metrics add little predictive value once more fundamental firm characteristics are accounted for.

Turning to macroeconomic determinants, South African GDP growth (-0.047) negatively correlates with delisting probability, consistent with the interpretation that stronger domestic economic performance enhances firm viability. In contrast, SA inflation (0.006) and interest rates (0.009) exert mild positive effects, possibly reflecting higher input costs and tighter borrowing conditions. Notably, the RMB/BER Business Confidence Index (0.006) also enters the model with a small positive coefficient. While not significant in conventional regressions, its inclusion suggests that it improves overall model fit under penalised estimation.

Global financial conditions feature prominently. The USD/ZAR exchange rate (-0.010) reaffirms that rand strength lowers delisting risk, potentially easing pressures on firms with foreign liabilities. US GDP growth (0.049) again enters with a positive coefficient, suggesting that strong US economic performance may coincide with capital reallocation away from emerging markets. The US yield curve level (0.024) is modestly positive, while the slope of the yield curve emerges as one of the most salient predictors in the model, with a coefficient of -0.290. This finding reinforces the role of global interest rate structures in shaping delisting dynamics, particularly in an open, financially integrated economy like South Africa. Finally, South African economic policy uncertainty (0.039) exerts a positive influence, highlighting the relevance of domestic policy stability in supporting market participation.

This analysis reinforces several patterns already uncovered by the probit and logit models, while also providing additional nuance. Firm age, size, and profitability stand out as the most powerful deterrents of delisting, while global interest rate expectations, captured by the US yield curve slope, emerge as a dominant external influence.

Importantly, LASSO highlights the predictive irrelevance of several traditional metrics, including turnover by volume and dividend yield, which it shrinks toward zero. Rather than arbitrarily retaining all variables, the LASSO model effectively distinguishes signal from noise, offering a more streamlined and interpretable specification. In doing so, it confirms the robustness of the key insights identified previously, while also strengthening confidence in the selection and relevance of the retained variables.

The Random Forest Model

To further assess the forecasting potential of firm-specific and macro-financial variables – and to test a more non-parametric estimation – the Random Forest (RF) model is employed. The RF approach will aid in testing and uncovering non-linear relationships that the above techniques may have missed. Random Forests aggregate the predictions of multiple decision trees, each constructed using a random subset of features and data, to improve classification accuracy and model robustness. The method reduces overfitting by decorrelating individual trees through feature-level randomness, and its generalisation error converges as the number of trees increases. Compared to boosting algorithms, Random Forests offer competitive performance while exhibiting greater resilience to noisy data. Importantly, they provide internal estimates of predictive error and variable importance, enhancing their utility in both

classification and regression settings (Breiman, 2001). This model will therefore test how well firm-level and macro variables predict the occurrence of a delisting. In this context, the model estimates the probability of delisting based on the full set of lagged predictors used in the logit, probit, and LASSO specifications.

The Random Forest classifier extracts the relative importance of each predictor based on the Mean Decrease in Accuracy (MDA) and Mean Decrease in Gini (MDG) metrics. Table 5 reports variable importance scores for the Random Forest model of delistings. The model was estimated with 500 trees. At each split, four predictors were randomly selected from the full set of 18 potential variables to determine the optimal partition, following the standard Random Forest procedure. Out-of-bag (OOB) error was 3.06 percent, with an overall classification accuracy exceeding 99 percent (4 816 listed and 152 delisted firms correctly classified). The confusion matrix confirms the robustness of predictions, with only a single misclassified delisted firm. The variable importance scores highlight market capitalisation, turnover, and return on assets as the strongest predictors across both Mean Decrease Accuracy and Mean Decrease Gini, followed by firm age and valuation ratios. Macroeconomic factors such as US GDP growth, SA GDP growth, and the USD/ZAR exchange rate display lower but non-negligible importance.

These diagnostics underscore the strong predictive performance of the Random Forest approach while complementing the parametric estimates from probit, logit, and LASSO. Table 5 on the next page reports the variable importance scores, while the figure presents the corresponding ranked plots.

Table 5: Determinants of delisting from JSE, Random Forest: 2002 – 2024

Variable	Mean Decrease Accuracy (MDA)	Mean Decrease Gini (MDG)
Market capitalisation (size)	24.367	33.985
Return on assets (ROA)	12.497	31.801
Debt/Equity	5.925	29.184
Firm age	12.613	26.859
Dividend yield	15.961	26.691
Price/Earnings	16.411	28.793
Price/Book	17.609	29.766
Turnover by volume	21.585	34.931
SA GDP growth	5.33	5.03
SA inflation	6.524	5.151
SA interest rate	6.38	4.652
SA policy uncertainty	10.069	4.735
USD/ZAR exchange rate	6.115	5.52
US GDP growth	3.964	4.948
US yield curve level	3.809	4.556
US yield curve slope	6.621	5.032

The results indicate that market cap (size) emerges as the most influential predictor. Its high importance under both MDA (24.37) and MDG (33.99) suggests that firm size is a critical determinant of the outcome variable. This finding is consistent with extant literature documenting the strong relationship between firm size and various corporate events, including listing and delisting activity. Larger firms may benefit from economies of scale, greater analyst coverage, and superior access to capital markets, all of which reduce the likelihood of exit.

Turnover by volume ranks second in importance (MDA = 21.59; MDG = 34.93), underscoring the predictive strength of liquidity in the secondary market. This result highlights the role of market participation and trading intensity in shaping firm outcomes. Illiquidity, often proxied by lower turnover, has been shown to increase transaction costs and reduce investor interest, potentially elevating exit risk for listed firms. The prominence of turnover by volume (TBV) in both accuracy and Gini-based metrics suggests that market-based measures of liquidity are as predictive as conventional financial ratios in the Random Forest framework.

Further, price-to-book ratio (MDA = 17.61; MDG = 29.77) and price-to-earnings ratio (MDA = 16.41; MDG = 28.79) also rank highly. These indicators likely capture investor sentiment,

growth expectations, and broader market perceptions of firm quality. The ranking of dividend yield further reflects how payout policies are interpreted by the market and potentially signal management confidence and cash flow stability.

ROA (MDA = 12.50; MGA = 31.80) and debt-to-equity (MDA = 5.92; MGA = 29.18) also exhibit relatively high variable importance. The contribution of these firm-level fundamentals supports the view that both profitability and capital structure are meaningful indicators of firm sustainability, especially when assessed in conjunction with market-based measures. The ranking of firm age (MDA = 12.61; MGA = 26.86) confirms that firm maturity plays a non-trivial role, although its predictive power is modest relative to market and liquidity indicators.

Macro-level variables such as RMB/BER/BCI, rand/dollar exchange rate and the US yield curve slope appear mid-ranked, suggesting that systemic economic and financial conditions impart explanatory value but are subordinate to firm-specific variables in this model.

Variables such as SA GDP, US GDP and US interest rates occupy the lower end of the importance spectrum. While they may contribute marginally through interactions or non-linearities, their standalone predictive power is limited in the current specification.

Overall, the results from the Random Forest model validate the dominance of firm size, trading liquidity, and valuation metrics in explaining the outcome of interest. The alignment between MDA and MDG rankings suggests that the selected variables exhibit consistent predictive value across distinct importance measures, thereby enhancing the robustness of the findings. The combination of market-based and financial ratio variables, complemented by select macroeconomic indicators, underscores the multifaceted nature of forecasting delistings on the JSE.

Summary of Results

The empirical analysis draws on a diverse range of modelling techniques to uncover the firm-level and macroeconomic determinants of delisting from the JSE. Across all models, logit, probit, LASSO and Random Forest, a number of robust patterns emerge that shed light on both the likelihood and timing of delisting events.

Firm characteristics, particularly size (market capitalisation) and age, consistently emerge as the most powerful protective factors against delisting. In the LASSO model, both variables carry large negative coefficients. The Random Forest model ranks size and age among the top

four predictors based on both Mean Decrease Accuracy and Mean Decrease Gini metrics. These findings align with theoretical expectations that larger and more established firms enjoy superior access to capital markets, greater investor visibility, and institutional support, which collectively enhance their survival prospects.

Profitability, proxied by return on assets, also features prominently in the analysis. Similarly, leverage, as measured by the debt-to-equity ratio, is moderately important. It is statistically significant in the LASSO model but less influential in the Random Forest output, suggesting its effect may be contingent on sectoral or firm-specific characteristics.

The role of firm size and market concentration in shaping these outcomes is further illustrated by the evolution of the Herfindahl-Hirschman Index (HHI), computed using market capitalisation rather than sales, a method rarely applied in the literature (apart from Nawrocki and Carter, 2010). Our application of market cap-based HHI serves as a proxy for firm power and investor interest, while acknowledging that market capitalisation is itself partly shaped by listing dynamics. To mitigate concerns of bi-causality, the HHI is constructed at the aggregate (market and sectoral) level and lagged in time relative to the delisting outcome, so that concentration reflects prior rather than contemporaneous market structure. Importantly, the HHI is used descriptively rather than as a core regression variable, thereby avoiding direct endogeneity concerns in the econometric models. The JSE's overall HHI trends upward from the mid-1990s, peaking in 2023 near 700, and reflecting increasing market dominance by large-cap firms. Focusing on the Basic Materials sector, the HHI sharply increases between 2020 and 2023, supporting a crowding-out hypothesis in which smaller firms are squeezed out amid sector consolidation. The modest dip in 2024 may indicate tentative market rebalancing, but concentration remains high, implying continued pressure on smaller entities. These findings reveal how regulatory reforms and evolving market structure interact with delisting waves, with lasting implications for investor diversity, liquidity distribution, and the allocative efficiency of capital markets.

Weak analyst coverage is argued to further exacerbate these challenges by reducing market visibility and dampening valuations, reinforcing investor bias in favour of large-cap firms. Inability to secure sufficient liquidity or raise capital on competitive terms often precipitates exit, particularly in a market increasingly dominated by a handful of large firms. In some instances, they also argue, delisting is pursued as a strategic means to restructure ownership in a less restrictive private setting. Collectively, these forces render the JSE an increasingly

unattractive exchange for smaller firms, corroborating our empirical findings that younger, smaller, and less profitable companies face significantly higher delisting risk under conditions of rising market concentration and regulatory complexity.

Finally, the Random Forest model affirms the primacy of firm fundamentals (size, ROA, price-to-earnings and price-to-book ratios) alongside market-based indicators like turnover and dividend yield. Although macro variables generally rank lower, business confidence and the USD/ZAR exchange rate appear as meaningful contributors. The convergence of results across both machine learning and parametric approaches enhances the robustness of our findings, and affirms that while macroeconomic context matters, delisting on the JSE is overwhelmingly shaped by firm-specific fundamentals and market structure effects.

Our findings also reinforce those of Nikani and Holland (2022), who investigate voluntary delistings from the JSE between 2012 and 2021. Their findings reveal that firms most susceptible to exit are those with limited market visibility and smaller capitalisations, typically below R10 billion. They attribute delisting decisions to high transaction costs and insufficient financial visibility, which reduce the incentive to remain listed. They argue that the JSE has become increasingly inhospitable to small- and mid-cap firms, reflecting a structural misalignment between the exchange's requirements and the needs of these companies.

Taken together, the results highlight three broad themes. First, firm-specific fundamentals are central to listing resilience, with size, age, profitability, and leverage emerging as the most consistent anchors across specifications. Firms with longer JSE tenure and stronger balance sheets are significantly less likely to delist. Second, macroeconomic drivers exert an important influence, particularly domestic GDP growth and global growth conditions, which amplify delisting pressures or provide resilience depending on the economic cycle. These macro factors matter but do not overwhelm firm-level characteristics, suggesting that delisting remains rooted in micro fundamentals even in the presence of strong external shocks. Third, uncertainty plays a more muted role than expected: measures of business confidence and policy uncertainty are not robust predictors in the probit, logit, or LASSO models, though they appear in the Random Forest results. This pattern reflects that the reported coefficients represent mean effects over the full sample period, which coexist with sector- and time-specific shocks such as those observed in mining. Overall, delisting on the JSE reflects an interaction between enduring firm characteristics, cyclical macroeconomic forces, and occasional sector-specific pressures.

Table 6: Summary of variable significance across models

Variable	Probit	Logit	LASSO	Random Forest
Market capitalisation (size)	✓	✓	✓	✓
Return on assets (ROA)	✓	✓	✓	✓
Debt/Equity	✓	✓	✓	✓
Firm age	✓	✓	✓	✓
Dividend yield	✗	✗	✗	✓ (moderate)
Price/Earnings	✓ (10%)	✓ (10%)	✓	✓
Price/Book	✗	✗	✗	✓ (moderate)
Turnover by volume	✗	✗	✗	✓ (moderate)
SA GDP growth	✓	✓	✓	✓
SA inflation	✗	✗	✓ (small)	✓ (small)
SA interest rate	✗	✗	✓ (small)	✓ (small)
SA business confidence	✗	✗	✓ (small)	✓ (small)
SA policy uncertainty	✗	✗	✓ (moderate)	✓ (small)
USD/ZAR exchange rate	✓	✓	✓	✓ (small)
US GDP growth	✓	✓	✓	✓ (small)
US yield curve level	✗	✗	✓ (small)	✓ (small)
US yield curve slope	✓	✓	✓	✓ (small)

The consolidated results show that firm fundamentals (size, profitability, leverage, and age) are consistently strong predictors of delisting across all models, while macroeconomic factors (GDP growth, exchange rates, and the yield curve) and selected sentiment variables play a secondary but non-negligible role.

To deepen the understanding of these quantitative findings and uncover motivations not readily captured in firm-level data, the next section turns to qualitative evidence derived from interviews and structured questionnaires.

9 DELISTING DIALOGUE: QUALITATIVE FINDING FROM INDUSTRY PARTICIPANTS

This section synthesises insights from industry participants[9] on the persistent wave of delistings and the parallel scarcity of new listings on the JSE. Drawing from their diverse experiences in asset management, corporate law, investment banking, and regulatory frameworks, this study identifies a complex interplay of macroeconomic headwinds, regulatory frictions, shifting investment mandates, and market structure changes that

[9] The analysis draws on a total of 15 participants, comprising 10 in-depth interviews with senior practitioners and five structured survey responses from listed firms.

collectively shape the net listing trends observed. The integration of questionnaire responses with qualitative interviews enriches the analysis by combining the narrative reflection with structured assessments of listing and delisting dynamics.

Macroeconomic and Structural Impediments

Across all industry participants, there was a consensus that South Africa's protracted period of low economic growth, a so-called "lost decade", has underpinned the muted appetite for new listings. Participants identified chronic infrastructure challenges, political risk premiums, and governance uncertainties as key drivers elevating the cost of equity capital, particularly for small- and mid-cap firms. In this environment, the cost of equity for these firms can exceed 17 percent, effectively stifling incentives for public listings and new capital formation. Investor sentiment, a critical factor in fostering an active listing environment, was also noted to be fragile. Participants also highlighted several proxies for sentiment, including the number of building plans passed, the rate of change in population moving out of poverty, exchange rate volatility, the steepness of the yield curve, cash inflows into domestic equities, and the number of new listings. These indicators collectively reflect broader structural economic challenges that have undermined domestic confidence and eroded appetite for riskier equity investments.

Questionnaire responses reinforce this fragility: several participants rated liquidity and trading volume as only moderately significant (2 – 3 out of 5) in sustaining market interest, with financial health rated below 3 pointing to deterioration. Participants also consistently flagged weak macroeconomic conditions and limited trading volumes as major factors constraining the appeal of remaining listed.

Participants also noted that the low rate of new business formation in South Africa, driven by these macroeconomic and policy uncertainties, has constrained the supply of firms that would otherwise consider listing. This persistent gap in entrepreneurial activity and firm-level growth further limits the pool of potential new listings, compounding the effects of weak macroeconomic conditions.

One participant linked household-level economic upliftment and the fortunes of listed retail firms, noting that improved nutrition, education, and household incomes would create a more inclusive retail investor base; while survey responses rated political and macroeconomic instability around 3 (moderately significant), confirming that firms perceive these risks as persistent headwinds, even if not always decisive on their own. This perspective underscores

how broader socioeconomic improvements from improved macroeconomic growth can expand demand for equity investments and support a healthier, more vibrant listing environment in the future.

Another participant further elaborated on the interplay between economic stagnation and listing activity, noting that the absence of vibrant new sectors and the subdued entrepreneurial environment in South Africa limit the emergence of viable new listing candidates. Participants also emphasised that the cumulative costs of maintaining a listing compound these macroeconomic constraints, deterring firms from remaining listed, especially for smaller firms.

The Influence of Regulation 28 and Shifting Investment Mandates

Participants consistently noted that regulatory frameworks, particularly Regulation 28[10] which allows up to 45 percent of assets to be allocated offshore, have reshaped domestic capital flows. This structural shift has redirected domestic savings towards global markets, draining liquidity from South African equities and reinforcing a bias towards large, index-included firms. As a result, the pool of capital available for new listings has contracted, while smaller firms have struggled to meet institutional size and liquidity thresholds.

One participant highlighted how the Regulation 28 changes have accelerated the outflow of capital from domestic equities, compounding the already tepid environment for new listings; while another argued that while these shifts have marginally affected capital allocation decisions, they pale in comparison to the more structural impediments of size, liquidity, and investor interest that define South Africa's listing dynamics.

Private Equity Activity and Strategic Acquisitions

Private equity and strategic cross-border acquisitions were identified as central drivers of delistings among participants. The private equity market's flexibility and growth, coupled with the undervaluation of South African assets, has created fertile ground for restructurings transactions. Participants observed that private equity ownership allows for restructuring away from public scrutiny, while strategic acquisitions by multinationals leverage the value disconnect in South African valuations.

[10] Regulation 28 is an amendment to the Pensions Fund Act that extends the proportion of a diversified portfolio to a maximum of 45 percent in international or offshore assets.

Participants noted that private markets might become the preferred route for companies seeking growth capital as they provide flexibility and avoid the regulatory burdens associated with listing. Other participants agreed, observing that the relative ease and opacity of private market transactions have rendered public markets comparatively unattractive.

However, the survey evidence showed that the participants generally rated access to private capital as low priority, suggesting that firms do not view the availability of private finance as a decisive factor in their listing status.

Evolving Role of the JSE and the Sponsorship Model

The evolving role of the JSE itself was noted by multiple participants. Traditionally a marketplace facilitating the intersection of traders, capital seekers, and liquidity, they argued that JSE has increasingly assumed a regulatory function, focusing on compliance and governance oversight rather than capital formation. The sponsorship model has evolved alongside this shift: previously a cornerstone of JSE activity, sponsorship has become economically marginal as fewer firms pursue listings and as sponsors shoulder increasing regulatory responsibility without commensurate profitability. This repositioning has implications for the JSE's ability to support the growth of small- and mid-cap firms.

Structured responses showed that firms view compliance costs as a material consideration in remaining listed, whereas analyst coverage and dual-listing opportunities were consistently rated very low. This suggests that companies are far more concerned with the regulatory burden than with the traditional supports of market visibility or access to foreign listings.

Participants noted how global regulatory changes such as MiFID II have curtailed sell-side research coverage, particularly for small- and mid-cap companies. This erosion of research coverage exacerbates information asymmetries, weakening investor confidence in these firms and further undermining their listing prospects.

One participant observed that the JSE's role as a capital-raising platform has been further weakened by its inability to support the growth of sub-R10 billion firms. This structural gap, compounded by the erosion of sell-side research coverage, has left smaller firms without the investor backing necessary to sustain a listing, reinforcing the JSE's repositioning towards compliance and governance oversight rather than capital formation.

Global Competitive Pressures and Missed Opportunities

Several participants highlighted South Africa's declining weighting in global emerging market indices and the missed opportunity to leverage the JSE as a continental platform for African capital flows. While other exchanges have modernised to attract niche growth segments, the JSE has not fully capitalised on the potential to intermediate the continent's growth narrative.

Participants noted the missed opportunity to position the JSE as a gateway for pan-African capital flows, limiting its regional competitiveness and dampening the incentive for regional listings. One participant reinforced this point by highlighting how global competitive pressures, combined with the structural limitations of South Africa's small-cap environment, have pushed some firms to consider listing in more liquid and globally connected markets such as London and New York. The absence of compelling local growth narratives for smaller firms further weakens the JSE's competitive positioning.

Regulatory and Compliance Burdens

Participants emphasised the burdensome compliance landscape, including board governance requirements, and the extensive processes around fairness opinions and circulars. These high compliance costs disproportionately affect smaller firms and have disincentivised public market participation. Minority shareholder activism, while intended to protect investors, has added a further layer of complexity to the decision to list or remain listed.

This sentiment was echoed in the structured results as JSE compliance was rated 3–4 in importance, and non-JSE compliance requirements (labour, BEE, tax, consumer, environmental) were consistently rated 3–4. Several participants noted that the costs of compliance would be significantly lower if firms exited the market, suggesting that avoiding regulatory burdens is a central motive underpinning listing dynamics.

Senior management in smaller listed firms find themselves dedicating considerable time to compliance and investor relations, detracting from core operational functions. In many cases, this dynamic has eroded the appeal of being a listed entity and contributed to decisions to delist or forego listing altogether. These cumulative pressures have created an environment where smaller firms increasingly prefer private ownership to the obligations of being listed.

One participant elaborated on how these compliance costs have become a critical factor in firms' decisions to delist, with smaller listed firms increasingly weighing the burdens of transparency, governance, and reporting obligations against the more flexible and confidential environment offered by private markets.

Political and Fiscal Uncertainty

Several industry participants discussed the high political-risk premium tied to BEE compliance, labour law rigidity, and governance challenges. These pressures feed directly into higher risk premiums and dissuade both domestic and foreign capital.

The survey evidence supports this narrative as political uncertainty and macroeconomic instability were frequently rated 3–4, highlighting how firms view the political and economic environment as a material constraint on the viability of remaining listed.

One participant added that the country's political risk premium, which has manifested through restrictive labour laws and the administrative complexity of BEE compliance, has further dissuaded firms from seeking public listings, reinforcing the bias towards delisting and private ownership structures.

Implications and Future Outlook

The convergence of these macroeconomic, regulatory, and investor-driven factors suggests that in the absence of structural reforms, the trajectory of delistings will persist. While the JSE has taken steps to reduce listing barriers, participants noted that the fundamental constraints remain unaddressed, namely domestic growth limitations, governance hurdles, and the shifting focus of large pools of capital towards offshore opportunities.

The combined evidence from the participants suggests a bifurcation with the perception of larger entrenched firms signalling moderate resilience and limited appetite for delisting, while for smaller firms the emphasis is that compliance costs, liquidity constraints, and political risks are pressures that could drive potential exits.

Participants collectively suggest that unless structural reforms address the twin challenges of macroeconomic stagnation and regulatory overreach, the trajectory of delistings will remain entrenched. Their perspectives underscore the need for an enabling environment that not only attracts new listings but also supports the growth of smaller firms beyond the R10 billion threshold to sustain the long-term health of the domestic capital market.

This analysis highlights how macroeconomic stagnation, evolving investor preferences, regulatory burdens, and the repositioning of the JSE itself collectively underpin the wave of delistings and the lack of new listings. Although these trends mirror global shifts, South Africa's unique political and economic circumstances intensify their local impact. Reinvigorating the JSE's role in capital formation, while simultaneously fostering broader domestic growth and reducing regulatory burdens, will be essential to revitalising the exchange as a platform for corporate expansion and innovation.

Conclusion

Taken together, the findings underscore the dual nature of the JSE's listing dynamics. On the one hand, persistent negative net listing rates by count signal structural weaknesses in attracting and retaining firms on the JSE. On the other hand, the fact that the JSE's mean net listing rate by market capitalisation converges more closely with high-income (HI) and non-HI exchanges suggests that these exits are concentrated among smaller firms, and therefore less damaging in terms of aggregate market value. This nuance reinforces the importance of distinguishing between frequency- and value-based measures when assessing the health of capital markets.

At an empirical level, several empirical wrinkles are noteworthy. First, the contrast between pre-2005 and post-2005 trends is stark: While delistings remain significant in both periods, the sustained plateau after 2005 points to a structural weakening in market dynamism. Second, results are sensitive to the measure applied – count versus market capitalisation – but the net effect is clear: exits dominate listings. Importantly, the evidence suggests that the JSE's contraction is driven less by a surge in delistings than by a failure to attract new listings.

Key features of the JSE data reinforce these findings. Schemes of arrangement remain the dominant route to exit, with mining firms particularly prominent in recent waves, shaped by regulatory and policy changes such as the Mining Charter. The Herfindahl-Hirschman Index further illustrates the rising concentration of the exchange, with a sharp post-2020 increase signalling growing dominance by large-cap firms and continued pressure on smaller entities.

The econometric analysis corroborates these patterns. Firm fundamentals, size, profitability, leverage, and age consistently emerge as strong predictors of listing resilience, while macroeconomic drivers, including GDP growth, exchange rates, and yield curve dynamics, exert additional influence without displacing firm-specific characteristics. In contrast,

uncertainty and sentiment measures appear less robust, though they do feature in selected specifications.

Taken together, the results paint a consistent picture: South Africa's delisting problem reflects both elevated firm exits and, more critically, a lack of new firm entry. This dual dynamic underscores the need for policies that not only address the drivers of delisting but also strengthen the pipeline of prospective entrants, ensuring the JSE remains an attractive and competitive venue for raising capital.

10 REFERENCES

Al-Thaqeb, S.A., & Algharabali, B.G. 2019. Economic policy uncertainty: A literature review. *The Journal of Economic Asymmetries,* 20: e00133.

Asker, J., Farre-Mensa, J. & Ljungqvist, A. 2015. Corporate investment and stock market listing: A puzzle? *The Review of Financial Studies,* 28, (2): 342-90.

Auret, C.J. & Britten, J.H.C. 2008. Post-issue operating performance of firms listing on the JSE. *Investment Analysts Journal,* 37(68): 21-9.

Baker, H.K., Nofsinger, J.R. & Weaver, D.G. 2002. International cross-listing and visibility. *Journal of Financial and Quantitative Analysis,* 37(3): 495-521.

Baker, M. & Wurgler, J. 2002. Market timing and capital structure. *The Journal of Finance,* 57(1): 1-32.

Baker, S.R., Bloom, N. & Davis, S.J. 2016. Measuring economic policy uncertainty. *The Quarterly Journal of Economics,* 131(4): 1593-1636.

Balios, D., Eriotis, N., Missiakoulis, S. & Vasiliou, D. 2015. Delisted versus voluntary delisted versus remain listed: An ordered analysis. *Applied Economics Letters,* 22(1): 66-70.

Bekaert, G. & Harvey, C.R. 2000. Foreign speculators and emerging equity markets. *The Journal of Finance,* 55(2): 565-613.

Bergh, D.D., Peruffo, E., Chiu, W.T., Connelly, B. & Hitt, M.A. 2020. Market response to divestiture announcements: A screening theory perspective. *Strategic Organization,* 18(4): 547-72.

Bergman, R. 2019. Life beyond the JSE for small cap companies. *Bizcommunity*. 22 October. Available: https://www.bizcommunity.com/Article/196/516/196992.html

Bessler, W., Beyenbach, J., Rapp, M.S. & Vendrasco, M. 2023. Why do firms down-list or exit from securities markets? Evidence from the German Stock Exchange. *Review of Managerial Science,* 17(4): 1175-211.

Bessler, W., Kaen, F.R., Kurmann, P. & Zimmermann, J. 2012. The listing and delisting of German firms on NYSE and NASDAQ: Were there any benefits? *Journal of International Financial Markets, Institutions and Money,* 22(4): 1024-53.

Bradfield, D.J., Barr, G.D.I. & Affleck-Graves, J.F. 1988. Asset pricing in small markets: The South African case. *South African Journal of Business Management,* 19(1): 11-21.

Breiman, L. 2001. Random forests. *Machine Learning,* 45: 5-32.

Brennan, M.J. & Subrahmanyam, A. 1996. Market microstructure and asset pricing: On the compensation for illiquidity in stock returns. *Journal of Financial Economics,* 41(3): 441-64.

Chaplinsky, S. & Ramchand, L. 2008. *From listing to delisting: Foreign firms' entry and exit from the US*. Working Paper. Charlottesville: University of Virginia.

Chaplinsky, S. & Ramchand, L. 2012. What drives delistings of foreign firms from US Exchanges? *Journal of International Financial Markets, Institutions and Money,* 22(5): 1126-48.

Chemmanur, T.J. & Fulghieri, P. 2006. Competition and cooperation among exchanges: A theory of cross-listing and endogenous listing standards. *Journal of Financial Economics,* 82(2): 455-89.

Christie, W.G. & Huang, R.D. 1994. Market structures and liquidity: A transactions data study of exchange listings. *Journal of Financial Intermediation,* 3(3): 300-26.

Claessens, S. & Laeven, L. 2003. Financial development, property rights, and growth. *Journal of Finance,* 58(6): 2401-36.

Claessens, S. & Schmukler, S.L. 2007. International financial integration through equity markets: Which firms from which countries go global? *Journal of International Money and Finance,* 26(5): 788-813.

Coffee Jr, J.C. 2001. The rise of dispersed ownership: The roles of law and the state in the separation of ownership and control. *The Yale Law Journal,* 111: 1.

Coffee, J.C. 2003. The impact of cross-listings and stock market competition on international corporate governance. In Milhaupt, C.J. Ed. *Global Markets, Domestic Institutions: Corporate Law and Governance in a New Era of Cross-Border Deals.* New York: Columbia University Press, 437-75.

DeAngelo, H., DeAngelo, L. & Stulz, R.M. 2010. Seasoned equity offerings, market timing, and the corporate lifecycle. *Journal of Financial Economics,* 95(3): 275-95.

de la Bruslerie, H. & Caby, J. 2023. Ex-ante determinants to delist or not delist targets after an M&A. *Review of Quantitative Finance and Accounting,* 61(4): 1441-78.

Demirgüç-Kunt, A. & Levine, R. 1996. Stock market development and financial intermediaries: Stylized facts. *The World Bank Economic Review,* 10(2): 291-321.

Doidge, C., Karolyi, G.A. & Stulz, R. 2004. Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics,* 71: 205-38.

Domowitz, I., Glen, J. & Madhavan, A. 2001. Liquidity, volatility and equity trading costs across countries and over time. *International Finance,* 4(2): 221-55.

Dudley, W.C. & Hubbard, R.G. 2004. *How capital markets enhance economic performance and facilitate job creation*. Global Markets Institute, Goldman Sachs, 1-26.

Egu, M.E. & Chiloane-Tsoka, E.G. 2023. Does listing on the JSE'S Altx improve the performance of small and medium-sized enterprises? *Cogent Business & Management,* 10(3): 2282750.

Ehrmann, M. & Fratzscher, M. 2004. Taking stock: Monetary policy transmission to equity markets. *Journal of Money, Credit and Banking,* 36(4): 719-37.

Faccio, M., McConnell, J.J. & Stolin, D. 2003. *Wealth creation for acquirers of listed and unlisted targets*. Purdue CIBER Working Paper 22. Krannert Graduate School of Management. West Lafayette, IN: Purdue University.

Fang, B., Hope, O.K., Huang, Z. & Moldovan, R. 2020. The effects of MiFID II on sell-side analysts, buy-side analysts, and firms. *Review of Accounting Studies*, 25(3): 855-902.

Frank, M.Z. & Goyal, V.K. 2003. Testing the pecking order theory of capital structure. *Journal of Financial Economics*, 67(2): 217-48.

Fungáčová, Z. & Hanousek, J. 2011. Determinants of firm delisting on the Prague stock exchange. *Prague Economic Papers*, 20(4): 348-65.

Gao, X., Ritter, J.R. & Zhu, Z. 2013. Where have all the IPOs gone? *Journal of Financial and Quantitative Analysis*, 48(6): 1663-92.

Guo, Y. & Mota, L. 2021. Should information be sold separately? Evidence from MiFID II. *Journal of Financial Economics*, 142(1): 97-126.

Hastie, T., Tibshirani, R., Friedman, J. & Franklin, J. 2005. The elements of statistical learning: Data mining, inference and prediction. *The Mathematical Intelligencer,* 27(2): 83-5.

Jensen, M.C. & Meckling, W.H. 2019. Theory of the firm: Managerial behavior, agency costs and ownership structure. In Tricker, R.I. Ed. *Corporate Governance*. Gower. Pp. 77-132.

Karolyi, G.A. 1998. Why do companies list shares abroad?: A survey of the evidence and its managerial implications. *Financial Markets, Institutions & Instruments*, 7(1): 1-60.

Johannesburg Stock Exchange (JSE). 2022. *JSE Listings Review*. May 2022. Available at: https://www.jse.co.za/sites/default/files/media/documents/JSE%20Consultation%20Paper%20May%202022.pdf

Karolyi, G.A. 2006. The world of cross-listings and cross-listings of the world: Challenging conventional wisdom. *Review of Finance*, 10(1): 99-152.

Khanna, T. & Palepu, K. 2000. Emerging market business groups, foreign intermediaries, and corporate governance. In Morck, R. Ed. *Concentrated corporate ownership*. Cambridge, MA: National Bureau of Economic Research, 265-94.

Klein, E. 2005. *Stock exchanges, IPO's and Mutual Funds*. Nova Publishers.

Kurov, A. 2010. Investor sentiment and the stock market's reaction to monetary policy. *Journal of Banking & Finance*, 34(1): 139-49.

Lansdell, P., Botha, I. & Marx, B. 2025. Unmasking delistings: A multifactorial analysis of financial, non-financial, and macroeconomic variables. *Journal of Risk and Financial Management*, 18(4): 194.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, R. 2000. Investor protection and corporate governance. *Journal of Financial Economics,* 58(1-2): 3-27.

Liu, W. 2006. A liquidity-augmented capital asset pricing model. *Journal of Financial Economics*, 82(3): 631-71.

Lins, K.V., Strickland, D. & Zenner, M. 2005. Do non-US firms issue equity on US stock exchanges to relax capital constraints? *Journal of Financial and Quantitative Analysis*, 40(1): 109-33.

Lo, S.F. 2013. Which stock exchanges are more attractive? The competition analysis of listing and trading performance. *Economic Modelling*, 30: 501-9.

Macey, J., O'Hara, M. & Pompilio, D. 2008. Down and out in the stock market: The law and economics of the delisting process. *The Journal of Law and Economics*, 51(4): 683-713.

Makuvaza, L., Chamboko, R., Guvuriro, S. & Coetzee, J. 2025. The role of intermediate financial distress events and business cycles in stock market delisting: Evidence from the Johannesburg Stock Exchange. *Cogent Economics & Finance*, 13(1): 2476098.

Malik, M.N., Xinping, X. & Shabbir, R. 2014. Corporate governance and involuntary delisting: Empirical evidence from China. *International Journal of Economics and Finance*, 6(6): 247-56.

Mangena, M. & Chamisa, E. 2008. Corporate governance and incidences of listing suspension by the JSE Securities Exchange of South Africa: An empirical analysis. *The International Journal of Accounting*, 43(1): 28-44.

Martinez, I. & Serve, S. 2017. Reasons for delisting and consequences: A literature review and research agenda. *Journal of Economic Surveys*, 31(3): 733-70.

Matanga, N. & Holman, G. 2024. Adapting Altman Z-score models for early warning signals: Evidence from delisted mining stocks on the Johannesburg Stock Exchange. *Investment Analysts Journal*, 53(3): 249-61.

McKane, G. & Britten, J. 2018. Liquidity and size effects on the Johannesburg Stock Exchange (JSE). *Investment Analysts Journal*, 47(3): 229-42.

Means, G. 2017. *The modern corporation and private property*. Routledge.

Mola, S., Rau, R. & Khorana, A. 2010. *Is there life after loss of analyst coverage?* West Lafayette, IN: Purdue University, Social Science Research Network.

Moreira, M., Flach, L. & Sallaberry, J.D. 2022. Delisting das Empresas Brasileiras: Um modelo de previsão do período de 2013 a 2018. *Revista de Educação e Pesquisa em Contabilidade (REPeC)*, 16(1).

Moshirian, F., Tian, X., Zhang, B. & Zhang, W. 2021. Stock market liberalization and innovation. *Journal of Financial Economics*, 139(3): 985-1014.

Myers, S.C. & Majluf, N.S. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2): 187-221.

Nawrocki, D. & Carter, W. (2010). Industry competitiveness using Herfindahl and entropy concentration indices with firm market capitalization data. *Applied Economics*, 42(22): 2855-63.

Nikani, A. & Holland, M. 2022. Why do public companies go private? The case of the Johannesburg Stock Exchange (September 10, 2022). SSRN.

Pagano, M., Panetta, F. & Zingales, L. 1998. Why do companies go public? An empirical analysis. *The Journal of Finance*, 53(1): 27-64.

Pour, E.K. & Lasfer, M. 2013. Why do companies delist voluntarily from the stock market? *Journal of Banking & Finance*, 37(12): 4850-60.

Sanger, G.C. & Peterson, J.D. 1990. An empirical analysis of common stock delistings. *Journal of Financial and Quantitative Analysis*, 25(2): 261-72.

Salmon, F. 2024. The stock market's concentration, in one chart. *Axios.* 27 June 27. Available at: https://www.axios.com/2024/06/27/the-stock-markets-concentration-in-one-chart

Sanusi, M.S. 2018. A critical overview of the transparency and competitiveness of the London stock exchange. *Risk Governance and Control: Financial Markets and Institutions*, 8(2): 74-83.

Schneller, M.I. 1980. Taxes and the optimal capital structure of the firm. *The Journal of Finance*, 35(1): 119-27.

Schoubben, F. & Van Hulle, C. 2006. *The impact of a stock listing on the determinants of firm performance*. Working Paper AFI 0608. Leuven: KU Leuven.

Sohl, J.E. 1999. The early-stage equity market in the USA. *Venture Capital: An International Journal of Entrepreneurial Finance*, 1(2): 101-20.

Tibshirani, R. 1996. Regression shrinkage and selection via the lasso. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 58(1): 267-88.

Thomsen, S. & Vinten, F. 2007. *Delistings in Europe and the costs of governance*. SSRN.

Tobin, J. 1978. Monetary policies and the economy: The transmission mechanism. *Southern Economic Journal*, 421-31.

van Rensburg, P. & Robertson, M. 2003. Size, price-to-earnings and beta on the JSE Securities Exchange. *Investment Analysts Journal*, 32(58): 7-16. https://doi.org/10.1080/10293523.2003.11082449

Wang, J. & Zhou, H. 2014. The determinants of trading volume distribution: Evidence from globally cross-listed stocks. *Journal of Multinational Financial Management*, 25: 64-94.

Wies, S. & Moorman, C. 2015. Going public: How stock market listing changes firm innovation behavior. *Journal of Marketing Research*, 52(5): 694-709.

Witmer, J.L. 2006. *Why do firms cross-(de) list? An examination of the determinants and effects of cross-delisting*. SSRN.

World Federation of Exchanges. 2024. About us. Accessed 31 July 2024: https://www.world-exchanges.org/about

11 APPENDIX: LOGIT MODEL RESULTS

To verify the robustness of the determinants of delisting identified in the probit specification, we next estimate a logit regression model using the same set of explanatory variables. While both the probit and logit models are appropriate for binary dependent variables and yield qualitatively similar results in many applications, the logit specification offers an alternative functional form for the distribution of the error term, assuming a logistic rather than a normal cumulative distribution. This allows us to assess whether the findings are sensitive to distributional assumptions and to test the stability of the estimated marginal effects. By comparing results across both models, we strengthen the empirical credibility of the analysis and mitigate concerns related to model-specific findings.

Table A1: Determinants of delisting from JSE, logit estimates: 2002 – 2024

DV: Listed = 0, Delisting = 1	
Variable	**Estimate**
Market capitalisation (size)	-0.087*
Return on assets (ROA)	-0.084**
Debt/Equity	-0.073**
Firm age	-0.192**
Dividend yield	-0.001
Price/Earnings	-0.007*
Price/Book	-0.001
Turnover by volume	-0.023
SA GDP growth	-0.53**
SA inflation	0.085
SA interest rate	0.066
USD/ZAR exchange rate	-0.328***
SA business confidence	0.516
SA policy uncertainty	0.507
US GDP growth	0.533***
US yield curve level	0.068
US yield curve slope	-0.3***

*Notes: Coefficient estimates are from probit regressions of delisting on firm-level and macroeconomic variables. Robust standard errors are used. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.*

The logit regression results offer complementary insights into the determinants of firm delistings, particularly by emphasising the magnitude of relationships and directional consistency across specification. While several variables retain similar signs to the probit model, the strength and significance of effects in the logit model yield further interpretive nuance.

A striking feature of the logit model is the sharper coefficient estimates for key macroeconomic drivers. For example, South African GDP growth exerts a strong dampening effect on delisting probability, with an estimate of -0.530 and a p-value of 0.020. The large magnitude of this coefficient underscores the pivotal role of the domestic macro environment: during periods of robust growth, firms appear considerably less likely to exit the exchange. Unlike the probit model where this effect is modest, the logit results suggest a more elastic relationship between national output and listing persistence.

Similarly, the effect of the USD/ZAR exchange rate is both economically and statistically significant. A stronger rand (lower USD/ZAR) is associated with a sharp decline in delisting risk (coefficient = -0.328, $p < 0.001$), reinforcing the notion that foreign exchange movements reflect both investor sentiment and capital market attractiveness. Importantly, this result is not merely statistically precise, but large in economic terms, suggesting that exchange rate stability may serve as a proxy for broader macro-financial health.

The slope of the US yield curve remains significant (coefficient = -0.300, $p = 0.009$), again suggesting that global monetary signals influence domestic listing decisions. However, the logit estimate highlights a greater sensitivity to global yield dynamics than initially observed in the probit results. The yield curve's predictive power in explaining delisting behaviour may relate to global credit availability, interest rate expectations, or investor allocation across risk classes.

Turning to firm-level fundamentals, firm age exerts a meaningful and statistically significant effect (coefficient = -0.192, $p = 0.033$) but is now more economically pronounced. This suggests that longevity not only reflects maturity and reputational capital but may also confer structural advantages in sustaining public market participation, such as established investor relations, legacy access to capital, or cumulative compliance experience.

Profitability, proxied by return on assets, remains significant (coefficient = -0.084, p = 0.049), but the logit model reveals a steeper decline in delisting probability per unit of ROA. This reinforces the interpretation that firm performance is not merely a marker of current viability but may shape strategic decisions about listing status, especially where retained earnings enable self-financing or where profitability supports investor pressure for continued transparency.

A noteworthy distinction from the probit model is the significance of the debt-to-equity ratio in the logit specification (coefficient = -0.073, p = 0.045). This result suggests that more leveraged firms, contrary to conventional distress narratives, are less likely to delist. The broader interpretation may relate to debt discipline: high leverage could reflect deliberate financial engineering, backed by active capital market engagement and creditor oversight, both of which may incentivise firms to remain listed.

US GDP growth also enters positively and significantly (coefficient = 0.533, p = 0.011), suggesting that improvements in global growth heighten delisting risk. This may point to "push factors" in the global economy, where strong offshore conditions raise the opportunity cost of maintaining a listing in a relatively illiquid or smaller market.

Other variables such as market capitalisation (coefficient = -0.087, p = 0.096) and the price-to-earnings ratio (coefficient = -0.007, p = 0.097) are marginally significant, and consistent in direction with prior models. However, the logit formulation suggests somewhat more elastic relationships, particularly with respect to firm size. Larger firms may derive greater reputational value from listing or may face higher indirect costs from delisting due to shareholder dispersion or regulatory scrutiny.

Variables such as dividend yield, turnover, inflation, and local sentiment proxies (interest rates, business confidence, and policy uncertainty) remain statistically insignificant. This reinforces the inference that transient cash flow measures and short-term macro sentiment may play a limited role in long-horizon decisions such as delisting.

Overall, the logit model highlights a more pronounced sensitivity of delisting behaviour to both firm fundamentals and macro-financial signals. It reveals that while the directionality of effects aligns with the probit results, the strength and statistical significance of several key variables, particularly leverage, exchange rates, and global growth, are accentuated.

Table A2: Logit – average marginal effects (AMEs) results

Variable	Average Marginal Effect
Dividend yield	-0.0
Debt/Equity	-0.002**
Return on assets (ROA)	-0.002**
SA business confidence (RMB/BER BCI)	0.015
Firm age	-0.006**
Market capitalisation (size)	-0.002*
Turnover by volume	-0.001
Price/Book	0.0
Price/Earnings	-0.0
SA inflation	0.002
SA interest rate	0.002
SA GDP growth	-0.015**
USD/ZAR exchange rate	-0.01***
US yield curve level	0.002
US GDP growth	0.016**
US yield curve slope	-0.009***
SA policy uncertainty	0.015

*Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.*

Figure A1: Average marginal effects of firm-level and macroeconomic variables on the probability of delisting (logit model, 2002 – 2024)

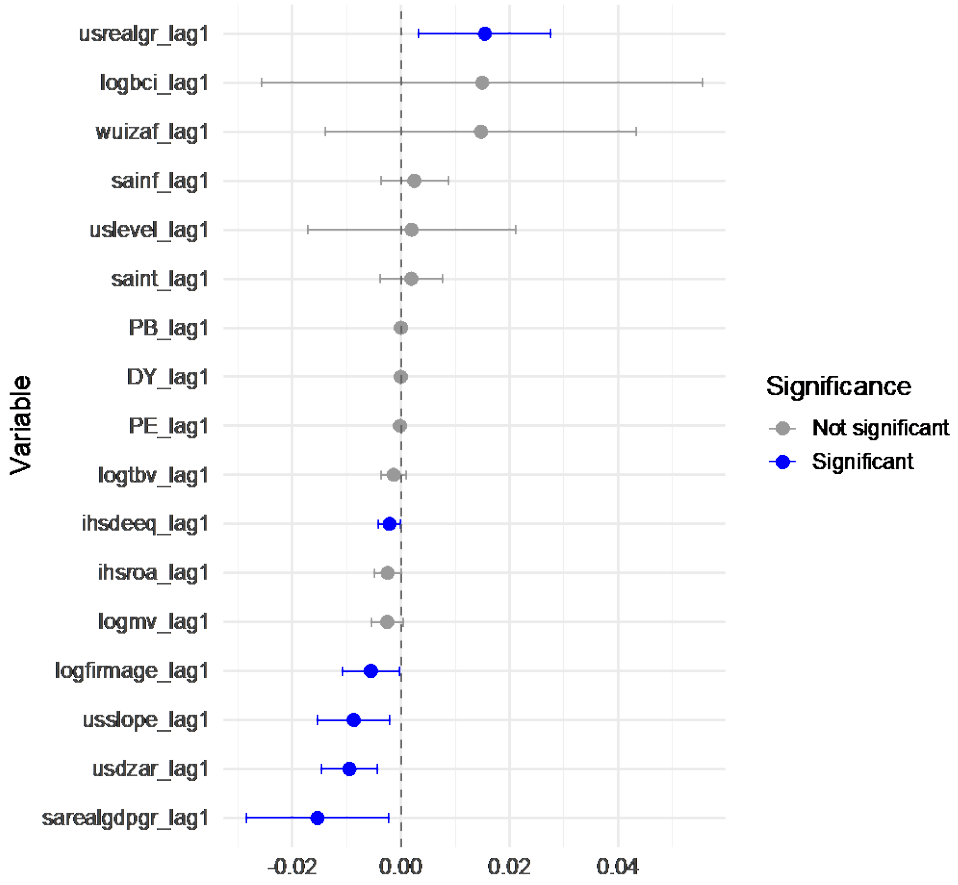


Figure A1 presents the average marginal effects derived from the logit model. These estimates reflect the change in the probability of delisting associated with a one-unit increase in each explanatory variable, holding all other factors constant. The associated z-statistics and confidence intervals allow for inference regarding statistical significance.

The logit results reaffirm several findings from the probit model while also offering subtle distinctions in magnitude and precision. The most robust and consistent finding across specifications is the role of global macroeconomic conditions. US GDP growth remains positively and significantly associated with delisting likelihood (AME = 0.016, p = 0.013), consistent with the hypothesis that improved growth in the United States may redirect capital or strategic attention away from emerging markets like South Africa following a flight-to-safety or risk-off notion. This is mirrored by a significant negative AME on the US yield curve slope (AME = -0.009, p = 0.010), reinforcing the interpretation that a flattening curve, often a

harbinger of weaker global growth, reduces delisting propensity as firms seek to preserve capital market access in an uncertain macroeconomic environment.

Exchange rate dynamics once again emerge as a key determinant. A stronger rand, indicated by a negative coefficient on the USD/ZAR exchange rate, significantly reduces delisting likelihood (AME = -0.010, $p < 0.001$). This effect is both economically and statistically stronger than in the probit model, reinforcing the conclusion that currency strength materially supports continued listing, potentially through enhanced investor confidence, more favourable import pricing, and diminished capital flight risk.

On the domestic front, South African GDP growth continues to play a stabilising role (AME = -0.015, $p = 0.022$), suggesting that improved domestic economic conditions lower the probability of delisting. This finding is highly consistent across both model specifications, underscoring the importance of macroeconomic fundamentals in supporting public market participation.

Turning to firm-specific characteristics, firm age is again statistically significant and negative (AME = -0.006, $p = 0.035$), with similar magnitude and interpretation to the probit model: older firms are more embedded in the capital market architecture and less inclined to exit. Interestingly, both return on assets (AME = -0.002, $p = 0.050$) and the debt-to-equity ratio (AME = -0.002, $p = 0.047$) reach statistical significance in the logit specification. While these variables were only borderline significant in the probit model, the logit results provide stronger evidence that higher profitability and greater leverage reduce the probability of delisting. These findings likely reflect better access to capital and more disciplined financial management among listed firms with healthier performance metrics.

Market capitalisation again carries a negative marginal effect (AME = -0.002, $p = 0.098$), though slightly weaker in statistical significance than in the probit model. The result continues to support the view that larger firms benefit from listing economies and are less likely to exit the exchange. Other firm-level indicators such as turnover by volume, price-to-book ratio, dividend yield, and the price-to-earnings ratio remain statistically insignificant.

The visualisation in Figure A1 graphically illustrates the AME estimates and their confidence intervals, with statistically significant variables highlighted. Notably, the blue-coloured markers underscore the same key drivers: US GDP growth, the slope of the US yield curve, the

exchange rate, firm age, profitability, and leverage. The relative positions and spreads of the confidence intervals confirm the greater precision of these estimates compared to others.

Finally, sentiment-based indicators, including the South African Business Confidence Index and the South African Economic Policy Uncertainty Index, do not exhibit statistically significant effects. However, their signs are consistent with theory, with higher confidence marginally reducing delisting risk and greater uncertainty increasing it.

In sum, the logit AME analysis validates many of the insights gleaned from the probit model, while providing stronger evidence of the importance of firm fundamentals, global conditions, and currency strength. The consistency of results across specifications supports the robustness of the underlying economic mechanisms, and the enhanced significance of certain covariates in the logit model strengthens the case for their policy and strategic relevance in understanding delisting behaviour on the JSE.