

Voluntary and Involuntary Delisting – Implications for Shareholder Wealth on the Johannesburg Stock Exchange

By

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DECLARATION

I, Itumeleng Mekwa, declare that this thesis is my work except where otherwise indicated and acknowledged. It is submitted to fulfil the Doctor of Philosophy degree requirement in the University of the Witwatersrand, Johannesburg. This thesis has not been submitted before for any degree or examination in any other academic institution.

Signature of candidate: 

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ABSTRACT

The delisting of stocks from major stock exchanges has been a focal point of academic and practitioner research due to its significant implications on market dynamics and investor wealth. Companies may opt to delist voluntarily to pursue private strategies or be involuntarily delisted for failing to meet regulatory requirements. The dichotomy between voluntary and involuntary delisting has generated extensive debate regarding the underlying drivers and the consequent impact on the value of assets traded. Despite a substantial body of literature on this subject, there is a notable scarcity of research focused on a major stock market such as the Johannesburg Stock Exchange (JSE). This thesis aims to fill this gap by examining the wealth effects of delisting events and identifying the determinants of delisting on the JSE. The event study methodology and logistic regression analysis is utilised for the study. The sample comprises 92 companies delisted from the JSE, encompassing voluntary and involuntary delistings. The findings reveal that delisting events generally result in significant negative impacts on shareholder wealth. Contrary to previous studies, voluntary delisting events do not demonstrate significant abnormal returns, suggesting market efficiency. Involuntary delisting events also fail to show significant abnormal returns, which may be attributed to informed investor behaviour. The sector-specific analysis highlights that the Consumer Non-Cyclical and Industrial sectors are particularly adversely affected by voluntary delistings, while the Technology sector experiences negative impacts from involuntary delistings. Regarding delisting determinants, cash flows emerge as a significant factor influencing overall delisting decisions, while growth prospects are particularly relevant for involuntary delistings. The study acknowledges limitations, including a relatively small sample size and the exclusion of specific contextual factors, and suggests avenues for further research. Based on the findings, policy recommendations are proposed to mitigate the negative impacts of delisting. These recommendations aim to benefit individual investors, companies, regulators, and financial advisors. Overall, this thesis contributes to a deeper understanding of the wealth effects of delisting events and the determinants of delisting decisions on the JSE, offering valuable insights for scholars and practitioners in financial markets.

Keywords: Involuntary delisting; Voluntary delisting; Johannesburg Stock Exchange (JSE); Event study; Logistic regression; Mergers and Acquisitions (M&A).

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LIST OF ABBREVIATIONS/ACRONYMS

AAR	Average abnormal return
APT	Asset pricing theories
BRVM	Bourse Régionale des Valeurs Mobilières
BVMAC	Bourse des Valeurs Mobilières de l'Afrique Centrale
CAAR	Cumulative average abnormal return
CAPM	Capital asset pricing model
CAR	Cumulative abnormal return
EESE	Equity Express Securities Exchange
FDI	Foreign direct investment
GDP	Gross Domestic Products
IBO	Institutional buyout
IMF	International Monetary Fund
IPO	Initial Public Offering
JSE	Johannesburg Securities Exchange
LBO	Leveraged Buyout
LPM	Linear Probability Model
M&A	Mergers and Acquisitions
MBI	Management Buy-in
MBO	Management buyout
NCA	National Credit Act
NPE	Non-practising entity
NYSE	New York Stock Exchange
OLS	Ordinal least square
OTC	Over the counter
PTP	Public-to--Private
RDD	Regression discontinuity design
ROE	Return on Investment
SARB	South African Reserve Bank
SEC	Securities Exchange Commission
SENS	Stock Exchange News Service

SME	Small and Medium-Sized Enterprise
SOX	Surbane-Oxley Act
TSX	Toronto Stock Exchange
UK	United Kingdom
USA	United States of America
ZSE	Zimbabwe Stock Exchange

CHAPTER 1: INTRODUCTION

1.1 Research background

The Johannesburg Stock Exchange (JSE) is the largest stock exchange in Africa and ranks among the top 20 globally in terms of market capitalization (JSE, 2023). As a regulated stock exchange, the JSE plays a crucial role in facilitating the trading of securities and enabling companies to raise funds. Listing on the JSE provides numerous benefits for companies, including access to capital, liquidity, growth prospects, the ability to attract executives through stock options, and increased shareholder confidence in management (Kim *et al.*, 2021; Feldman, 2018).

However, in recent decades, there has been a significant increase in the number of delistings across stock exchanges worldwide (Doidge, Karolyi & Stulz, 2015; Gao, Ritter & Zhu, 2012; Grullon, Larkin & Michaely, 2015). Delisting refers to the removal of a listed entity from a stock exchange, either voluntarily or involuntarily (Martinez & Serve, 2017). While voluntary delistings can be advantageous for investors, involuntary delistings can have disruptive and negative consequences. Stock exchanges often delist companies involuntarily to protect their reputation and when a company violates listing requirements (Chen & Schoderbek, 1999; Sanger & Peterson, 1990; Čornanič & Novák, 2015; Martinez & Serve, 2013).

The JSE has also experienced a decline in the number of listed companies over the years. Between 1998 and 2004, the number of listed companies on the JSE decreased significantly from 669 to 396 (Tarrant, 2017). This trend has continued, with the number of JSE listings decreasing from 402 to 315 between 2012 and April 2022, representing a decline of 28% (Shiba, 2022). Delistings on the JSE have outpaced new listings, with 14 delistings reported as of June 2023 (Janse van Rensburg, 2023). The reasons for delisting on the JSE range from strategic decisions, regulatory changes, mergers and acquisitions, financial distress, non-compliance with exchange rules, to global and domestic economic factors (Shiba, 2022).

Understanding the impact of delistings on shareholder wealth is crucial for investors, companies, and regulators. The extent to which delistings affect shareholder value can guide effective management of the delisting process and its implications. Additionally, analysing the sector-specific impact of delistings can provide insights into industry-

specific factors that influence shareholder wealth. Furthermore, identifying the factors that drive delistings on the JSE can help safeguard investor interests. Therefore, this study aimed to quantify the overall and sector-specific wealth effect of delistings on shareholders and identify the determinants of delisting on the JSE.

To achieve these objectives, this study employed the short-term event study methodology to analyse the movement of share prices following delisting events. Logistic regression analysis was also utilised to determine the factors that drive delisting, using company-specific performance measures such as gearing, free-cash flows, growth prospects, and profitability.

While numerous studies have examined various aspects of delisting phenomena in advanced stock exchanges like the United States of America (USA) and the United Kingdom (UK), there is a lack of literature on delisting in the African context. The limited research on delisting in Africa can be attributed to factors such as the underdeveloped and illiquid nature of most African stock exchanges, limited data availability, and constraints faced by African scholars (Kumwenda *et al.*, 2017). Therefore, this study sought to contribute to the existing literature by examining delisting trends and their implications on the JSE, the largest stock exchange in Africa.

In conclusion, this study aimed to provide valuable insights into the wealth effect of delistings on shareholders and identify the factors that drive delisting on the JSE. By understanding the impact and determinants of delisting, investors, companies, and regulators can make informed decisions and take appropriate measures to protect shareholder interests and ensure the stability and growth of the South African capital market.

1.2 Problem statement

This study investigated the factors that cause voluntary and involuntary delisting of firms at the JSE in order to estimate the overall and sector-specific shareholders' wealth effect on shareholders. A number of researchers are in unison, generally noting that delisting of firms has adverse effects on the wealth of shareholders of those (delisted) entities and, ultimately, the national economy of South Africa. Whilst that finding is true in general terms, little research exists that demonstrates the effect of delisting in the JSE. There is therefore a lack of understanding of the overall impact of

delisting in the JSE, especially in respect of sector-specific shareholders' wealth effects of delisting and regarding the determinants driving the delisting decisions on the JSE. This knowledge gap necessarily calls for an in-depth analysis of the overall and sector-specific wealth effects experienced by shareholders because of delisting, while also examining the determinants that result in companies delisting on the JSE.

Research shows that involuntary delisting is an unsettling occurrence for stakeholders as it has many negative consequences. Not only does the delisted company lose access to a vital source of funding, but investors also lose a significant amount of wealth (Angel *et al.*, 2004; Park *et al.*, 2014; Sanger & Peterson, 1990; Shumway, 1997). Involuntary delisting usually leads to negative abnormal returns (Dasilas, Grose & Spyridis, 2017; Park *et al.*, 2018), a decline in firm value (Baker & Kennedy, 2002; Park *et al.*, 2014), liquidity constraints for the delisted company (Angel *et al.*, 2004; Macey, O'Hara & Pompilio, 2008), liquidity constraints for the stock exchange (Muyeche, 2014) as the stock exchanges forego significant amounts of trading revenue (Čornanič & Novák, 2015). Indeed, negative consequences are widespread, affect the general economy, and intensify industry concentration (Sarkissian & Wang, 2014). Moreover, the threat of involuntary delisting may elicit fraudulent behaviour by managers who might decide to manipulate the company's earnings for the company to remain as a listed entity (Campbell, Knowles & Martin, 2014; Cheng, Aerts & Jorissen, 2010; Čornanič & Novák, 2015; Li *et al.*, 2006; Zhou *et al.*, 2018). Delisting also deprives the economy of an economic agent that would have made it more competitive and possibly more productive and created jobs (Bakke, Jens & Whited, 2012). All these cited authors conducted their research in the context of various capital markets in South Africa (JSE), thus augmenting the fact that there is limited knowledge on the impact of delisting on the JSE, and this study is plugging such gap.

The study of the impact of delisting on shareholders was warranted given the fact that literature review noted some inconsistencies. For example, some empirical studies on voluntary delisting indicate that such delisting leads to value creation (Andres, Betzer & Weir, 2007; Boubaker, Cellier & Rouatbi, 2014), while other studies reflect value destruction (Leuz, Triantis & Yue, 2008; Marosi & Massoud, 2007). Marosi and Massoud (2007) found evidence that voluntarily delisted companies destroy shareholders' wealth, as cumulative abnormal returns (0, +1) within the event window are -10.99%. Leuz *et al.* (2008) found evidence that the market reacts negatively

(cumulative abnormal returns recorded within the event window (-20, +20) are -7.6 %) to a company voluntarily delisting because they perceive the deregistration by the company as a mechanism for managers to hide poor performance, as well as a strategy by managers and large equity holders to avoid outside scrutiny that comes with being compliant with stock market reporting. These inconsistencies are evident in varied bourses. There is no study that has been conducted to test these inconsistent assertions and research conclusions on the JSE, hence the relevance of this doctoral study.

In the same vein, there is a lack of literature on the sector-specific wealth effect of shareholders; industry-specific factors such as regulatory change and harsh market conditions can result in delisting, for example, commodities fluctuations (which affected mining companies negatively) and the global financial crisis (which reduced demand for South Africa's exports, particularly commodities), the eurozone debt crisis (which also impact on South Africa's exports) and the slowdown on China's GDP growth (which reduced the demand on South Affrica's export and also resulted in a decline in commodity prices) had an adverse impact on several sector on the JSE, resulting in delistings. Such events also resulted in capital flight as international investors' risk appetite declined. Since other industries are defensive and non-cyclical, such global events do not significantly impact on the delisting decision. Nonetheless, it is vital to investigate the sector-specific wealth effect of delistings on shareholders.

Understanding factors that determine delisting is important to industry players as well as investors. Growth prospects of a listed entity are an important determinant of a firm's delisting decision (Boehmer & Ljungqvist, 2004; Kang & Ang, 2017). In this regard, research indicates that firms with fewer growth prospects are likely to delist (Marosi & Massoud, 2007; Pour & Lasfer, 2013). Similarly, Trang's (2018) study confirms that profitable firms are unlikely to delist. Additionally, Chaplinsky and Ramchand (2008) and Edelman *et al.* (1990) argue that the lower the profitability of the firm, the higher the probability that a firm delists voluntarily. Companies that are highly geared delist (Algebaly *et al.*, 2014; Marosi & Massoud, 2007; Martinez & Serve, 2011; Pour & Lasfer, 2013; Trang 2018; Tutino, Panetta & Laghi, 2013). Scholars found share liquidity to be one of the critical determinants of delisting (Bortolon & Da Silva, 2015; Kang & Ang, 2017). Again, there are no empirical studies that show motivations of companies delisting from the JSE, and this study sought to fill this gap.

Despite empirical evidence, particularly from the USA and Japan, regarding the wealth effect of delisting on shareholders' wealth, such evidence on this subject is non-existent in South Africa. To fill this void, the current study investigated the impact of voluntary and involuntary delisting on shareholders' wealth and factors that determine delistings. Furthermore, the study also investigated the effects of voluntary and involuntary delisting on shareholders' wealth across various sectors; there is a lack of empirical evidence on this subject matter. Thus, this study will also fill this gap. Concerning the determinants of delisting, there is empirical evidence from Egypt, Nigeria, Zimbabwe, Europe, North and South America, while in the South African context, there is no study that the authors know of; thus, this study will fill this void.

Delistings from the bourse has significant implications for shareholders, as highlighted in the preceding discussion. Still, there is a gap in understanding the specific wealth effect on a broader scale and within specific sectors on the JSE. In addition, there is a lack of studies on the JSE concerning factors that determine delistings.

Understanding the overall and sector-specific wealth effect of delisting is crucial to assessing the financial impact on shareholders. At the same time, identifying factors that are driving companies to delist will provide insight into the firm's financial performance. Therefore the problem statement focused on investigating the overall and sector-specific wealth effect of delisting on shareholders and determining the factors driving companies' decisions to delist. The research covered delisting on the JSE within various sectors. The expected outcomes of the study included understanding the overall wealth effect experienced by shareholders because of delisting, gaining insight into sector-specific wealth effects on shareholders within different industries, identification of crucial company financial performance indicators that drive firms to delist, and potential recommendations for shareholders, companies, and regulators based on the study findings.

The limitation of the study includes the lack of data and limitations in capturing the full range of determinants.

The research is significant as it provides a comprehensive understanding of the overall and sector-specific wealth effect of delisting on shareholders, providing insight into the

financial implications of delisting events. Identifying the determinants driving companies to delist can offer investors, regulators, and market participants valuable insights. The findings can inform investment, regulatory, and corporate decisions, ultimately contributing to a better understanding of the dynamics and implications of delisting. Therefore, this doctoral study contributes new knowledge while simultaneously being relevant in the industry.

1.3 Research questions

- i. What is the relationship between the wealth effect of firms that involuntarily delist and those that delist voluntarily?
- ii. To what extent does delisting affect the sectoral performance of stocks in South Africa?
- iii. What explains voluntary and involuntary delisting on the Johannesburg Stock Exchange?

1.4 Research objectives

- i. To investigate the presence of asymmetric wealth effect of shareholders in firms that delist involuntarily and those that delist voluntarily.
- ii. To empirically measure the differential impact on various sectors due to voluntary and involuntary delisting.
- iii. To identify the determinants of both voluntary and involuntary delisting.

1.5 Justification and significance of the study

In finance, understanding the overall and sector-specific shareholders' wealth effects of delisting and identifying delisting determinants holds importance for investors, companies, and policymakers. Furthermore, the impact of delisting is profound for shareholders' wealth and financial market dynamics, thus highlighting the importance of identifying factors determining delisting on the JSE. This study sought to provide valuable insight to key stakeholders (investors, companies, and policymakers).

The overall and sector-specific shareholder's wealth effects of delisting, as well as determinants of delisting, directly affect investors' financial positions and investment decisions. Investigating the overall and sector-specific shareholders' wealth effects of delisting, as well as determinants of delisting, provides investors with the upper hand

to put in place measures to deal with potential risks that might emerge following a delisting event, and it also aids the investors to have a thorough understanding of returns associated with delisted stocks. The implications of this are that investors will be able to make well-informed investment decisions and will have the required knowledge to effectively manage their investment portfolios accordingly.

Delisting outcomes are crucial for companies as they affect their strategic direction, financial structure, and investor relations. Insight into the overall and sector-specific shareholders' wealth effects of delisting as well as determinants of delistings can assist companies in evaluating the possible impact on shareholders' wealth and formulating suitable measures to lessen any adverse consequences. This study presents companies with the prospect of making knowledgeable decisions regarding their listing status, considering the long-term financial implications for their investors.

This study is vital to regulators as they oversee the functioning of the bourse and play a pivotal role in protecting investors' interests. Knowing the overall and sector-specific shareholders' wealth effects of delisting as well as the determinants of delisting, enables regulators to formulate efficient guiding principles that safeguard market transparency, fairness, and investor protection. Additionally, this study will help regulators to enhance the bourse regulatory framework, contributing to the financial market's overall stability and integrity.

Academics will benefit from this study as it lays the foundation for further research on delisting in the context of the South African financial markets and will help to provide insight into the delisting phenomenon. Furthermore, this study will fill the gap in existing literature on delisting.

Overall, the magnitude of the study is critical for investors, companies, market regulators, and the academic community. The findings of this research have the potential to result in informed investment decisions and contribute to the overall stability and efficiency of financial markets.

1.6 Theoretical framework

This study used a number of theoretical constructs to underpin this thesis on a firm academic foundation. A theoretical framework is a blueprint for an academic output.

Grant and Osanloo (2014) define a theoretical framework as a base or an anchor on which the entire academic edifice rests. Grant and Osanloo (2014:12) maintain that theoretical framework

is the foundation from which all knowledge is constructed (metaphorically and literally) for a research study. It serves as the structure and support for the rationale for the study, the problem statement, the purpose, the significance, and research questions. The theoretical framework provides a grounding base, or an anchor, for the literature review, and most importantly, the methods and analysis.

This suggests that the theoretical framework is the epicentre and philosophical underpinning of the research being carried out. Park, Konge and Artino (2020) add another perspective to understanding framework, noting that it is a concept that when applied to research, assists academics, knowledge workers and readers to understand the world or a phenomenon pertaining to human behaviour. That said, theoretical concepts on which this study anchors follow below, beginning with going public theories, followed by others such as shareholder maximisation theory, and the agency theory creation.

1.6.1 Going public theories

Going public theories are largely based on the trade-off between costs and benefits associated with the listing. Firms generally delist when the costs of listing exceed the benefits. The latter is true for firms that decide to remain listed. The theories outlined in this section of the paper highlight the impact of going public on the delisting decisions using the general framework provided by Sreedhar and Dittmar (2010). We classify the going public theories into four categories: access to capital, liquidity, adverse selection and information asymmetry, agency and free cash flow. Furthermore, given that going public theories do not focus on involuntary delisting, we conclude this subsection by providing insight into involuntary delisting.

1.6.1.1 Access to capital

High-growth firms usually list to fund their growth prospects as these firms might have limited access to capital due to their high gearing (Mayur & Kumar, 2006). Listing such companies provides an alternative source of funding in the form of equity. Usually, a listing is a crucial stage in a firm's life cycle as it represents growth. Firms in their growth phase with numerous investment opportunities but constrained in undertaking the

opportunities at hand due to limited capital access usually opt to list. According to Kim and Weisbach (2005), matured firms with fewer growth prospects have a higher probability of delisting. A firm's growth prospects are essential in the delisting decision (Boehmer & Ljungqvist, 2004; Kang & Ang, 2017). As already mentioned, firms with fewer growth prospects are likely to delist (Pour & Lasfer, 2013). Thomsen and Vinten (2006) argue that high-growth firms find it advantageous to remain listed as this aids them in funding their future expansions. However, low-growth firms opt to delist from the exchange to reduce listing costs. The profitability of a firm plays a pivotal role in the firm's decision to delist. Trang (2018) found evidence that Vietnamese firms that are profitable are unlikely to delist. We believe that a firm will voluntarily delist when it is not profitable, as it would have to continue to pay substantial listing fees. Chaplinsky and Ramchand (2008) and Edelman *et al.* (1990) argue that the lower the profitability of the firm, the higher the probability that a firm will delist involuntarily.

A firm has an incentive to list if it will benefit from the low cost of capital relative to it being a private company. In the same notion of gaining access to capital, as a listed firm it is also expected that the cost of capital should be cheaper, maximising the firm's value. This view is well entrenched in the pioneering paper by Modigliani and Miller (1963). According to Bharath and Dittmar (2010), a firm is likely to delist when its cost of capital increases (i.e. due to increased information production costs or lower liquidity). Firms that acquire substantial debt while listed are likely to delist as they might struggle to raise additional funding via equity.

Gearing is an important factor determining a firm's decision to delist (Marosi & Massoud, 2007; Pour & Lasfer, 2013). Firms that delist are usually highly geared (Algebaly *et al.*, 2014; Tutino *et al.*, 2013). Leslie and Yanthi (2013) argue that there is a positive relationship between gearing and the probability of delisting, meaning that highly geared companies are likely to default on their debt obligations which result in a delisting.

1.6.1.2 Liquidity

A study by Amihud and Mendelson (1988) was one of the earliest studies that highlighted the importance of liquidity in the life of a listed firm. Several scholars support this notion; Thomsen and Vinten's (2014) study confirmed that liquidity is one

of the key drivers which induces a firm to list. Fidanza *et al.* (2018) describe liquidity as how a listed company's shares can be traded quickly at a low cost.

According to Zingales (1995), being a listed entity is only beneficial if the listed firm manages to maintain its initial market price (value) established at the IPO. This simply suggests that liquidity is one of the reasons why firms list. Bharath and Dittmar (2010) state that trading on the stock exchange is relatively cheaper than bilateral trades and that trading volumes signal liquidity. Illiquid stocks are not easily tradeable; in turn, this simply suggests that they might have to be priced at a massive discount for such stocks to be traded by market players. This will erode the benefits that are supposed to accrue to a listed entity, thus making it unattractive for such firms to remain listed. Thomsen and Vinten (2014) argue that a firm voluntarily delists if the stock market in question is illiquid, its shares are less traded. Its shareholders are highly concentrated (meaning there will be a less free float).

1.6.1.3 Agency theory and Free Cash Flow theory

Jensen developed the free cash flow theory in 1986, emanating from the Agency theory developed by Jensen and Meckling (1976). The free cash flow theory explains why firms might go private. According to Jensen (1986), free cash flows are excess cash flows that remain after firms have made investments in positive net present value projects. Additionally, the managers (agents) control these cash flows as they have no current obligation. Free cash flows usually have the potential to ignite agency problems. There might be a difference of opinion on the utilisation of free cash flows by agents (managers) and principals (shareholders) that fosters agency problems. For example, the principals might prefer the agent to declare dividends. The principal might prefer to use the free cash flows inefficiently and not in the principal's interest. The principal-agent problem that arises from free cash flows might result in the principal opting for a firm to go private to resolve the principal-agent problem. Delisting via leverage buyouts is optimal for listed entities with high free cash flows. According to Jensen (1986), the substantial debt materialised from the LBO transaction will align the agent's and principal's interests. In such circumstances, the high debt will resolve the principal and agent problem, Renneboog, Simons and Wright (2007) did not find evidence that UK firms decide to delist due to principal-agency problems. Aslan and Kumar (2011) found evidence that UK firms delist to avoid agency problems. This was also the case in the US (Hamid & Perstiani, 2010).

1.6.1.4 Adverse selection and information asymmetry

In instances where the buyer of an equity stake in a firm that is likely to list is less informed (owing to information asymmetry) about the fair value of firm in question than the seller as a result of the information asymmetry, concerns might arise for the potential buyers as they might have believed that they are buying a lemon; in turn, this could impact adversely on the price (initially and during the firm's life). The old shareholders will sell the firm's equity stake. According to Bharath and Dittmar (2010) and Sreedhar and Dittmar (2010), adverse selection costs are severe for young small firms with low visibility (low analyst coverage and the lack of intuitional ownership) and high ownership concentration. Such firms are likely to delist to mitigate adverse selection costs. In conclusion, Raffaelli (2015) states that adverse selection costs have the implications of the undervaluation of shares of a listed entity due to asymmetric information, thus incentivising a public firm to delist (Raffaelli, 2015).

1.6.2 Shareholder's Wealth Maximisation Theories

This section follows the same framework adopted by Hecking (2002) to describe and highlight some of the financial theories that could enhance shareholders' wealth. All the theories covered are consistent on particular business objectives, namely that managers must take decisions that align with the shareholders' interests, such as shareholder value maximisation, including the aiding of investors in selecting stocks that earn adequate returns. This section of the study thus starts by discussing the agency theory, followed by the option pricing theory, signalling theory, immunisation theory, and asset pricing theory. Understanding various shareholders' wealth maximisation theories provides insight on how wealth for shareholders can be created and destroyed. Since our study is concerned with the wealth effect of shareholders, it is crucial to understand wealth maximisation theories, as our research questions relate to how delistings impact on the wealth effect of shareholders.

1.6.2.1 Agency theory (Jensen & Meckling, 1976)

Agency theory describes how to align the principal's interests (shareholders) and the agent's (firm's executives) to maximise the shareholder's wealth (Fontrodona & Sison, 2006). Since the principal hires the agent to act on their behalf to maximise their wealth, there might be instances whereby the agent might not act in the principal's interest. A

principal-agency problem usually arises when the agent does not act in the principal's interest, which would typically result in the erosion of wealth for the principal. The theory proposes that the agents should be adequately incentivised to resolve the principal agency problems. The incentives (remuneration system) that the agent would receive should align the agent's and the principal's interest (Jensen & Meckling, 1976). With the alignment of interests between both parties, the assumption is that the agent would look to maximise the principal's wealth.

1.6.2.2 Option pricing and maximum

The option pricing model developed by Black and Scholes (1973) helps managers/executives to maximise shareholders' wealth. It provides fundamental tools to assess and select investments that would generate wealth for shareholders. Black and Scholes's (1973) model is a pricing tool used for financial instruments, and it is predominantly used for the valuation of stock options with the primary aim of determining the fair value of stock options. Using the pricing tool does help financial players to decide on different hedging strategies to minimise financial loss and the generation of wealth for shareholders (Stulz, 2013). The pricing tool also allows managers to decide when to exercise their call or put option, whether to hold, or European call, or put options. A call option is the right to sell an underlying asset (for example stocks, bonds, commodities) at a specific price and time period. The buyer of a call option generates profit when the underlying assets appreciate in value. The put option is the right to sell the underlying asset at an outlined price and on or prior to its expiration. With the put option holders make a profit when the underlying asset depreciates in value. An American option can be exercised at any time, while the European option can only be exercised at maturity.

1.6.2.3 Signalling theory

The signalling theory developed by Ross (1977) indicates that gearing can be used as an effective tool to signal good and bad firms. One key component of the signalling theory is that there is an assumption that information is not equally available between managers and investors simultaneously and that information asymmetry is the result. The signalling theory dictates that managers' financial decisions can signal to the investors about the company's current state. This can enhance the shareholder's wealth if the market deems the signal to be positive for the company's future prospects.

Ross (1977) argues that within the context of prevailing information asymmetry between management and investors, signals from firms are crucial to obtain financial resources, especially for investors. The key assumption of the signalling theory developed by Ross (1977) is that managers as insiders are more informed than investors about the firm's true value. Ross (1977) states that higher gearing is a good signal to investors as it indicates an optimistic future for a firm, and that highly geared firms are good firms as they are not concerned or worried to be scrutinised by investors. On the flip side, Ross (1977) describes bad firms as those that are scared to be scrutinised by investors, and thus in order not to be discovered, their levels of gearing would be lower. The inference that we can draw is that managers can maximise shareholders' wealth by changing the firm's capital structure towards gearing, which could be deemed a positive signal by investors.

1.6.2.4 Immunisation

Redington developed the immunisation concept in 1952. The immunisation theory's primary objective was to offer a solution as to how a fixed income portfolio could be shielded from losses that might arise as a result of adverse movements in interest rates. The immunisation concept developed by Redington has been widely used to manage fixed income portfolios in the financial services sector (Afolabi, 2013). For a fixed income portfolio to be shielded from adverse interest rate movement, the following two conditions must hold: the first derivate of assets must be equal to the first derivate of liabilities in respect of interest rates, and the second derivate of assets must be greater than the second derivate on liabilities in respect of interest rates. If the above-mentioned two conditions hold, the net present value of cash-flows will remain positive in respect of any fluctuations in interest rates; thus a portfolio of fixed income securities will be shielded or immunised from losses, and this will have the ability to enhance shareholders' wealth.

1.6.2.5 Asset pricing theories (APT)

The asset pricing theory was developed by Ross (1976), and it assumes that assets returns can be estimated by using a linear relationship between the expected returns of assets and macroeconomic variables. The assets return derived from the APT model is used to price assets correctly. As per the APT model, asset prices should equal the

expected end-of-period price discounted at the rate implied by the model, and in instances where the price diverges, arbitrage will bring the prices back into line.

The capital asset pricing model (CAPM) was developed by Sharpe (1964) and Lintner (1965) and is used by investors to determine the appropriate required rate of return of an asset, to take decisions about adding assets to a well-diversified portfolio. With CAPM, the assumption is that systematic risk (that is recession, interest rates, amongst others) cannot be diversified and the investor should be compensated for this risk. The aim of CAPM is to assess whether a stock is fairly valued when its risk and the time value of money are compared to its expected return. Using CAPM, investors can assess if assets (stock) they are evaluating are over or undervalued. This provides the investors with insight as to whether to buy or sell the stocks to enhance their portfolio returns.

1.7 Organisation of the thesis

Chapter 2 commences with an introductory review, followed by a thorough literature review of the aspects contributing to voluntary and involuntary delisting. This is followed by the presentation of empirical evidence, offering the most recent data on the impacts of delisting. The chapter then discusses the methodology adopted for identifying these delisting factors, and the statistical findings are presented. The chapter culminates by underlining key findings from the literature and reaffirming the research gap.

Chapter 3 offers a detailed description of the essential steps required in executing an event study and logistic regression methodology. These two methodologies are utilised to analyse the impact of delisting events on firm performance and examine the factors influencing delisting decisions. The chapter begins by justifying the use of the event study methodology and providing an overview of the research design. It then delves into the data acquisition process, which involves collecting pertinent financial and market data, such as stock prices, for a sample of delisted firms. Furthermore, the chapter outlines the event selection process and explains how abnormal returns are estimated. It also discusses the statistical analysis techniques employed to analyse the data, ensuring the reliability and validity of the findings. Additionally, the chapter introduces the logistic regression methodology, which is used to examine the factors influencing delisting decisions. It scrutinises various financial indicators, including

account ratios, growth prospects, profitability, gearing, and cash flows, to determine their impact on the probability of delisting. Throughout the chapter, the research design, data collection process, sample selection criteria, variables of interest, and data analysis techniques are described in a coherent manner to ensure a smooth flow and comprehensive understanding of the methodologies employed. The chapter concludes with a summary of the key points covered.

Chapter 4 focuses on the empirical results regarding the wealth effect of delisting, specifically examining both general delisting and the distinctions between involuntary and voluntary delisting. This chapter is closely connected to Chapter 3, where the necessary data and methodology for investigating the research questions were identified. Within this chapter, a thorough analysis is presented through an event study that aimed to address the first research questions. It includes a descriptive summary of both voluntary and involuntary delisted firms, the event study findings related to the wealth effect of these delisted firms and concludes with a summary of the chapter.

In contrast, Chapter 5 delves into the empirical results concerning the wealth effect of delisting, specifically focusing on involuntary and voluntary delisting at a sectoral level. Like Chapter 4, this chapter is intricately linked to Chapter 3, where the relevant data and methodology for scrutinising the research questions were identified. Within Chapter 5, a comprehensive analysis is presented through an event study that aimed to address the second set of research questions. The chapter provides a descriptive summary of both voluntary and involuntary delisted firms, subdivided into various sectors. It further presents the event study findings pertaining to the wealth effect of delisted firms at a sectoral level and concludes with a summary of the chapter.

Chapter 6 addresses the third research question. It initiates with data visualisation, creating graphical representations of data to convey information and insights effectively. Descriptive statistics were computed to provide an overview of the sample characteristics. A correlation table was created to display the correlation coefficients between pairs of variables in a dataset. Furthermore, the Logistic Regression Analysis was conducted. Finally, the findings of the study are presented, and the chapter concludes with a summary.

Chapter 7 discusses the thesis results, focusing on the findings related to general delisting, voluntary delisting, involuntary delisting, and delisting within specific sectors. The chapter examines the overall effect of delisting on shareholders, laying the groundwork for further exploration of the specific effects of voluntary and involuntary delisting. Additionally, the chapter investigates the wealth effects on shareholders at the sectoral level, and thoroughly explores the factors that determine delisting.

Chapter 8 provides a summary of the study's main findings, implications, study limitations, and policy recommendations, offering insights into future research directions. The chapter begins with a discussion of the main findings regarding the wealth effect and the factors that determine delisting. It then discusses the study's limitations and policy recommendations and concludes with a chapter summary.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the various factors that pertain to voluntary and involuntary delistings in a stock exchange. When companies go public (or list) they do so through the process of an IPO. The IPO entails a process whereby a private company sells its shares to the public. Listing on the stock exchange is an important stage in a company's growth aspirations as it allows the company to have access to capital from a large pool of investors in the capital markets and provides existing shareholders with liquidity (Kim *et al.*, 2021). Feldman (2018) highlights five key advantages for an entity to be listed: access to capital, liquidity, growth prospects, ability to retain and attract senior executive personnel (through stock options), and increased shareholder confidence in management.

Martinez and Serve (2017:736) describe delisting as “the removal of a listed entity from a stock exchange”, through either voluntary and/or involuntary channels or processes. A voluntary delisting is usually instituted by a listed company, and this is often an advantage for its investors as they can sell off their shareholding at a premium. An involuntary delisting process will usually be instituted by the stock exchange authorities and is a highly disruptive event with many negative consequences. The stock exchange generally delists companies involuntarily on two accounts: to protect its reputation (Chen & Schoderbek, 1999; Sanger & Peterson, 1990), and when a listed company violates listing requirements (Čornanič & Novák, 2015; Martinez & Serve, 2013).

Having begun discussing delistings and their determinants as well as the situation that applies to the JSE in relation to the analysis of delisting trends, this chapter presents data regarding the overall wealth effects of shareholders as a consequence of voluntary and involuntary delisting. This involves analysing the effect of delisting on shareholders in firms and in general with regard to specific sectors in South Africa. The chapter commences with a discussion on delisting trends on the JSE.

2.2 Stock exchanges in South Africa

2.2.1 Overview

A stock market or a stock exchange is a marketplace where market players trade securities such as shares, bonds, futures, and derivatives. The number of bourses on the African continent has grown from seven in the 1980s to 30 in 2020 (Agyemang-Badu *et al.*, 2022). Of the 30-stock exchange, three are regional stock exchanges: the East Africa Exchange, based in Rwanda (which serves countries in East Africa); Bourse Régionale des Valeurs Mobilières (BRVM), based in Côte d'Ivoire, (which serves eight member countries in West Africa: Senegal, Togo, Niger, Mali, Cote d'Ivoire, Guinea Bissau, Burkina Faso, and Benin); and Bourse des Valeurs Mobilières de l'Afrique Centrale (BVMAC) based in Gabon (with six member countries: Cameroon, Central Africa Republic, Chad, Congo, Equatorial Guinea, and Gabon). Regional stock exchanges help companies to access capital and enhance liquidity by attracting diverse investors.

Several African countries (for example South Africa-Altx, Botswana - Growth Enterprise Market Segment, Malawi - Alternative Capital Market, Zambia - Alternative Market, Egypt - Nile Stock Exchange, Swaziland (Eswatini) - SME Board, and Ghana - Ghana Alternative Market) have set up alternative stock exchanges to cater to Small and Medium-Sized Enterprises (SMEs).

Listing on the stock exchange is conducted in the primary market, whereby new shares of the company that will list will be made available to the public (IPO) or to a limited number of private investors (private placement) or existing shareholders (rights issue) to purchase. What is unique about rights issues is that they are conducted post an IPO (Hulamin IPO was on 25 June 2007, and its rights issue was 14 May 2010), or a private placement (SA Corporate Real Estate Ltd 20 June 2007 and its rights issue was on 13 November 2015) as a mechanism to raise additional funding. A rights issue is a process whereby existing shareholders will be issued new shares based on their current shareholding. As these shareholders have pre-emptive rights (a clause that dictates that should a company issue shares in future, preference will be given to existing shareholders) to follow their rights, they will either exercise their rights or not. There is dilution risk if the existing shareholders do not follow their rights, meaning their shareholding will be reduced. In a rights issue, shares are typically sold at a discount.

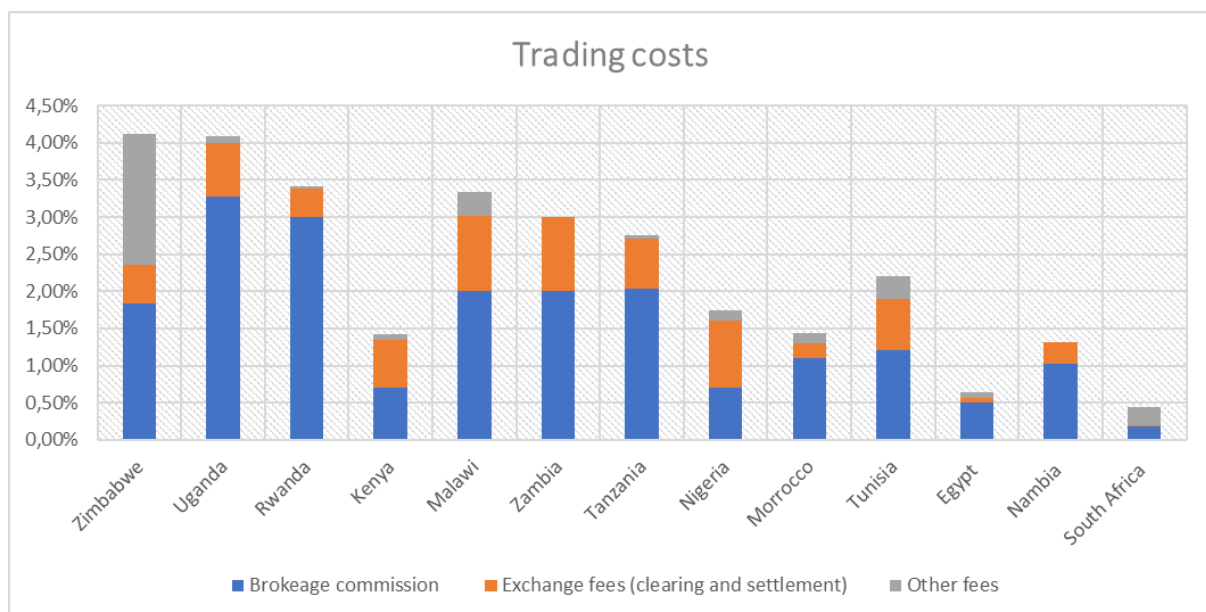
Proceeds from a rights issue are predominately used to reduce a company's gearing (this was the case with Hulamin). Companies can also use rights issues proceeds for expansion projects, such as Discovery Ltd.

There are different types of listings, such as primary listing, dual, and secondary (or cross) listings. Primary listing is the main stock exchange where a company's ordinary shares are only listed. A company's primary listing is dictated by where its headquarters are or its significant presence (for companies like MTN, Sasol, and Naspers, its primary listing is on the JSE). In a nutshell, dual listing is different stocks of the same entity traded on multiple bourses in various geographical jurisdictions. Usually, the primary stock exchange is in the company's domestic market. Dual listings are anchored by multiple companies operating as a single entity. An example of a dual-listed company is Investec, which is listed in South Africa and the United Kingdom (UK), whereby the primary listing is on the London Stock Exchange and the secondary listing is on the JSE. In contrast, cross-listings (or secondary listings) are whereby an entity lists the same shares across multiple exchanges (domestic and foreign stock exchanges market). In some instances, the domestic company may opt to cross-list within its boards in various stock exchanges that are at its disposal (Dabengwa,.2017). The most common cross-listings are when a domestic entity lists its shares in foreign stock markets (Dabengwa,.2017). An example of a cross-listing is Liberty Holding, primarily listed on the JSE, while the secondary listing is Kenya. Liberty Holdings being cross-listed, its shareholders' shares are interchangeable and can be traded on the JSE and the Nairobi stock exchange.

The main objective of listing a company is to raise funds. Listing can also be used as an exit strategy by existing investors (which can be founders - DisChem Pharmacracies Ltd, or private equity firms - Life Healthcare), and it may present an opportunity for potential shareholders to earn superior returns (assuming that the weak, semi-strong and strong market efficiency does not hold). Shares of a listed company can be traded (bought and sold) in the secondary market. Private placements, IPOs, and rights issues are conducted in the primary market. Funds generated in the primary market flow directly to the listed entity, whereas funds generated in the secondary market flow directly to the investor.

The JSE is liquid compared to other African countries. This view is informed by the fact that JSE's (South Africa) value of shares traded as a percentage of gross domestic product (GDP) (which tracks stock markets trading activities with regard to economic activity) ranged between 54.23% to 135.80% (Agyemang-Badu *et al.*, 2022), while other stock exchanges in Africa (Namibia, Kenya, Nigeria, Mauritius, Ghana, Côte d'Ivoire) are generally illiquid as the value of shares traded as a percentage of GDP ranges below 6% to less than 1% (Agyemang-Badu *et al.*, 2022). The other measure that indicates that the JSE is liquid is that its transactional costs are less than 1% (Agyemang-Badu *et al.*, 2022). This is in line (Agyemang-Badu *et al.*, 2022) with other developing (Indonesia – 0.68%, Thailand – 0.57%, and Peru - 0.46%) and developed markets (Germany - 0.32% and the USA - 0.26%).

Graph 2.1: Trading costs



Source: Author's construct- Bright Africa Riscura

As per the above graph, in line with line Agyemang-Badu *et al.* (2022), costs of trading on African markets are costly as the trading cost can be more than 4% (in countries like Uganda and Zimbabwe), and a significant portion of trading costs comprises brokerage commission (Riscura, 2019). In South Africa, even though its trading costs are lower, a concern is the Securities Transfer Tax, which forms part of trading and is a fee not charged in most developed markets (Riscura, 2019). Given the fact that there is a limited pool of brokers and these brokers have to cover their costs, this results in them charging higher prices; thus, this limits the scope of reducing brokerage fees (Riscura, 2019). The implication of the high trading cost affects trading strategies and

reduces the liquidity of traded shares. This affects potential investors adversely as it might result in low participation by domestic and international investors. The JSE, being liquid, does not mean that all the traded shares have the same liquidity, as companies like Naspers Limited, Standard Bank Group Limited, and MTN Group Limited have higher traded volumes, indicating that these companies' shares are liquid. Companies like Blue Label Telecoms Limited, Master Drilling Group Limited, and Pioneer Foods Group have lower traded volumes, meaning that the companies are less liquid. Liquidity between the main board and the Altx also varied from 2007 to 2018; Altx companies depicted lower liquidity levels than the main board. This view is anchored by the fact that the main board attracts financially stronger companies that have to comply with strict listing requirements (this contributes to the companies being liquid), there is more foreign investment participating (this is due to the presence of larger multinational corporations) in the main board and this enhanced liquidity and the main board since it caters for larger companies is normal for trading volumes to be higher.

2.2.2 JSE (Main Board)

The JSE was established in 1887 (Lukasiewicz, 2017:716) and is the biggest stock exchange on the African continent. It is ranked globally in the top 20 largest stock exchanges by market capitalisation (JSE, 2023). The three biggest stock exchanges in Africa are in South Africa, Nigeria, and Egypt (Agyemang-Badu *et al.*, 2022).

The JSE comprises the main and the Alternative Exchange Board (Altx). The JSE offers market players five markets where they can conduct their trades: the equities, bonds, financial, commodity, and interest rate derivatives submarkets (Baker McKenzie, 2023). Furthermore, the JSE provides a primary market (where IPOs occur) and a secondary market where stocks are traded, post-trade services, technology services, and information services, as well as regulatory oversight for both the primary and secondary markets (Baker McKenzie, 2023).

As of 2018, most of the listings on the JSE were primary listings (75%), followed by primary dual listings (13%) and secondary dual listings (12%) (South African Reserve Bank [SARB], 2018). This trend has been ongoing since 2007, whereby primary listings have dominated listings. Some of the listings on the JSE main board between 2007 and 2018 include Steinhoff Africa Retail Ltd (now known as STAR, its parent Steinhoff

International which was engulfed in an accounting irregularity scandal in the last quarter of 2017), Vivo Energy PLC, Alexander Forbes Group Holding Ltd, DisChem Pharmacies Ltd, Liberty Two Degrees, Ethos Private Equity Capital Partners Ltd, Balwin Properties Ltd, Novus Holdings, Stor-Age Property REIT Ltd and Capital Appreciation Ltd. These listings were from various sectors: the financial, consumer services, consumer goods, real estate, and industrials. Some of the above-mentioned listings were via private placements (DisChem Pharmacies Ltd, Liberty Two Degrees, Ethos Private Equity Capital Partners Ltd, Balwin Properties Ltd, Novus Holdings, Stor-Age Property REIT Ltd, and Capital Appreciation Ltd). The companies that were listed via IPOs (which include public participation) included Steinhoff Africa Retails, Vivo Energy PLC, and AlexanderForbes (which was delisted voluntarily in 2007 as a result of a private equity buyout and the company was relisted as an exit strategy by the private equity led consortium (which included Ethos) in 2014).

2.2.3 JSE (Alternative board 'Altix')

Altix was established by the JSE in 2003 to target SMEs and enable them to access equity financing. Altix's listing requirements are less onerous than the main board (Sebastian & Kransdorff, 2017). At the same time, the main board is for large firms (Ferreira *et al.*, 2019). Altix can be viewed as an avenue where SMEs can raise funding. The importance of SMEs in the South African economy is highlighted by the fact that in 2015 the SARB estimated that 91% of formal SMEs accounted for between 52% to 57% of the country's GDP while contributing 60% of employment (Mmako, 2021). South Africa suffered from high unemployment of around 32.6% in 2021 on average, and the high unemployment rate can be resolved by promoting and supporting SMEs (Mmako, 2021). The major challenge that is faced by SMEs is access to capital. Alternative stock exchanges such as the Altix are trying to address the capital needs of SMEs. Some SMEs listed on the Altix include Kaap Agri Limited, Digicore Holdings Limited, and Rolfes Holdings Limited. The above-mentioned companies are just a small sample of listed firms on the Altix. Companies that are listed on the Altix can also migrate to the JSE's mainboard. The following examples are companies that migrated to the main board: Nepi Rockcastle, Sirius Real Estate, and Curro (JSE, 2021). There were 29 migrations from Altix to the main board in 2014. The migration to the main board depends on several factors: the company's market capitalisation, compliance with the bourse regulatory requirements, and the company's track record.

2.2.4 Other alternative stock exchanges in South Africa

The Alternative Stock Exchanges in South Africa besides the JSE AltX include the A2X, ZARX, Cape Town Stock Exchange (4AX) and Equity Express Securities Exchange (EESE). Not all newly established alternative stock exchanges in South Africa cater to SMEs. EESE sustainability will face challenges if the bourse does not increase the number of its listings. Increasing the number of listings will not be a simple task, as we have seen with the JSE's empowerment scheme listings which are not frequent (as since the JSE empowerment schemes segment's inception in 2011 there has not been more than six listings). The formation of the EESE is not a threat to the JSE, as empowerment schemes are not the JSE's primary focus. While A2X has successfully attracted secondary listing of blue-chip companies, its value proposition is lower transactional cost. A2X is still dependent on the JSE for clients and regulatory compliance. The JSE's upper hand is that it is reputable and has a solid track record.

Additionally, the JSE will continue to generate revenue from listed firms on A2X as these firms have to pay ongoing listing fees (the primary listing of these firms is on the JSE), and not all trades will be performed on A2X's trading platform. Even though Cape Town Stock Exchange is a fully-fledged stock exchange, it is unlikely to take market share from the JSE as it primarily focuses on SMEs and is plagued by liquidity constraints, and the shares listed on this stock exchange lack analyst coverage. Investors like a liquid stock exchange as this allows them to sell their shares as and when they wish to do so. The ALTX can be seen as a competitor to ZARX. Its upper hand is that most companies prefer to list on the JSE ALTX, knowing that it is easy to migrate to the JSE main board. In addition, ALTX enjoys the support of the JSE main board. Thus, the JSE will continue to be the leading stock exchange in South Africa based on its track record and its reputation. This subsection will provide an overview of alternative stock exchanges besides the ALTX.

2.2.5 A2X

A2X launched in October 2017 intending to lower transactional and clearing fees; as of 30 June 2020, there were 37 listed securities with a combined market capitalisation of approximately R2.2 trillion (Jericevich, Chang & Gebbie, 2020). Some of the listed stocks in the exchange include African Rainbow Capital Investments, Naspers Ltd, Standard Bank Group, Sasol, Santam, and Mr Price Group. The listings are from a

variety of sectors, namely mining, media, property, financial services, health care, and telecommunication. This stock exchange is unlikely to suffer from liquidity constraints as it targets JSE's top 40 shares. It is essential to note that investors frequently trade the JSE top 40 shares (comprising blue-chip companies like Naspers, Sasol, British American Tobacco, and Aspen Pharmacare); thus, this enhances liquidity. To also aid the liquidity, the registered brokers (Avior, ABSA Capital, Investec, Legae, Pereseg, RMB Morgan Stanley, and SBG securities) on the bourse are also the most active. The bourse trading costs are 50% lower than the JSE's, thus boosting liquidity. One of the advantages of listing on A2X is that no fees are associated with the listing.

Furthermore, A2X's target market is secondary listings (which can be defined as an entity listing the same shares across multiple exchanges [Dabengwa, 2017]), meaning that for regulatory compliance, the bourse depends on the JSE because the primary listing of their clients is with the JSE. In a nutshell, A2X can be viewed as a cost-effective trading platform that targets large companies. A2X as an alternative exchange is unique as its primary focus is not to target SMEs but is more beneficial to investors as they can execute their trades cheaper. The bourse is a competitor to the JSE when it comes to the execution of trades, and an important aspect to point out is that on the stock exchange, at these bourses, firms cannot raise funds as the focus is on the secondary markets. We do not anticipate that A2X will shift its focus in the near term to target primary markets, which would entail the execution of IPOs, private placement, and rights issues. This will hinder its business model as it would incur more cost by ensuring regulatory compliance, and the bourse might lose its appeal of being cheaper compared to the JSE, as listed companies might have to incur ongoing listing fees, and investor costs to trade will be higher.

2.2.6 ZARX

In 2016, ZARX became operational, and its primary focus was to target unlisted companies. The bourse struggled to attract listings, and the bourse itself was unprofitable as it had to depend on shareholders' funding. This view is informed by the fact that the bourse, in its short stint, had two right issues used to raise funds in order to keep the stock exchange afloat. Given the bourse's performance, it was no surprise that the ZARX stock exchange license was cancelled due to the exchange's prolonged non-compliance with capital and liquidity requirements (Business Tech, 2023). Following the cancellation of the ZARX licence, all the securities (Agribusiness

Senwes, Orion Real Estate, and Transformational Investment Portfolio, an investor of broad-based black economic empowerment shares schemes) listed on the stock exchange had to be delisted.

2.2.7 Cape Town Stock Exchange (4AX)

In 2017, 4AX was instituted; later, the bourse was rebranded and relaunched as Cape Town Stock Exchange in September 2021. 4AX is a fully-fledged stock exchange (offering debt and equity trading) aiming to reduce listing costs for SMEs. The bourse has 10 listings (NWK, Heartwood Properties, Assupol, iHealthcare, TWK Agri, GAIA Renewable, GAIA Fibonacci, TipOne, BKB, Altvest). The current listings are in the following sectors: agriculture, health care, insurance, investment holdings, and real estate. The biggest challenge that the stock exchange faces is liquidity constraints. If the stock exchange does not resolve this issue, it will face challenges in attracting new clients. Lessons learned from ZARX's experience are that failing to attract listings has dire consequences, potentially resulting in the bourse being financially unsustainable. It will also be difficult for institutional investors to invest in this stock exchange due to liquidity constraints and the listed entities' small size, as this goes against financial institutions' mandates, as the preference is to invest in large companies that are liquid. The reason why financial institutions are important in the capital markets is that they are the dominant players. Predominantly, the South African stock exchanges' prominent investors are not retail investors. For the bourse to improve its liquidity, it will have to broaden its investor base, attract quality entities (financially sound, solvent, profitable, and generating positive free cash flows and market leaders in their respective sectors), and financial institutions will have to amend their mandates to accommodate small firms. It will be difficult for 4AX to compete with the likes of AltX as the latter is well known, has a solid track record, and enjoys the support of the JSE.

2.2.8 Equity Express Securities Exchange

In September 2017, the Equity Express Securities Exchange (EESE) was instituted. EESE aimed to target black economic empowerment schemes. The listed securities on EESE as of 31 March 2020 included Ukhamba 1, Ukhamba 2, Phuthuma Nathi, and Vunani Capital Partners. The JSE also has a black economic empowerment segment comprising three schemes, namely MTN Zakhele Futhi, Sasol Inzalo, and Vodacom's YeboYethu, despite the segment being established in 2011. Between 2011 and 2015,

Sasol Inzalo was the only listed scheme. The number of BEE-listed schemes seems minimal for both the JSE and ESE. This can be explained by the fact that not many companies have BEE schemes that they would like to list as, in some cases, the company prefers to offer shares to its employees rather than the broader communities to strategically align the interests of the employees and shareholders. Furthermore, listing BEE schemes is costly as the underlying company would incur costs for the listing; for example drafting the prospectors would involve lawyers and investment banks that have to be hired and paid, and the listing firm would also have to pay for the marketing. Another hindrance to listing such schemes might be an unfavourable economic climate, and such a decision might not fall within the underlying company's strategic objectives.

2.3 Delistings on the Johannesburg Securities Exchange

The JSE listed companies experienced a significant adverse impact because of the economic slowdown in China. This impact was particularly felt by South African companies that relied heavily on Chinese demand, leading to financial difficulties and the need to explore alternative funding sources. Consequently, several of these companies decided to delist from the JSE. The global financial crisis in 2008 precipitated a period of economic uncertainty and caution among investors. This, in turn, resulted in a decline in market capitalisation and a diminished appetite for risky investments. Therefore, certain companies were compelled to delist from the JSE. The Eurozone debt crisis contributed to heightened market volatility and greater investor aversion to risk. South African companies exposed to European markets encountered reduced demand and decreased profitability, compelling some of them to delist from the JSE. The cumulative impact of these events created a challenging economic environment characterised by reduced demand, diminished investor confidence, and an increased aversion to risk. Numerous companies strategically opted to delist from the JSE in response to these adverse conditions. From 2007 to 2018, South Africa experienced several economic challenges, including slow economic growth, high unemployment rates, and currency volatility. These conditions affected the performance and profitability of many companies, prompting some to consider delisting as a strategic response to financial pressures. The mining sector encountered significant challenges during this period. Declining commodity prices, such as platinum, gold and coal adversely impacted on the financial performance of mining companies.

The primary causes of most delistings on the JSE during the period from 2007 to 2018 were mergers and acquisitions (M&A). Overall, the challenging economic conditions between 2007 and 2018 gave rise to various motivations for M&A activity on the JSE. Whether it was market consolidation, cross-border expansion, private equity involvement, restructuring and turnaround efforts, industry consolidation, or strategic alliances, these factors contributed to a significant quantum of delistings on the JSE during this period. For example, one important driver of M&A activity was the desire for market consolidation. In 2016, South African Breweries (SAB) merged with Anheuser-Busch InBev, establishing AB-InBev and implementing its subsequent delisting from the JSE. The primary purpose of this merger was to create the largest beer company in the world. Furthermore, M&A transactions were motivated by cross-border expansion. Walmart, for example, acquired a majority stake in Massmart, leading to Massmart's delisting from the JSE. This acquisition allowed Walmart to enter the South African market. Private equity firms also actively participated in M&A, targeting undervalued or underperforming companies to increase the acquired companies' value and subsequently delist them. One example is Bain's acquisition of Edcon in 2007, which resulted in Edcon's delisting from the JSE. Additionally, companies facing financial difficulties often pursued M&A transactions as part of their efforts to restructure or turn around their operations.

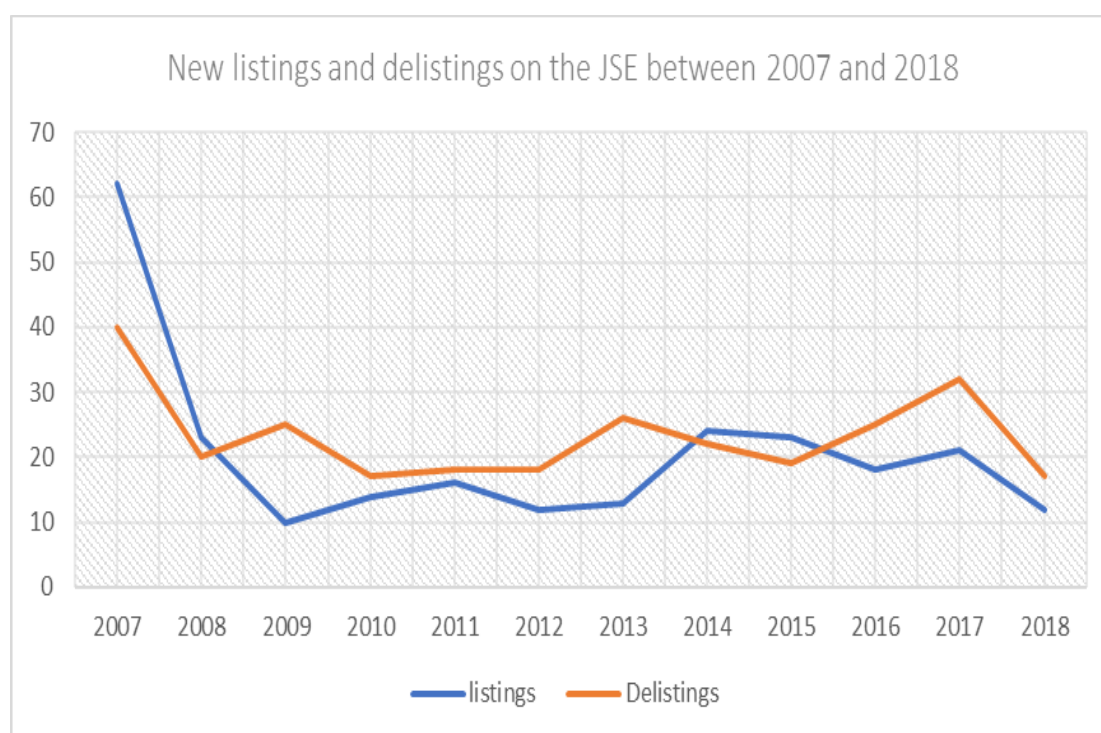
Other M&As that resulted in voluntary delisting listings involved Namibian Sea Products Ltd, MICC Property Income Fund Ltd, Alexander Forbes Ltd, Atlas Properties Ltd, and Consol Ltd. Some voluntary delistings were at a company's request (for example Capevin Investments Ltd, Torre Holdings Pty Ltd, Dorbyl Ltd and Kuuhubb Inc).

Most of the involuntary delistings were due to companies failing to meet listing requirements (for example Rentsure Holdings Ltd, Emergent Properties Ltd, Kelgran Ltd, Northern Engineering Industries Africa Ltd, Consolidated Property and Finance Ltd, Corvus Capital SA Holding Ltd, Tiger Wheels Ltd, Stilfontein Gold Mining Co Ltd, S&J Land Holdings Ltd). Liquidations were the second largest contributor for firms (Square One Solutions Group Ltd, M Fitec International Ltd, Beget Holdings Ltd, Best Cut Ltd, and Diversified Property Fund Ltd/fund) to delist involuntarily.

Overall, voluntary and involuntary delisting occurred on both the main board and AltX. The reasons for JSE-listed firms to delist can be attributed to strategic decisions, such as cost-cutting measures, liquidity constraints, M&As, restructuring, and simplifying corporate and ownership structures. Other reasons for delisting include financial distress, regulatory issues, and non-compliance with exchange rules. Global and domestic economic landscapes may also trigger delisting. The reasons for delisting from the main board and AltX were similar, including the view that migrations also drove the AltX delistings. The upward delisting trend of the domestic and global economic environment does not significantly improve. The sub-section below provides an overview of the net listing trend on the JSE from 2007 to 2018.

2.4 Delisting trends

Graph 2.2: Net listings from 2007 to 2018



Source: Authors own construct - data source SARB quarterly bulletins from 2006-2019

2.4.1 Positive net listing (2007, 2008, 2014 and 2015)

In 2007, the JSE experienced 62 new listings, with 25 on the main board and 37 on AltX; this surpasses the number of delistings totalling 40 (JSE, 2007). Notable listings during this period included Hulamin Ltd, Raubex Group Ltd, and South Ocean Holdings Ltd. However, it is important to note that there were many delistings during this time,

potentially influenced by the onset of the global financial crisis. Some companies that delisted during this period include Aps Technologies Ltd, Exxoteq Ltd and Rentsure Holdings Ltd.

The high number of new listings can be attributed to factors such as South Africa's robust GDP growth of 5.36% (International Monetary Fund [IMF], 2021), positive investor sentiment, and favourable business confidence reflected in the RMB/BER Business Confidence Index, which averaged 72.25 for the year. Additionally, buoyant global and domestic stock market performance contributed to the intention of companies to raise funds through the JSE for expansion projects. In 2007, R125 billion was raised on the JSE equity market (SARB, 2008).

The global financial crisis, which originated in the USA in 2007, had a significant impact on the number of listings. The effects of this crisis became more pronounced in 2008. Madubeko (2010) explains that the South African banking system was relatively insulated from the crisis for several reasons. Firstly, the system was well-regulated, with the implementation of the new Credit Act (NCA) and compliance with Basel II, which aimed to tighten credit standards. Secondly, South African banks did not invest heavily in high-risk securities. As a result, South African banks did not experience liquidity issues, and the SARB did not need to support any banks during this time. The strength of the banking system can also be attributed to the banks' low leverage, high profitability, and limited exposure to foreign assets. The global financial crisis did, however, impact on the South African economy through decreased exports, particularly in the manufacturing and mining sectors, as companies scaled back production due to low demand. South Africa's economic growth declined from 5.36% (2007) to 3.19% (2008) (IMF, 2008). Foreign portfolio flows subsided, with net purchases of shares by non-residents amounting to R63.3 billion in 2007 and sales totalling R54.4 billion in 2008 (SARB, 2009). The number of IPOs on the JSE decreased in 2008 to 23 from 62 in 2007, accompanied by 20 delistings (JSE, 2008). Some delisted companies in the period included Kelgran Ltd, Johnnic Holdings Ltd and Ellerrine Holdings Ltd. The capital raised through primary shares by JSE-listed companies amounted to R63.3 billion in 2008, compared to R124 billion in 2007 (SARB, 2009). During this period, the JSE's market capitalisation declined by 40% (Kapingura, Mishi & Khumalo, 2014). The global financial crisis negatively impacted on the JSE due to its integration with developed markets such as the United States,

Japan, and Germany. Investor sentiment was negative and risk aversion was high, resulting in decreased IPO activity and companies delaying fundraising on the JSE due to unfavourable market conditions.

In 2014, there was a slight recovery in the South African economy and improved investor sentiment, leading to new listings surpassing delistings. Several companies, including Visual International Holdings, Alexander Forbes Groups Holdings and RFG Holdings Ltd listed during this period. The number of new listings increased to 24 in 2014 compared to 13 in 2013, whereas the delistings in 2014 (22) were less than those in 2013 (26) (JSE, 2014). Additionally, there were 29 migrations from Altx to the main board in 2014 (JSE, 2014). Some notable delistings included Afgri Ltd, Dorbyl Ltd and Sherbourne Capital Ltd. The reduced number of delistings and the higher number of new listings was a consequence of positive market sentiment, which resulted in net share purchases worth R13 billion (SARB, 2015). The capital raised through primary shares by JSE-listed companies amounted to R153 billion in 2014 (SARB, 2015).

In 2015, sector-specific factors drove new listings on the JSE, particularly in the real estate sector, where growth potential and market conditions were favourable. Property companies such as Balwin Properties, Stor-Age Property REIT Ltd, and Indluplace Property Ltd were listed during this time. Examples of companies include Cadiz Holdings Ltd, Metmar Ltd, and Capital Property Fund Ltd. However, in 2015, there were fewer listings (22) compared to 2014 (24), and the number of delistings was 19, with net sales of shares totalling R40 billion (SARB, 2016). Weak economic prospects, low share prices, and international investor risk aversion drove the low number of listings and delistings during this period.

2.4.2 Spike in negative net listing (2009, 2013 and 2017)

There was a notable increase in delistings in 2009, 2013 and 2017. The spike in delistings in 2009 can be attributed to the lingering effects of the global financial crisis and the South African economic recession. Many companies experienced poor financial performance during this time, such as declining revenues and liquidity constraints. Corvus Capital SA Holding Ltd, Tiger Wheels Ltd and Stilfontein Gold Mining Co. Ltd were affected. The availability of capital in the equity market was limited during this period. The spillover effects of the financial crisis and the European sovereign debt crisis impacted on the number of new IPOs in 2009, with only ten new

listings as compared to 25 delistings (JSE, 2009). Additionally, South Africa experienced a recession in 2009, resulting in a significant loss of jobs and elevated unemployment rates. The European sovereign debt crisis had repercussions for the performance of the stock market in 2009, given the strong ties between South Africa and Europe regarding foreign direct investment (FDI). Sugimoto, Matsuki and Yoshida (2014) determined that African markets are mainly affected by spillovers from global markets, particularly those in Europe, as well as from commodity and currency markets. Furthermore, the aggregated spillover effects from European countries to African markets were more severe than those from the global financial crisis. It is worth noting that South Africa's GDP growth is highly dependent on the outcomes of European economies. Unfavourable market conditions and negative investor sentiment resulted in companies delaying their listings, as evidenced by the increased net sales (R75,4bn) (SARB, 2010) of shares by non-residents in 2009.

The number of new listings in 2013 was marginal compared to the previous year; the low number of listings can be attributed to the challenging economic environment. Delistings in 2013 were significant, with 20 companies being affected by regulatory changes and takeovers (JSE, 2013). The most notable delistings were Lonrho Ltd, Mvelaserve Ltd, and Thabex Ltd. Foreign investor net sales of equity holdings amounted to R200m (SARB, 2014).

In 2017 the number of new listings increased, with 21 companies listing, but this was overshadowed by the highest number of delistings (32) since 2007 (JSE, 2017). Delistings in 2017 were driven by the sluggish South African economy and the country's credit rating downgrade, leading to negative investor sentiment. The majority of the delistings were M&As such as Holdsport Ltd, Windhold Ltd and Astrapak Ltd.

2.4.3 Steady negative net listing (2010, 2011 and 2012)

The delisting trend from 2010 to 2012 remained relatively steady, primarily due to the economic recovery following the global financial crisis. During this period, the JSE did not change its listing requirements. Sectors such as mining and metals experienced a recovery as there was sustained demand for commodities. Some companies that delisted during this period include S&J Land Holdings Ltd, Good Hope Diamonds Kimberley Ltd, Industrial Credit Co. Africa Holdings Ltd, Dialogue Group Holdings Ltd, and Square One Solutions Group Ltd. These delistings were driven by various factors

such as failure to comply with listing requirements, financial difficulties, declining share prices and the need for restructuring.

Between 2010 and 2013, the South African economy started to recover and expand, with an average GDP growth of 2.77% (IMF, 2013). The number of new listings showed an upward trend from 2010 to 2011 but remained below the levels seen in 2007. The number of listings was negatively impacted by sluggish domestic and global GDP growth as well as the lingering effects of the global financial crisis and reduced business and investor confidence. In 2010 there were 17 delistings driven by corporate actions and non-compliance with listing requirements (JSE, 2010). The number of new listings declined in 2012 compared to 2011, influenced by the economic climate in South Africa. In 2013 there were 18 delistings, mainly due to corporate actions (JSE, 2013). Non-resident investors sold off their equity holdings (R3,4bn) with a lower value compared to the previous year (R17,2bn) (SARB, 2014).

2.4.4 Declining net listing (2018)

South Africa experienced a technical recession in 2018 with negative growth for two consecutive quarters. This contributed to negative investor sentiment, with foreign investors selling shares worth R53bn (SARB, 2019). This impacted the low number of listings and drove delisting. However, the country achieved 1.57% GDP growth (IMF, 2018). Additionally, notable corporate actions such as M&A related to Buildmax Ltd and Capevin Holdings Ltd resulted in delistings.

2.5 Voluntary and Involuntary Delisting determinants across global markets

2.5.1 Africa

There have been four three significant studies on delistings on African stock exchanges. Of the three studies, Algebaly *et al.* (2014) examined the Egyptian stock exchange and focused on analysing the survival rates of recently listed companies. The study by Mazengera (2016) focused on why the Zimbabwean stock exchange involuntarily delisted a company. The third study by Iliemena, Goodluck and Amahalu (2019) primarily focused on the effect of delisting on the performance of the Nigerian stock exchange. The fourth study by Onuorah and Kifordu (2021) examined the impact of voluntary and involuntary delisting on the performance of the Nigerian Stock Exchange. The common conclusion drawn by these three African studies indicated

that highly geared firms are likely to delist involuntarily and firms that do not submit their financial information within the stock exchange's stipulated period are likely to experience a similar outcome. In addition, delisting itself negatively impacts on the stock exchange as well as the firms.

The Egyptian study by Algebaly *et al.* (2014) used a binary logit model to determine which factors are the main drivers of involuntary delisting for recently listed companies on the Egyptian Stock Exchange. A unique aspect of this study is that it uses new variables, such as firm type, institutional ownership and listing variables. The sample size consists of 169 IPO firms, including 50 involuntarily delisted firms. The total sample of 169 IPO firms is divided into two sub-samples. The first sub-sample contains 163 IPO firms over the period 1992 to 2004, including 44 involuntarily delisted firms. The second sub-sample is from 2005 to 2009 and contains six IPO firms which were all involuntarily delisted during the five-year observation period. The study reveals that IPO firms with sizeable gearing levels are likely to delist involuntarily. The study further indicates that the likelihood of a firm involuntarily delisting diminishes significantly with the surge in firm size, institutional ownership, asset growth rate, operating efficiency, offering size, initial returns, and insider ownership. However, the following variables do not play an important role in the involuntary delisting of a firm: age, liquidity, firm type, cash coverage ratio, profitability, IPO activity, quality of auditor, venture capital backing and listing rules. The research further confirms the importance of firm characteristics, signalling and offering variables in predicting the probability of involuntary delisting. The implications of this study, according to the research linked to investors, is that they must invest in large firms with a significant offering size and in firms with low debt levels, in addition to investing in firms with high operating efficiency, initial returns, insider and institutional ownership.

A study in Zimbabwe undertaken by Mazengera (2016) adopted a different approach by using primary data in investigating involuntary delisting. The researcher utilised a case study methodology complemented by 40 questionnaires accompanied by one-on-one interviews with the four senior management team members of The Cotton Company of Zimbabwe. The Zimbabwean Stock Exchange (ZSE) involuntarily delisted The Cotton Company of Zimbabwe for not submitting its financial statements within the stipulated 90 days after its financial year-end. This study revealed that involuntary

delisting, as expected, negatively impacted on the Cotton Company of Zimbabwe as the company was compelled to delist.

A Nigerian study conducted by Iliemena *et al.* (2019) examined the effects of delisting on the performance of the Nigerian Stock Exchange. The study primarily investigated the impact of delisting on market capitalisation and traded shares from 1998 to 2018 and employed a longitudinal research design using a simple linear regression as the analysis technique. The results of this study indicate that delisted companies adversely impacted on the performance of the Nigerian Stock market liquidity as well as its market capitalisation.

Another Nigerian study by Onuorah and Kifordu (2021) examined the impact of voluntary and involuntary delisting on the performance of the Nigerian Stock Exchange. The data spans from 1998 to 2019. The study develops two models, one relating market capitalisation to delisting and the other relating the volume of stock traded to delisting. Multiple regressions are used to analyse the data. The results show that overall firm delisting, encompassing both voluntary and involuntary delisting, has a significant impact on market capitalisation. However, it has an insignificant effect on the volume of stock traded. Individually, voluntary delisting has a negative but insignificant impact on both market capitalisation and stock trading volume. This implies that an increase in voluntary delisting reduces market capitalisation and stock trading volume, although not significantly. This finding suggests that voluntary delisting does not provide sufficient investor protection in developing economies. The study also finds that involuntary delisting has a negative impact on market capitalisation, but it does not significantly affect the volume of stock traded. This indicates that when companies are involuntarily delisted due to reasons such as corporate restructuring, legal issues, or regulatory requirements, market capitalisation is significantly reduced while the impact on stock trading volume is negligible. The findings of this study are aligned with Iliemena *et al.*'s (2019) research.

The literature reviewed in this sub-section reveals that what is known is that gearing results in the stock exchange delisting companies as highly geared companies are at risk of being financially distressed. This in itself might result in a listed company failing to comply with listing requirements. Failure by a listed entity to submit its financial information in a timely manner results in the stock exchange delisting such firms as the

listing requirements have not been complied with. Delisting is found to impact on the stock exchange negatively as delisting results in liquidity constraints for the stock exchange and the bourse market capitalisation is adversely impacted by a delisting event. This suggests that listed companies in Africa, in order to avoid being delisted, must submit their financial statements timeously and that listed companies' gearing should not be sizeable. The stock exchange, in order to maintain its liquidity and market capitalisation, should ensure as a listing requirement that quality firms with sound management teams and financial stability are considered for IPOs.

2.5.2 Asia

In Asia, in line with Europe and the United States, corporate governance plays a pivotal role in the delisting decision as suggested by the literature reviewed. The result is that firms that have weak corporate governance structures often delist, although in Asia agency costs do not play a role in the delisting decision (Chien *et al.*, 2009). In the United States and some European countries, agency costs are a central factor in the delisting decision. Liquidity constraints may also play an important role in the delisting decision in Asia, the United States and Europe as companies with shares that are illiquid are likely to delist since the shares of such firms are not usually traded frequently. This contributes to shareholders of illiquid stock being unable or unlikely to sell their shares at a premium as such shares are usually sold at a large discount, which results in existing shareholders experiencing losses when disposing of their shares. Furthermore, in Asia firms that suffer liquidity constraints which impact on the ability of the firm being able to service short-term debt obligations as and when these fall due (current assets/current debt) are likely to delist (Leslie & Yanthi, 2013). Delisting triggers in Asia vary across sectors as this view is based on the fact that in the construction sector, for example, there are high listing costs, low market capitalisation and high shareholder concentration that may trigger a delisting, while in the real estate sector, voluntary delisting is triggered by high shareholder concentration and the undervaluation of a firm's value (Konno & Itoh, 2018). In Asia, firms with high growth prospects are unlikely to delist whereas firms with higher liquidity (current assets/current debt), growth prospects and concentrated shareholders are likely to voluntarily delist (Kang & Ang, 2017). Additionally, the likelihood of involuntary delisting is reduced based on the firms, revenue growth and foreign ownership (Trang, 2018). On the contrary, involuntary delisting will be triggered by gearing and the ratio of fixed assets over total assets (Trang, 2018). In Japan, certain factors like higher leverage,

lower capital expenditure and lower return on assets were found to increase the likelihood of parent companies delisting their subsidiaries (Kaneda, 2019). Similarly, in China, the proportion of state-owned shares, tradable shares, degree of loss and listing age were significant factors in delisting decisions (Zhang, 2020). Furthermore, insufficient stock liquidity and decentralised control rights were the primary factors contributing to voluntary delisting (Yang *et al.*, 2021).

The situation in Pakistan was different, as profitability, asset utilisation and leverage were not found to be significant indicators for predicting delisting (Khan & Ali, 2019). In Malaysia, poor financial condition characterised by higher losses, negative return on assets, higher leverage and lower total assets were identified as major factors leading to delisting (Raza, Hussin & Majid, 2019). In Indonesia a predictive model called the Normit model showed the highest accuracy in predicting delisting occurrences in sharia-compliant stocks (Hari, Endri & Anwar, 2019). Another study found that that solvability and size had a significant negative effect on financial distress, while leverage and size had a significant positive effect on financial distress in the forced delisted companies (Alatas & Arsjah, 2019).

2.5.3 South and North America, with a focus on the United States

In the United States, accounting numbers play a secondary role in an involuntary delisted firm (Chen & Schoderbek, 1999). The stock exchange is usually motivated to delist an entity that negatively impacts on its reputational capital (Chen & Schoderbek, 1999). Corporate governance also plays an important role in the delisting decision (Charitou *et al.*, 2007). Foreign firms delist in the United States due to higher regulatory costs, lack of interest from investors, and because the quality of these firms is not of an acceptable standard (Chaplinsky & Ramchand, 2008). International studies indicate that firms with few growth prospects, greater insider ownership, few institutional investors, higher gearing, and lower market momentum are unlikely to succeed (Marosi & Massoud, 2007). Furthermore, higher regulatory costs trigger the negative decisions made by a firm. Information and liquidity considerations are motivating factors for a firm to stay listed and other factors such as access to capital and control considerations only become pivotal to the United States firm's delisting decision over the firm's listed life (Sreedhar & Dittmar, 2010). Firms also delist in the United States to mitigate agency problems and the failure by listed firms to accrue the benefits that arise from listing (Sreedhar & Dittmar, 2010). Mergers and acquisitions further drive the high rate of

delisting in the United States (Doidge *et al.*, 2015). The delisting rate was higher than the new listing rate from 1997 until 2012, although this trend was not in line with other countries and the United States historical listing/delisting gap (Doidge *et al.*, 2015). Delisted firms via merger and acquisition enjoy extensive analyst coverage and have strong stock price performance before the delisting period (Cai, Lee & Valero, 2018). On the other hand, firms that delist involuntarily or voluntarily (other than via merger and acquisition) experience low and declining analyst coverage as well as subpar stock price performance before delisting (Cai *et al.*, 2018). In the United States, small-cap firms delisted voluntarily and involuntarily while mid-sized and large cap firms only delisted voluntarily via takeovers (Rose & Solomon, 2016). There was also an interesting trend in the United States where Chinese American Deposit Receipts (ARDs) delisted due to China's favourable regulatory and economic changes instituted by the Chinese government (Hu *et al.*, 2019). In South America, particularly Brazil, larger firms with lower free float, lower share liquidity, greater cash availability and high concentration of ownership and control are more likely to delist (Bortolon & da Silva, 2015). Market players in the United States could predict delisting by observing the access to capital and financial visibility of firms using the survival analysis technique (Kalak, Azevedo & Tunaru, 2018). Further studies focused on the United States on factors influencing companies' decisions to delist found that firms with higher cash reserves and lower debt levels are more likely to list, while those with lower cash reserves and higher debt levels are more likely to delist (Davis *et al.*, 2023). The decision to delist can also be influenced by factors such as merger and acquisition announcements, governance structure, ownership, and the company's performance (De la Bruslerie & Caby, 2023). The consequences of delisting can vary depending on whether it is voluntary or involuntary. Involuntary delisting can lead to declines in liquidity, market access, investments, and performance, particularly for firms with actively traded stocks (Li, Liu & Zhu, 2023). However, the overall costs of delisting are not universally high (Li *et al.*, 2023). Delisted Chinese firms tend to have worse performance as measured by return on equity (ROE) and lower debt ratios, making them less attractive to investors (Xiaojun, 2019). The United States-China trade war and financial leverage also impact the delisting decisions of United States-listed Chinese firms (Ma, 2022). Non-practising entity (NPE) patent litigation, particularly frivolous patent trolling, has a positive influence on delisting decisions, especially for small, young, distressed and negatively perceived firms (Siddiqui & Shams, 2022). Hence laws aimed at curbing NPE trolls have an impact on delisting decisions (Siddiqui

& Shams, 2022). Determining the optimal time for voluntary delisting involves considering factors such as the firm's growth rate, business risk and the total costs associated with remaining public (Azevedo *et al.*, 2021). Political and regulatory uncertainty also affects the timing of delisting decisions, and the stock market reacts differently to announcements of optimal and non-optimal delisting (Azevedo *et al.*, 2021).

2.5.4 Europe

As in other parts of the world, in Europe voluntary delisting is triggered by high gearing while corporate governance regulations (for example, investor protection and corporate governance codes) amplify the likelihood of delisting and an exit via merger and acquisition (Thomsen & Vinten, 2014). European firms are likely to delist if listing benefits (liquidity and analyst coverage) do not accrue to them (Martinez & Serve, 2011). In Italy, firms that normally delist are small, highly geared and are from a matured industry with low growth prospects (Tutino *et al.*, 2013). Additionally Italian firms delist to avoid hostile takeovers by competitors and optimise their capital structure (Tutino *et al.*, 2013). The delisting decision in Europe does not inevitably lead to the exploitation of minority shareholders (Crocì & Del Giudice, 2014). Additionally gearing seems to be one of the key determinants of delisting, where firms that are highly geared tend to delist (Pour & Lasfer, 2013) while audit quality, information transparency and market timing in Europe are the main drivers of involuntary delisting (Yiannoulis, 2019). A Portuguese study found that companies with lower return on assets, smaller size, lower liquidity, and poor stock market performance were more likely to be delisted (Lopes, 2019). A German study identified factors such as diminished growth outlook, limited stock liquidity, smaller size, poor operational performance, increased audit fees and agency disputes as influencing delisting decisions (Bessler *et al.*, 2023).

2.6 Delisting determinants and regulatory changes

Regulatory changes may trigger delistings. The literature reviewed in this sub-section revealed that the introduction of the Sarbanes-Oxley (SOX) Act of 2002 increased the likelihood of a firm delisting (going dark) (Coles, 2008). What drove firms to delist after introducing the SOX Act were agency costs, poor growth prospects, the likelihood of financial distress and increased compliance costs. (Coles, 2008). Additionally, firms that went dark had poor prospects and were facing financial distress. Moreover, firms

also went dark due to controlling insiders protecting their private control benefits (Leuz *et al.*, 2008). Stringent ST policy led to financially healthy firms being delisted and such policies can promote unruly behaviour (earning manipulation) by firms to remain listed (Jiang & Wang, 2008). Regulatory changes normally result in high listing costs; thus, companies end up delisting (Daugherty & Georgieva, 2011). Furthermore, delisting has an adverse effect on minority shareholders' interests (Khort, 2014).

2.7 Delisting determinants of cross-listed firms

Cross-delisting is a process whereby an entity that is listed on two stock exchanges (domestic and foreign market) delists from one of the stock markets on which is listed (Chemmanur & Fulghieri, 2006). Witmer (2008) indicates that more than one-quarter of Canadian cross-listed firms involuntarily delisted, mainly from the NASDAQ stock exchange. These firms delisted as the cost of cross-listing did not exceed the benefits. Such firms experienced poor liquidity and had a marginal increase in analyst coverage following the cross-listing.

Bessler *et al.* (2011) investigated market segmentation and evidence which suggests that cross-listing is not beneficial for German firms and the findings refute the market segmentation and bonding theories. This study revealed that regulatory changes have the potential to lead firms to delist. Liu, Stowe and Hung (2012) investigated why United States firms voluntarily delisted in Japan from 1982 to 2015. The authors discovered that this was due to a small shareholder base. This study reaffirms foreign listing literature which indicates that shareholder base and liquidity are the primary reasons for foreign listings.

Cross-delistings are driven by market integration and the introduction of new and lenient corporate governance laws (SOX). Cross-listings are not beneficial for German firms since German firms that cross-listed did not benefit from a lower cost of capital and a higher valuation. One-quarter of Canadian cross-listed firms involuntarily delisted, mainly from the Nasdaq stock exchange. These firms delisted as the cost of cross-listing did not exceed the benefits. Such firms experienced poor liquidity and had a marginal increase in analyst coverage following the cross-listing.

2.8 Accounting ratios that determine delistings

2.8.1 Growth prospects

The growth prospects of a listed entity are an important determinant of a firm's delisting decision (Boehmer & Ljungqvist, 2004; Kang & Ang, 2017). Firms with fewer growth prospects are likely to delist (Marosi & Massoud, 2007; Pour *et al.*, 2013). Matured firms with fewer growth prospects have a high probability of delisting, according to Kim and Weisbach (2005). Marosi and Massoud (2007), as well as Pour *et al.* (2013), confirm that firms with fewer growth prospects are likely to delist. According to Thomsen and Vinten (2006), low-growth firms will voluntarily delist to reduce listing costs. In contrast, in Korea Kang and Ang (2017) found evidence that firms with both higher liquidity and growth prospects, as well as concentrated shareholders, are likely to delist voluntarily.

2.8.2 Profitability

Trang's (2018) study confirms that Vietnamese firms that are profitable are unlikely to delist. On the other hand, unprofitable firms are likely to voluntarily delist as they would have to continue paying substantial listing fees. Additionally, Chaplinsky and Ramchand (2008) and Edelman *et al.* (1990) argue that the lower the profitability of the firm, the higher the probability that a firm voluntarily delists.

2.8.3 Gearing

Gearing plays a pivotal role in a firm's decision to delist (Algebaly *et al.*, 2014; Marosi & Massoud, 2007; Martinez & Serve, 2011; Pour & Lasfer, 2002, 2013; Trang, 2018; Tutino *et al.*, 2013). Firms that usually delist are highly geared (Algebaly *et al.*, 2014; Tutino *et al.*, 2013). Leslie and Yanthi (2013) demonstrated a positive relationship between gearing and the probability of delisting, meaning that highly geared companies have a high probability of defaulting on debt.

2.8.4 Liquidity Theory

Amihud and Mendelson (1988) noted in an earlier study the importance of liquidity in the life of a listed firm. Thomsen and Vinten (2014) confirmed that liquidity is one of the key drivers which induces a firm to list. Furthermore, Thomsen and Vinten (2014) argue that a firm will voluntarily delist if a stock market is illiquid, its shares are less traded,

and its shareholders are highly concentrated (meaning there will be a less free float). In Indonesia, for example, the key determinant of delisting is the firm's liquidity and this implies that share liquidity (illiquidity) decreases (increases) delisting probability (Leslie & Yanthi, 2013). In Brazil and Korea, scholars found liquidity to be one of the key determinants of delisting (Bortolon & da Silva, 2015; Kang & Ang, 2017).

2.8.5 Agency costs

Renneboog *et al.* (2007) did not find evidence that UK firms decide to delist due to principal-agency problems. Aslan and Kumar (2011) found evidence that firms in the United Kingdom delist to avoid agency problems. This was also the case in the United States (Coles, 2008; Hamid & Perstiani, 2010).

2.8.6 Corporate governance

Corporate governance plays an important role in the delisting process of a listed entity. Firms implementing a sound corporate governance framework are least likely to delist involuntarily or experience bankruptcy or liquidation (Thomsen & Vinten, 2006). Firms with more independent boards and greater insider ownership are unlikely to delist (Charitou *et al.*, 2007). According to Chien *et al.* (2009), firms are less likely to delist when the majority of the board are independent directors, the board size is large, there is a lower ratio of share pledged to the total shares, there are higher control rights over seats and lower control rights over rights for cash flow.

In the context of emerging markets, Liao (2020) examined delisting behaviour and its relationship with corporate governance. The study revealed a wave of delisting in emerging markets between 2008 and 2014. Additionally, it was found that stronger corporate governance, as measured by the rule of law index and investor protection index, was inversely associated with the incidence of overall delisting. This suggests that firms in countries with stronger rule of law and investor protection are less likely to undergo delisting. Furthermore, the study identified a connection between governance and different types of delisting, indicating that better governance is associated with a lower occurrence of involuntary delisting triggered by mergers and acquisitions or bankruptcy and liquidation, but a higher occurrence of voluntary delisting through going private transactions.

2.8.7 Regulatory changes

Stringent regulatory changes with financial implications can lead to delisting, as these regulations tend to increase the compliance costs of a listed entity (Coles, 2008; Daugherty & Georgieva, 2011). However, Khort (2014) argues that the United States market should introduce more regulation to promote investor protection rights as shareholders should have influence in the firm's decision to delist voluntarily. Interestingly, Khort's (2014) study deemed compliance costs as not being especially onerous. A study conducted in China by Jiang and Wang (2008) highlighted that over-regulation in an underdeveloped market can result in firms delisting and even lead to firms manipulating their earnings to remain listed. Additionally, upgrading listing standards also has the potential to lead to delisting by listed firms. Firms delisted due to regulatory changes usually record negative abnormal returns (Chandy, Sarkar & Tripathy, 2004; Leuz *et al.*, 2008) and the liquidity of these firms is significantly reduced (Leuz *et al.*, 2008). For example, trading values decrease and bid asked spread increases. Furthermore, the cost of capital tends to increase once a firm is delisted (Chandy *et al.*, 2004). The types of firms that delisted following the new regulations experienced poor prospects, agency cost issues, or were facing financial distress (Coles, 2008). The conclusion drawn is that stringent and lenient regulatory changes can lead firms to delist (Chandy *et al.*, 2004; Leuz *et al.*, 2008).

2.9 Involuntary delisting factors driven by non-financial ratios

The stock exchange has the incentive to involuntarily delist a firm that fails to comply with its regulations to preserve its reputation capital (Chen & Schoderbek, 1999). Sanger and Peterson (1990) believe that delisting events result from the failure by a listed entity to achieve its minimum numerical requirements. On the other hand, Chen and Schoderbek (1999) argue that accounting numbers play a secondary role in the stock market's decision to delist a listed entity. The stock exchange usually delists firms that violate or fail to comply with its listing requirements and to preserve its reputation capital (Chen & Schoderbek, 1999). This is supported by Djama, Martinez and Serve's (2013) study which observes that violation of the stock exchange regulations or poor firm performance by a listed entity might lead the stock exchange to delist a listed firm involuntarily. Firms that cannot pay for their ongoing listing fees will be involuntarily delisted (Čornanič & Novák, 2015).

2.10 Delisting determinants for cross-delisting

Based on the empirical evidence provided by various scholars across the spectrum, cross-delisting could result from multiple and diverse reasons. According to Bessler *et al.* (2011), introducing new lenient regulatory changes, for example, exchange act rule 12h-6 in the United States, resulted in many foreign firms cross-delisting. The small investor base in the foreign market, such as Japan, resulted in United States firms cross-delisting (Liu *et al.*, 2012). In 2002 the United States introduced new stringent corporate governance laws (which intensified disclosure requirements), resulting in cross-delisting foreign firms listed on the United States stock exchanges (Chaplinsky & Ramchand, 2012). Furthermore, according to Witmer (2008), firms cross-delist if they do not benefit from the cross-listing. Additionally, according to Svensson and Heikenström (2016), firms cross-delist due to market integration as cross-listing does not benefit the cross-listed firm. Firms cross-delist when no benefits are accruing to them, for example, when such a firm experiences low returns as well as low trading volumes on the host market (You, Parhizgari & Srivastave, 2012). Overall, firms cross-delist when they do not gain any benefits from the cross-listing.

2.11 Other delisting determinants

Many other factors trigger delisting: high shareholder concentration (Bortolon & da Silva, 2015; Martinez & Serve, 2011), listing costs (Konno & Itoh, 2018; Martinez & Serve, 2011), undervaluation of listed firms (Boehmer & Ljungqvist, 2004; Hu *et al.*, 2019; Konno & Itoh, 2018), negative abnormal returns (Cai *et al.*, 2018; Pour & Lasfer, 2013), a lack of analyst coverage (Cai *et al.*, 2018), and a lack of access to capital (Hu *et al.*, 2019).

2.12 Involuntary delisting

2.12.1 Firm-side triggers

The leading reason why a bourse delists firms involuntarily is because a firm fails to comply with listing requirements (Djama *et al.*, 2013). Therefore, this is a risk management exercise intended to safeguard market discipline, and it demonstrates how strict the bourse is at enforcing listing requirements (Martinez & Serve, 2007).

Sanger and Peterson (1990) conducted a study aimed at analysing circumstances around involuntary delisting within the context of stock exchanges enforcing listing discipline. The findings of this research (Sanger & Peterson, 1990) indicate that stock exchanges pay particular attention to the conduct of firms in respect of particular requirements, namely accounting conducted, liquidity constraints (inability to meet debt obligations with the creditors), illiquid share, and shares selling at a large discount. This suggests that listed firms are required to behave as conscientious moral enterprises, failing which they will be delisted.

Chen and Schoderbek (1999) proffered a counter to Sanger and Peterson (1990), arguing that grounds for delisting have a salient caveat. The caveat is that in the United States, accounting variables (going concern audit opinion and non-compliance financial guidelines) play a secondary role in the delisting decision by the bourse. Similarly, Chen and Schoderbek (1999) found evidence that the most critical variable in the delisting decision is the Chapter 11 filing (this type of bankruptcy enables a company to stay operational while it restructures its debt obligations).

Macey, O'Hara and Pompilio's (2004) study on causal factors observed an increase in factors that result in companies being delisted involuntarily: a company does not necessarily violate one set of conditions of listing such as minimum assets requirements or the market capitalisation criteria in the United States. It was further noted that bankruptcy remains the leading factor in determining the delisting decision.

2.12.2 Stock exchange-side triggers

The preceding literature on involuntary delisting observed mainly firm-side behaviour as the trigger leading to the publicly trading company being disbarred from the bourse. Macey *et al.* (2008) argue that some stock exchanges do not apply listing requirements consistently, a phenomenon that results in some companies being delisted. Ostensibly, this perspective appears to be based on ideological grounds, in particular a preference of stock exchanges to not self-regulate.

Chemmanur and Fulghieri (2006) analysed the behaviour of stock exchanges in respect of bourses and the impact this has on the decision to involuntarily delist a trading enterprise. The bourse that considers itself to uphold high reputation is most likely to apply listing rules more strictly in a manner that punishes listed companies to

the point of delisting them. In contrast, an accommodating non-conservative stock exchange is less likely to apply similar listing rules stringently and this results in more companies being less likely to be delisted.

Serrano (2013) made critical observations about stock exchange behaviours, noting distortions in the application of listing rules, and anchoring on the fragmentary evolution of exchanges that Macey *et al.* (2004) emphasised.

2.13 Voluntary delisting

Voluntary delisting can be classified into two categories depending on whether the delisted entity does not trade or if a company continues trading after being delisted. The first form of voluntary delisting is when a company delisting from the main stock exchange does not trade in any stock exchange as it has become an unlisted company. The stock exchange does not initiate a voluntary delisting process. Martinez and Serve (2017) observe several conditions that give rise to voluntary delisting. First is that voluntary delisting occurs when a listed company is merged with another. Secondly, voluntary delisting is occasioned after a public take-over bid. Martinez and Serve (2017) also argue that take-overs are considered voluntary delistings as the delisting decision is taken by the firm and not by the bourse. Moreover, Martinez and Serve (2017) highlight that 'going dark' or deregistration is another form of voluntary delisting. In such an instance, a company withdraws from a regulated market but continues to trade on an unregulated market. This state of deregistration is a downward step in the firm's life as it would be delisted from the main stock exchange.

Firms with fewer growth prospects are likely to delist voluntarily (Marosi & Massoud, 2007; Pour & Lasfer, 2013). Thomsen and Vinten (2006) assert that low-growth firms voluntarily delist to reduce listing costs. Trang (2018) supports this assertion, noting that in Vietnam profitable firms are unlikely to delist. On the contrary, unprofitable firms are likely to delist voluntarily as they would have to continue paying substantial listing fees – echoing the view of Pour and Lasfer (2013). Firms that usually choose to delist voluntarily are highly geared (Tutino *et al.*, 2013). Thomsen and Vinten (2014) confirm this observation, noting that liquidity is one of the key drivers which induces a firm to list. Studies in upper middle economies – such as Brazil and Korea - concluded that liquidity is one of the critical determinants of voluntary delisting (Bortolon & Silva, 2015; Kang & Ang, 2017).

The inference is that voluntary delisting is not initiated by the bourse but by the company's management team. A firm can delist voluntarily by becoming an unlisted company or continue to trade on the over-counter market while it is delisted from the main stock exchange. A few factors that drive companies to delist voluntarily are the lack of growth prospects, lack of profitability, high listing costs, regulatory changes, and a lack of listing benefits.

2.14 Cross-delisting

According to Maier (2007), cross-listing is when an entity is listed on multiple stock exchanges (domestic and foreign markets), but then chooses to delist voluntarily on the foreign market whilst continuing to trade on its local market. Cross-delisting can be involuntary (initiated by the stock exchange) or voluntary (initiated by the company). Cross-listing is usually motivated by the cheap cost of borrowing, liquidity, and the desire for investor recognition (Füss, Hommel & Plagge, 2016). Loureiro and Silva (2020) concur, highlighting that cross-listing does enhance the cross-listed company's access to capital, curbs insider trading, and reduces a company's financial constraints.

Karolyi's (2004) study highlighted non-conventional motives that usually induce a firm to cross-list. These motives include "spillover" effects of cross-listings, corporate governance, agency conflicts and legal "bonding", global equity offerings, changes in the information environment of cross-listing firms, multi-market trading, liquidity, price discovery, and arbitrage. Karolyi's (2004) study highlighted that the new stream of literature on motivation for cross-listing does not support the notion that companies cross-list to break down investment barriers, resulting in a lower cost of capital (market segmentation hypothesis). Karolyi (2004) argues that if the main reason for cross-listing is based on the cheap cost of funding that eliminates investment barriers, then the cost of capital for all cross-listed firms would fall significantly where such firms are cross-listed, which is not usually the case.

Djankov *et al.* (2008) observes that companies from a developed capital market do not necessarily contend with financial constraints, meaning that these companies do not struggle to gain access to capital. Given the relative ease they have in accessing capital, cross-listing therefore does not benefit these companies in terms of access to capital.

However, leading companies from developing economies gain considerably by listing in developed markets. Indeed, there is evidence that companies from emerging markets that cross-delist on the United States stock market gain access to the capital once they are listed on the United States stock exchanges (Lins, Strickland & Zenner, 2005).

According to Witmer (2005), firms cross-delist if they do not benefit from the cross-listing. According to Svensson and Heikenström (2016), firms cross-delist due to market integration, as cross-listing does not benefit the cross-listed firm. Firms cross-delist when no benefits are accruing to them, for example when such a firm experiences low returns and low trading volumes on the host market (You *et al.*, 2012). Overall, firms cross-delist when they do not derive benefit from cross-listing.

The conclusion is that companies usually cross-list to gain access to the cheap cost of capital, liquidity, and increased investor recognition, and this curbs insider trading and reduces a company's financial constraints. Cross-delisting can be involuntary (initiated by the stock exchange) or voluntary (initiated by the company). Companies that fail to comply with the listing requirement are usually delisted involuntarily.

2.15 Wealth effect of delisting

Ando and Modigliani (1963), as well as Shirvani and Wilbratte (2012), define the wealth effect as an increase in stock price, which can induce more consumption. On the other hand, Friedman (1957) and Angelucci *et al.* (2021) hold a different view as they explain that household consumption is not based on transitory income; they maintain that stock price appreciation should not be seen as permanent household income, and as such this might not have consequences for household consumption patterns.

Pearce (1983) reviewed the theoretical and empirical literature on the relationship between stock prices and real economic activities. His study found evidence similar to Al-Obaid (2011), in that the stock price increase drives consumer spending. Stock price increases are viewed as the main drivers of household wealth. The author's study is unclear about how increases in stock prices drive investments in the broader economy and points out that an increase in stock prices can motivate companies to make investments; furthermore, the increase in stock prices increases real investments as a

company is likely to benefit from the lower cost of funding its expansion. Pearce (1983) states that most empirical evidence surveyed indicates a positive relationship between the stock market and consumer spending. This aligns with Paiell's (2009) study. However, the effect is over various periods, and while stock prices when increased enhanced investments, the effect appears uncertain. Lastly, the author states that the increase in stock prices has driven real output, consumption and investments in the United States domestic economy.

Ludvigson and Steindel (1999) investigated the wealth effect of stock market changes on consumer spending. The study indicates a positive correlation between aggregate wealth changes and spending, and further observes that spending growth in the past was driven by stock market gains, but that these effects were unstable. The authors point out that unexpected changes in wealth do not drive consumption growth and the response appears to be significantly short-lived. Based on their study, the authors noted that the empirical evidence from their study is limited.

2.16 The impact of involuntary delisting on shareholders' wealth

Sanger and Peterson (1990) investigated the impact of involuntary delisting on stock returns and liquidity (bid spreads and trading volumes). The authors' findings are consistent with the study by Amihud and Mendelson (1988) which revealed that liquidity constraints result in a lower asset value. In addition, their study found empirical evidence that involuntary delisting reduces the value of a company.

Baker and Kennedy (2002) investigated the 10-year survival rate of companies listed on the United States New York and American stock exchanges. This study indicates that the majority of the delistings were driven by takeovers where 66% of the delistings were via takeovers. The study further indicated that, on average, firms that are likely to be delisted usually underperform against the market in the years leading up to the last year of their existence. The research indicates that the average (median) firm underperforms the market by 25% (48%) over the period from 10 years prior to one year before delisting.

Harris, Panchapagesan and Werner (2008) built on the study of Sanger and Peterson (1990) by examining the extensive number of NASDAQ delistings with more comprehensive data, thereby addressing the data shortcomings highlighted by

Shumway (1997). Harris *et al.* (2008) found evidence that despite the advance notice for delisting, delisted firms lose 19% of the value (on an equal-weighted basis) from the day before to the day after delisting. They point out that prior to the company being involuntarily delisted – since delisting itself is anticipated – the delisted company's share prices are also significantly depressed, leading up to delisting so that this lost value (19%) likely underestimates total shareholder losses. Furthermore, this study indicates that involuntary delisting also leads to immediate adverse effects on market quality, with volatility, quoted and effective spreads tripling, volume dropping by two-thirds on the day of delisting, and that market quality deteriorates permanently and significantly, only partially reverting from the spike on the delisting day. Additional findings were that for companies that have a bank as a shareholder, their share price decline rate prior to the delisting event is minimal, but once upon the delisting event, the share price decline is significant.

Rogova and Belousova (2021) examined how a company's delisting announcements and finalisation affect the stock prices of competitor firms within the Russian market. Their findings suggest that following a delisting announcement, competitor stock prices significantly increase, indicating potential growth opportunities as a consequence of decreased competition. The study further noted that abnormal returns in the lead-up to the completion of the delisting process are positive, albeit less significant. The research emphasises the significant impact of delisting events on the industry and competitors' stock prices.

Mohapatra and Chaturvedula (2022) explored how delisting events impact on shareholder wealth in the Indian stock market and found that shareholders of delisted stocks faced a considerable loss of 13.89% in the run-up to the delisting, indicating a substantial impact on shareholders' wealth. The research helps to understand the implications of delisting events in Indian capital markets.

2.17 Voluntary Delisting (going dark – impact on shareholders' wealth)

'Going dark' refers to those companies that have voluntarily delisted (by deregistering) from the main stock exchange but continued to trade on the Over The Counter (OTC) markets. Marosi and Massoud (2007) investigated the reasons for companies to delist voluntarily (go dark) and the impact of the delisting event on the shareholders' wealth. Those firms with fewer growth opportunities have concentrated internal ownership, few

institutional ownerships and high gearing and are likely to delist (go dark). In addition, regulatory costs (high audit fees) are also the main driver of the going dark decision.

These scholars argue that their results comparing pre- and post-Sarbanes-Oxley (United States law that mandates certain practices in financial record-keeping and reporting for corporations) deregistration decisions indicate that companies are likely to go dark in the post-Sarbanes-Oxley period due to the impact of high audit fees. The study further reveals that shareholders suffer significant negative cumulative abnormal returns upon the announcement of deregistration as these investors, post-going dark, are left holding illiquid shares. The recorded cumulative abnormal returns (0, +1) within the event window are -10.99%, indicating that the going dark decision does erode shareholders' wealth.

Leuz *et al.* (2008) sought to establish why firms go dark, as well as the cause and economic implications of voluntary Securities Exchange Commission (SEC) deregistrations in the United States. This study suggested that agency problems may also motivate a company to go dark. However, some firms were not only influenced by cost savings as the only consideration. Regarding the latter, companies with weak governance structures, outside monitoring and larger free cash flow were more likely to go dark.

There are two types of voluntary delisting, and in this sub-section one form of voluntary delisting was discussed. It is necessary to understand all forms of voluntary delisting holistically, and the following sub-section presents the other form of voluntary delisting.

2.18 Voluntary Delisting (without subsequent listing impact on shareholders' wealth)

DeAngelo, Dangelo and Rice (1984) published a pioneering paper on the going-private transaction (voluntary delisting) and shareholder wealth in the United States and defined a going-private transaction as an instance whereby the incumbent management team acquires the full equity interest of the voluntary delisted company. Furthermore, according to the author's definition of the going-private transition, such private transactions can be referred to as minority freeze-outs. Research suggests that this is because management already owns the majority of outstanding shares in the public corporation and the minority stockholders are "cashed out" of their investment

in the firm. The researchers raised concerns that such transactions might lead to minority shareholders being exploited as the management team is the purchaser of the public shares and agent for the sellers. This should not present a significant concern as, according to the same research, minority shareholders' interests are protected by the United States legal system.

DeAngelo *et al.* (1984) undertook a study on the public announcement of going-private transactions by 72 AMEX and NYSE-listed firms from 1973 to 1980. The study also investigated going-private transaction proposals that were withdrawn. The methodology used for the analysis was the event study. This explained that going private is beneficial to the voluntarily delisted companies as they will save on listing expenses. The study established that going private transactions yield positive abnormal returns for existing shareholders, thus suggesting that voluntary delists create wealth for existing shareholders. This view is informed by the fact that for two days surrounding the initial proposal to go private, the wealth of existing stockholders increased by an average of 22.27%. When scholars considered the effects of pre-proposal leakage, existing shareholder wealth increased by an average of 30.40% at the proposal. Additionally, existing shareholders experienced losses of approximately 8.88% on their wealth when a company withdraws its going-private proposal. This result highlights an important point, namely that minority shareholders are not discriminated against in the going-private transaction as they generate positive abnormal returns for such transactions.

Renneboog *et al.* (2007) examined the quantum of shareholders' gains in the United Kingdom for public-to-private transactions (PTPs) in capital markets. The study sample comprised 177 UK public-to-private transactions between January 1997 and February 2003. These PTPs in the dataset were subdivided into three categories, namely management buyouts (MBOs), management buy-ins (MBIs), and institutional buyouts (IBOs). Findings revealed that existing shareholders following a PTP on average receive a premium of 40% and the market reaction to the announcement of a PTP transaction as measured by the cumulative abnormal returns (CARs) over an 11-day event window was around 30%. This suggests that these premiums and wealth effects are not dissimilar to the United States findings. According to the authors, the existing shareholder gains are driven by the target firm's undervaluation over a one-year period prior to the first PTP announcement. They also point out that the higher premiums

offered for the target firms reflect the potential additional value that will be generated once the firm reaches its private status (delisted) and further argue that this effect is stronger for MBOs and IBOs than for MBIs, which may arise due to differences in asymmetric information. The findings suggested that in contrast to United States research, there is no relation between a target firm's tax burden prior to the PTP and the expected wealth gains. However, they note that the higher premiums that are paid for firms with low leverage do support the tax benefits hypothesis. In addition, the researchers point out that the unused debt capacity is likely to create a large additional tax shield, and that this has the potential for increased incentive realignment in the private firm and is also an important determinant of the shareholder wealth gains, since both the premium and CARs are higher for firms with lower levels of managerial ownership. There is further evidence from the study that for firms with stronger outside blockholders (substantial owners of the company's shares or debt), the premiums and CARs are lower. Renneboog *et al.* (2007) argue that the negative relationship is particularly strong for firms monitored by corporates as existing shareholders and that this supports the notion that firms monitored by outside shareholders have less scope for operating performance improvements in the post-PTP period. Lastly, the research revealed that free cash-flows do not determine the premiums, nor are PTPs a defensive reaction against a take-over.

Sannjust (2010) analysed public-to-private (PTP) performance from an international perspective which suggested that voluntary delisting (public-to-private transactions) in the United States, Europe and Asia results in positive abnormal returns for shareholders. This view is informed by the fact that shareholders selling their shares to the final bidder will earn a premium of approximately 20% for Europe, 29% for the United Kingdom, 27% for Asia, and 34% for the United States.

2.19 Cross-delisting and Shareholders' Wealth Effect

Meera, Tripathy and Redfearn (2000) examined the impact of delisting on firm value and market liquidity using the GARCH error model and stocks that were dual-listed between the stock exchanges of Malaysia and Singapore. The study found evidence that delisting does harm stock exchange value and the magnitude of the negative effect on the delisted companies depends on their market capitalisation. A listed company with larger market capitalisation – when delisted – loses quite significantly (-11.84%) when compared to those delisting companies of lower market capitalisation (-4.13%).

Evidence on the effects of delisting on the overall economy is mixed, as firms experience a negative wealth effect (negative abnormal returns). Heavily traded companies on the foreign stock exchange tend to display a substantial increase in trade volumes on the local market following delisting from the foreign market.

Witmer (2005) investigated cross-listed companies that delisted on the United States exchanges (NYSE, AMEX or NASDAQ) between 1990 and 2003. The study did not find evidence supporting the bonding hypothesis as firms that were from countries with poorer investor protection, or where they are listed in the Post-SOX period, are more likely to delist. However, there is evidence to suggest avoiding hypotheses whereby the added costs of United States regulations would appear to deter these firms from maintaining a United States listing. The study suggests that cross-delisted firms experienced abnormal stock returns (-5%) upon announcing the cross-delisting. The authors suggest that the negative abnormal returns are driven by involuntarily delistings.

Ureche-Rangua and Carugati (2008) undertook a study aimed at qualifying the impact of voluntary foreign delisting on domestic stock prices which revealed that content announcement plays a pivotal role in the domestic stock price of foreign voluntary delisted firms. The study indicated that if a foreign firm is voluntarily delisted due to failure to accrue any benefits from listing in Japan, for example, then investors in the domestic market punish such companies due to the lack of benefits from listing abroad and the price reacting to such delistings is significantly negative, indicating that shareholders of the delisted company will suffer losses as they would generate negative abnormal returns.

Cong (2017) investigated the impact of international delisting and cross-listing on daily volatility, non-trading hour volatility, and trading hour volatility of share prices. The primary focus was on United States entities that cross-listed / delisted on the Japanese Stock Exchange. The study revealed that cross-listing (delisting) reduces (increases) trading volatility. Cong (2017) argues that the findings are consistent with the joint hypothesis that cross-listing (delisting) reduces (increases) the quantum of private information and that informed traders are reluctant to trade abroad.

2.20 Summary and Conclusions

This literature review explored variables around stock exchange delisting. Involuntary delistings are initiated by the bourse, and firms that are delisted involuntarily tend to fail to comply with listing requirements. The literature review noted that the market promptly communicates its displeasure with delisted firms, and the reason the market reacts negatively to involuntary delisting is due to the number of market turbulences that befall investors, including the fact that liquidity constraints hamper existing shareholders. The perception of market players is also detrimental, and sends negative signals, thus reinforcing the delisting in question.

In some instances of involuntary delisting, researchers noted that stock exchanges apply rules arbitrarily. An independent body should be appointed to enforce the listing requirements so that when a delisting decision is taken, the process is perceived to be fair. This will ensure that shareholders are protected as firms that would need to be involuntarily delisted will be delisted in a timely and objective manner. It is clear that the firms being delisted involuntarily will be those that fail to comply with listing requirements.

This study is of the view that earlier studies in the United States underestimated the negative abnormal returns that are generated by shareholders during an involuntary delisting event, where negative abnormal returns are sizeable and accounted for in a range of United States-based studies. In addition, studies reveal that negative abnormal returns are significant for underdeveloped markets with liquidity constraints. In some markets, attempts have been made to address liquidity constraints by developing secondary markets; however, these have not been useful as was the case in Japan, where the negative abnormal returns experienced by shareholders following a delisting event may be significant.

There were indications that markets are not efficient as in some instances before the announcements of stocks being delisted, there were signs of insider trading. There appears to be little doubt that involuntary delisting does erode shareholders' value, since subsequent to the delisting event, shareholders generate negative abnormal returns. This is construed to mean that the market anticipates that these shareholders will struggle to sell their shares, or if they had to sell their shares, they will have to do so at a considerable discount.

A common conclusion from most of the literature reviewed was that firms in all instances will be delisted if they fail to comply with listing requirements. However, there were some exceptions in that certain studies noted that the stock exchanges do not always enforce listing requirements for those firms that have violated the listing requirements but are able to continue paying their listing fees. This engendered debate that an independent body could be designated to enforce the listing requirements as there will be no concerns related to conflict of interest.

Delisting literature is limited as the majority of the studies focus on Europe and the United States. Recent studies have emerged that draw on experiences in Russia and India. In emerging markets there has been limited research undertaken, as well as across Africa, where there were no studies identified that have quantified the wealth effect of involuntary delisting.

Voluntary delisting (going dark transaction) does not offer respite to shareholders in relation to impact on shareholder wealth. Shareholders of delisted companies are adversely impacted in the form of negative abnormal returns. The recorded negative abnormal returns seem to vary from -7.6% to 28.28%. The market reacts negatively to the going dark firms in view of resultant liquidity constraints, meaning that the current shareholders are unlikely to find buyers for the shares they may presently hold. For such shareholders to sell their shares, they may have to do that at a considerable discount, resulting in further losses.

Regarding characterisation of delisting companies, the market perceives deregistration by the company as a mechanism for managers to hide poor performance and a strategy by managers and large owners to avoid outside scrutiny that comes with being compliant with the SEC reporting. The literature highlights that firms go dark due to agency costs and high compliance costs. Firms that go dark are typically small, display poorer financial performance, are highly geared, have fewer growth prospects, concentrated internal ownership, and few institutional ownerships. Overall, firms that go dark tend to erode shareholders' wealth. As shareholders in these companies record negative abnormal returns, the equity value of the shareholders will decline, indicating that they would have incurred losses on their investment. The main drivers

for companies to go dark were to avoid high listing costs emanating from regulatory changes.

Based on the literature reviewed, the majority of voluntary delisted companies – that do not continue to trade on the stock exchange following a delisting – generate positive abnormal returns for existing shareholders as these shareholders are paid a premium for the disposal of their shares to the acquirers. The acquirers pay a premium to existing shareholders to entice these shareholders to sell their shares. The premium paid can also be seen as a proxy for the potential additional value generated once the firm goes private. As revealed in the literature review, the premium paid varies across geographical locations. Studies that have indicated that voluntary delisting does not create value for shareholders would appear to overlook that for existing shareholders to sell their shares, they would need to be incentivised by being paid a premium for their shares. This is an important component that must be factored in. Thus, the inference to be drawn is that voluntary delisting should create value for existing shareholders and these shareholders should be paid a premium to sell their shares as the acquirers are of the shared view that the company, they will be purchasing will create wealth for them. A study regarding these types of delistings indicated that voluntary delisting can result in the erosion of shareholder wealth.

Since voluntary delisting is initiated by the companies and shareholders have to grant approval, there are concentrated shareholders in some instances as well as cases where families are the majority shareholders. This gives rise to concerns that these shareholders might not act in the interests of the minority shareholders when they approve voluntary delisting transactions. The literature indicates that in a voluntary delisting, minority shareholders are not discriminated against but that when a company withdraws its going-private proposal, existing shareholders may suffer losses.

Voluntary cross-delisting tends to erode shareholders' wealth, as indicated by the literature reviewed, and this is informed by the motives that inform the cross-delisting. The market generally punishes a company that would cross-delist voluntarily due to failing to benefit from the cross-listing. The punishment by the market results in the fall in prices in the local market of the cross-delisted company. In contrast, the market rewards a company that would cross-delist due to strategic reasons, as in the local markets of such companies their share prices increase following a voluntary cross-

delisting. Companies that are generally from a smaller less-developed stock market that cross-list on the bigger established stock markets tend to suffer losses, since there will be a drop in the share price of the company in the local market following the delisting event, when they voluntarily cross-delist from a larger established stock market. The drop in the share prices following the delisting event might signal that the company no longer has the benefits – such as access to capital, enhanced corporate governance, and similar – of being cross-listed on the bigger established bourse, while companies that are from more established and larger stock markets when they voluntary delist are less likely to experience any loss as they still have benefits that accrue from the larger established stock market. The inference to be drawn is that the reasons a company cross-delists and the market that a company originates from play an important role in the market players' reactions to a delisting event. Cross-delisting tends to increase the cross-delisted company's liquidity in the domestic market due to the migration of trading volume back to the domestic markets. The benefit of the increased liquidity has positive economic implications, as the increased liquidity of the firms in the domestic (home) market is likely to increase income for other sectors of the economy, particularly brokerage firms. As suggested by the literature review, cross-listing is usually motivated by the cheap cost of borrowing, liquidity, and increased investor recognition. There is also a view that cross-listing will enhance the cross-listed company's access to capital, curb insider trading, and reduce a company's financial constraints.

There are other motivations to consider, such as to remedy agency conflicts, multi-market trading and liquidity, price discovery and arbitrage, that influence a firm to cross-list. Firms that normally cross-list do not enhance corporate governance or improve their accounting reporting practice transparency. In the literature review in this sub-section, there is no evidence that supports the bonding hypothesis. This is not unexpected, since, being a listed company, the corporate governance practices are improved due to listing requirements. Firms that cross-delist normally delist in an event when these firms do not benefit from the cross-listing.

The literature suggests that pre-bid run-up in stock prices represented by statistically significant abnormal returns before delisting may indicate insider trading or informed trading or speculators anticipating the delisting.

Based on the reviewed literature, there is mixed empirical evidence regarding the relationship between stock prices and consumption. Studies that did identify a positive relationship between stock prices and consumption were criticised by other scholars for the poor data quality that informed those studies; additionally, some scholars countered that consumption of households is not based on transitory income, and that stock price increases might not be seen as permanent income by households and therefore might not have consequences for household consumption patterns. The studies that did not identify the relationship between stock prices and consumption were criticised by other scholars for the poor data used in these studies due to the small sample sizes. This study posits that stock prices should impact on consumers' spending patterns and wealth in instances where the stockholders predominantly source their income and wealth from being shareholders. If the stockholder in question is able to sell their shares at a high price, the dividend stream that they have been receiving has increased and the value of their shares will concomitantly increase substantially. The stockholders' wealth and marginal propensity to consume should thus be higher, which supports the argument that stock prices have the potential to impact on consumers' spending patterns and wealth. Should the stockholders' wealth only be derived from being an equity holder and stocks that they have invested in underperform or their value is depleted, this would result in the stockholders' wealth and marginal propensity to consume declining significantly. A determination may therefore be made that shareholders' wealth and consumption patterns will be undermined when their shares decline in value or when the companies that they would have invested in go bankrupt, since in the aftermath of such an event the shareholders may lose all or a significant part of their investment and future income streams. In sub-Saharan African countries, there was evidence that there is a direct relationship between stock prices (returns) and consumption growth, thus implying the existence of wealth effect. These findings confirm the main argument that stock prices impact on shareholders' wealth and consumption patterns.

The determinants of delisting in financial markets vary across different regions. In Africa, highly geared firms and those that fail to submit financial information on time are more likely to delist. In Asia, weak corporate governance, liquidity constraints, and shareholder concentration play a role in the delisting decision. In the United States, factors such as regulatory costs, corporate governance, and mergers and acquisitions influence delisting. In Europe, high gearing, lack of listing benefits, and regulatory

changes impact on delisting decisions. Regulatory changes, such as the introduction of the Sarbanes-Oxley Act, can trigger delistings. Delisting also has implications for cross-listed firms, with factors like shareholder base and liquidity influencing the decision. Overall, understanding the determinants of delisting is necessary for market participants and policymakers to effectively manage and regulate financial markets.

Delisting decisions across different regions often exhibit common trends and themes. Financial factors play a significant role, with heavily indebted firms, liquidity constraints, and poor financial performance being associated with delisting. Weak corporate governance structures, characterised by lack of transparency and insider control, are particularly relevant in Asia and Europe. Regulatory changes, including shifts in listing requirements and increased compliance costs, can trigger delisting. Market conditions, such as low market capitalisation and illiquidity of shares, also influence delisting decisions. Mergers and acquisitions frequently drive delisting, while cross-listed firms may choose to delist from one stock exchange due to limited benefits and high costs. Understanding these factors can assist in understanding delisting decisions and their impact on financial markets.

The researcher is unaware of any research carried out on the JSE focusing on the overall and sector-specific shareholder wealth effect as well as factors that cause voluntary and involuntary delisting. Therefore, the current study would appear to be the first study in South Africa to quantify the wealth effect of delisting on shareholder wealth in general and across sectors, as well as factors that determine delisting.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Event Study

The research methodology section of this study aims to provide a comprehensive explanation of the research methods used to examine the wealth effect of delisting events, both overall and within specific sectors, using an event study methodology and the logistic regression to examine factors that determine delisting. Delisting events have the potential to impact significantly on investor wealth, and this study sought to analyse the market reactions and wealth implications associated with such events. By employing rigorous and systematic research methods tools, we aimed to contribute significantly to the existing literature on the wealth effect of delisting and provide valuable insights for investors, policymakers, and market participants.

This section outlines the key steps involved in conducting an event study. These steps include data collection, event selection, estimation of abnormal returns, and statistical analyses. The data collection process involved gathering relevant financial and market data, such as stock prices, for a sample of delisted companies. The event selection criteria were based on companies with inadequate data for the event study timelines. By focusing on both overall delisting events and sector-specific delisting, we could capture the nuanced dynamics of the wealth effect within different industries. The estimation of abnormal returns was a crucial component of the event study methodology. By comparing the actual returns of delisted stocks with the expected returns based on market performance, we could determine the impact of delisting events on investor wealth. Statistical techniques, such as the market model or the event window approach, were employed to calculate abnormal returns and assess their significance.

By employing the event study methodology, we aimed to shed light on the market reactions and wealth implications associated with delisting events, contributing to the existing literature on this topic. This chapter is structured as follows: the rationale for selecting the event study methodology, the research design, data collection, sample selection, data analysis and summary of the chapter.

3.2 Rationale for selecting the event study methodology

The present study employed the short-horizon event study methodology to assess the impact of delisting on shareholder wealth, overall and across different sectors. This methodology has been widely recognised for its simplicity, ease of implementation, and higher reliability compared to the long-horizon event study methodology (Kothari & Warner, 2006). Fama (1991) supports the use of short-horizon event study, as it provides more direct evidence of market efficiency.

In contrast, the study did not utilise the long-horizon event studies due to its inherent limitations. Kothari and Warner (2006) suggest that long-horizon event studies face challenges in joint testing and often have low statistical power, making them less predictable. Lyon, Barber and Tsai (1999) argue that analyses of long-run abnormal returns can be deceptive, while Kothari and Warner (1997) found that long-horizon event studies tend to produce misleading results, indicating abnormal performance even when none exists. Therefore, caution must be exercised when interpreting findings from long-horizon event studies, as highlighted by other scholars (Barber & Lyon, 1996; Brown & Warner, 1980).

To address the limitations of long-horizon event studies, researchers have proposed alternative approaches. Kothari and Warner (1997) suggest using non-parametric and bootstrap tests to partially mitigate misspecification issues. However, these methods do not completely resolve the problem of model misspecification.

Event study methodologies have evolved based on the foundational principles established by Fama *et al.* (1969). According to Kothari and Warner (2006), two significant changes have occurred in event study methods. Firstly, researchers increasingly prefer using daily or intra-day stock returns instead of monthly data. This allows for more precise estimation of abnormal returns and better captures the effects of announcements. Secondly, there have been advancements in the calculation of abnormal returns and the use of statistically significant tests in long-horizon event studies.

Like previous studies (Dasilas *et al.*, 2017; Sanger & Peterson, 1990) on the wealth effect of delisting, this study adopted an event study methodology, given the rationale provided for choosing the short-horizon event study approach.

3.3 Event study methodology: research design

The research design for this thesis was quantitative in nature, utilising an event study methodology. This approach allowed for the examination of the wealth effect of delisting on the JSE over a specific period of time. The event study methodology is widely used in finance and provides a robust framework for analysing the impact of specific events on stock prices.

3.4 Event study methodology: data collection

The data for this study were collected from two primary sources: Bloomberg and FactSet. Bloomberg provided the majority of the data, including closing historical daily stock prices for voluntarily delisted companies, the All-Share Index, and Stock Exchange News Service (SENS) announcements regarding delisted companies. However, Bloomberg did not have complete data for closing historical stock prices for involuntarily delisted companies. To overcome this limitation, FactSet was utilised to source the missing data for involuntarily delisted stocks. By combining the data from both sources, a comprehensive dataset was obtained for the analysis.

3.5 Event study methodology: sample selection

Table 3.1: Raw Data of Delisted Companies and Reasons for Delisting (2007-2018)

Type of delisting	Reasons for delisting	Number of companies	Reasons as % of the kind of delisting	% of voluntary delisting vs involuntary delisting
Voluntary delisting	Acquired/Merged	135	99%	86%
	Company's request	2	1%	
Involuntary delisting	Failure to meet listing requirements	15	68%	14%
	Liquidated	6	27%	
	Insufficient assets	1	5%%	
Total		159	-	100%

Source: Author's construct

Preliminary data collected for the study indicated that most delisting (86%) between 2007 and 2018 on the JSE were voluntary. Voluntary delisting was via M&As. These delistings were predominantly motivated by the acquirers implementing their growth strategies and dealing with the harsh economic condition, as well as volatile commodity prices for various companies. There is a small number of involuntarily delisted companies (14%). These delistings are due to companies failing to comply with listing requirements or liquidations.

The sample population for this study comprised companies that delisted from the JSE between 2007 and 2018. Initially, 159 delisted companies were identified, consisting of 137 voluntary delistings and 22 involuntary delistings. However, some companies had inadequate data for the event study timelines, resulting in a final sample of 92 delisted companies. Among these, 86 companies delisted voluntarily, while six companies delisted involuntarily. It is acknowledged that the sample size for involuntarily delisted companies was small, but efforts were made to maximise the available data for analysis.

3.6 Event study methodology: data analysis

The data analysis for this thesis involved several steps. Firstly, descriptive statistics were computed to provide an overview of the sample characteristics, including mean, median, standard deviation, and the range. These statistics helped to identify any trends or patterns in the data.

Next, in the event study methodology, the overall wealth effect of delisting was examined using the entire sample of 92 delisted companies. This involved analysing the abnormal returns of delisted companies around the time of delisting, compared to a control group or benchmark. This analysis aimed to assess the impact of delisting, regardless of whether the companies chose to delist voluntarily or were involuntarily delisted.

Furthermore, sub-sector analysis was conducted to explore the wealth effect of delisting across different sectors. The sample was subdivided into relevant sub-sectors, and the abnormal returns were analysed separately for voluntary and involuntary delisting within each sub-sector. The sub-sector analysis distinguished between companies that had voluntarily delisted (86 companies) and those that were

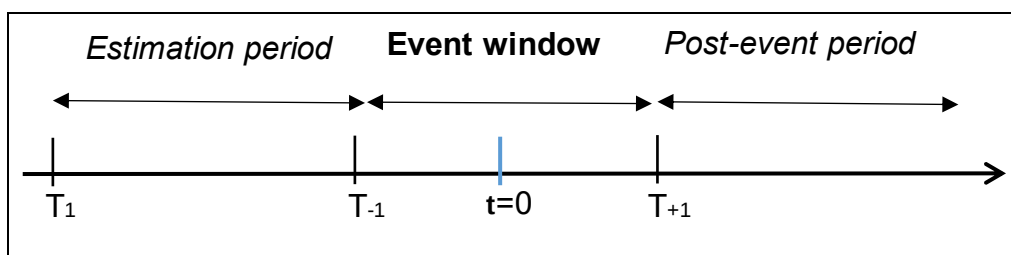
involuntarily delisted (six companies). This approach provided insights into the variation in the wealth effect across different sectors and shed light on the differential impact of delisting within each sector.

Lastly, the cumulative average abnormal return (CAAR) and the average abnormal return (AAR) were calculated to determine the impact of delisting on shareholder wealth statistical. The tests, such as t-tests, were conducted to determine the significance of the findings and assess the relationship between delisting and abnormal returns. The results were presented in tables, accompanied by a thorough interpretation and discussion of the findings. The next section provides a comprehensive overview on the event study.

3.6.1 Model specification

Fama *et al.* (1969) are widely recognised as the pioneers of event study methodologies, which aim to quantify the impact of specific events on a company's value or share price (Vänskä, 2016). These events can include corporate actions such as delisting, mergers, rights issues, and dividend declarations, among others (Sitthipongpanich, 2011). By analysing the response of stock prices to these events, event studies provide valuable insights into how other stocks may react to similar occasions. The success of event studies relies on several key assumptions, as outlined by Lin (1997). First, the efficient market hypothesis should hold which asserts that capital markets are efficient, meaning that stock prices accurately reflect all available information. Second, the event under investigation should be unexpected. Lastly, there should be no other events occurring within the event window that could account for changes in stock prices.

Figure 3.1: Timeline for the Event Study



Source: Author's construct

The initial phase of an event study involves specifying the event of interest, which, in the context of this particular study, pertained to announcements concerning delisted stocks on the JSE. Subsequently, a determination is made regarding the time period during which the stock prices will be analysed, known as the event window. For firms that are voluntarily delisted, the event day corresponds to the date on which a stock exchange announcement is made regarding the delisting of a specific company. In the case of involuntarily delisted firms, the event day is marked by the suspension date, which signifies the cessation of trading activities for the company. The reason for utilising the suspension date is that when a company is delisted, its shares are no longer traded on the stock exchange. Consequently, a company is delisted if it fails to resolve any outstanding issues with the stock exchange. Therefore, employing the suspension day is more appropriate. This study focused exclusively on companies that were suspended and subsequently delisted. The event day was designated as time zero. Typically, the duration of an event window for daily studies ranges from 21 to 121 days (Peterson, 1989). For the proposed research, the event window utilised was 11 days, encompassing five days prior to the event day and five days following the event day [-5, +5]. This timeframe enabled the researcher to capture both leading and lagging effects. A narrower event window was chosen for this study to mitigate potential confounding factors and minimise the risk of event contamination.

The primary objective of an event study is to identify and analyse abnormal returns. The magnitude of abnormal returns is primarily influenced by the frequency of the data utilised. Extensive research, such as the studies conducted by Mackinlay (1997) and Peterson (1989), supports the superiority of daily data compared to monthly, yearly, quarterly, and intra-daily data. Daily data are particularly advantageous as it minimises the impact of microstructure noise, as highlighted by Brooks (2014). Consequently, the present study employed daily data to ensure robust and accurate findings.

In the current study, as already mentioned, daily historical closing stock prices were used to calculate continuously compounding stock returns using the following mathematical formula:

$$R_{it} = \ln \left(\frac{P_t}{P_{t-1}} \right) \quad \text{Eq. 3.1}$$

Where:

P_t = Closing price on day 't'

P_{t-1} = Closing price on day (t-1)

Normal returns are calculated by examining the impact of a specific event (stock delisting) on stock price returns (shareholders' wealth). The returns expected if the event (stock delisting) had not taken place (Ma, Pagán & Chuc, 2009) are known as normal returns.

The two standard statistical models for short-horizon event studies to calculate normal returns are the constant mean and market models. The constant mean return model presumes that the mean return of a given financial instrument is constant over time, while the market model assumes a stable linear relationship between the market return and the return on the financial instrument.

In order to enhance the accuracy of the constant mean return model and eliminate the influence of market movements on returns, the market model was employed in this study. According to MacKinlay (1997), the effectiveness of utilising the market model primarily relies on the coefficient of determination, which measures the extent to which the variability of the financial instrument is explained by the variability of the market. By utilising the market model, the variability of abnormal returns identified in this study is limited, thereby enhancing the ability to observe and analyse event effects (MacKinlay, 1997).

According to Ma *et al.* (2009), the mathematical formula for the market model is written as:

$$R_{it} = \alpha_1 + \beta_i R_{mt} + e_{it} \quad \text{Eq. 3.2}$$

Where:

t is the time index, i = 1, 2, 3 ... stands for security

R_{it} and R_{mt} are returns on security i and market portfolio (JSE All share index) respectively during period t. e_{it} is known as the disturbance term. The disturbance term, $e_{i,t}$, is underpinned by the following assumptions:

$$E(e_i) = 0$$

$\sigma^2 (e_{i,t}) = \sigma^2 (e_i), \forall t$ (homoscedasticity) since variance of the residual is not time-dependent

$E(e_{i,t}, e_{i,t'}) = 0, \forall t \neq t'$ meaning the absence of autocorrelation among the residuals.

The above are part of the Gauss-Markov Theory that makes necessary assumptions for the ordinal least square (OLS) to be preferred among other analytic methods whose regression estimators are unbiased.

The estimated period of the event study timeline is used to calculate equation (3.2), whereby returns on given security i are regressed against the concurrent returns of the market using the OLS model (Peterson, 1989). Typically, the length of the estimation period used for daily data ranges from 100 to 300 days (Peterson, 1989). In line with Campbell, Lo and MacKinlay (1997), we used an estimated window of 120 days before the event. The estimation window does not include the event (delisting).

The event window, in the case of this study, was 10 days. With the estimates of parameters (α_1 and β_i) in equation (2), normal returns are estimated over the event window. The prediction error (which is the difference between actual and predicted normal returns), known as the abnormal return (AR), can be calculated using the following mathematical equation (Ma *et al.*, 2009):

$$AR_{it} = R_{it} - \hat{\alpha} - \hat{\beta} R_{mt} \quad \text{Eq. 3.3}$$

Where:

AR_{it} is the abnormal returns for firm i on day t

R_{it} is the actual return for firm i on day t

R_{mt} is market portfolio returns

The symbol ‘ $\wedge$ ’ is called a *carat* sign standing for estimate value of the given parameter.

The researcher aggregated the abnormal return observations to draw overall inferences for the event of interest. The aggregation was along two dimensions, through time and across securities.

The mathematical equation below represents average aggregate abnormal returns (AAR):

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad \text{Eq. 3.4}$$

Where:

AAR_t is the average aggregate abnormal returns on day t (which is the event day).

It is the mean value of the summed abnormal returns of sample firms (N). AARs help in removing idiosyncrasies in measurement as a result of a particular stock.

The proposed study reported daily AARs from five days before the announcement date to five days after. Equation (3.4) calculates AAR.

By summing daily abnormal returns over the event window, cumulative abnormal returns (CARs) are derived.

$$CAR_{i(T_1, T_2)} = \sum_{t=T_1}^{T_2} AR_{it} \quad \text{Eq 3.5}$$

Where:

CAR_i is the cumulative abnormal return for firm i over the event window (T_2, T_1) .

An average aggregate cumulative abnormal return (AACAR) is defined as:

$$AACAR(T_1, T_2) = \frac{1}{N} \sum_{i=1}^N CAR_{it}(T_1, T_2) \quad \text{Eq. 3.6}$$

AACAR helps to provide a sense of the aggregate effects of abnormal returns in an event whereby the events influencing the event window are not exclusively on the event date itself.

3.6.2 Test statistics

It is vital to test whether the calculated abnormal returns are statistically significant on the event day and the event window. The researcher conducted a two-tail t-statistic and the t-statistic (at a 1%, 5%, and 10% significance level) – the calculated t-statistics for all the average abnormal and cumulative average abnormal returns over the entire event window. The computed test statistic draws an inference as to whether delisting impacts shareholders' wealth.

$$t_{CAR} = \frac{\overline{CAAR}_{i,m,n}}{\left(\frac{\sigma(CAR_{i,m,n})}{\sqrt{n}} \right)} \quad \text{Eq. 3.7}$$

Where:

$\overline{CAAR}_{i,m,n}$ represents the cumulative abnormal average returns over the event window
 $\sigma([CAR]_{(i,m,n)})/\sqrt{n}$ represents the standard deviation of average abnormal returns
 and n is the number of days in an event window. $t = \frac{x - \mu_0}{s/\sqrt{n}}$

$$t_{CAR} = \frac{\overline{AAR}_{i,m,n}}{\left(\frac{\sigma(AAR_{i,m,n})}{\sqrt{n}} \right)} \quad \text{Eq. 3.8}$$

Where:

$\overline{AAR}_{i,m,n}$ represents average abnormal returns over the event window
 $\sigma([CAR]_{(i,m,n)})/\sqrt{n}$ represents the standard deviation of average abnormal returns, and n is the number of days in an event window. $t = \frac{x - \mu_0}{s/\sqrt{n}}$

3.6.3 Model limitations

Some of the limitations are identified in Sitthipongpanich's (2011) study regarding event studies. One potential issue is the violation of assumptions made by the event study model. For instance, the assumption of market efficiency may not always hold true, and in some cases, the occurrence of the event may be anticipated by market participants. Additionally, unanticipated co-existing events can influence the market reaction. These violations of assumptions can introduce bias into the computed abnormal returns, making them less reliable as an accurate reflection of the market response.

Another concern is the estimation of the event window, which can be subject to researcher discretion. This flexibility in choosing the event window can potentially impact the results of the event study. Similarly, the choice of the model used to estimate expected returns is also at the researcher's discretion. Different models can yield different outcomes, leading to variations in the findings of the event study.

Data sourcing can also pose challenges in event studies. Not all stocks trade daily, and this can result in thin trading volumes during the estimation and test periods. Limited data availability can affect the accuracy and reliability of the results obtained.

Lastly, the issue of calendar time clustering of events can be problematic. When the test periods or event dates of sample stock prices cluster in the same calendar period, it can lead to cross-sectional dependence and cross-correlation in abnormal stock returns. This clustering effect can impact the interpretation of the findings and needs to be considered carefully.

Given these limitations, it is important for researchers to exercise caution when interpreting the results of event studies. Understanding the potential shortcomings of the event study methodology allows for a more nuanced interpretation of the findings and a better understanding of their implications.

3.7 Inferences: Event study methodology

Thus far, this chapter has provided a detailed overview of the event study methodology used to examine the wealth effect of delisting events overall and within specific sectors. By utilising an event study methodology, we can capture the immediate market reactions and wealth implications of delisting events, allowing for a nuanced understanding of the phenomenon. By adhering to the event study assumptions, event studies can offer valuable insights into the relationship between events and stock price movements. However, it is important to acknowledge the limitations and potential shortcomings of such studies, as highlighted in the previous sub-section. These limitations include the potential violation of model assumptions, challenges in defining the event window and estimating expected returns, difficulties in sourcing data for thinly traded stocks, and the issue of calendar time clustering. Awareness of these limitations allows researchers to approach event studies with caution and interpret their findings within a broader context. The steps outlined in this section, such as data collection, event selection, and statistical analysis, ensured a robust and systematic investigation of the research question. The data were collected from Bloomberg and FactSet, and the sample selection process resulted in a final sample of 92 delisted companies. The data analysis involved descriptive statistics, event study analysis, sub-sector analysis, and statistical tests. The findings from this analysis will contribute to the understanding of the financial implications of delisting and provide valuable insights for investors and

policymakers. Notwithstanding the fact that event study methodology unearthed significant knowledge discoveries, another quantitative tool was used to increase scientific rigour of this doctoral study, namely logistic regression, and is discussed in detail below.

3.8 Logistic regression

The logistic regression analysis enables an academic enquiry to estimate the relationship between the independent variables (account ratios, growth prospects, profitability, gearing, and cash flows) and the dependent variable (delisting or listed firms). Such capability empowers this study to determine the significance and direction of influence of each factor on the likelihood of delisting.

The data for this study were collected from reliable and publicly available sources such as financial databases (Bloomberg and Factset). By accessing these sources, we gathered comprehensive financial information on the sample companies, ensuring the accuracy and relevance of our analysis. Sample selection was a critical aspect of our methodology to ensure the representation of a diverse range of companies. The variables of interest in our study included account ratios (growth prospects, gearing, profitability and cash flow).

Data analysis involved data visualisation, descriptive statistics and the correlation matrix to provide an overview of the financial characteristics of the sample companies. Furthermore, logistic regression models were constructed to estimate the relationship between the independent variables and the binary dependent variable (delisting or listed firms). Model fit statistics, such as the Hosmer-Lemeshow goodness-of-fit test and the McFadden pseudo-R-squared, were used to assess the overall fit of the logistic regression models.

To investigate the determinants of involuntary and voluntary delisting separately, separate logistic regression models were developed for each category. This approach allowed us to gain insights into the distinct factors driving these different types of delisting.

By employing a robust methodology that encompassed a quantitative research design, logistic regression analysis, careful data collection, and ethical considerations, we

aimed to provide valuable insights into the factors that determine delisting. The findings from this study will contribute to the understanding of delisting risks and aid investors, regulators, and other stakeholders in managing these risks effectively.

The chapter is structured as follows: rationale for selecting the event study methodology, research design, data collection, study variables, sample selection, data analysis and the chapter's summary.

3.9 Rationale for selecting the logistic regression

Given that the dependent variable in this study was binary, the use of conventional regression analysis (CRA) was deemed inappropriate as it violated the assumptions of the CRA model, thereby rendering the results meaningless (Muchabaiwa, 2013). Consequently, alternative models suitable for binary dependent variables were required. In this regard, three models were considered: the linear probability model (LPM), the logit model, and the probit model.

However, the LPM model is associated with several limitations, as highlighted by Gujarati (2003). These shortcomings include non-normality and heteroscedasticity of the residuals, lower R-squared values, and the model's tendency to predict values outside the acceptable range of 0 to 1. While some of these issues could be addressed, the LPM model's inability to predict probabilities within the 0 to 1 range could only be resolved by using either the logit or probit model (Gujarati, 2003). Consequently, the LPM model was deemed unsuitable for this study.

The logit and probit models, on the other hand, provide similar results, with the primary distinction being that the logistic distribution exhibits slightly fatter tails compared to the normal distribution used in the probit model (Gujarati, 2003). Moreover, the probability curve of a binary scale follows a sigmoid shape, which aligns with the logit and probit models. Considering these factors, logistic regression, an extension of the LPM, was selected as the most appropriate model for this study. It is worth noting that while the probit and logistic models share similarities, logistic regression has been widely utilised in empirical studies (Kang & Ang, 2017; Konno & Itoh, 2018; Leslie & Yanthi, 2013; Trang, 2018) to identify factors that contribute to company delisting.

In summary, the logistic regression model was chosen for this study to analyse the factors influencing delisting of JSE listed companies due to its suitability for binary dependent variables. The probit model was also considered, but logistic regression was preferred due to its widespread use in previous research.

3.10 Logistic regression: research design

The research design for this study involved conducting a quantitative analysis using logistic regression. The data used in this study consisted of accounting ratios (gearing, profitability, cash flow and growth prospects) for both delisted and listed companies on the JSE from 2007 to 2018. The accounting ratios for delisted companies were collected prior to their delisting, while the accounting ratios for listed companies in 2018 were obtained from Bloomberg.

3.11 Logistic regression: data collection

To collect data for delisted companies, Bloomberg was utilised, which yielded 150 delisted companies. Of these 150 companies, 128 delisted voluntarily and the remaining 22 delisted involuntarily. Due to missing values, data were only available for 128 delisted companies (111 voluntary delisting and 17 involuntary delisting). Data for voluntarily delisted companies were sourced from Bloomberg, while data for involuntarily delisted companies were obtained from FactSet. For the control sample, companies that were part of the JSE All Share index as of December 2018 were selected. The JSE All Share index consisted of 164 companies, but data were available for only 156 companies due to missing data for the remaining companies. Data for the JSE All Share index were sourced from Bloomberg. The reason that companies that were in the All Share Index were selected since the JSE All Share Index represents 99% of the total market capitalisation of JSE listed firms (Sarpong, 2017).

3.12 Logistic regression: study variables

Table 5.1 below provides an overview of the variables that were used in the logistic regression analysis, including their units and descriptions. The variables included gearing, profitability, growth prospects, free cash flow, and dummy variables representing the delisting status (involuntary or voluntary) and the listing status (listed or delisted).

Table 3.2: Overview of Variables used in the Logistic Regression Analysis

Variable	Unit	Description
Gearing	%	Total debt divided by total assets
Profitability	%	Return on assets (ROA)
Growth prospects	%	Market to book value
Free cash flow	%	Free cash flow divided by total assets
Share price liquidity	%	Bid-asked spreads
Listed stock	0	Dummy variable
Involuntarily delisted stock	1	Dummy variable
Listed stock	0	Dummy variable
Voluntarily delisted stock	1	Dummy variable
Listed stock	0	Dummy variable
Involuntarily and voluntarily delisted stock	1	Dummy variable

Source: Author's construct

3.13 Logistic regression: sample selection

The final sample was for 127 delisted companies (110 voluntary delisting and 17 involuntary delisting) and 156 listed companies. The sample for this study consisted of 700 involuntary delisted companies and control sample-listed firms, 1,064 voluntary delisted companies and control sample-listed firms, and 1,132 voluntary and involuntary delisted companies as well as control sample-listed firms cases. This sample size was considered adequate according to the recommendations by Long (1997) and Auerswald and Moshagen (2019). Long (1997) suggests that logistic regression with a minimum of 10 cases per predictor is adequate, while Auerswald and Moshagen (2019) states that a sample size of at least 500 cases is deemed sufficient.

3.14 Logistic regression: data analysis

Data visualisation was employed to represent the data using graphs, facilitating the identification of patterns, trends, and relationships between variables. Descriptive statistics analysis was utilised to calculate fundamental statistical measures such as the mean, median, and standard deviation, providing an overall understanding of the variables employed. Correlation analysis was also employed to determine the strength and direction of relationships between variables through the calculation of correlation coefficients, such as Pearson's correlation, and subsequent interpretation of the results.

Furthermore, logistic regression analysis was conducted to explore the relationship between dependent and independent variables using regression analysis. Separate logistic regression models were estimated for overall delisting, voluntary delisting, and involuntary delisting in our specific case. The performance of the logistic regression model was evaluated through various methods, including assessing the goodness-of-fit using measures like the Hosmer-Lemeshow test or the AIC/BIC criteria, as well as examining the significance of individual predictors by analysing p-values. The coefficients of the logistic regression model were then interpreted, with each coefficient representing the effect of the corresponding independent variable on the log-odds of delisting. These coefficients were exponentiated to obtain odds ratios, indicating how the odds of delisting changed for a one-unit increase in the predictor variable.

To validate the models, prediction and validation were conducted using the logistic regression model to predict the probability of delisting for new or unseen data. This process involved assessing the model's predictive accuracy by comparing the predicted probabilities with the actual delisting outcomes in a validation dataset, if available.

3.15 Logistic regression assumption

Logistic regression is purely a statistical model which is used to examine the relationship between binary dependent variables and at least one or more independent variable that can either be binary or continuous or a combination. As with all the other regression models, the main objective of building a logistic regression is to develop a model that will be reliable when it comes to predicting the values of the dependent variables while using the values of the independent variables. The two key assumptions underpinning logistic regression are the probability of success (p) and the probability of failure ($1-p$). Thus, p will have to comply with the following conditions (Vidhya Analytic Content Team, 2015); it must always be positive (since $p \geq 0$) and it must always be less than or equal to 1 (since $p \leq 1$). Other factors that underpin logistic regression, according to Schreiber-Gregory and Jackson (2018), are as follows: a relationship between a dependent and independent variable in logistic regression does not have to be linear; the error terms (residuals) do not have to be normally distributed; homoscedasticity is not required; dependent variables in logistic regression are not measured on an interval or ratio scale; binary logistic regression requires the dependent variable to be binary and ordinal logistic regression requires

the dependent variable to be ordinal; observations are required to be independent of each other in logistic regression; there should not be multicollinearity among the independent variables as per the requirements of logistic regression; logistic regression assumes linearity between log odds and independent variables; and logistic regression requires a large sample size.

3.16 The Backward-Likelihood Ratio Logistic Regression Model

The Backward logistic model estimates multiple regressions in a stepwise fashion and simultaneously by progressively removing some explanatory variables and finally compare the results of various models.

$$\ln \left(\frac{p_i}{1-p_i} \right) = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} \quad \text{Eq. 3.9}$$

Where $p = P(Y_i=1) = 1 - P(Y_i=0)$

$P(Y_i=1)$ represents the probability of success of an observation i

$P(Y_i=0)$ represents the probability of failure of an observation i .

In our case $P(Y=1)$ is the probability of de-listing at the Johannesburg Securities Exchange and $P(Y=0)$ is the probability of not delisting.

α = Log-odds when all X_{jk} are 0

β_j = increase in log-odds when x_{ji} is increased by one unit, $j=1, \dots, k$

$e^{\beta_j} =$ increase in odds when x_{ji} is increased by one unit, $j=1, \dots, k$

In logistic regression, the model parameters such as the intercept (α) and the coefficients (β s) are typically estimated by the maximum likelihood method. The maximum likelihood method is a large sample methodology and estimates asymptotic standard errors.

From equation 3.9 we have $\alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} = X' \beta$, meaning the log of odds will be:

$$\ln \left(\frac{p}{1-p} \right) = X' \beta \quad \text{Eq. 3.10}$$

After exponentiating equation 3.10 above, we get:

$$\frac{p}{1-p} = e^{X'\beta} \quad \text{Eq. 3.11}$$

Solving for the probability (p) gives:

$$p = \frac{e^{X'\beta}}{1+e^{X'\beta}} = \frac{1}{1+e^{-X'\beta}} \quad \text{Eq. 3.12}$$

In this case the Logistic Sigmoid link $\frac{1}{1+e^{-X'\beta}}$ ensures that the condition $0 \leq p \leq 1$ is fulfilled as x ranges from $-\infty$ to $+\infty$ and that it converts outcomes into categorical values.

3.16.1 Interpretation of the Logistical Regression results

The coefficients themselves are not interpreted in the same way as the OLS regression results but rather in terms of increasing or decreasing the odds of delisting.

The equation $\frac{p}{1-p} = e^{X'\beta}$ basically is a predictive model where target variables are discrete values for a given set of features or input (in this case the x-values). The equation gives the odds of delisting for a unit change in a given x-value. The greater the value of the odds the greater is the likelihood that the event (delisting) will occur for a given feature or independent variable.

3.16.2 Post Regression diagnostics

Regression diagnostics are important to test the significance of the estimated parameters as well as test of significance of the entire model. The significance tests are necessary to ensure we do not have spurious inferences that result in poor policy implications.

3.16.3 The Wald χ^2 Test of Significance of Logistic Parameters

The significance of parameters in a logistic model is not via the t-statistics but rather through the Wald Ratio Test statistic given by:

$$Wald (\chi^2) = \left(\frac{\hat{\beta}}{s_{\hat{\beta}}} \right)^2 \quad \text{Eq. 3.13}$$

Where β is a parameter with the caret symbol (^) meaning that the parameter is that of a sample and not population. The larger the Wald statistic, the more significant the parameter and hence the independent variable associated with it. The decision as to whether the parameter is significant or not should be arrived at when the p-value is less than 5% if the significance level is set at that level.

3.16.4 The Log Likelihood Function

After estimating a model there is a need to judge the performance of the estimated model in as far as the model fit is concerned. We need to know if the model does fit the given data. This is normally done via the negative log likelihood values. The log likelihood of a given function is the product of all the likelihood values of different y outcomes ($\mathcal{L}(y_i | \beta)$) for given parameters and observation. The larger the value the better would be the fit. The function can be given by:

$$\begin{aligned}\mathcal{L}(y_1). \mathcal{L}(y_2). \mathcal{L}(y_3) \dots \mathcal{L}(y_n) &= \log \prod_{i=1}^n p(y_i | x_i, \widehat{\beta}_0, \widehat{\beta}_1, \dots, \widehat{\beta}_n, s^2) \quad \text{Eq. 3.14} \\ &= \sum_{i=1}^n \log p(y_i | x_i, \widehat{\beta}_0, \widehat{\beta}_1, \dots, \widehat{\beta}_n, s^2) \\ &= -\frac{n}{2} \log(2\pi) - n \log(s) - \frac{1}{2s^2} \sum_{i=1}^n \left(y_i - (\widehat{\beta}_0 + \widehat{\beta}_1 x_1 + \widehat{\beta}_2 x_2 + \dots + \widehat{\beta}_n x_n) \right)^2\end{aligned}$$

Where p is the probability of the event taking place, n = sample size and s is the sample standard deviation. The idea of using a negative logarithm comes from the fact that we want to maximise the likelihood of an even happening by minimising the loss function which is associated with negative. The log likelihood values would be used for model selection purposes.

In the study, the Likelihood ratio test was used to test the significance of all the independent variables simultaneously. In essence, it is a test of model fitness. The Wald test was used to examine the significance of the individual regression coefficients. According to Bayaga (2010), the likelihood test ratio performs better than the Wald test.

The Likelihood test ratio statistic is -2 multiplied by the difference between the log likelihood of two models, one of which is a subset of the other. The distribution of the

LR statistic is estimated by applying the chi-square distribution for large sample sizes. The degrees of freedom (DF) of the estimated chi-square distribution are equal to the difference between the number of regression coefficients from the two models.

The Likelihood test ratio is defined as:

$$\begin{aligned} LR &= -2[L_{\text{subset}} - L_{\text{full}}] \\ &= -2 \left[\ln \left(\frac{l_{\text{subset}}}{l_{\text{full}}} \right) \right] \end{aligned} \quad \text{Eq. 3.15}$$

The above equation indicates that the likelihood test ratio test statistic is -2 multiplied by the difference between the log likelihood of two models, one of which is a subset of the other. For large sample sizes the distribution of the LR statistic is estimated by the chi-square distribution, the DF of the estimated chi-square distribution is equal to the difference in the number of regression coefficients in the two models.

3.16.5 Alternative Measures of Goodness-of-Fit

To measure how well the multiple binary logistic regressions fit our data, we observed the pseudo R^2 values for which larger numbers represent a better fit. We observed the McFadden R^2 , the Cox & Snell and the Nagelkerke pseudo R^2 values.

3.16.6 McFadden's pseudo- R^2

The McFadden R -squared can be written as:

$$R_{\text{logistic}}^2 = \frac{-2LL_{\text{Null}} + 2LL_{\text{Model}}}{-2LL_{\text{Null}}} = 1 - \frac{LL_{\text{Model}}}{LL_{\text{Null}}} \quad \text{Eq. 3.16}$$

Where LL_{Null} stands for log likelihood of the model with a constant only and no other explanatory variables and LL_{Model} is the log likelihood value of a full model. If the model with a constant only can predict almost the same as the full model, then $R_{\text{logistic}}^2 \approx 0$ meaning the model, itself, has a poor goodness of fit. The only problem with the McFadden's measure is that it is biased downwards and numbers between 0.2 and 0.4 are considered a good fit, which is a source of confusion. A better approach is to use the Cox & Snell measure of goodness of fit.

3.16.7 Cox & Snell pseudo-R²

The Cox & Snell measure is given by a formula:

$$R_{C\&S}^2 = 1 - \left[\frac{-2LL_{Null}}{-2LL_{Model}} \right]^{2/n} \quad \text{Eq. 3.17}$$

The criticism of the Cox & Snell method is that the measure does not stretch all the way to 1 and therefore there was a need to modify the method and this was done by Nagelkerke (1991).

3.16.8 Nagelkerke pseudo-R²

The Nagelkerke R-squared is a result of dividing the Cox & Snell measure by a correction term as shown below:

$$R_{Nagelkerke}^2 = \frac{1 - \left[\frac{-2LL_{Null}}{-2LL_{Model}} \right]^{2/n}}{1 - (-2LL_{Null})^{2/n}} \quad \text{Eq. 3.18}$$

The greater the value of the Nagelkerke the better the fit.

3.16.9 Conclusion on the pseudo- R² values

One can use any of the R-squared values to interpret the goodness of fit, but for the purpose of more clarity and less confusion it is better to use the Nagelkerke measure.

3.16.10 The Hosmer-Lemeshow Test of Non-linearities and Interacting Terms in the Model

The mistake that is always made is to assume that the model has linear explanatory variables. It could be the case that the specification should sometimes include non-linear as well as interactive terms. The Hosmer-Lemeshow test is primarily a test of model specification. The predicted values are divided into deciles and then computing the Pearson's chi-square that compares the predicted to the observed frequencies (in a 2x10 table). Lower values indicate a good fit or specification. The problem with the measure is that it performs better with a sample of at least 400 (Hosmer & Lemeshow, 1997).

3.16.11 The Expectation-Prediction Evaluation Table

After estimating the model, one needs to show how good the model is in predicting the outcomes. This is done through the use of the evaluation tables that give the percent prediction for the binary outcomes. In the case of this research, the model gave the percent prediction for delisting as well as the percent prediction for not delisting. Predictions close to 100% show that the model is good in predicting the outcome and therefore can be relied upon.

3.16.12 Stepwise Regressions for Model Selection

The simultaneous estimation of various models by systematically excluding a variable allows us to compare the suitability of the model using their Information Criteria include the Akaike Information Criterion (AIC) and the Swatz Bayesian Information Criterion (SBIC). A better model is one with the lowest values of these criteria. The criteria are based on the log likelihoods of the models:

$$AIC = -2LL + 2(p+1) \quad \text{Eq. 3.19}$$

$$SBIC = -2LL + \log(n). (p+1) \quad \text{Eq. 3.20}$$

Where p is number of predictors and n is the sample size while LL is log likelihood. A model with the highest AIC as well as the highest SBIC indicates that the exclusion of a certain variable results is a worse model and therefore implies that the excluded variable is crucial in explain delisting.

3.17 Limitation

According to Von Hippel (2015), logistic regression exhibits certain limitations. One such limitation is the model's vulnerability when probabilities reach extreme values. Specifically, the log odds in the model become undefined when the probability (p) is equal to 0 or 1. Moreover, as p approaches 0 or 1, logistic regression is prone to encountering issues of complete separation, quasi-complete separation, and rare events bias. However, it is important to note that these problems are less likely to arise in the context of a large sample size, as opposed to a small sample. Logistic regression

necessitates a large sample size since maximum likelihood estimates are less powerful when applied to small sample sizes, as compared to ordinary least square methods.

3.18 Inference: Logistic regression

This chapter explained the methodology section of a logistic regression analysis for determining factors that influence delisting overall, involuntary delisting, and voluntary delisting. The rationale for using logistic regression as the statistical technique was explained, as well as why it was appropriate for analysing binary dependent variables and continuous or categorical independent variables. Additionally, the choice of logistic regression over other models was highlighted and its alignment with the research objectives. The research design described in terms of how the researcher aimed to investigate the factors influencing delisting. The data collection process was explained, including the source of the data and any steps taken to ensure data quality and reliability. Potential limitations or biases in the data collection process were also discussed. The study variables were identified and defined, including the dependent variables (delisting overall, involuntary delisting, and voluntary delisting) and the independent variables that were hypothesised to influence them. The sample selection process was explained, including the criteria used to include or exclude observations from the dataset. Lastly, the data analysis approach was outlined, specifying the logistic regression models used (e.g. binary logistic regression and any assumptions made. The steps taken to assess the model's fit, interpret coefficients, and test the significance of independent variables were described. Any additional statistical techniques used, such as model selection or goodness-of-fit tests were also mentioned.

CHAPTER 4: WEALTH EFFECTS: INVOLUNTARY VS. VOLUNTARY DELISTING: EMPIRICAL EVIDENCE

4.1 Introduction

Chapter 4 of the present study focuses on conducting a comprehensive analysis examining the wealth effects of delisting in emerging markets such as South Africa. Building upon the data and methodologies previously discussed in Chapter 3, this chapter aims to provide a deeper understanding of how delisting impacts shareholder value, a topic of great significance within financial markets.

Delisting events, whether voluntary or involuntary, hold considerable importance for listed companies as they have the potential to bring about substantial changes in shareholder wealth, thereby influencing investment decisions and shaping market perceptions. Despite this significance, there exists a scarcity of research specifically dedicated to examining the wealth effects of delisting in emerging markets such as South Africa. This study sought to fill this research gap by offering empirical evidence on the financial implications of delisting events on the JSE.

The identified research gap pertaining to the understanding of wealth effects resulting from delisting events in emerging markets, particularly South Africa, underscores the need for this study. By thoroughly exploring the financial implications of delisting events on the JSE, this research aims to make a valuable contribution to the existing body of literature, providing insights into the wealth effects experienced by shareholders.

The primary research problem addressed in this study revolved around comprehending the wealth effect encountered by shareholders following delisting events on the JSE. More specifically, the study aimed to answer the following question: How do delisting events impact shareholder wealth?

To achieve this objective, the structure of this chapter is organised as follows: Section 4.2: Provides a descriptive summary of voluntary and involuntary delisted firms, Section 4.3: Presents the event study results for the wealth effect of all delisted firms, Section 4.4: Analyses the wealth effect on voluntarily delisted firms, Section 4.5: Examines the wealth effect on involuntarily delisted firms, and Section 4.6: Summarises the key findings and implications of the chapter.

Developing a comprehensive understanding of the wealth effect resulting from delisting events holds paramount importance for investors, policymakers, and financial analysts alike. Such understanding provides valuable insights into the financial implications of delisting, which, in turn, informs investment strategies and regulatory policies. By focusing on the unique context of an emerging market, this research aims to contribute to the existing body of literature, offering valuable insights that have the potential to shape future financial decision-making and policy formulation.

In summary, this chapter utilises a quantitative methodology to investigate the impact of delisting on the wealth of the JSE. By utilising data from reputable sources such as Bloomberg and FactSet, the analysis incorporates various statistical techniques, including descriptive statistics, event study analysis, and statistical tests. The primary objective of this research is to enhance comprehension of the financial consequences associated with delisting, thereby offering valuable insights for both investors and policymakers.

4.2 Descriptive statistics

For an event study, descriptive statistics play a crucial role in providing a comprehensive overview of the event and its impact on the variables of interest. In this section, we present a detailed write-up of the descriptive statistics that were used in our event study analysis.

Firstly, we focused on the event window and examined the Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) during this period. The event window represents the time period around the event of interest, such as delisting. We calculated the mean abnormal returns to understand the overall impact of the event on stock prices. Additionally, we calculated the median abnormal returns to assess if there were any extreme values that may have influenced the mean.

To assess the significance and variability of abnormal returns, we computed measures of dispersion. The standard deviation of abnormal returns provides insights into the volatility and variability of stock prices during the event window. A higher standard deviation indicates greater volatility and suggests that the event had a more significant impact on stock prices. Moreover, calculating the range of abnormal returns helped to

identify the minimum and maximum values, providing an understanding of the potential range of price movements during the event.

Furthermore, we examined the CAAR and AAR over the event window. CAAR and AAR represent the total abnormal returns accumulated over the event window and provide a holistic view of the event's impact. We calculated the mean and median CAR and CAAR to understand the average and typical cumulative returns experienced by investors. Additionally, we computed measures of dispersion such as standard deviation and range to assess the variability and potential outliers in CAAR and AAR.

Table 4.1: Descriptive Statistics

	Delisting (Voluntary and Involuntary) – Full sample - N=92		Delisting (Voluntary) - N=86		Delisting (Involuntary) - N=6	
	AAR	CAAR	AAR	CAAR	AAR	CAAR
Mean	-0,23%	-2,44%	-0,21%	-2,21%	-0,53%	-5,72%
Median	-0,32%	-2,50%	-0,36%	-2,12%	0,39%	-7,43%
Standard Deviation	0,75%	0,97%	0,75%	0,86%	5,93%	4,33%
Minimum	-1,15%	-4,15%	-0,99%	-3,82%	-10,72%	-10,24%
Maximum	1,61%	-0,58%	1,70%	-0,66%	11,26%	1,02%

Source: Author's own construct

The descriptive statistics in Table 4.1 were calculated on the entire sample (a combination of involuntary and voluntary delisted companies) as well as on two sub-samples (involuntary and voluntary delisted companies) over the event window.

The analysis of the full sample, which includes both voluntary and involuntary delisting, reveals a mean AAR of -0.23% and CAAR of -2.44%. These figures indicate a general tendency for firms undergoing delisting to experience a decline in stock performance during the event window. The standard deviations, recorded at 0.75% for AAR and 0.97% for CAAR, imply a relatively narrow dispersion around the mean, suggesting a homogeneous impact across the sample. The negative AAR and CAAR underscore the market's overall negative perception of delisting, likely due to concerns regarding reduced transparency and liquidity. This market sentiment may stem from anticipated difficulties in trading the stock or uncertainties about the company's prospects, contributing to a decline in stock prices.

For firms that opted for voluntary delisting, the mean AAR stands at -0.21%, while the mean CAAR is -2.21%. The close alignment of median values with the means indicates a symmetric distribution of returns. Standard deviations of 0.75% for AAR and 0.86% for CAAR point to a consistent market reaction to voluntary delisting. Firms often choose voluntary delisting to alleviate regulatory burdens or associated costs. The slightly negative returns reflect investor apprehensions about diminished oversight and share marketability (liquidity). However, the relatively minor negative returns suggest that the market may not view voluntary delisting as severely negative, possibly due to confidence in the firm's strategic decisions.

In the subset of involuntary delisting, with only six observations, the mean AAR is -0.53% and the mean CAAR is -5.72%. The significantly higher standard deviations (5.93% for AAR and 4.33% for CAAR) indicate a considerable variability in market responses. The median AAR of 0.39% suggests that some firms might not have encountered negative abnormal returns, yet the median CAAR of -7.43% reflects substantial cumulative negative impacts. Involuntary delisting typically signals severe issues such as financial distress or non-compliance with listing requirements. The pronounced negative returns mirror investor loss of confidence, anticipating further declines in the firm's value post-delisting. The high variability suggests that while most firms suffer, a few might stabilise or recover, explaining the less negative median AAR.

The findings indicate that delisting, particularly involuntary, generally elicits negative market reactions. These results highlight the critical importance of maintaining listing standards and effective communication with investors to mitigate adverse impacts.

4.3 Wealth effects of delisting overall (involuntary and voluntary)

Table 4.2: t-test Results of AARs and CAARs for Delisted Companies (in all sectors)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,58%	-0,69	0,49	-0,58%	-0,69	0,49
-4	-0,66%	-0,55	0,58	-1,24%	-1,03	0,30
-3	-1,15%	-0,78	0,44	-2,39%	-1,63	0,11
-2	-0,19%	-0,11	0,91	-2,58%	-1,52	0,13
-1	-0,68%	-0,36	0,72	-3,27%	-1,72	0,09*
0	-0,01%	-0,01	1,00	-3,28%	-1,58	0,12
1	-0,87%	-0,39	0,70	-4,15%	-1,85	0,07*
2	1,61%	0,67	0,50	-2,53%	-1,05	0,29
3	0,36%	0,14	0,89	-2,17%	-0,85	0,40
4	-0,01%	0,00	1,00	-2,18%	-0,81	0,42
5	-0,32%	-0,11	0,91	-2,50%	-0,89	0,38

Source: Author's own computations

Notes: Involuntarily and voluntarily delisted companies (in all sectors) on the JSE for the period between 2007 and 2018. Using a sample of 92 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

As evidenced in Table 4.2, the noted AARs (-0.01%) and CAARs (-3.27%) on the day of the event were statistically insignificant and negative. This suggests that there is no significant impact on shareholders' wealth on the day of the event due to the market's non-reactivity. The AARs remained insignificant throughout the event window, with a positive trend only observed for three days within this period. The market's lack of response could be attributed to several reasons: Firstly, the premium paid by acquirers to existing shareholders may not have been substantial, potentially indicating that the discounts offered by the existing shareholders on the M&A could have negated any premium gains. Secondly, the bid price that was paid to the existing shareholders could have resulted in a zero net present value for the existing shareholders of the target companies. Thirdly, involuntary delisting typically does not create value for shareholders. Additionally, Involuntary delisted companies often convey a negative market signal when they are delisted from the exchange and, as a result, suffer from liquidity constraints. Moreover, some of the involuntarily delisted firms were liquidated, suggesting a probable null equity value for existing shareholders. Lastly, the larger size of the voluntary delisted firms in the sample compared to involuntary delisted firms

might have reduced the effects and impact of involuntary delisting on the overall sample.

CAARs displayed a negative and significant trend the day before (-3.27%) and after (-4.15%) the event. Given that the CAARs were negative throughout the event window and statistically insignificant for nine out of 11 days within this period, the negative returns could be attributed to weak governance practices by the target firms, lower premiums paid for these firms, and high gearing. The payment method (mixed payments) used to fund the acquisition also contributed to this negative trend. Involuntarily delisted firms often convey a negative market signal, leading to a significant liquidity discount, which could reach up to 90%.

Our results suggest that the pre-bid escalation in stock prices, characterised by significant abnormal returns prior to delisting, could be indicative of insider trading, informed trading, or speculators forecasting the delisting. The notable abnormal returns before delisting might also signify inefficiencies within the JSE. The efficient market hypothesis posits that investors cannot outperform the market since stock prices incorporate all available information, implying that stocks are neither undervalued nor overvalued and are hence appropriately priced (Singh, Babshetti & Shivaprasad, 2021). According to this theory, abnormal returns should not occur. However, the generation of abnormal returns in our results suggests that the JSE may not be efficient, and thus, market participants could potentially realise profits by investing in this exchange.

4.4 Wealth effects of voluntary delisting

Table 4.3: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (in all sectors)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,66%	-0,77	0,46	-0,66%	-0,77	0,45
-4	-0,70%	-0,57	0,58	-1,36%	-1,11	0,27
-3	-0,48%	-0,32	0,76	-1,84%	-1,23	0,22
-2	-0,99%	-0,57	0,58	-2,83%	-1,63	0,11
-1	-0,01%	0,00	1,00	-2,84%	-1,46	0,15
0	-0,07%	-0,03	0,97	-2,91%	-1,37	0,17
1	-0,91%	-0,39	0,70	-3,82%	-1,66	0,10
2	1,70%	0,69	0,51	-2,12%	-0,86	0,39
3	0,31%	0,12	0,91	-1,80%	-0,69	0,49
4	-0,11%	-0,04	0,97	-1,91%	-0,70	0,49
5	-0,36%	-0,12	0,90	-2,26%	-0,79	0,43

Source: Author's own computations

Notes: Voluntarily delisted companies (in all sectors) on the JSE for the period between 2007 and 2018. Using a sample of 86 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

Table 4.3 reveals that on the event day, both AARs at -0.07% and CAARs at -2.91% were statistically insignificant and negative. This implies that the market did not respond to the delisting news on that day. Based on the literature review, one would anticipate that companies voluntarily delisting would generate wealth for incumbent shareholders, as these transactions typically involve a premium paid to existing shareholders for their equity stakes. However, the premium varies across different countries and is also contingent on the characteristics of the firms and the M&A deal. In our study, a voluntary delisting firm in South Africa did not produce wealth for the existing shareholders.

This finding contradicts previous research conducted on the JSE, which found that target shareholders typically yield positive abnormal returns from M&A transactions. One possible explanation for this discrepancy is that the M&A transactions we examined might have not been driven by synergies and the hubris theory did not apply (this theory suggests that overconfident managers of the bidding company often pay more than the market value of the company being acquired). The bid price paid to

existing shareholders, on average, appears to have resulted in a zero net present value for the existing shareholders of the target companies.

Throughout the event window, our study found that the CAARs were statistically insignificant and negative. The negative CAARs could potentially be attributed to weak governance practices within the target firms, lower premiums paid for these firms, high financial leverage within these firms, and the mixed-payment method used to finance the acquisition. This perspective is supported by research conducted by Ismail (2012).

4.5 Wealth effects of involuntary delisting

Based on the reviewed literature, our initial expectation was that the market would respond negatively to involuntary delisting. However, our study findings indicate that the market did not exhibit a significant reaction to the delisting announcement on the event day, as both AARs at 0.82% and CAARs at -8.58% were statistically insignificant. This lack of significance in AARs and CAARs persisted throughout the event window. Specifically, CAARs were negative and statistically insignificant for eight days within the event window but turned positive and statistically insignificant for the first three days. Similarly, AARs were negative and statistically insignificant for two days but became positive and statistically insignificant for the remaining eight days within the event window. The lack of significance in the negative AARs and CAARs could potentially be attributed to the negative signal involuntary delisting sends to investors, as well as the significant liquidity discount experienced by these firms

Table 4.4: t-test Results of AARs and CAARs for Involuntarily Delisted Companies (in all sectors)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	0,60%	0,14	0,89	0,60%	0,14	0,89
-4	-0,13%	-0,02	0,98	0,48%	0,08	0,94
-3	-10,72%	-1,38	0,17	-10,24%	-1,32	0,19
-2	11,26%	1,26	0,21	1,02%	0,11	0,91
-1	-10,41%	-1,04	0,30	-9,39%	-0,94	0,35
0	0,82%	0,07	0,94	-8,58%	-0,78	0,44
1	-0,34%	-0,03	0,98	-8,92%	-0,75	0,45
2	0,39%	0,03	0,98	-8,53%	-0,67	0,50
3	1,10%	0,08	0,93	-7,43%	-0,55	0,58
4	1,35%	0,10	0,92	-6,08%	-0,43	0,67
5	0,22%	0,01	0,99	-5,86%	-0,40	0,69

Source: Author's own computations

Notes: Involuntarily delisted companies (in all sectors) on the JSE for the period between 2007 and 2018. Using a sample of 6 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

One possible explanation for our finding that involuntary delisting does not lead to wealth erosion for shareholders could be the small sample size of our study and the possibility that the market had already incorporated the expected loss suffered by shareholders. Typically, prior to being involuntarily delisted, a stock is first suspended, meaning it is not actively traded. Additionally, the event window used in our study may not have been wide enough to capture the market's reaction. Shareholders may already have experienced a prolonged period of stock declines, indicating losses, before the shares were suspended. In other countries, such as the US, involuntarily delisted companies transition to the OTC market where trading continues, allowing for a clearer assessment of the market's response to such stocks. However, in the case of South Africa, where the stock market is less sophisticated, delisted stocks do not normally trade on the OTC market, making it challenging to evaluate the impact of delisting on shareholders' wealth.

Despite our findings suggesting that involuntary delisting does not lead to significant negative abnormal returns, we argue that involuntary delisting on the JSE should result in the erosion of shareholders' wealth. This argument is based on several factors. Firstly, we found that 50% of the firms in our sample that were involuntarily delisted

were liquidated. This implies that these firms were facing severe financial difficulties, which likely resulted in significant losses for shareholders. Additionally, the firms that were delisted due to not meeting listing requirements were not listed on the OTC market. This suggests that these firms were experiencing substantial liquidity constraints, further contributing to wealth erosion for shareholders. Furthermore, the delisting of these firms by the JSE itself sent a negative signal to the market. This signal indicated that these firms were underperforming and unlikely to be able to afford listing fees in the future. Previous literature has shown that exchanges often choose to delist firms that are unable to meet listing requirements or are expected to face financial challenges. Therefore, this negative signal from the JSE would have further diminished the prospects for these firms and their shareholders' wealth.

4.6 Summary and Conclusions

The analysis of the descriptive statistics reveals that, on average, delisted companies experienced a slight negative abnormal return during the event period. The values are clustered around the mean, indicating limited dispersion. The cumulative abnormal returns for delisted companies were consistently negative throughout the event period, with some variability around the mean. Voluntary delistings also exhibited a slightly negative average abnormal return, while involuntary delistings had a more pronounced negative abnormal return with greater variability. These findings emphasise the importance of considering the nature of delisting when evaluating the financial performance of firms.

Overall, the descriptive statistics presented in this chapter demonstrate that both voluntary and involuntary delisting erode shareholders' wealth. These findings contribute to the existing literature on delisting and provide important implications for investors, regulators, and policymakers. The event study analysis further supports these results, indicating that delisting, whether voluntary or involuntary, generally has an unfavourable effect on overall shareholder wealth. The findings from this study shed light on the detrimental consequences of delisting for shareholders' wealth.

CHAPTER 5: RESULTS – WEALTH EFFECT OF DELISTING AT SECTORAL LEVEL: EMPIRICAL EVIDENCE

5.1 Introduction

Chapter 5 of this thesis focuses on analysing the wealth effects experienced by shareholders in different sectors following delisting events on the JSE. The objective is to evaluate how delisting events impact shareholder wealth across various industries, including Basic Materials, Financial, Industrial, Consumer Cyclical, Communication, Technology, Diversified, and Consumer Non-Cyclical sectors.

While there is existing research on the overall impact of delisting events on shareholder wealth, there is a lack of understanding regarding the sector-specific effects. The current literature often overlooks the unique responses of different industries to delisting events, resulting in a lack of detailed analysis that distinguishes the responses of individual sectors. This knowledge gap limits the understanding of the full implications of delisting and hinders the development of tailored strategies for investors and policymakers. This study aims to address this gap by providing a nuanced understanding of the wealth effects across various sectors, enabling informed decision-making.

The research problem addressed in this study is the insufficient understanding of sector-specific wealth effects experienced by shareholders following delisting events on the JSE. The lack of detailed analysis regarding how different industries respond to delisting events leads to a generalised view that may not accurately reflect the unique dynamics and financial implications within each sector. This lack of specificity can result in suboptimal investment decisions and ineffective regulatory policies.

The central aim of this study is to evaluate the wealth effects experienced by shareholders after delisting and explore the variability of these effects across different sectors. By examining the wealth effect of delisting across sectors, the study seeks to provide a nuanced understanding of these impacts, enabling informed decision-making by investors, policymakers, and other stakeholders.

To achieve these research objectives, an event study methodology was employed, analysing a comprehensive dataset comprising stock returns and event-specific

information. This methodology allows for the isolation of the impact of delisting events on stock returns, providing insights into shareholder wealth within various sectors.

Through sector-specific analyses of the wealth effect, this study aims to elucidate how different industries react to delisting events. Each sector has distinctive attributes that may result in varied responses, highlighting the importance of a sector-specific approach in understanding the financial implications of delisting.

The chapter is structured as follows: Section 5.2: Presents a descriptive summary of voluntarily and involuntarily delisted firms across various sectors, Section 5.3: Provides the event study results for the wealth effect of delisting on voluntarily delisted firms in different sectors, Section 5.4: Focuses on the results of the wealth effect of delisting on involuntarily delisted firms across multiple industries, and Section 5.5: Summarises the key findings and implications of the chapter.

Understanding the wealth effects of delisting within different sectors is crucial for investors, policymakers, and financial analysts. This analysis offers insights into the financial consequences of delisting events, informing investment strategies and regulatory policies. The research contributes to the existing literature by providing a sector-specific analysis, offering valuable guidance for navigating the complexities of financial markets and comprehending the broader implications of delisting events on shareholder value.

In summary, this chapter employs a rigorous quantitative approach, utilising data from Bloomberg and FactSet, to examine the wealth effects of delisting on the JSE across various sectors. The analysis incorporates descriptive statistics, event study analysis, sub-sector analysis, and statistical tests. The findings aim to enhance the understanding of the financial implications of delisting, providing practical insights for investors and policymakers.

5.2 Descriptive statistics

Table 5.1: Average Abnormal Returns (AARs) and Cumulative Abnormal Average Returns (CAARs) for Financial and Technology Sectors during Involuntary Delisting

	Involuntary delisting Financial sector N=2		Involuntary delisting Technology Delist-N=2	
	AAR	CAAR	AAR	CAAR
Mean	0,30%	1,81%	-2,70%	-23,89%
Median	0,20%	2,44%	0,36%	-31,70%
Standard Deviation	0,44%	1,34%	18,08%	15,26%
Minimum	0,07%	0,13%	-33,82%	-34,83%
Maximum	1,61%	3,34%	32,71%	0,49%

Source: Author's own computations

Table 5.1 presents the key findings of the analysis, including the mean, median, standard deviation, minimum, and maximum values for both average abnormal returns and cumulative abnormal average returns of involuntary delisting in the Financial and Technology sector.

The data indicate that during involuntary delisting events, firms within the Financial sector exhibit a mean AAR of 0.30%, suggesting a performance marginally above the expected return benchmarks. The sector's standard deviation of 0.44% underscores a relatively consistent performance across different firms. Similarly, the mean CAAR stands at 1.81%, reflecting modest yet positive gains over the delisting period, with a standard deviation of 1.34% highlighting minimal volatility. The observed stability in the Financial sector can be attributed to its inherently robust and diversified operational frameworks. Financial institutions typically engage in various activities such as banking, insurance, and investment management, which distribute risks and maintain steady returns. Additionally, these entities operate under stringent regulatory environments, which can mitigate sudden market fluctuations and provide a stabilising effect on their performance during adverse events such as delisting.

Conversely, the Technology sector presents a starkly different scenario. The mean AAR is recorded at -2.70%, indicating significant underperformance relative to market expectations. This sector also displays a high standard deviation of 18.08%, signifying

substantial volatility. The mean CAAR of -23.89% underscores a pronounced decline in performance over the delisting period, with a standard deviation of 15.26% further illustrating the sector's unpredictability. The Technology sector's marked underperformance and elevated volatility can be attributed to the industry's intrinsic reliance on rapid innovation and technological advancements. Firms in this sector often depend heavily on a limited range of products or technologies, exposing them to heightened risks of obsolescence and market disruption. The necessity for continuous innovation and the potential for disruptive technologies contribute to the sector's financial unpredictability, as evidenced by the high standard deviations.

The comparative analysis between the Financial and Technology sectors during involuntary delisting periods reveals significant disparities influenced by industry-specific characteristics. The Financial sector's inherent stability and diversification act as buffers against the negative impacts of delisting, leading to positive AARs and CAARs with low volatility. In contrast, the Technology sector's dependence on innovation and exposure to rapid market changes result in negative AARs and CAARs accompanied by high volatility.

Table 5.2: Average Abnormal Returns (AARs) and Cumulative Abnormal Average Returns (CAARs) for Financial and Technology Sectors during Involuntary Delisting

	Consumer non-cyclical		Basic material		Financial		Industrial		Consumer cyclical		Communication		Technology		Diversified	
	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR
Mean	-0,00731	0,015973936	0,002246	0,001888	-0,00055	-0,0114	-0,00474	-0,04474	-0,00565	-0,01832	-0,00187	-0,01973	0,006698	0,018401	-0,0029	-0,01397
Median	-0,00521	0,022133216	0,003352	0,004543	-0,00217	-0,01002	-0,00444	-0,04774	-0,00214	-0,01558	-0,00037	-0,0185	-0,00142	-0,00146	-0,00314	-0,01495
Standard deviation	0,011277	0,016366282	0,010592	0,016569	0,005463	0,006212	0,027301	0,029832	0,013679	0,015569	0,006247	0,002458	0,0255	0,035999	0,022619	0,016257
Minimum	-0,03436	-0,009256771	-0,02574	-0,0211	-0,00723	-0,02402	-0,03853	-0,10606	-0,04542	-0,0622	-0,01733	-0,02357	-0,00578	-0,00521	-0,04958	-0,03187
Maximum	0,005542	0,036761495	0,014323	0,024711	0,007919	-0,00217	0,067819	-0,0002	0,00456	-0,00107	0,005226	-0,01704	0,082495	0,077509	0,050111	0,020703

Source: Author's own computations

When examining the average abnormal return (AAR) and cumulative abnormal average return (CAAR) based on the data provided, certain patterns become apparent. The Consumer Non-cyclical sector displays a negative mean AAR of -0.73% but a positive mean CAAR of 1.60%, suggesting a slight underperformance (this could be due to increased competition) but an overall positive trend. In contrast, the Basic material sector demonstrates a positive mean AAR of 0.22% and a positive mean CAAR of 0.19%, indicating a slightly better performance (which might be due to the steady growth driven by a stable demand for raw materials). The Financial sector exhibits a slightly negative mean AAR of -0.05% and a negative mean CAAR of -1.14%, implying underperformance (which could be due to low interest rates impacting profitability and regulatory changes affecting the industry). The Industrial sector presents a negative mean AAR of -0.47% and a negative mean CAAR of -4.47%, indicating significant underperformance (this might be explained by reduced demand for industrial products). Similarly, the Consumer Cyclical sector displays a negative mean AAR of -0.57% and a negative mean CAAR of -1.83%, signifying underperformance (this could be driven by negative economic cycles). The Communication sector exhibits a negative mean AAR of -0.19% and a negative mean CAAR of -1.97%, also pointing to underperformance (this might be reflecting competition, technological disruptions, or evolving consumer behaviour). On the other hand, the Technology sector shows a positive mean AAR of 0.67% and a positive mean CAAR of 1.84%, suggesting better performance (this could be driven by advancements in technology and innovation). Finally, the Diversified sector showcases a negative mean AAR of -0.29% and a negative mean CAAR of -1.40%, indicating underperformance (might be due to the lack of focus or specialisation within the sector).

Analysing the standard deviation values, we observe noteworthy insights. The Technology sector displays the highest standard deviation for the AAR, standing at 34.56%. This finding indicates a greater degree of variability in the sector's performance during the delisting period. Conversely, the Consumer Non-cyclical and Basic material sectors exhibit relatively lower standard deviations of 9.64% and 11.34%, respectively, suggesting more stable returns within these sectors. Similarly, in terms of the CAAR, the Technology sector once again exhibits the highest standard deviation of 21.78%, reflecting greater fluctuations in the cumulative abnormal returns compared to other sectors. Conversely, the Consumer non-cyclical and Basic material

sectors display lower standard deviations of 7.81% and 9.45%, respectively, indicating relatively less volatility in their cumulative abnormal returns during delisting.

In summary, in analysing the provided data, it is evident that the sectors demonstrate varying levels of volatility and stability during the delisting period. The Consumer Non-cyclical sector exhibits a lower standard deviation, indicating relatively stable performance. This can be attributed to the sector's composition, including industries that offer essential products such as food and household goods, which typically experience consistent demand (this sector is not impacted by different economic cycles). On the other hand, the Basic material sector shows a slightly higher standard deviation due to its exposure to factors like commodity price fluctuations and global economic conditions. The Financial sector displays a lower standard deviation, likely due to strict regulatory frameworks and robust risk management practices within the industry. In contrast, the Industrial and Consumer Cyclical sectors exhibit higher standard deviations, suggesting greater variability in returns. The Communication sector demonstrates relatively stable performance, given its inclusion of industries providing essential services. The Technology sector, known for its dynamic nature, exhibits a significantly higher standard deviation, reflecting both its potential for high returns and higher risk. Lastly, the Diversified sector's standard deviation aligns with the Basic material and Consumer cyclical sectors, highlighting the impact of diverse industries on returns.

In addition to the mean and standard deviation values, the minimum and maximum values provide insights into the range of performance within each sector. For instance, the Financial sector demonstrates a minimum AAR of -4.54% and a maximum AAR of 0.46%. Similarly, the Technology sector displays a minimum CAAR of -6.22% and a maximum CAAR of 8.25%. These numbers further emphasise the variability and potential extremes within each sector's performance.

5.3 Voluntary delisting across various sectors

5.3.1 Consumer Non-cyclical

The Consumer non-cyclical sector, commonly referred to as consumer staples, consists of defensive stocks that are unaffected by different economic cycles. According to Mahfudz and Wijayanto (2020), these defensive stocks are provided by

companies that offer essential goods and services that consumers cannot do without, regardless of the economic environment. Examples of sectors that fall under defensive stocks include food manufacturers and retailers, medical care, and the tobacco and alcohol industries.

Table 5.3: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Consumer Non-cyclical sectors)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-3,44%	-1,54	0,13	-3,44%	-1,54	0,13
-4	-0,25%	-0,08	0,94	-3,55%	-1,13	0,26
-3	-0,62%	-0,16	0,87	-4,13%	-1,07	0,29
-2	-0,78%	-0,17	0,86	-4,90%	-1,10	0,27
-1	0,28%	0,06	0,96	-4,34%	-0,87	0,39
0	-11,11%	-2,03	0,04**	-4,83%	-0,88	0,38
1	-22,56%	-3,82	0,00***	-6,81%	-1,15	0,25
2	-4,65%	-0,74	0,46	-6,27%	-0,99	0,32
3	-15,26%	-2,28	0,02**	-6,79%	-1,01	0,31
4	4,78%	0,68	0,50	-7,57%	-1,07	0,29
5	-1,00%	-0,14	0,89	-8,04%	-1,09	0,28

Source: Author's own computations

Notes: Voluntarily delisted companies (consumer non-cyclical) on the JSE for the period between 2007 and 2018. Using a sample of 12 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

When a delisting announcement occurs in the consumer non-cyclical sector, the market reacts negatively, as evidenced by statistically significant and negative abnormal returns (AARs) of -11.11% on the event day. Similarly, AARs remained negative and statistically significant at -22.56% on day 1 and -15.26% on day 3 following the event day. Overall, shareholders experienced a negative impact on their wealth during the event day and the subsequent days post-announcement. The negative market reaction to the delisting announcement and the following days can be attributed to the fact that defensive stocks are more valuable when listed, as portfolio managers seek to diversify their portfolios with these stocks, leading to a higher demand. These stocks are not valuable when they are not listed, hence the negative market reaction. The M&A activities in this sector were primarily driven by acquirers aiming to expand their asset base.

5.3.2 Basic material

The Basic material sector comprises firms in the mining, forestry, and chemical industries, with the mining sector dominating in South Africa. Voluntary delisting in the Basic material sector mostly involved mining companies.

Table 5.4: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Basic material sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	0,59%	0,27	0,79	0,59%	0,27	0,79
-4	-2,57%	-0,83	0,41	-1,98%	-0,63	0,53
-3	0,34%	0,09	0,93	-1,64%	-0,43	0,67
-2	-0,47%	-0,11	0,92	-2,11%	-0,48	0,63
-1	1,43%	0,29	0,77	-0,68%	-0,14	0,89
0	0,32%	0,06	0,95	-0,36%	-0,07	0,95
1	0,81%	0,14	0,89	0,45%	0,08	0,94
2	1,14%	0,18	0,85	1,60%	0,26	0,80
3	0,20%	0,03	0,98	1,80%	0,27	0,79
4	0,14%	0,02	0,98	1,93%	0,28	0,78
5	0,54%	0,07	0,94	2,47%	0,34	0,74

Source: Author's own computations

Notes: Voluntarily delisted companies (Basic material) on the JSE for the period between 2007 and 2018. Using a sample of 10 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

In contrast to the Consumer non-cyclical sector, the market did not exhibit a significant reaction to delisting announcements in the Basic material sector. The AARs (0.32%) and cumulative abnormal returns (CAARs) (-0.36%) on the event date were statistically insignificant, with both positive and negative trends. Table 5.4 illustrates that AARs of voluntarily delisted companies in the Basic material sector showed statistically insignificant positive and negative trends before and after the announcement date. Similarly, CAARs exhibited statistically insignificant positive and negative trends during the pre- and post-announcement periods. These findings imply that the market does not anticipate or react to delisting announcements in this sector. Furthermore, voluntary delisting in the Basic material sector does not have a significant impact on shareholders' wealth.

Most of the delisting in the Basic material sector was driven by mining companies as there was many M&A deals in the mining sector motivated by the harsh economic environment, volatile commodities prices, regulatory uncertainties (referring to the mining charter), rising input costs, labour unrest, skills shortage, illegal mining and declining resource grade, and commodity prices (BMI Research, 2015).

There should be market efficiency in the Basic material sector, meaning investors should be unable to generate abnormal returns by investing in this sector. Heymans and Santana (2018) suggest that older sectors such as forestry and paper, gold mining, and industrials, which have been listed on the JSE for over 100 years, should be efficient by now. Investors should also have a good understanding of the growth potential and factors influencing stock prices in the Basic material sector. Furthermore, market analysts' research on firms in these sectors over an extended period of time should contribute to market efficiency, enabling investors to make informed investment decisions. Our findings seems to suggest that the mining industry is market efficient.

5.3.3 Financial

According to BMI Research (2019), the South African banking sector is primarily controlled by five major banks: Standard Bank, FirstRand, Absa (at the time of this study a part of Barclays Group Africa), Nedbank, and Investec. Together, these banks hold around 90% of the total banking-sector assets. In addition to these banks, there are 19 registered banks, three mutual banks, three co-operative banks, 15 local branches of foreign banks, and 29 foreign banks with approved local representative offices operating in the sector. Bloomberg classification includes property funds in the Financial sector. Most of the delisting in the Financial sector were related to property funds and were driven M&As. These delisted funds were typically small in nature and faced liquidity constraints, making it difficult for them to attract large institutional investors. The motivation behind their delisting was the inability to attract sufficient capital. Regarding the M&A, the acquirers of these delisted funds were primarily motivated by expansion and improving their overall portfolio of underlying assets.

Contrary to expectations, the global financial crisis of 2008 did not drive delisting in the South African Financial sector. This view is informed by the analysis that was conducted by Madubeko (2010). This was because South African banks had limited exposure to risky foreign financial instruments and adhered to high lending standards.

They had also maintained profitability over the years and had a strong capital base. Furthermore, their activities outside the African continent were limited, and they had limited foreign funding. Prior to the financial crisis, South African banks had already begun tightening lending practices in compliance with the new National Credit Act introduced in 2007 and the implementation of Basel II regulations. Since the global economic crisis, South African regulators have continued to tighten lending practices.

Table 5.5: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Financial sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,22%	-0,17	0,86	-0,22%	-0,17	0,86
-4	-0,27%	-0,16	0,88	-0,49%	-0,28	0,78
-3	-0,49%	-0,23	0,82	-0,98%	-0,45	0,65
-2	-0,70%	-0,28	0,78	-1,68%	-0,67	0,50
-1	-0,72%	-0,26	0,80	-2,40%	-0,86	0,39
0	0,79%	0,26	0,80	-1,61%	-0,53	0,60
1	0,61%	0,18	0,85	-1,00%	-0,30	0,76
2	0,01%	0,00	1,00	-0,99%	-0,28	0,78
3	-0,50%	-0,13	0,89	-1,49%	-0,40	0,69
4	0,42%	0,11	0,91	-1,07%	-0,27	0,79
5	0,47%	0,11	0,91	-0,60%	-0,15	0,88

Source: Author's own computations

Notes: Voluntarily delisted companies (financials) on the JSE for the period between 2007 and 2018. Using a sample of 23 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

Analysing the data presented in Table 5.5, it can be observed that the CAARs and AARs for the entire event window were negative and statistically insignificant. The only difference was that the AARs were positive for four days within the event window, but they remained statistically insignificant. On the event day, both AARs (0.79%) and CAARs (-1.61%) were statistically insignificant. From these findings, it can be inferred that voluntary delisting does not have a significant impact on shareholders' wealth in the Financial sector. The lack of market response could be attributed to the limited coverage of small firms by analysts and the perceived lack of synergies in the M&As undertaken.

The Financial sector appears to be efficient, as there were no statistically significant abnormal returns prior to delisting events. This can be attributed to the dominance of the five major banks in the sector, which have a long history of being listed on the JSE and are extensively covered by analysts (Heymans & Santana, 2018). In contrast, the delisted stocks were smaller and less researched by market analysts, leading to reduced availability of fundamental information and potentially contributing to market efficiency (Hong, Lim & Stein, 2000, as cited by Heymans & Santana, 2018).

5.3.4 Industrial

The industrial sector houses entities ranging from electronic and electronic equipment, industrial transport, general industries, construction and material, supportive services, to industrial engineering. Based on the data provided in Table 5.6, on the event, AARs (-1.07%) and CAARs (-6.75%) were found to be negative, albeit statistically insignificant. Nonetheless, the CAARs following the delisting announcement on the subsequent day were negative (-10.61%) and statistically significant. Except for the second day post-event, CAARs were predominantly negative and statistically insignificant throughout the event window. Similarly, AARs were found to be negative, and only for a single day did they turn positive; however, they remained statistically insignificant all through the event window. The acquirer's growth strategies were found to be the driving force behind voluntary delisting in the industrial sector.

Table 5.6: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Industrial sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,02%	-0,01	0,99	-0,02%	-0,01	0,99
-4	-0,32%	-0,11	0,91	-0,34%	-0,12	0,91
-3	-1,70%	-0,49	0,63	-2,04%	-0,59	0,56
-2	-3,33%	-0,83	0,41	-5,37%	-1,34	0,18
-1	-0,30%	-0,07	0,95	-5,68%	-1,26	0,21
0	-1,07%	-0,22	0,83	-6,75%	-1,37	0,17
1	-3,85%	-0,73	0,47	-10,61%	-2,00	0,05*
2	6,78%	1,19	0,23	-3,82%	-0,67	0,50
3	-0,76%	-0,13	0,90	-4,59%	-0,76	0,45
4	-0,19%	-0,03	0,98	-4,77%	-0,75	0,45
5	-0,44%	-0,07	0,95	-5,22%	-0,78	0,44

Source: Author's own computations

Notes: Voluntarily delisted companies (industrial) on the JSE for the period between 2007 and 2018. Using a sample of 15 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

5.3.5 Consumer, cyclical

The sector is also categorised as the consumer cyclical sector. Cyclical stock services and products are typically purchased by consumers when the economy is stable or growing. However, they are also high risk as they can be significantly affected by economic cycles, leading to unstable returns (Mahfudz & Wijayanto, 2020). Edcon's delisting is one of the sector's largest and was facilitated through a leveraged buyout (LBO) by Bain, a private equity entity.

The predominant trend observed was that the CAARs and AARs were largely negative and insignificant. On the day of the event, both the AARs at 0.42% and the CAARs at -1.54% were statistically insignificant. As suggested in Table 4.9 covering the full event window, both the AARs and CAARs were in the negative but statistically insignificant. The AARs, however, were positive on two days within the event window but remained statistically insignificant. The market did not exhibit any anticipation or reaction to the delisting announcement and remained unreactive even after the announcement.

Table 5.7: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Consumer cyclical sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,11%	-0,10	0,92	-0,11%	-0,10	0,92
-4	-0,62%	-0,41	0,68	-0,73%	-0,48	0,63
-3	-0,48%	-0,26	0,79	-1,21%	-0,66	0,51
-2	-0,21%	-0,10	0,92	-1,43%	-0,67	0,51
-1	-0,53%	-0,22	0,82	-1,96%	-0,82	0,41
0	0,42%	0,16	0,87	-1,54%	-0,59	0,56
1	-0,48%	-0,17	0,87	-2,01%	-0,71	0,48
2	0,46%	0,15	0,88	-1,56%	-0,52	0,61
3	-0,15%	-0,05	0,96	-1,71%	-0,53	0,59
4	0,03%	0,01	0,99	-1,68%	-0,50	0,62
5	-4,54%	-1,28	0,20	-6,22%	-1,76	0,08

Source: Author's own computations

Notes: Voluntarily delisted companies (consumer cyclical) on the JSE for the period between 2007 and 2018. Using a sample of 8 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

It can be inferred that the voluntary delisting of firms within the consumer cyclical sector does not exert any substantial effect on shareholders' wealth. The negative returns could be explained by their high-risk nature as they were profoundly influenced by economic cycles and did not yield stable returns. Given that, our study concluded that voluntary delisting in the consumer cyclical sector does not impact shareholders' wealth significantly. As with other sectors explored in this study that experienced voluntary delisting, apart from the mining sector, the M&As executed in this sector were primarily motivated by growth strategies of the acquiring firms.

5.3.6 Communication

In this context, the communication sector encompassed both telecommunication and media companies, with media companies constituting a majority of the firms that underwent delisting. On the event date, both the AARs at -1.77% and CAARs at -1.76% were statistically insignificant. This implies that the market did not show any response to the delisting announcement in the communication sector on the event date.

Table 5.8: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Communication sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-1,73%	-1,59	0,12	-1,73%	-1,59	0,12
-4	-1,81%	-1,17	0,24	-1,81%	-1,17	0,24
-3	-1,85%	-0,98	0,33	-1,85%	-0,98	0,33
-2	-2,17%	-0,99	0,32	-2,17%	-0,99	0,32
-1	-1,77%	-0,72	0,47	-1,77%	-0,72	0,47
0	-1,76%	-0,66	0,51	-1,76%	-0,66	0,51
1	-2,36%	-0,82	0,42	-2,36%	-0,82	0,42
2	-2,23%	-0,72	0,47	-2,23%	-0,72	0,47
3	-1,70%	-0,52	0,60	-1,70%	-0,52	0,60
4	-2,27%	-0,66	0,51	-2,27%	-0,66	0,51
5	-2,06%	-0,57	0,57	-2,06%	-0,57	0,57

Source: Author's own computations

Notes: Voluntarily delisted companies (communications) on the JSE for the period between 2007 and 2018. Using a sample of 7 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

Similarly, both AARs and CAARs remained statistically insignificant throughout the entire event window. The market did not exhibit any reaction on the event day or the days leading up to and following the announcement. As a result, shareholders' wealth was not impacted by the delisting process in the communication sector. The M&As within this sector were primarily driven by the growth strategies of the acquirers. The market's lack of reaction to the voluntary delisting suggests that the premium paid to existing shareholders was not substantial, resulting in a zero net present value for the existing shareholders of the target companies on average.

5.3.7 Technology

Referring to Table 5.9, on the event date, the AARs (-0.53%) and CAARs (-0.33%) were statistically insignificant. Throughout the event window, both AARs and CAARs continued to be statistically insignificant. The table also illustrates that AARs and CAARs exhibited a rising trend throughout the event. The market did not show any reaction on the event day or on the days preceding and following the announcement. These observations suggest that voluntary delisting in the technology sector does not significantly impact shareholders' wealth. The M&As within the sector were primarily

propelled by acquirers seeking to expand their growth strategies, with the acquired firms being relatively small. The acquisition strategies were aimed at addressing challenges that directly affected revenue, such as disruptive innovation and globalisation, thus gaining access to new technologies, skills, and markets (Tshitangano, 2015). Similar to the communication sector, the market's non-response to voluntary delisting suggests that the premium offered to existing shareholders was not substantial, possibly offset by the liquidity discount and the small stock discount.

Table 5.9: t-test results of AARs and CAARs for Voluntarily Delisted Companies (Technology sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,38%	-0,08	0,93	-0,38%	-0,08	0,93
-4	-0,14%	-0,02	0,98	-0,52%	-0,08	0,94
-3	0,38%	0,05	0,96	-0,15%	-0,02	0,99
-2	-0,29%	-0,03	0,97	-0,43%	-0,05	0,96
-1	0,62%	0,06	0,95	0,19%	0,02	0,98
0	-0,53%	-0,05	0,96	-0,33%	-0,03	0,98
1	0,40%	0,03	0,97	0,07%	0,01	1,00
2	-0,57%	-0,04	0,96	-0,50%	-0,04	0,97
3	8,25%	0,61	0,54	7,75%	0,57	0,57
4	-0,58%	-0,04	0,97	7,17%	0,50	0,62
5	0,20%	0,01	0,99	7,37%	0,49	0,62

Source: Author's own computations

Notes: Voluntarily delisted companies (technology) on the JSE for the period between 2007 and 2018. Using a sample of 8 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

5.3.8 Diversified

The diversified sector comprises diversified banks, industrials, and basic and diversified chemicals. M&As in this sector were driven by the acquirers' expansion objectives, with the acquired firms being relatively small. The market's lack of response could be attributed to the bid price premium being counterbalanced by the liquidity and small stock discounts. The results also suggest that the market is efficient, given that smaller companies are not as thoroughly researched by market analysts, resulting in limited fundamental information and more predictable behaviours (Hong *et al.*, 2000). Similar to the communication sector, the market showed no reaction on the event day

or the days before and after the announcement. On the event date, both the AARs at -0.59% and CAARs at -2.08% were statistically insignificant. As evidenced in Table 5.10, AARs and CAARs remained statistically insignificant throughout the event window. These findings suggest that voluntary delisting in the diversified sector does not significantly affect shareholders' wealth. Despite not being statistically significant, negative returns may indicate weak governance practices in target firms, lower premiums paid for these firms, high leverage, and the use of mixed payments to finance acquisitions.

Table 5.10: t-test Results of AARs and CAARs for Voluntarily Delisted Companies (Diversified sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	-0,08%	-0,05	0,96	-0,08%	-0,05	0,96
-4	-0,31%	-0,15	0,88	-0,39%	-0,18	0,86
-3	0,12%	0,05	0,96	-0,27%	-0,10	0,92
-2	-1,01%	-0,34	0,74	-1,28%	-0,42	0,67
-1	-0,22%	-0,06	0,95	-1,50%	-0,44	0,66
0	-0,59%	-0,16	0,87	-2,08%	-0,56	0,57
1	-0,86%	-0,22	0,83	-2,94%	-0,74	0,46
2	5,01%	1,18	0,24	2,07%	0,49	0,63
3	-4,96%	-1,10	0,27	-2,89%	-0,64	0,52
4	0,05%	0,01	0,99	-2,84%	-0,60	0,55
5	-0,35%	-0,07	0,94	-3,19%	-0,64	0,52

Source: Author's own computations

Notes: Voluntarily delisted companies (diversified) on the JSE for the period between 2007 and 2018. Using a sample of 3 companies with an event window of 11 days. *denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

5.4 Wealth effects of involuntary delisting across various sectors

5.4.1 Financial

In the Financial sector, property funds were the only firms that underwent voluntary delisting. Our sample consisted of two firms, one of which was delisted for non-compliance with listing requirements, while the other was delisted due to liquidation. On the event date, both the AARs at 1.61% and CAARs at 2.44% were statistically insignificant. As depicted in Table 5.11, AARs and CAARs remained positive but statistically insignificant throughout the event window. Similar to the previous sectors,

the market did not respond on the event day, as well as the days before and after the announcement. These findings suggest that involuntary delisting in the Financial sector does not impact shareholders' wealth significantly.

Table 5.11: t-test Results of AARs and CAARs for Involuntarily Delisted Companies (Financial sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	0,13%	0,10	0,92	0,13%	0,10	0,92
-4	0,18%	0,10	0,92	0,30%	0,16	0,87
-3	0,07%	0,03	0,97	0,38%	0,17	0,87
-2	0,25%	0,10	0,92	0,63%	0,24	0,81
-1	0,20%	0,07	0,94	0,83%	0,29	0,78
0	1,61%	0,50	0,62	2,44%	0,76	0,45
1	0,21%	0,06	0,95	2,65%	0,77	0,44
2	0,26%	0,07	0,94	2,91%	0,79	0,43
3	0,21%	0,05	0,96	3,12%	0,80	0,43
4	0,12%	0,03	0,98	3,24%	0,78	0,43
5	0,10%	0,02	0,98	3,34%	0,77	0,44

Source: Author's own computations

Notes: Involuntarily delisted companies (financials) on the JSE for the period between 2007 and 2018. Using a sample of 2 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

The positive AARs and CAARs observed may be attributed to specific circumstances surrounding the delisted firms. For example, the firm that failed to comply with listing requirements may have violated a minor requirement, such as a delay in submitting financial statements. This non-compliance and subsequent delisting could have been a strategic decision made by the management team. Voluntarily liquidated firms typically experience numerous takeover attempts, concentrated ownership, stagnant growth, substantial cash reserves, and deterioration in key financial variables (Ghosh, Owers & Gorgers, 1991). The motive behind voluntary liquidation is often to prevent hostile takeovers, and since these firms tend to have significant cash reserves, shareholders benefit from the distribution of funds after creditors are paid through the sale of the firm's assets (Ghosh *et al.*, 1991). The lack of market reaction could also be attributed to the fact that investors had anticipated the delisting of both these companies.

5.4.2 Technology

There is evidence of adverse effects on shareholders' wealth prior to the event day. AARs (-33.8%) and CAARs (-33.9%) were statistically significant three days before the event date, suggesting the possibility of insider trading, informed trading, or speculation anticipating the delisting. The market's negative reaction could be attributed to the anticipated liquidity discount and the negative signal associated with the delisting of such companies by the exchange. However, on the event date, both AARs (0.36%) and CAARs (-34.5%) were statistically insignificant. Analysis of Table 5.12 reveals that AARs and CAARs were statistically insignificant for 10 out of 11 days in the event window. The market did not respond on the event day or after the announcement, indicating that the delisting was already anticipated.

Table 5.12: t-test Results of AARs and CAARs for Involuntarily Delisted Companies (Technology sector)

Day	AAR	t-stat	p-value	CAAR	t-stat	p-value
-5	0,49%	0,05	0,96	0,49%	0,05	0,96
5.-4	-0,6%	-0,04	0,97	-0,1%	-0,01	0,99
-3	-33,8%	-1,87	0,06*	-33,9%	-1,88	0,06*
-2	32,7%	1,57	0,12	-1,2%	-0,06	0,95
-1	-33,6%	-1,44	0,15	-34,8%	-1,49	0,14
0	0,36%	0,01	0,99	-34,5%	-1,35	0,18
1	0,2%	0,01	1,00	-34,3%	-1,24	0,22
2	1,0%	0,03	0,97	-33,3%	-1,13	0,26
3	1,6%	0,05	0,96	-31,7%	-1,01	0,31
4	1,9%	0,06	0,95	-29,8%	-0,90	0,37
5	0,1%	0,00	1,00	-29,6%	-0,86	0,39

Source: Author's own computations

Notes: Involuntarily delisted companies (technology) on the JSE for the period between 2007 and 2018. Using a sample of 2 companies with an event window of 11 days. *Denotes significance at 90% confidence level. **denotes significance at 90% and 95% confidence level. ***denotes significance at 90%, 95% and 99% confidence level.

5.5 Summary and Conclusions

The descriptive statistical analysis findings underscore the potential impact of sector-specific dynamics and market conditions on performance and volatility during adverse situations. In particular, the Financial sector exhibits more positive average abnormal

returns, positive cumulative abnormal average returns, and a lower standard deviation compared to the Technology sector. These observations imply that the Financial sector may possess greater stability and superior performance during involuntary delisting events, likely due to robust regulatory frameworks and effective risk management practices that mitigate market shocks. Conversely, the Technology sector displays higher volatility and underperformance during involuntary delisting, which can be attributed to the rapid pace of innovation and intense competition that heighten its sensitivity to market fluctuations and investor sentiment.

In the Technology sector, heightened volatility during delisting, both voluntary and involuntary, can be attributed to the sector's susceptibility to rapid market changes and investor sentiment. Companies in this sector face constant pressure to innovate, leading to high operational costs and uncertainties. Investor sentiment in the Technology sector is often driven by market perception of future potential rather than current performance, making it more vulnerable to disruptions. Voluntary delisting events in this sector might involve strategic moves such as mergers, acquisitions, or shifts in business models, further introducing uncertainty. The sector's inherent high-risk profile, due to rapid technological advancements and innovation pressures, contributes to persistent volatility during delisting events.

The analysis further reveals that during voluntary delisting, the Consumer Non-cyclical and Basic Material sectors maintain stable performance. These sectors often deliver essential goods and services that remain in demand regardless of market conditions, contributing to their stability. Similarly, the Basic Material sector also maintains stability during voluntary delisting due to its provision of fundamental commodities like chemicals, construction materials, and metals, which are essential to various industries. In contrast, the Financial and Industrial sectors underperform during voluntary delisting, potentially due to sector-specific challenges such as regulatory changes, economic cycles, and capital-intensive operations. The Technology sector continues to exhibit higher volatility during voluntary delisting, mirroring its behaviour during involuntary delisting scenarios. This persistent volatility may stem from the inherent uncertainty and rapid changes characteristic of the Technology industry.

Comparative insights between voluntary and involuntary delisting reveal distinct patterns. Involuntary delisting in the Financial sector demonstrates stronger

performance and stability, suggesting that such events do not significantly disrupt the sector's operations or investor confidence. On the other hand, the Technology sector's involuntary delisting is marked by underperformance and higher volatility, indicating that these events are particularly detrimental due to the sector's susceptibility to market perceptions and operational disruptions. Voluntary delisting results in underperformance in both the Financial and Technology sectors, with the Technology sector showing greater fluctuations. This suggests that voluntary delisting decisions might be driven by strategic repositioning or other factors introducing uncertainty, especially in the rapidly evolving technology landscape.

The event study analysis corroborates these findings, highlighting that delisting has adverse effects on specific sectors. For voluntarily delisted companies, sectors such as Consumer Non-cyclical and Industrial experience negative impacts, demonstrating sector-specific vulnerabilities during voluntary delisting events. In contrast, the technological industry is significantly affected by involuntary delisting, reinforcing the notion that such events exacerbate volatility and underperformance in this sector. These findings provide valuable insights for investors aiming to understand sector-specific risks and returns during delisting events. By recognising stability and volatility patterns across different sectors, investors can make more informed decisions and potentially mitigate risks associated with delisting scenarios.

In conclusion, this analysis emphasises the importance of considering sector-specific dynamics when evaluating delisting events. By delving into the comparative performance and volatility across sectors, the findings offer a comprehensive understanding of the factors driving these outcomes and their implications for stakeholders. Understanding the distinct responses of different sectors to delisting events enables more informed investment strategies and risk management practices. The regulatory frameworks, strategic planning, and inherent characteristics of each sector play a crucial role in mitigating the adverse impacts of delisting, ensuring sustained stability and performance across diverse market conditions.

CHAPTER 6: DETERMINANTS OF BOTH VOLUNTARY AND INVOLUNTARY DELISTING: EMPIRICAL EVIDENCE

6.1 Introduction

Chapter 6 investigates the determinants of delisting events in financial markets, specifically focusing on differentiating between involuntary and voluntary delistings. This research is essential as it provides stakeholders with critical insights to make informed decisions and assists policymakers in developing strategies to mitigate potential adverse outcomes.

Delisting refers to removing a company's stock from a stock exchange, terminating its public trading status. Delisting events can occur involuntarily, often due to non-compliance with regulatory requirements, or voluntarily, when a company chooses to go private. The decision-making processes and underlying factors leading to delisting are complex and multifaceted, making this area of academic inquiry compelling.

Examining delisting events is significant due to their potential impact on market stability and investor confidence. Involuntary delistings may indicate financial distress or regulatory non-compliance, with possible repercussions for the broader market. On the other hand, voluntary delistings may reflect strategic business decisions aimed at restructuring or avoiding the costs associated with public listing. By analysing these events separately, this research aimed to provide a nuanced understanding of the factors driving delisting.

Despite the importance of this topic, there is a research gap regarding the specific financial factors influencing delisting decisions. This chapter addresses this gap by employing logistic regression analysis to identify and evaluate these factors. The primary research question investigates the significant financial variables that influence the likelihood of a company being delisted and how these variables differ between involuntary and voluntary delistings.

This chapter identifies the financial determinants of delisting and delineates the differences between involuntary and voluntary delistings, making a valuable contribution to financial studies.

The chapter is structured as follows: Section 6.2 focuses on data visualisation techniques, Section 6.3 presents descriptive statistics, Section 6.4 conducts correlation analysis, Section 6.5 performs logistic regression analysis for Model 1 (involuntary delisted firms), Section 6.6 analyses Model 2 (voluntary delisted firms), Section 6.7 explores Model 3 (both voluntary and involuntary delisted firms), and finally, Section 6.8 provides a summary and conclusions derived from the analysis.

Understanding the determinants of delisting within South Africa is crucial for investors, policymakers, and financial analysts. This analysis offers insights into the financial ratios driving delisting events, informing investment strategies and regulatory policies. The research enhances existing literature by providing valuable guidance for navigating the complexities of financial markets and understanding the broader implications of delisting events on shareholder value.

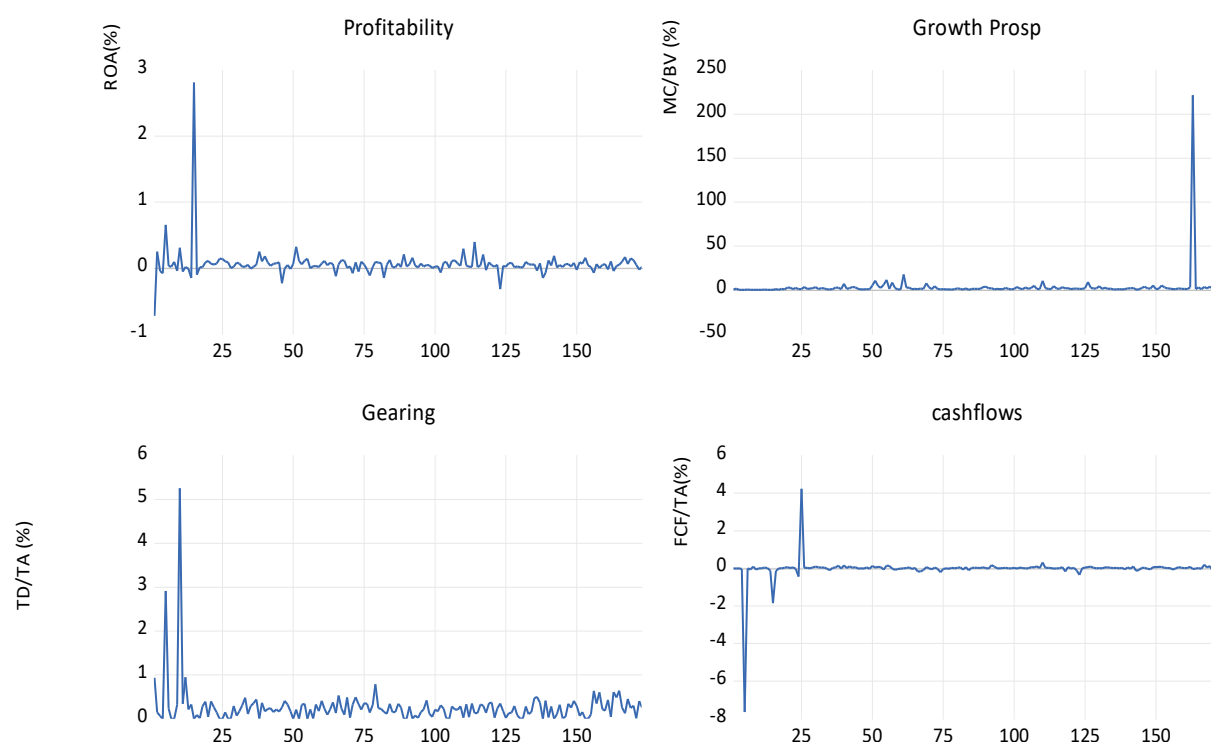
In summary, this chapter employs a rigorous quantitative approach, utilising data from Bloomberg and FactSet, to examine the wealth effects of delisting on the JSE. The analysis incorporates descriptive statistics, correlation analysis, and logistic regression. Finally, a comprehensive summary and conclusions derived from the study are presented.

6.2 Estimation and interpretation of results

For a comprehensive statistical and econometric analysis, a detailed scrutiny of the individual characteristics of the variables being studied is imperative. The characteristics of these variables deliver significant insights into prevailing trends, patterns, and interconnections. Graphical representations of these characteristics are typically more easily interpreted than numerical data. Furthermore, through an in-depth examination of the variables' trends and overall behaviour, researchers are better positioned to discern the suitable statistical methodologies to utilise. This way, the research's validity and reliability are significantly enhanced, contributing to the accuracy and relevance of the research findings.

6.2.1 Model 1 Graphs of Independent Variables (Involuntary delisting and not delisting)

Graph 6.1: Independent Variables (Involuntary delisting and not delisting)



Source: Author's construct

The graph illustrating profitability indicates that the initial firms that were subjected to involuntary delisting presented negative profits, despite occasional positive spikes observed in one or two firms. The profitable firms that were forcibly delisted can be attributed to non-compliance with listing requirements (as seen in Industrial Credit Co Africa Holdings Ltd and Corvus Capital SA Holding Ltd) and possessing inadequate assets (as observed in Sherbourne Capital Ltd). For these corporations, profitability was not the primary concern.

It is noteworthy that there are scenarios where companies, despite being profitable, can create negative cash flows. This implies that such firms are incapable of meeting their debt obligations, potentially leading to reliance on shareholders' loans for survival and possible liquidation. Therefore, a profitable firm does not necessarily indicate robust financial health. Cash flows carry more weight than profitability as they reflect the actual cash generation of a company.

Profitability can be misleading due to the accrual accounting method, where revenues and expenses are recorded when earned or incurred, regardless of actual cash receipt or payment. This creates a temporal discrepancy between when a company recognises revenue and when it receives cash from customers. Similarly, companies may have expenses recorded on their financial statements that have not yet been paid in cash. These timing mismatches may lead to a scenario where a company generates negative cash flows while its financial statements indicate profitability.

Notably, a company might appear profitable by selling a large volume of their products on credit, as per the accrual accounting method. However, such a company might generate negative cash flow if customers default on their credit sales. Consequently, it is not unusual to witness profitable firms being delisted, as profitability does not guarantee positive cash flow generation.

From the profitability profile, it is apparent that most firms that were involuntarily delisted had near-zero profitability levels. These low profitability levels could be viewed as an early warning sign of delisting. The stock exchange may be motivated to delist unprofitable firms, as these firms are unlikely to contribute to the exchange's revenue due to their inability to afford listing fees (Chen & Schoderbek, 1990). Firms that cannot meet their ongoing listing fees will be involuntarily delisted (Čornanič & Novák, 2015). Hence, it is beneficial for the stock exchange to engage with profitable companies, as these can afford listing fees and prevent financial losses for the exchange.

The firms that were subject to involuntary delisting demonstrated minimal growth prospects, thus heightening the likelihood of delisting. Growth is a prerequisite for the prosperity and longevity of firms, as it opens avenues for business expansion. However, in this case, firms that were involuntarily delisted exhibited almost no growth potential. Among the firms that were not delisted, one displayed a growth rate exceeding 200%, as depicted by a spike in the graph. Such firms, often referred to as high-growth firms, are generally younger, but not necessarily small, and can be found across various sectors. Their growth is typically driven by innovation, economies of scale, managerial capabilities, and a skilled labour force (World Bank, 2018).

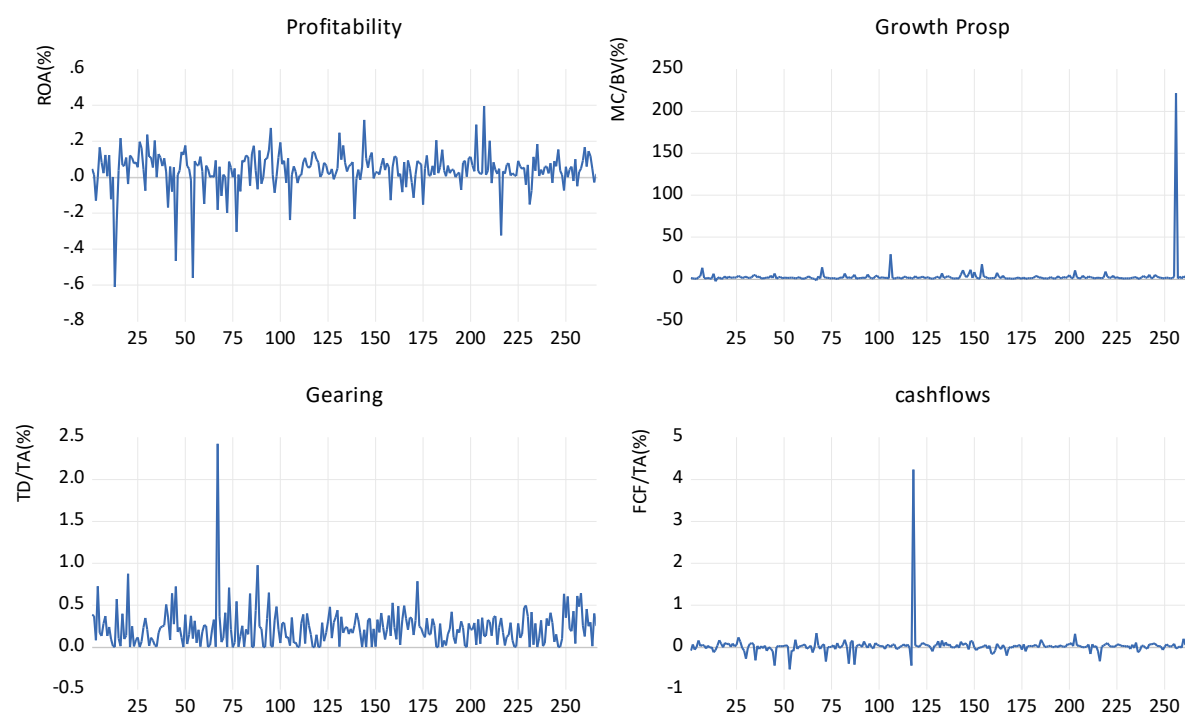
The graph illustrates that firms subjected to involuntary delisting were highly geared compared to others, indicating a high Debt/Equity ratio. While highly geared firms can

sometimes outperform those with low gearing, this may not hold true for distressed firms. Under normal circumstances, a high-performing, highly geared firm has the potential for rapid wealth accumulation through investments funded from external sources, with the costs of gearing being tax-deductible. However, for distressed firms facing delisting, high gearing ratios can lead to negative outcomes. High gearing can push a company into financial distress, prompting the stock exchange to delist it. Such firms can be delisted due to their inability to afford listing fees and in order to protect the reputation of the stock exchange (Čornanič & Novák, 2015). Studies have found that most involuntarily delisted firms experience financial distress prior to delisting, and highly geared companies are often involuntarily delisted (Algebaly *et al.*, 2014; Park *et al.*, 2014).

The free cash flows of involuntarily delisted firms were either negative or zero. Free cash flows provide a measure of a firm's liquidity and its capacity to fulfil its financial obligations, as well as acting as a buffer against future financial challenges. Negative cash flows suggest a decline in the firm's liquid assets, which, if sustained, might lead to forced delisting. The graphical representation of involuntarily delisted firms aligns with the typical characteristics of such firms, which are unlikely to generate positive free cash flow. Negative free cash flow is an indication that these firms may not be able to afford listing fees. Free cash flow can also serve as an indicator of agency costs, which arise when a company generates substantial free cash flow and the managers do not act in the shareholders' best interests. It is clear that involuntarily delisted firms are unlikely to incur agency costs, as such firms do not generate positive free cash flows.

6.2.2 Model 2 Graphs of independent variables (Voluntary delisting and not delisting)

Graph 6.2: Independent Variables (Voluntary delisting and not delisting)



Source: Author's construct

The profitability variable for voluntarily delisting firms exhibits a seemingly normal distribution, with the exception of a spike among those firms that choose to delist. The profitability of these firms has a tendency to revert to the mean around a value of zero. This roller-coaster pattern of profitability, mean-reverting around zero, is observed in most of the voluntarily delisting firms. The graph illustrates that there is no significant difference in profitability levels between voluntarily delisting firms and those that do not delist. However, it should be noted that the initial few firms that delisted registered higher negative profitability levels. This suggests that firms typically choose to voluntarily delist when they are not profitable, as a means to avoid paying substantial listing fees. This decision can be considered a cost-cutting measure (Trang, 2018).

Similarly, the growth prospects for voluntarily delisting firms are generally low, with only a few positive spikes. Overall, there is no significant difference in growth prospects between voluntarily delisting firms and those that do not delist. It is logical for firms with low growth prospects to choose to delist, as such firms delist in order to reduce listing costs (Thomsen & Vinten, 2006). Numerous studies (Marosi & Massoud, 2007; Pour & Lasfer, 2013) have found evidence that firms with low growth prospects opt for

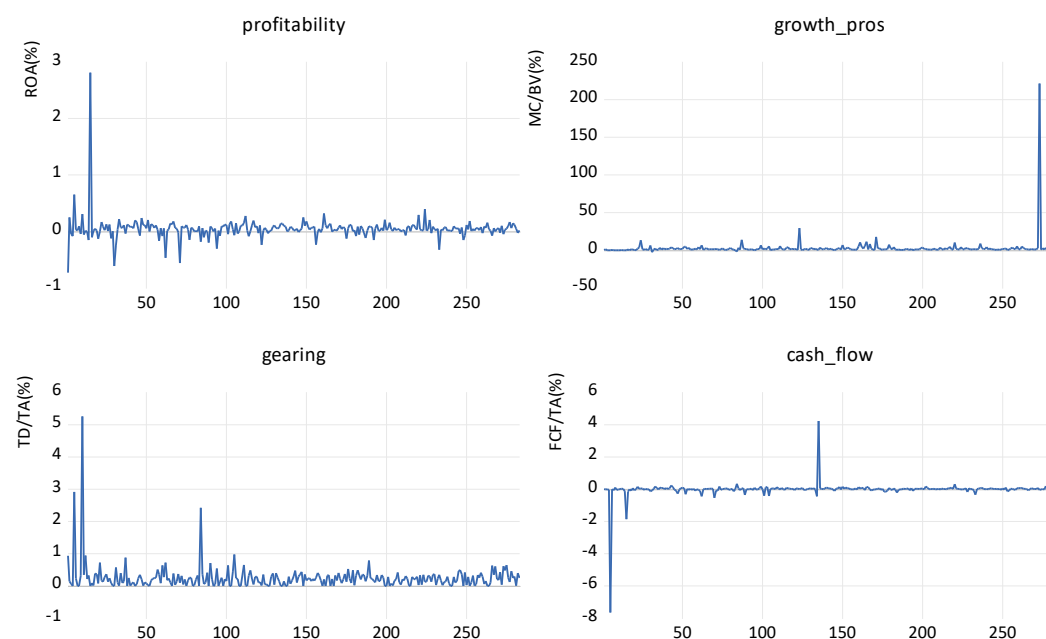
voluntary delisting. Firms typically list in order to access cheaper funding, and without growth prospects, it is not beneficial for the firm to remain listed.

Most firms in the voluntarily delisting category have moderate levels of leverage, with only one or two firms exhibiting high levels of leverage, as indicated by the spikes. It is reasonable for moderately geared firms to choose to delist compared to highly geared firms. Listing is essential for highly geared firms as it provides access to capital (Aslan & Kumar, 2011).

With the exception of a few spikes, most firms experience low cash flows that revert to the mean around a value of zero. A mean of zero implies that there was a tendency for cash flows to have a long-term average of zero for the selected firms at the JSE during the study period. Free cash flow does not appear to be a motivating factor for firms to voluntarily delist. Typically, firms delist when they generate significant positive free cash flow in order to avoid agency costs (Aslan & Kumar, 2011). The inference that can be drawn is that firms choose to delist when they generate close to zero free cash flows as a cost-cutting measure to reduce significant listing fees. Leuz *et al.* (2008) found evidence that firms with low free cash flow voluntarily delist.

6.2.3 Model 3 Graphs of independent variables (Voluntary and Involuntarily delisting)

Graph 6.3: Independent Variables (Voluntary and involuntarily delisting)



Source: Author's construct

The graphs of model 3 do not differ fundamentally from those of model 1, as the graphs of model 1 can be viewed as subsets of the graphs of model 3. The cash flow graph appears to reinforce the phenomenon of both voluntarily and involuntarily delisting firms, as indicated by the strong initial negative cash flows.

6.3 Categorical Descriptive Statistics for Models 1, 2 & 3

Descriptive statistics were computed to provide an overview of the sample characteristics. This involved calculating the mean and standard deviation for each variable used in the logistic regression analysis. These statistics helped in understanding the distribution and variability of the variables.

6.3.1 Descriptive Statistics for Model 1 Variables (Involuntarily Delisting firms)

Table 6.1: Descriptive statistics for Model 1 Variables (Involuntarily delisting firms)

Variable	Mean		All	Standard Deviation		All
	Dep=0	Dep=1		Dep=0	Dep=1	
Profitability	0.047928	0.172977	0.060216	0.082836	0.731921	0.239605
Growth Prospects	3.517730	0.182671	3.190008	17.71614	0.390425	16.84773
Gearing	0.221732	0.694266	0.268166	0.162544	1.372802	0.467996
Cash Flows	0.040469	-0.573901	-0.019903	0.347568	1.877116	0.685768
C	1.000000	1.000000	1.000000	0.000000	0.000000	0.000000

Source: Author's own computations

Dep=0 represents listed firms Dep=1 represents involuntary delisted firms

The descriptive statistics are presented in Table 6.1 for Model 1 variables, focusing on listed (Dep=0) and involuntarily delisted firms (Dep=1). Table 6.1 shows the mean and standard deviation of profitability, growth prospects, gearing, and cash flows, comparing listed and involuntarily delisted firm.

The profitability of involuntarily delisted firms is notably higher on average (Mean = 0.172977) compared to listed firms (Mean = 0.047928). However, the standard deviation for profitability among delisted firms (0.731921) is substantially greater than that of listed firms (0.082836), indicating a larger variance and suggesting financial

instability within the delisted group. This variability implies that while some delisted firms may be highly profitable, while others could be incurring significant losses, leading to a broader distribution around the mean.

In terms of growth prospects, listed firms exhibit a considerably higher average (Mean = 3.517730) than delisted firms (Mean = 0.182671). The high standard deviation for growth prospects among listed firms (17.71614) suggests substantial variability, whereas the lower standard deviation for delisted firms (0.390425) indicates more consistent but poorer growth potential. This disparity suggests that listed firms are generally expected to perform better in the future, with greater market confidence in their growth trajectories.

Gearing ratios further distinguish the two groups, with involuntarily delisted firms showing a higher average gearing (Mean = 0.694266) compared to listed firms (Mean = 0.221732). The standard deviation for gearing is also higher among delisted firms (1.372802), indicating wide variability in leverage levels. This high gearing ratio suggests that delisted firms are more heavily reliant on debt financing, which increases their financial risk and may contribute to their delisting due to financial distress or inability to meet debt obligations.

Cash flow analysis reveals that listed firms maintain positive average cash flows (Mean = 0.040469), in contrast to delisted firms, which experience negative average cash flows (Mean = -0.573901). The negative cash flows among delisted firms point to liquidity issues, which are critical for the survival and operational efficiency of firms. The markedly higher standard deviation for cash flows among delisted firms (1.877116) highlights significant variability in cash flow management, further indicating financial instability.

In summary, the descriptive statistics suggest that involuntarily delisted firms are characterised by financial instability, poor growth prospects, high leverage, and liquidity problems. These factors collectively increase the risk of delisting, underscoring the importance of robust financial health for sustained market presence. The analysis indicates that listed firms generally exhibit better financial health and future growth potential, while delisted firms struggle with financial inconsistencies and higher risk profiles.

6.3.2 Descriptive Statistics for Model 2 Variables (Voluntarily Delisting firms)

Table 6.2: Descriptive Statistics for Model 2 Variables (Voluntarily delisting firms)

Variable	Mean		All	Standard Deviation		All
	Dep=0	Dep=1		Dep=0	Dep=1	
Profitability	0.047928	0.025620	0.038703	0.082836	0.139383	0.110116
Growth Prospects	3.517730	2.134760	2.945825	17.71614	3.395191	13.73996
Gearing	0.221732	0.227563	0.224143	0.162544	0.297215	0.227589
Cash Flows	0.040469	-0.002634	0.022644	0.347568	0.125220	0.278497
C	1.000000	1.000000	1.000000	0.000000	0.000000	0.000000

Source: Author's own computations

Dep=0 represents listed firms Dep=1 represents voluntary delisted firms

The descriptive statistics are presented in Table 6.2 for Model 2 variables, focusing on listed (Dep=0) and voluntarily delisted firms (Dep=1). Table 6.2 shows the mean and standard deviation of profitability, growth prospects, gearing, and cash flows, comparing listed and voluntarily delisted firms.

The mean profitability of voluntarily delisted firms (Dep=1) is 0.025620, significantly lower than that of listed firms (Dep=0) with a mean of 0.047928. This difference can be attributed to several economic factors. Financial distress may be prevalent among voluntarily delisted firms, leading to difficulties in generating sustainable profits. Additionally, market conditions within the industries in which they operate might be challenging, resulting in a decline in profitability. The higher standard deviation for voluntarily delisted firms (0.139383) compared to listed firms (0.082836) suggests a higher variability in profitability, potentially indicating greater vulnerability to economic fluctuations.

Voluntarily delisted firms exhibit lower mean growth prospects (Dep=1) compared to listed firms (Dep=0). The mean growth prospects for voluntarily delisted firms is 2.134760, while listed firms have a mean of 3.517730. The higher standard deviation for listed firms (17.71614) compared to voluntarily delisted firms (3.395191) suggests greater variability in growth prospects for listed firms. The lower growth prospects of voluntarily delisted firms can be attributed to reduced investment opportunities, limited

access to capital markets, and external funding constraints. Moreover, market perception plays a role, as investors and stakeholders may perceive voluntarily delisted firms as having lower growth potential, affecting their ability to attract investments and pursue expansion initiatives.

Although the mean gearing (leverage) of voluntarily delisted firms (Dep=1) is slightly higher than that of listed firms (Dep=0), the standard deviation for voluntarily delisted firms (0.297215) is notably higher compared to listed firms (0.162544). This difference can be explained by several economic factors. Voluntarily delisted firms may encounter financial constraints, making it challenging to access external financing and leading to an increased reliance on debt financing. The higher standard deviation suggests a greater variation in gearing among voluntarily delisted firms, potentially indicating differences in risk management strategies and financial circumstances.

The mean cash flows of voluntarily delisted firms (Dep=1) is -0.002634, significantly lower compared to listed firms (Dep=0) with a mean of 0.040469. The standard deviation for voluntarily delisted firms (0.125220) is also lower compared to listed firms (0.347568), indicating lower variability in cash flows for voluntarily delisted firms. The lower cash flows of voluntarily delisted firms can be attributed to various economic factors. These firms may face financial difficulties, including declining revenues, higher costs, or liquidity issues, impacting cash flow generation. The delisting process itself can disrupt normal business operations, leading to a temporary disruption in cash flow generation for voluntarily delisted firms. Additionally, strategic decisions focused on short-term financial objectives, such as restructuring or asset sales, may take precedence over cash flow generation.

Overall, the analysis of mean and standard deviation for profitability, growth prospects, gearing, and cash flows of voluntarily delisted firms compared to listed firms provides valuable insights into the economic factors influencing firm performance. The lower profitability, growth prospects, and cash flows observed among voluntarily delisted firms can be attributed to financial distress, market conditions, limited investment opportunities, market perception, and disruption during delisting. The slightly higher gearing among voluntarily delisted firms may be driven by financial constraints and risk management strategies. It is essential to consider industry-specific dynamics, company-specific circumstances, and broader economic conditions to gain a

comprehensive understanding of the factors influencing voluntarily delisted firms' performance.

6.3.3 Descriptive Statistics for Model 3 Variables (Voluntarily and Involuntarily Delisting Firms)

Table 6.3: Descriptive Statistics for Model 3 Variables (Voluntarily and involuntarily delisting firms)

Variable	Mean		All	Standard Deviation		All
	Dep=0	Dep=1		Dep=0	Dep=1	
Profitability	0.047928	0.045345	0.046769	0.082836	0.295585	0.206908
Growth Prospects	3.517730	1.873457	2.779841	17.71614	3.230591	13.33593
Gearing	0.221732	0.290035	0.252384	0.162544	0.584110	0.410029
Cash Flows	0.040469	-0.079103	-0.013191	0.347568	0.706497	0.541265
C	1.000000	1.000000	1.000000	0.000000	0.000000	0.000000

Source: Author's own computations

Dep=0 represents listed firms Dep=1 represents both voluntary and involuntary delisted firms

The descriptive statistics are presented in Table 6.3 for Model 3 variables, focusing on delisted (both voluntarily and involuntarily) and listed firms. Table 6.3 shows the mean and standard deviation of profitability, growth prospects, gearing, and cash flows, comparing listed firms (Dep=0) and a combination of voluntarily and involuntarily delisted firms (Dep=1).

The mean profitability of both voluntarily and involuntarily delisted firms (Dep=1) is 0.045345, slightly lower compared to listed firms (Dep=0) with a mean of 0.047928. The lower profitability among delisted firms can be attributed to various economic factors. Delisting may occur due to financial distress or poor performance, leading to decreased profitability. Additionally, market conditions and industry competition may contribute to lower profitability for delisted firms. The higher standard deviation for delisted firms (0.295585) compared to listed firms (0.082836) suggests a greater variability in profitability, potentially indicating higher financial instability and vulnerability among delisted firms.

Both voluntarily and involuntarily delisted firms exhibit lower mean growth prospects (Dep=1) compared to listed firms (Dep=0). The mean growth prospects for delisted

firms are 1.873457, while listed firms have a mean of 3.517730. The lower growth prospects among delisted firms can be attributed to economic factors such as financial difficulties, limited investment opportunities, and market perception. Delisted firms may face challenges in securing external funding and attracting investments, which hinder their ability to pursue growth initiatives. The higher standard deviation for listed firms (17.71614) compared to delisted firms (3.230591) suggests greater variability in growth prospects for listed firms, potentially due to a wider range of investment opportunities and market conditions.

The mean gearing (leverage) of both voluntarily and involuntarily delisted firms (Dep=1) is higher compared to listed firms (Dep=0). The mean gearing for delisted firms is 0.290035, while listed firms have a mean of 0.221732. The higher gearing among delisted firms can be attributed to economic factors such as financial distress, limited access to capital markets, and the need to rely on debt financing. Delisted firms may face difficulties in obtaining external financing, leading to an increased reliance on debt to finance their operations. The higher standard deviation for delisted firms (0.584110) compared to listed firms (0.162544) suggests greater variation in gearing among delisted firms, potentially indicating differences in risk management strategies and financial circumstances.

The mean cash flows of both voluntarily and involuntarily delisted firms (Dep=1) are negative, indicating challenges in generating positive cash flows. The mean cash flows for delisted firms are -0.079103, while listed firms have a mean of 0.040469. The negative cash flows among delisted firms can be attributed to economic factors such as financial distress, declining revenues, higher costs, and liquidity issues. Delisting itself can disrupt normal business operations, leading to a temporary decline in cash flow generation. The higher standard deviation for delisted firms (0.706497) compared to listed firms (0.347568) suggests greater variability in cash flows for delisted firms, potentially reflecting the financial instability and challenges they face.

Overall, the analysis of mean and standard deviation for profitability, growth prospects, gearing, and cash flows of voluntarily and involuntarily delisted firms compared to listed firms provides insights into the economic factors influencing firm performance and the distinctions between different types of delisted firms. The lower profitability, growth prospects, and cash flows observed among delisted firms can be attributed to financial

distress, market conditions, limited investment opportunities, and market perception. The higher gearing among delisted firms reflects the challenges they face in accessing external financing. The negative cash flows among delisted firms indicate difficulties in generating positive cash flows. It is crucial to consider industry-specific dynamics, company-specific circumstances, and broader economic conditions to gain a comprehensive understanding of the factors influencing delisted firms' performance and the distinctions between voluntarily and involuntarily delisted firms.

6.4 Correlation tables for Models 1, 2 and 3

The primary objective of examining correlations is to obtain a preliminary understanding of the linear relationship between different variables. A positive correlation coefficient indicates that the two variables under investigation tend to move in the same direction, implying that an increase in one variable is associated with an increase in the other variable. However, it is crucial to note that the strength of this association can vary, ranging from statistically significant to insignificant.

It is important to exercise caution when utilising correlations as the sole basis for making policy decisions. While correlations can provide valuable insights, they do not establish causality or provide a comprehensive understanding of the underlying mechanisms. Consequently, relying solely on correlations may lead to misguided policy measures.

In contrast, regression analysis offers a more robust approach by quantifying the impact of one variable on the dependent variable. By incorporating additional variables and controlling for their effects, regression analysis enables a more nuanced examination of the relationship between variables. This makes it a valuable tool for policy considerations, as it provides insights into the quantitative nature of the relationship between variables.

Thus, regression analysis complements the information obtained from correlation analysis by providing a more comprehensive and rigorous understanding of the relationship between variables. By combining both approaches, policymakers can make more informed decisions based on a deeper understanding of the quantitative relationships at play.

6.4.1 Model 1: Partial Correlation Table (Involuntarily Delisting Firms)

Table 6.4: Partial correlation table (Involuntarily delisting firms)

Correlations					
		Gearing	Profitability	Growth Prospects	Free Cash Flow
Gearing	Pearson Correlation				
	N	173			
Profitability	Pearson Correlation	.063	--		
	Sig. (2-tailed)	.413			
	N	173	173		
Growth Prosp	Pearson Correlation	.037	-.024	--	
	Sig. (2-tailed)	.625	.753		
	N	173	173	173	
Cashflows	Pearson Correlation	-.386**	-.316**	.010	--
	Sig. (2-tailed)	.000	.000	.892	
	N	173	173	173	173

Source: Author's construct

** . Correlation is significant at the 0.01 level (2-tailed).

In model 1, the correlation focused on firms that were involuntarily delisted and identified a positive but statistically insignificant correlation between the variable of gearing and two other variables: profitability and growth prospects. The study also found a negative and statistically insignificant correlation between growth prospects and profitability. Additionally, the variable of cash flow demonstrated a negative and statistically significant correlation with both profitability and gearing in these firms. This finding is consistent with a previous study by Sila (2018) conducted on the Nairobi Stock Exchange, which also found a negative and significant relationship between cash flow and profitability. The negative relationship between profitability and cash flow could be attributed to strategies such as offering substantial discounts to improve profitability at the expense of cash flow or granting extended payment terms to customers. The correlation between cash flow and growth prospects was found to be insignificant but positive, indicating some degree of association between the two variables without a robust relationship.

6.4.2 Model 2: Partial Correlation Table (Voluntarily Delisting and Not Delisting Firms)

Table 6.5: Partial correlation table (Voluntarily delisting and not delisting firms)

Correlations					
		Gearing	Profitability	Growth Prospects	Free Cash Flow
Gearing	Pearson Correlation	-			
	N	266			
Profitability	Pearson Correlation	-0.231**			
	Sig. (2-tailed)	0.000			
	N	266	266		
Growth Prosp	Pearson Correlation	0.087	-0.20		
	Sig. (2-tailed)	0.159	0.743		
	N	266	266	266	
Cashflows	Pearson Correlation	-0.078	0.183**	-0.012	
	Sig. (2-tailed)	0.204	0.003	0.843	
	N	266	266	266	266

Source: Author's construct

** . Correlation is significant at the 0.01 level (2-tailed).

In model 2, the correlation was examined on firms that voluntarily delisted and found a negative and significant correlation between gearing ratio and profitability. In contrast to involuntarily delisting firms, there was a significant and positive correlation between profitability and cash flows. These results suggest that lower gearing ratios, indicating less external funding and loans, are associated with higher profitability for voluntarily delisting firms. The positive correlation between profitability and cash flows aligns logically, as higher profits should result in greater availability of cash for day-to-day business operations.

6.4.3 Model 3: Partial Correlation Table (Voluntarily and Involuntarily Delisting Firms)

Table 6.6: Partial correlation table (Voluntarily and involuntarily delisting firms)

Correlations					
		Gearing	Profitability	Growth Prospects	Free Cash Flow
Gearing	Pearson Correlation	-			
	N	283			
Profitability	Pearson Correlation	0.009			
	Sig. (2-tailed)	0.881			
	N	283	283		
Growth Prosp	Pearson Correlation	0.032	-0.19		
	Sig. (2-tailed)	0.590	0.758		
	N	283	283		
Cashflows	Pearson Correlation	-0.341**	-0.261**	0.008	
	Sig. (2-tailed)	0.000	0.000	0.897	
	N	283	283	283	283

Source: Author's construct

** . Correlation is significant at the 0.01 level (2-tailed).

Model 3 cash flows and gearing in delisting firms were found to have a negative and significant correlation, indicating that, on average, delisting firms had higher gearing ratios, which impacted negatively on their cash flows. The study also observed a significant negative correlation between cash flows and profitability for both voluntarily and involuntarily delisted firms, with the negative effect being more pronounced for involuntarily delisted firms. Additionally, a positive correlation between cash flows and growth prospects was identified, although this association lacked statistical significance.

6.4.4 Summary

Overall, the results indicated that delisting firms tend to have higher gearing ratios, which adversely affect their cash flows. The relationship between profitability and cash flows differs for involuntarily and voluntarily delisting firms, with the former experiencing

a stronger negative correlation. The relationship between cash flows and growth prospects, while positive, lacks statistical significance.

6.5 Logistic Regression results for Model 1 ((Involuntarily Delisting firms) Dependent Variable = log (odds of delisting))

Table 6.7: Logistic Regression Results for Model 1 ((Involuntarily Delisting firms) Dependent Variable = log (odds of delisting))

Variables in the Equation									
		B	S.E	Wald	df	Sig.	Exp(B)	95% C.I. for EXP (B)	
		B	S.E	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1 ^a	Gearing	0.559	1.120	0.2490	1	0.6180	1.749	0.195	15.712
	Profitability	-.0401	2.273	0.0310	1	0.8600	0.670	0.008	57.666
	Growth Prospects	-5.580	1.261	19.596	1	0.0000	0.004	0.000	0.0450
	Cash Flows	-1.554	3.703	0.1760	1	0.6750	0.2110	0.000	299.912
	Constant	1.120	0.740	2.2890	1	0.1300	3.0640		
Step 2 ^a	Gearing	0.5810	1.1890	0.2390	1	0.6250	1.7870	0.1740	18.3740
	Growth Prospects	-5.6070	1.2550	19.9510	1	0.0000	0.0040	0.0000	0.04300
	Cash Flows	-1.0430	2.3710	0.19400	1	0.6600	0.3520	0.0030	36.7550
	Constant	1.1450	0.7350	2.4270	1	0.1190	3.142		
Step 3 ^a	Gearing	0.6420	1.0790	0.3540	1	0.5520	1.9000	0.2290	15.7590
	Growth prospects	-5.768	1.2490	21.3290	1	0.0000	0.0030	0.0000	0.03600
	Constant	1.2470	0.7050	3.1290	1	0.0770	3.4790		
Step 4 ^a	Growth Prospects	-5.925	1.250	22.4490	1	0.0000	0.0030	0.0000	0.0310
	Constant	1.531	0.6190	6.108	1	0.1300	4.621		

Source: Author's construct

a variable entered on step 1, Gearing, profitability, Growth prospects, Cash flows

The regression parameters presented in the table 6.7 demonstrate the process of progressively removing one variable at a time from the model and re-estimating it to observe the changes in regression dynamics. This is known as the Backward-

Likelihood Ratio approach, which allows for an examination of the relationship between these variables and the likelihood of delisting.

The gearing ratio has consistently been found to have a positive association with delisting for firms. In contrast, the other factors examined indicate that an increase in these variables reduces the odds of delisting. Specifically, an increase in profitability by one unit leads to a decrease in the odds of delisting. The reciprocal of the odds ratio, 0.67, suggests that increasing profitability by one unit results in a 1.49 times greater chance of remaining listed compared to the chance of delisting.

Regarding the gearing parameter (0.559) and its odds ratio ($e^{0.559} = 1.749$), it can be inferred that an increase in gearing by one unit (one percentage point) leads to 1.749 times greater odds of delisting compared to remaining listed. However, this variable is not statistically significant in explaining delisting. The only variable that holds significance in explaining delisting is Growth Prospects. The p-value of the growth parameter is less than 5% and the pseudo-t statistic, represented by the Wald Statistic, exceeds 19 for all equations shown in Steps 1 to 4. This indicates that increasing growth prospects by 1 percentage point would result in a 250 times reduction in the odds of delisting (reciprocal of the odds of delisting, which is 0.004).

6.5.1 Model Selection Analysis for Involuntarily Delisting Firms Redundancy Tests and Model Suitability for Involuntarily Delisting Firms

Table 6.8: Model Selection Analysis for Involuntarily Delisting Firms Redundancy Tests and Model Suitability for Involuntarily Delisting Firms

Model Selection Test Table						
MODEL (Step-wise regressions)	OBS	Log (Likelihood) -Null	Log (Likelihood)-model	Degrees of Freedom	Akaike Info Criteria (AIC)	Schwarz-Bayesian Info Criteria (SBIC)
M1:All variables present	173	-55.5773	-21.73127	5	53.462	69.229
M2:All except Gearing	173	-55.5773	-21.97429	4	51.949	64.562
M3:All except Profitability	173	-55.5773	-21.74696	4	51.494	64.107
M4:All except Growth Prospects	173	-55.5773	-45.65730	4	99.315	111.928
M5: All except Cash flow	173	-55.5773	-21.87490	4	51.750	64.363

Source: Author's own analysis

Log likelihood Interpretation:

The log likelihood is a measure of the goodness-of-fit for a model. The greater the value, the better the model fits the data. The null and its alternative hypothesis can be written as follows:

H_0 : The model does not fit the data, against:

H_a : The model does fit the data

Decision Rule: Reject the null hypothesis if the log(likelihood) for model is greater than the log(likelihood) of the null.

In examining all the models, it can be concluded that they fit the data well, as indicated by the log(likelihoods) of the models being greater than those of the null hypothesis. The primary objective of this redundancy test is to determine which of the models, M1 to M5, is the most appropriate based on the information criteria presented.

During the model selection analysis, higher values of the AIC and SBIC indicated poorer performance of the model. The results of the model selection test revealed that removing profitability from the regression estimation leads to an improvement in the results. This is evident from the lowest AIC (51.494) and SBIC (64.107) values obtained when profitability is omitted. Lower values of these criteria indicate a better

model compared to the others. Conversely, removing growth prospects as a determinant of delisting yields the highest AIC and SBIC values, indicating that this model performs the least effectively. Consequently, it can be inferred that growth prospects play a significant and crucial role in determining delisting. In other words, a decrease in growth prospects increases the likelihood of delisting on the JSE.

The findings from the model selection analysis validated the significance of growth prospects as a determining factor for delisting, thereby reinforcing the robustness of the logistic regression results. Similarly, the insignificance of profitability in the model selection analysis aligned with the results obtained from the logistic regression, where profitability was also found to be statistically insignificant.

6.5.2 Variable Importance Table

Table 6.9: Model Statistical Changes if Term Removed Piece-wise

Variable		Model Log Likelihood	Changes in -2 Log Likelihood	df	Sig.
Step 1	Gearing	-21.9740	0.48600	1	0.4860
	Profitability	-21.7470	0.03100	1	0.8590
	Growth Prospects	-45.6570	47.8520	1	0.0000
	Cash Flows	-21.8750	0.28700	1	0.5920
Step 2	Gearing	-21.9810	0.46700	1	0.4940
	Growth Prospects	-47.2540	51.014	1	0.0000
	Cash Flows	-21.9670	0.4400	1	0.5070
Step 3	Gearing	-22.2950	0.6560	1	0.4180
	Growth prospects	-51.1150	58.2960	1	0.0000
Step 4	Growth Prospects	-55.5770	66.5640	1	0.0000

Source: Author's construction

The null hypothesis to test for importance of variable in a model is given by:

H₀: variable is not a key factor of odds of delisting

H_a: variable is a key factor of odds of delisting

Decision Rule: Reject H₀ if significance of a change is less than 5%.

The table presented above clearly indicates that the removal of Growth Prospects from the different equations leads to a substantial alteration in the results, with a P-value of less than 5%. This observation underscores the crucial significance of growth prospects as a determining factor for the de-listing of firms listed on the JSE.

6.5.3 Omnibus Test

The Omnibus Test below is a test that is used to assess the overall significance of a regression model. This means that we are testing to see if the model can still be useful to explain the odds of delisting even though some individual variables may be insignificant in regression. This is, therefore, a test for the joint significance of the regression parameters.

The null and alternative hypotheses are shown below:

H_0 : all regression parameters are simultaneously equal to zero and the alternative is:

H_a : At least one parameter is significant

Reject H_0 if the p-value for model is less than 5%.

Table 6.10: Omnibus Tests of Model 1 Coefficients

		Chi-square	df	Sig.
Step 1	Step	67.6920	4	0.0000
	Block	67.6920	4	0.0000
	Model	67.6920	4	0.0000
Step 2 ^a	Step	-0.0310	1	0.8590
	Block	67.6610	3	0.0000
	Model	67.6610	3	0.0000
Step 3 ^a	Step	-0.4400	1	0.5070
	Block	67.2200	2	0.0000
	Model	67,2200	2	0.0000
Step 4 ^a	Step	-0.6560	1	0.4180
	Block	66.564	1	0.0000
	Model	66.564	1	0.0000

Source: Author's construction

a. A negative Chi-squares value indicates that the Chi-squares value has decreased from the previous step.

The Chi-Square value and its associated probability value indicate that all models possess a significant capability to elucidate the delisting phenomenon among firms listed on the JSE, despite the lack of individual significance for certain variables. The utilisation of stepwise regression in this analysis demonstrates that although certain variables may be systematically excluded, the remaining constructs (variables) facilitate the prediction of binary outcomes sufficiently.

6.5.4 Cox & Snell R² and Nagelkerke R²

The Cox & Snell R² and the Nagelkerke R² both measure the level of variation in the dependent variable explained by the exogenous factors.

Table 6.11: Model Summary for Explaining Variation in the Log (odds)

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	43.463 ^a	0.3240	0.6830
2	43.494 ^a	0.3240	0.6830
3	43.934 ^a	0.3220	0.6790
4	44.591 ^a	0.3190	0.6740

Source: Author's construction

a. Estimation terminated at iteration number 11 because parameter estimates changed by less than .001.

The model demonstrates that the included covariates account for approximately 68% of the variation observed in the binary dependent variable, indicating a strong level of explanatory power. This model exhibits a favourable level of explanatory power in relation to the covariates. Of particular importance is the Nagelkerke R, which ranges from 0 to 1, unlike the Cox & Snell R, that fails to reach a maximum probability of 1. The Nagelkerke R can be considered as the adjusted version of Cox-Snell's R squared, allowing for a complete range of probabilities. Based on this, it can be concluded that more than 60% of the variation in the dependent variable can be attributed to the independent variables or regressors.

6.5.5 Hosmer-Lemeshow Test

The Hosmer-Lemeshow Test serves as a diagnostic tool for detecting non-linearities and interaction terms in a regression model. While the test does not imply that the assumed linear regressors are undesirable, it suggests that incorporating non-linearities and interaction terms would lead to a better fit of the model to the data.

Table 6.12: Hosmer-Lemeshow Test

Step	Chi-square	Df	Sig.
1	36.9249	8	0.0000
2	36.5520	8	0.0000
3	38.9960	8	0.0000
4	37.4380	8	0.0000

Source: Author's construction

The Null Hypothesis (H_0) in the Hosmer-Lemeshow test is that there are no interacting terms and well as no non-linearities. We reject H_0 if the p-value of the test statistic is less than 5%.

In the case of our results, the Hosmer-Lemeshow test indicates that the model does not fit the data particularly well, suggesting the possible absence of non-linear variables in the model. However, this outcome was anticipated due to the limited size of the sample. It is important to note that the Hosmer-Lemeshow Test is highly sensitive to sample size (Benedict, Andridge & Lemeshow, 2016), and therefore its results can be disregarded in certain cases. Furthermore, the Hosmer-Lemeshow Test assesses not only the presence of interaction terms and non-linearities, but also the significance of parameters derived from linear independent variables. Although the actual results of the Hosmer-Lemeshow test do not support the notion that the model adequately fits the data, the individual groups falling within a common probability range demonstrate that the observed probabilities are not significantly different from the estimated ones. It is crucial to recognise that the Hosmer-Lemeshow test solely examines the correctness of the specified link function and does not render the entire model irrelevant.

6.5.6 Expectation-Prediction Evaluation Table for Model 1

Table 6.13: Expectation-Prediction Evaluation Table for Model 1

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
$P(\text{Dep}=1) \leq C$	155	3	158	156	17	173
$P(\text{Dep}=1) > C$	1	14	15	0	0	0
Total	156	17	173	156	17	173
Correct	155	14	169	156	0	156
% Correct	99.36	82.35	97.69	100.00	0.00	90.17
% Incorrect	0,64	17.65	2.31	0.00	100.00	9.83
Total Gain	-0,64	82.35	7.51			
Percent Gain	NA	82.35	76,47			

Source: Author's construction

The evaluation of the model's predictive capabilities is essential in assessing its effectiveness in predicting binary outcomes. For instance, among the 156 firms that did not delist, the probability of a firm delisting, denoted as $P(\text{Dep} = 1)$, was actually less than 0.5. This indicates that the likelihood of a randomly selected firm delisting was small, and 155 firms were accurately predicted as not delisting. Conversely, the model predicted that out of the 17 firms that did delist, the probability of delisting was greater than 0.5, correctly predicting 14 of these firms.

The results of the model's predictive power reveal an overall accuracy of 97.7%. This accuracy comprises a 99.4% success rate in predicting a response of zero ($\text{Prob}(Y = 0)$), indicating that the model effectively predicts non-delisting outcomes. Furthermore, the model achieves an 82.4% success rate in predicting a response of one ($\text{prob}(Y = 1)$), suggesting its proficiency in predicting delisting outcomes. In simpler terms, the model demonstrates a strong ability to accurately predict the probabilities of both delisting and non-delisting, making it suitable for economic and policy applications. In summary, the model is well-suited for its intended purpose and exhibits a high level of predictive capability.

6.6 Logistic Regression Results for Model 2

Table 6.14: Logistic Regression Results for Model 2

Variables in the Equation									
								95% C.I. for EXP (B)	
		B	S.E	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1 ^a	Gearing	-0.0700	0.570	0.0150	1	0.9030	0.9330	0.3050	2.850
	Profitability	-1.5070	1.262	1.425	1	0.2330	0.2220	0.0190	2.631
	Growth Prospects	-0.0120	0.0180	0.4340	1	0.5100	0.9880	0.9530	1.024
	Cash Flows	-1.033	1.186	0.7590	1	0.3840	0.3560	0.0350	3.639
	Constant	0.234	0.1950	1.4340	1	0.2310	0.7920		
Step 2 ^a	Profitability	-1.4730	1.2300	1.4340	1	0.2310	0.2290	0.0210	2.5540
	Growth Prospects	-0.0120	0.0180	0.4420	1	0.5060	0.9880	0.9530	1.0240
	Cash Flows	-1.0370	1.1880	0.7610	1	0.3830	0.3550	0.0350	3.6410
	Constant	-0.2510	0.1390	3.2580	1	0.0710	0.7780		
Step 3 ^a	Profitability	-1.4700	1.2290	1.431	1	0.2320	0.2300	0.0210	2.556
	Cashflow	-1.0350	1.190	0.7570	1	0.3840	0.3550	0.0350	3.658
	Constant	-0.2820	0.1330	4.5250	1	0.330	0.7540		
Step 4 ^a	Cashflow	-1.551	1.2180	1.620	1	0.2030	0.2120	0.0190	2.309
	Constant	-0.3340	0.1250	7.1140	1	0.008	0.716		

Source: Author's construction

a. Variable(s) entered on Step 1: Gearing, Profitability, Growth Prospects, Cash flows

The findings of this logistic regression model reveal that an increase in gearing, profitability, growth prospects, and cash flows leads to a decrease in the odds ratio. Specifically, for highly geared firms, the odds of delisting are reduced by a factor of 0.933 compared to the probability of not delisting. Interestingly, this result contradicts what was observed for involuntarily delisted firms. The remaining covariates, when increased by one unit, result in smaller decreases in the odds compared to gearing. These results were anticipated, as we were examining voluntarily delisting firms, where gearing actually increases the odds of remaining listed, unlike for involuntarily delisted firms. Furthermore, the regression results indicate that none of the exogenous variables are statistically significant in determining the odds of delisting, at a 5% level of significance.

6.6.1 Model Selection Analysis for Voluntarily Delisting Firms Redundancy Test and Model Suitability for Voluntarily Delisting Firms

Table 6.15: Model Selection Analysis for Voluntarily Delisting Firms Redundancy Test and Model Suitability for Voluntarily Delisting Firms

Model Selection Test Table						
Model	OBS	Log (Likelihood)- Null	Log (Likelihood)- Model	Degrees of Freedom	Akaike Info Criteria (AIC)	Schwarz- Bayesian Info Criteria (SBIC)
M1:All variables present	266	-180.38	-177.83	5	365.75	383.66
M2:All except Gearing	266	-180.38	-177.88	4	363.76	378.10
M3:All except Profitability	266	-180.38	-178.60	4	365.20	379.53
M4:All except Growth Prospects	266	-180.38	-178.31	4	364.61	378.95
M5:All except Cash flow	266	-180.38	-178.61	4	365.23	379.56

Source: Author's own analysis

The model that outperforms the others for voluntarily delisting firms is the one that excludes gearing as a determinant. This model has the lowest AIC and SBIC, as displayed in the table above. Therefore, for firms that voluntarily delist, gearing is not a significant factor in the decision to deregister from the stock exchange.

6.6.2 Variable Importance Table Model if Term Removed

Table 6.16: Variable Importance Table Model if Term Removed

Variable		Model Log Likelihood	Changes in -2 Log Likelihood	df	Sig.
Step 1	Gearing	-177.881	0.0150	1	0.9030
	Profitability	-178.601	1.4540	1	0.2280
	Growth Prospects	-178.306	0.864	1	0.3530
	Cash flows	-178.613	1.4790	1	0.2240
Step 2	Profitability	-178.610	1.4580	1	0.2270
	Growth Prospects	-178.323	0.8840	1	0.3470
	Cash flows	-178.620	1.4770	1	0.2240
Step 3	Profitability	-179.051	1.4550	1	0.2280
	Cash flows	-179.0530	1.4600	1	0.2270
Step 4	Cash flow	-180.380	2.6580	1	0.1030

Source: Author's construction

Upon systematically removing one variable at a time in successive regressions, there were no significant changes observed. This is evident from the minimal alterations in the log likelihoods and p-values. All p-values are greater than 5%, indicating a failure to reject the null hypothesis that removing any variable has no effect on the regression results.

6.6.3 Omnibus Test

Table 6.17: Omnibus Test

		Chi-square	df	Sig.
Step 1	Step	5.0120	4	0.2860
	Block	5.0120	4	0.2860
	Model	5.0120	4	0.9030
Step 2 ^a	Step	-0.0150	1	0.1720
	Block	4.9970	3	0.1720
	Model	4.9970	3	0.3470
Step 3 ^a	Step	-0.8840	1	0.1280
	Block	4.1130	2	0.1280
	Model	4,1130	2	0.2280
Step 4 ^a	Step	-1.455	1	0.1030
	Block	2.6580	1	0.1030
	Model	2.6580	1	0.1030

Source: Author's construction

a. A negative Chi-square value indicate that the Chi-square value has decrease from the previous step

None of the equations from steps 1 to 5 demonstrate statistical significance, as evidenced by the chi-square statistics' probability values exceeding 5%. Consequently, model 2 does not explain voluntary delisting robustly. These results align with those obtained from the main logistic regression output and variance importance output.

6.6.4 Cox & Snell R² and Nagelkerke R²

Table 6.18: Model Summary for Explaining Variation in the Log (odds)

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	43.463a	0.3240	0.6830
2	43.494a	0.3240	0.6830
3	43.934a	0.3220	0.6790
4	44.591a	0.3190	0.6740

Source: Author's construction

a. Estimation terminated at iteration number 11 because parameter estimates changed by less than .001.

The table above illustrates that the exogenous variables account for approximately 68% of the variation in the dependent variable. This suggests that the model is effective in explaining the odds of delisting from the stock exchange, even though no individual variable significantly explains voluntary delisting.

6.6.5 Hosmer-Lemeshow Test for Model 2

Table 6:19: Hosmer-Lemeshow Test for Model 2

Step	Chi-square	Df	Sig.
1	16.5010	8	0.0360
2	16.8210	8	0.0320
3	22.5380	8	0.0040
4	11.1580	8	0.1930

Source: Author's construction

The Null Hypothesis (H_0) in the Hosmer-Lemeshow test is that there are no interacting terms as well as no non-linearities in the model. We reject H_0 if the p-value of the test statistic is less than 5%.

The Hosmer-Lemeshow Test indicates a failure to reject the null hypothesis, implying that only model 4, where cash flow is the only independent variable, fits the data well. In essence, the 4th stepwise regression model demonstrates a good fit without any non-linearities, unlike the other step-wise regressions (1 to 3).

6.6.6 Expectation-Prediction Evaluation Table for Model 2

Table 6:20: Expectation-Prediction Evaluation Table for Model 2

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)≤C	152	97	249	156	110	266
P(Dep=1)>C	4	13	17	0	0	0
Total	156	110	266	156	110	266
Correct	152	13	165	156	0	156
% Correct	97.44	11.82	97.69	100.00	0.00	90.17
% Incorrect	2,56	88.18	37.97	0.00	100.00	41.35
Total Gain	-2.56	11.82	3.38			
Percent Gain	NA	11.82	8,18			

Source: Author's construction

The model demonstrates good prediction of the probability of not delisting. Of the 156 firms that did not delist, only four were predicted incorrectly. However, the predictive power for delisted firms was not as strong, with only 13 predicted correctly and the rest being incorrect predictions. Consequently, the overall predictive power of the model is reduced to approximately 62%.

Table 6.21: Logistic Regression Results for Model 3

Variables in the Equation									
								95% C.I. for EXP (B)	
		B	S.E	Wald	Df	Sig.	Exp(B)	Lower	Upper
Step 1 ^a	Gearing	0.3260	0.3560	0.838	1	0.360	1.3850	0.690	2.781
	Profitability	-0.8090	0.7330	1.219	1	0.269	0.445	0.1060	1.872
	Growth Prospects	-0.0210	0.0310	0.4330	1	0.5100	0.980	0.922	1.041
	Cash Flows	-2.047	0.991	4.271	1	0.390	0.129	0.019	0.900
	Constant	-0.2060	0.1650	1.545	1	0.2140	0.8140		
Step 2 ^a	Profitability	-0.8490	0.7270	1.368	1	0.2430	0.4280	0.1030	1.7770
	Growth Prospects	-0.0220	0.0350	0.403	1	0.5260	0.978	0.9140	1.047
	Cash Flows	-2.058	0.987	4.347	1	0.0370	0.1280	0.180	0.884
	Constant	-0.122	0.1420	0.740	1	0.390	0.8850		
Step 3 ^a	Growth Prospects	-0.0260	0.040	0.410	1	0.522	0.9750	0.901	1.054
	Cashflow	-1.871	1.137	2.701	1	0.100	0.1540	0.0170	1.434
	Constant	-0.1470	0.1450	1.038	1	0.308	0.863		
Step 4 ^a	Cashflow	-1.899	1.137	2.791	1	0.095	0.150	0.016	1.389
	Constant	-0.205	1.210	2.881	1	0.090	0.8150		

Source: Author's construction

a. Variable(s) entered on Step 1: Gearing, Profitability, Growth Prospects, Cash flows

The results presented in the table indicate that the gearing ratio has a positive relationship with the log of odds ratio. Specifically, an increase in the gearing ratio by one unit leads to an increase in the log of odds ratio. To enhance the interpretation, it is necessary to exponentiate the results. The odds ratios can be calculated as $e^{(X\beta)}$, where X represents the variable and β represents the coefficient. In the case of profitability, the exponentiated value is $e^{(-0.809044)} = 0.4453$. This implies that a one-unit increase in profitability results in a reduction in the odds ratio in favour of not delisting. In other words, an increase in profitability is associated with a higher likelihood of not delisting. The results also indicate that none of the variables, except cash flows in regression steps 1 and 2, are statistically significant.

6.7 Logistic Regression Results for Model 3

6.7.1 Model Selection Analysis for Voluntarily and Involuntarily Delisting Firms

Table 6.22: Robustness checks on the model suitability for both voluntarily and involuntarily delisting firms

Model Selection Test Table						
MODEL	OBS	Log (Likelihood)- Null	Log (Likelihood)- Model	Degrees of Freedom	Akaike Info Criteria (AIC)	Schwarz- Bayesian Info Criteria (SBIC)
M1: All present	283	-194.6722	-189.5544	5	389.1089	407.3361
M2: All except gearing	283	-194.6722	-190.0306	4	388.0611	402.6429
M3: All except Profitability	283	-194.6722	-190.1075	4	388.215	402.7968
M4: All except Growth Prospects	283	-194.6722	-190.3182	4	388.6364	403.2182
M5: All except Cash flow	283	-194.6722	-192.7788	4	393.5576	408.1394

Source: Author's own analysis

The most suitable model for predicting the probability of delisting, whether voluntary or involuntary, is the one without the gearing ratio variable. This model exhibits the lowest values for the AIC and the SBIC. Conversely, the model with the highest information criteria is the one without the cash flows variable. This implies that the exclusion of the cash flows variable results in a less effective model, highlighting the importance of cash flows as a determinant of delisting.

Table 6.23: Variable Importance Table Model if Term Removed

Variable		Model Log Likelihood	Changes in -2 Log Likelihood	df	Sig.
Step 1	Gearing	-190.031	0.9520	1	0.3290
	Profitability	-190.108	1.106	1	0.2930
	Growth Prospects	-190.318	1.5280	1	0.2160
	Cash flows	-192.779	6.440	1	0.0110
Step 2	Profitability	-190.646	1.231	1	0.2670
	Growth Prospects	-190.774	1.4870	1	0.2230
	Cash flows	-193.803	7.545	1	0.0060
Step 3	Profitability	-191.415	1.537	1	0.2150
	Cash flows	-193.808.	6.323	1	0.0120
Step 4	Cash flow	-194.672	6.515	1	0.0110

Source: Author's construction

The analysis reveals that removing the cash flows variable impacts significantly on the value of $-2\ln(\text{likelihood})$, as well as the AIC and SBIC, in all equations from steps 1 to 4. This finding has implications for the suitability of the model, indicating that cash flows play a crucial role in both voluntary and involuntary delisting at the JSE.

6.7.2 Omnibus Test

Table 6.24: Omnibus Test

		Chi-square	df	Sig.
Step 1	Step	10.235	4	0.0370
	Block	10.235	4	0.0370
	Model	10.235	4	0.0370
Step 2 ^a	Step	-0.9520	1	0.3290
	Block	9.2830	3	0.0260
	Model	9.2830	3	0.0260
Step 3 ^a	Step	-1.231	1	0.2670
	Block	8.052	2	0.0180
	Model	8,052	2	0.0180
Step 4 ^a	Step	-1.537	1	0.2150
	Block	6.515	1	0.1100
	Model	6.515	1	0.1100

Source: Author's construction

a. negative Chi-square value indicate that the Chi-square value has decrease from the previous step

Although the predictive power of the model is weak, the entire model remains useful. The omnibus significant values, mostly below 5%, indicate that the null hypothesis of no significance in the overall model can be rejected.

6.7.3 Cox & Snell R² and Nagelkerke R²

Table 6.25: Model Summary for Explaining Variation in the Log (odds)

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke R Square
1	379.109 ^a	0.0360	0.0480
2	380.061 ^a	0.0320	0.0430
3	381.292 ^a	0.0280	0.0380
4	382.829 ^a	0.0230	0.0300

Source: Author's construction

Estimation terminated at iteration number 11 because parameter estimates changed by less than .001.

The model summary supports the findings of the expectation-prediction table, which suggests a diminished predictive power. Both the Cox & Snell R Square and the Nagelkerke R Square values are small, indicating that the variation in the dependent categorical variable is largely explained by other variables not included in the model.

6.7.4 Hosmer-Lemeshow Test for Model 3

Table 6.26: Hosmer-Lemeshow Test for Model 3

Step	Chi-square	Df	Sig.
1	9.5740	8	0.2960
2	14.6830	8	0.0660
3	10.420	8	0.2370
4	14.2650	8	0.0750

Source: Author's construction

The Null Hypothesis (H_0) in the Hosmer-Lemeshow test is that there are no interacting terms as well as no non-linearities in the model. We reject H_0 if the p-value of the test statistic is less than 5%.

The Hosmer-Lemeshow Test confirms that the model fits the data well. This particular model underscores the importance of sample size, as the reasonable sample size contributes to the positive H-L test result.

6.7.5 Expectation-Prediction Evaluation Table for Model 3

Table 6.27: Expectation-Prediction Evaluation Table for Model 3

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)≤C	139	98	237	156	127	283
P(Dep=1)>C	17	29	46	0	0	0
Total	156	127	283	156	127	283
Correct	139	29	168	156	0	156
% Correct	89.10	22.83	59.36	100.00	0.00	55.12
% Incorrect	10.90	77.17	40.64	0.00	100.00	44.88
Total Gain	-10.90	22.83	4.24			
Percent Gain	NA	22.83	9.45			

Source: Author's construction

The expectation-prediction table demonstrates the model's ability to accurately predict the probability of not delisting for most firms, with 139 out of 156 predicted correctly. However, the predictive power for firms that delisted is relatively poor, with only 29 predicted correctly.

6.8. Summary and Conclusions

6.8.1 Data visualisation

The analysis of profitability, growth prospects, gearing, and cash flows among voluntarily and involuntarily delisting firms revealed several important findings. The profitability variable shows a mean-reversion pattern around zero for both types of firms, with no significant difference in profitability levels between the two groups. However, the initial few firms that delisted registered higher negative profitability levels. Voluntarily delisting firms have low growth prospects, similar to those that do not delist. Moderately geared firms are more likely to delist compared to highly geared firms, as listing provides access to capital for the latter. Most firms, except for a few spikes, face low cash flows that mean-revert around zero. Free cash flow does not appear to be a motivating factor for firms to voluntarily delist, as firms typically delist when they generate close to zero free cash flows as a cost-cutting measure. Overall, the graphs of the different models did not differ significantly, indicating a strong initial negative cash flow pattern for both voluntarily and involuntarily delisting firms.

6.8.2 Descriptive statistics

The analysis of accounting ratios in determining delisting revealed several key findings. Firstly, firms that voluntarily delist from the stock market tend to have higher mean values of profitability, growth prospects, and cash flows compared to firms that involuntarily delist. This suggests that voluntarily delisting firms may be in a more favourable financial position. However, the higher mean profitability among delisting firms does not necessarily indicate lower chances of delisting, as the reasons for delisting are multifaceted and may include factors such as loan repayment difficulties.

Secondly, the comparison of gearing ratios between delisting and non-delisting firms showed that delisting firms have higher ratios, indicating a higher level of financial risk. This highlights a significant difference between the two groups. Additionally, the standard deviation, as a measure of data dispersion, reveals that delisting firms have a greater spread for profitability and cash flows, indicating a higher level of financial risk associated with these variables.

Overall, the analysis suggests that profitability alone is not the sole determinant of delisting. Other factors, such as growth prospects, cash flows, and gearing ratios play a significant role in determining whether a firm chooses to delist or is forced to delist. Furthermore, delisting firms, both voluntarily and involuntarily, experience negative cash flows and higher gearing ratios, which impact significantly on their operations and growth prospects. The higher standard deviation of profitability and the wider spread of cash flows and gearing ratios among delisting firms further reflect the instability and financial risks they face.

6.8.3 Correlation

Overall, the results indicated that delisting firms tend to have higher gearing ratios, which affect their cash flows adversely. The relationship between profitability and cash flows differs for involuntarily and voluntarily delisting firms, with the former experiencing a stronger negative correlation. The relationship between cash flows and growth prospects, while positive, lacks statistical significance.

6.8.4 Logistic regression model 1 factors that determine involuntary delisting

The regression models fit the data well, as indicated by the log-likelihoods being greater than those of the null hypothesis. The Omnibus Test confirms that the models have a significant capability to explain the likelihood of delisting, despite certain variables being statistically insignificant. The Nagelkerke R^2 test shows that the included covariates account for approximately 68% of the variation in the likelihood of delisting. This indicates a strong level of explanatory power for the model.

The Hosmer-Lemeshow Test, although suggesting that the model does not fit the data particularly well, can be disregarded due to the small sample size. Additionally, its results do not render the entire model irrelevant.

In terms of predictive capabilities, the model accurately predicts both delisting and non-delisting outcomes, with an overall accuracy of 97.7%. This indicates that the model is suitable for predicting the probabilities of delisting and non-delisting, making it applicable for economic and policy purposes.

6.8.4.1 Regression results in brief

Table 6.28: Regressions Results

Variable	Logit parameter	P-value	Odds Ratio
Profitability	-0.401	0.8600	0.670
Growth Prospects	-5.580	0.0000	0.04
Gearing	0.559	0.6180	1.749
Cash Flows	-1.554	0.675	0.211

The results showed that the gearing ratio had a positive association with delisting, indicating that higher ratios increase the likelihood of delisting. On the other hand, profitability and growth prospects had a negative association, suggesting that higher profitability and growth prospects reduce the odds of delisting. The only variable that holds significance in explaining delisting is Growth Prospects.

Overall, the results of the regression analysis, model selection analysis, and predictive power evaluation support the significance and suitability of the model in explaining and predicting the likelihood of delisting for firms listed on the JSE.

6.8.5 Logistic regression model 2 factors that determine voluntary delisting

6.8.5.1 Summary of the results

The logistic regression analysis examined the factors influencing voluntary delisting of firms. The results showed that increasing levels of gearing, profitability, growth prospects, and cash flows were associated with a decrease in the odds of delisting. This finding differed from what was observed for involuntarily delisted firms. The regression model also indicated that none of the other covariates were statistically significant in determining the odds of delisting.

6.8.5.2 Regression results

Table 6.29: Regressions Results

Variable	Logit parameter	p-value	Odds Ratio
Profitability	-1.507	0.233	0.222
Growth Prospects	-0.012	0.510	0.988
Gearing	-0.070	0.903	0.933
Cash flows	-1.033	0.384	0.356

Source: Author's construction

Further analysis was conducted to select the best model for voluntarily delisting firms. It was found that excluding gearing as a determinant resulted in the model with the lowest AIC and SBIC suggested that gearing is not an important factor in voluntary deregistration from the stock exchange.

The examination of variable importance revealed that removing any variable from the model did not significantly impact the regression results, as indicated by minimal changes in log likelihoods and p-values.

The Omnibus Test showed that none of the equations from steps 1 to 5 were statistically significant in explaining voluntary delisting. This aligned with the results from the main logistic regression output and variance importance analysis.

The Cox & Snell R^2 and Nagelkerke R^2 values indicated that the exogenous variables explained around 68% of the variation in the dependent variable. Despite no individual variable being significant for explaining voluntary delisting, the model was considered reliable in explaining the odds of delisting at the stock exchange.

The Hosmer-Lemeshow Test suggested that only model 4, where cash flow were the only independent variable, provided a good fit to the data without non-linearities.

Lastly, the expectation-prediction evaluation revealed that the model accurately predicted the probability of not delisting but had lower predictive power for delisted firms, resulting in an overall predictive power of approximately 62%.

6.8.6 Logistic regression model 3 factors that determine overall delisting (voluntary and involuntary)

In summary, the logistic regression analysis reveals the positive relationship between the gearing ratio and the log of odds ratio. The exponentiated odds ratio for profitability suggests that an increase in profitability leads to a higher likelihood of not delisting. The results also indicate that none of the variables, except cash flows in regression steps 1 and 2 are statistically significant.

Table 6.30: Logistic Regression

Variable	Logit parameter	p-value	Odds Ratio
Profitability	-0.809044	0.268	0.4453
Growth Prospects	-0.020533	0.510	0.9797
Gearing	0.325645	0.360	1.3849
Cash flows	-2.047137	0.039	0.1291

Source: Author's construction

The model selection analysis identifies the exclusion of the gearing ratio variable as the best model for predicting delisting probabilities. The importance of the cash flows variable is highlighted, as its removal diminishes the model's effectiveness. The Omnibus Test confirms the overall significance of the model, despite its weak predictive power. The Cox & Snell R² and Nagelkerke R² values indicate that other variables not included in the model explain a significant portion of the dependent categorical variable's variation. The Hosmer-Lemeshow Test confirms the model's good fit to the data, while the expectation-prediction evaluation demonstrates its ability to predict the probability of not delisting, albeit with limited accuracy for delisted firms.

CHAPTER 7: RESULTS DISCUSSION

7.1 Introduction

The results discussion chapter of this thesis focuses on the findings related to general delisting, voluntary delisting, involuntary delisting, and delisting within specific sectors. The aim is to provide a comprehensive analysis of the impact of these delisting events on shareholder wealth and the implications for market reactions. The methodology used is the event study to investigate the wealth effect of delisting in general, as well as involuntary and voluntary delisting. The chapter also employs logistic regression to examine the factors that determine delisting.

To begin, the chapter examines the overall effect of delisting on shareholders, regardless of its nature. It presents the study's findings on the negative impact on shareholder wealth before and after the delisting announcement, as indicated by Cumulative Average Abnormal Returns (CAAR) and their corresponding t-statistics. These results lay the groundwork for further exploration of the specific effects of voluntary and involuntary delisting.

The subsequent sections of the chapter delve into the effects of voluntary delisting on shareholder wealth. Various factors contributing to the observed negative abnormal returns are discussed, including lack of strategic alignment in mergers and acquisitions, concerns about the acquiring company's financial health and future prospects, integration challenges, dilution of shareholder value, and reduced liquidity and access to capital. Additionally, the chapter highlights any disparities between this study's findings and existing literature regarding the statistical significance of abnormal returns in voluntary delisting events.

Moving on to involuntary delisting, the chapter explores the implications of non-compliance with listing requirements or company liquidations on shareholder wealth. It addresses the negative signal perceived by the market, reflecting increased risk and uncertainty surrounding the company's operations and prospects. The chapter also investigates the possibility of informed trading, insider trading, or information leakage prior to the delisting event. Moreover, it examines the delayed market response indicated by the negative abnormal returns following the event.

Furthermore, the chapter investigates the wealth effects on shareholders at the sectoral level, shedding light on which sectors are more susceptible to adverse impacts from voluntary or involuntary delisting. It analyses the impact and implications of voluntary and involuntary delisting within specific sectors.

In addition, the chapter comprehensively explores the factors that determine delisting. It discusses the implications and significance of these factors, aiming to enhance understanding of the delisting phenomenon.

Ultimately, the chapter concludes by summarising the overall findings related to general delisting, voluntary delisting, involuntary delisting, sectoral delisting, and the factors that determine delisting. It underscores the contribution of this study to the existing literature on delisting events. This chapter sets the stage for subsequent chapters, where the implications and significance of these findings will be further explored and discussed.

7.2 Wealth effect- General delisting (Voluntary and involuntary delisting)

In assessing the overall effect of wealth, irrespective of the form of delisting, the study reveals a significant negative impact on shareholders both before and after the delisting announcement. Specifically, the average CAAR for delisted firms is found to be -3.27% with a *t*-statistic of -1.72 ($p < 0.10$) before the event day, and -4.15% with a *t*-statistic of -1.85 ($p < 0.10$) after the event day.

The implications drawn from our findings suggest that the occurrence of delisting, whether involuntary or voluntary, has a significant effect on abnormal returns and market reaction. This analysis encompassed 86 instances of voluntary delisting resulting from M&As, as well as six cases of involuntary delisting due to non-compliance with listing requirements or company liquidations. In the instance of voluntary delisting as a result of M&A, the significantly negative CAAR may be attributed to the perception by investors that the M&A is unfavourable due to a lack of strategic alignment or synergies between the companies, concerns about the financial health or future prospects of the acquiring company, integration challenges, potential dilution of shareholder value, overpayment by the acquiring company, loss of liquidity, reduced access to capital and lax corporate governance compliance. Consequently, these factors could affect investor sentiment negatively.

Involuntary delisting due to non-compliance with listing requirements and liquidation might be interpreted by the market as a negative signal, reflecting increased risk and uncertainty associated with the company's operations or prospects. The statistically significant and negative pre-event CAAR may suggest informed trading, insider trading or information leakage, while post-event CAAR could indicate a delayed market response.

Our observations are consistent with previous studies conducted by Mohapatra and Chaturvedula (2022), Onuorah and Kifordu (2021), and Dasilas *et al.* (2017), which likewise demonstrated that delisting (both voluntary and involuntary) affect shareholder wealth negatively.

However, it is noteworthy that the negative abnormal return observed in this study is less severe than in other studies. Such discrepancy could be attributed to a variety of factors. Firstly, variations in the time period examined across different studies can yield divergent results due to changes in market conditions, regulations, and investor sentiment. Furthermore, differences in sample size and the composition of the delisting firms may also contribute to variations in abnormal returns. This study includes a relatively small sample of 92 delisting events, covering both voluntary and involuntary delisting, while other studies may use larger samples or focus exclusively on one type of delisting. Compared to other studies (Dasilas *et al.*, 2017; Mohapatra & Chaturvedula, 2022; Onuorah & Kifordu, 2021), the study used a short-term event study methodology with a small event window to investigate the wealth effect of delisting, therefore reducing the potential for confounding factors and minimising the risk of event contamination.

This study contributes to the literature on delisting, which is especially scarce for African countries, and provides market participants with a deeper understanding of the impact and implications of delisting on shareholders' wealth.

7.3 Wealth effect- Voluntary delisting

In our comprehensive analysis, we have discovered that the abnormal returns associated with voluntary delisting lack statistical significance across the entire event window. This defies the expectations set by existing literature (Leuz *et al.*, 2008; Marosi

& Massoud: 2007; Zhu, 2016), which suggests that firms voluntarily delisting often experience negative and statistically significant abnormal returns. This phenomenon, known as "going dark," which refers to firms that delist from the main stock exchange in favour of listing on an OTC stock. Negative statistical significant abnormal transaction for going dark is characterised by distressed firms using delisting as a strategy to hide poor performance. However, our findings contradict this notion.

Conversely, literature suggests that firms that delist and subsequently do not list experience positive statistically significant abnormal returns (Geranio & Zanotti, 2012; Pour & Lasfer, 2013 Sannjust, 2010). The positive statistically significant abnormal returns in these cases are often attributed to the market perceiving the delisting as a strategic move with synergistic benefits, and existing shareholders benefiting from selling their shares to bidders at a premium. This notion also contradicts our findings (Sannjust, 2010).

Specifically, on the day of the delisting event, the firms that were delisted experienced an average abnormal return (AAR) of -0.07% with a t -statistic of -0.32 ($p > 10\%, 5\%, 1\%$). Additionally, the cumulative abnormal return (CAAR) was -2.91% with a t -statistic of -1.37 ($p > 10\%, 5\%, 1\%$). These values indicate that the delisting event did not result in any significant deviation from the normal returns that would be expected if the delisting did not occur.

The lack of statistical significance in our findings is that voluntary delisting is often driven by strategic decisions made by companies. These decisions involve weighing the benefits of delisting, such as reduced regulatory requirements and cost savings, against the potential negative impact on shareholder wealth. As a result, careful planning and consideration may help mitigate any adverse effects on shareholder returns. Furthermore, If the market is experiencing a downturn or negative sentiment, the impact of the delisting event on shareholder wealth may be diluted or overshadowed by these external factors. Therefore, it is essential to analyse the interaction between market conditions and voluntary delisting to gain a better understanding of their combined impact on abnormal returns.

While our findings suggest that the abnormal returns associated with voluntary delisting were not statistically significant, it is important to acknowledge that other

factors may contribute to shareholder wealth. Factors such as company performance, industry trends, and macroeconomic conditions can all influence shareholder returns. Therefore, additional research may be necessary to explore the interplay between these factors and the impact of delisting.

To sum up, our analysis indicates that the abnormal returns linked to voluntary delisting did not exhibit statistical significance. These findings challenge the existing literature and emphasise the need for further research to enhance our understanding of the factors influencing shareholder wealth in the context of delisting events. By delving deeper into this topic, we can gain valuable insights into the dynamics of delisting and its implications for investors.

7.4 Wealth effect- Involuntary delisting

In our comprehensive analysis, we have found that involuntary delisting events do not exhibit statistical significance in terms of abnormal returns. Specifically, the firms that were delisted experienced an average abnormal return (AAR) of 0.82% on the day of the delisting event, with a t -statistic of 0.07 ($p > 10\%$, 5%, 1%). Additionally, the cumulative abnormal return (CAAR) was -8.58% with a t -statistic of -0.78 ($p > 10\%$, 5%, 1%). These findings indicate that the delisting event did not result in any significant deviation from the expected normal returns.

This contrasts with previous literature, which suggests that involuntary delistings lead to negative significant abnormal returns (Harris *et al.*, 2008; Parker *et al.*, 2018; Sanger & Peterson, 1990; Shumway, 1997). These studies argue that liquidity constraints, financial distress, and the negative signal sent by the stock exchange when delisting such firms contribute to the negative significant abnormal returns.

The lack of statistical significance in our analysis suggests that the delisting events did not have a significant impact on the stock returns of the delisted firms. There are several possible explanations for this finding. One possibility is that the market efficiently incorporated the information about the delisting event into stock prices prior to its occurrence, resulting in minimal subsequent price adjustments. Another explanation could be the presence of informed investors who anticipated the delisting and adjusted their positions, accordingly, dampening the abnormal returns.

The insignificant abnormal returns observed in involuntary delisting events have important implications for existing theories and literature on delisting events. Our findings challenge the notion that delistings inherently lead to abnormal returns for shareholders, suggesting that investors may not perceive involuntary delistings as significant events warranting substantial adjustments in stock prices.

Although our study provides valuable insights into involuntary delisted firms with statistically insignificant abnormal returns, it is crucial to acknowledge the limitations of our methodology and data. The small sample size of delisted firms may have influenced the statistical power of our analysis. Future research could explore alternative approaches or methodologies to address these limitations and gain a more comprehensive understanding of involuntary delistings. Additionally, the inclusion of other variables and a larger sample size could enhance the robustness of the analysis.

In conclusion, our study contributes to the existing literature by demonstrating the lack of statistical significance in abnormal returns for involuntary delisting events. This challenges existing theories and provides new insights into the impact of delisting events on shareholder wealth. Further research is needed to investigate other factors that may influence abnormal returns in involuntary delistings, such as the nature of regulatory intervention or the specific circumstances of the bankruptcy proceedings.

7.5 Wealth effect- Voluntary delisting sector specific

With regards to sectoral voluntary delisting, the analysis revealed that only the consumer non-cyclical and industrial sectors exhibited statistically significant negative abnormal returns. Companies in the consumer non-cyclical sector experienced an average abnormal return (AAR) of -11.11% on the day of delisting, with a t -statistic of -2.03 ($p < 10\%$, 5%). This negative trend continued in the post-event period, as the AAR recorded on the day after the event was -22.56% with a t -statistic of -3.82, and on the third day after the event, it was -15.26% with a t -statistic of -2.28 ($p < 10\%$, 5%, 1%). Similarly, companies in the industrial sector recorded an average abnormal return (CAAR) of -10.61% with a t -statistic of -2.00 ($p < 10\%$). These findings suggest that voluntary delisting in these sectors has a significant adverse impact on shareholder wealth.

The observed significant negative abnormal returns in the consumer non-cyclical and industrial sectors contradict previous studies conducted by Sannjust (2010), Geranio and Zanotti (2012), and Pour and Lasfer (2012). These studies suggested that voluntary delisting events do not have a significant effect on shareholder wealth. However, our findings align with the literature on "going dark" delisting, as indicated by Marosi and Massoud (2007), Leuz *et al.* (2008), and Zhu (2016). It is worth noting that our sample did not include any going dark delistings. Therefore, our study contributes to the literature by examining sector-specific voluntary delistings and filling this research gap.

In the consumer non-cyclical and industrial sectors, the analysis revealed a lag response by the market following the delisting events in the consumer non-cyclical and industrial sectors. In the consumer non-cyclical sector, the market reaction was observed on the day after the event and the third day after the event. Similarly, in the industrial sector, the market reaction occurred on the day after the event. This lag response may be attributed to factors such as information asymmetry, differing investor sentiment, trading restrictions, market efficiency, and cautious investor behaviour.

The significant negative abnormal returns observed in the consumer non-cyclical and industrial sectors can be attributed to several factors. These include strategic misalignment, financial health issues, integration challenges, dilution of shareholder value, reduced liquidity, and limited access to capital markets. These factors contribute to the adverse impact on shareholder wealth in these sectors.

The analysis revealed statistically insignificant abnormal returns in the Basic material, Financial, Consumer cyclical, Communication, Technology, and Diversified sectors. This may be due to various factors such as market conditions, investor sentiment, or the specific circumstances surrounding the delisting events in these sectors. However, it is important to note that even though the abnormal returns are not statistically significant, there may still be potential negative effects on factors such as liquidity, access to capital markets, or shareholder value dilution. Further analysis with a larger sample size may be necessary to fully understand the impact of voluntary delisting events in these sectors.

7.6 Wealth effect- Involuntary delisting sector specific

In the technology sector our findings indicate a significant negative AAR of -33.8% three days after the delisting event, with a t -statistic of -1.78 ($p < 10\%$). This suggests that the involuntary delisting in the technology sector had an adverse effect on shareholders' wealth. Furthermore, the CAAR, which accounts for the cumulative impact of the delisting event, also showed a significant decline of -33.9% with a t -statistic of 0.65 ($p < 0.10$). These results are consistent with prior studies on involuntary delisting, supporting the notion that delisting negatively impacts shareholders' wealth (Harris *et al.*, 2008; Parker *et al.*, 2018; Sanger & Peterson, 1990; Shumway, 1997).

The negative market reaction in the technology sector can be attributed to several interconnected factors. Firstly, the delisting introduces uncertainty regarding the financial health and regulatory compliance of the delisted company. This uncertainty leads to a decline in investor confidence, as shareholders become concerned about the firm's ability to meet its obligations and ensure future profitability. Moreover, the negative perception associated with involuntary delisting further exacerbates the sell-off and erodes trust in the company's management and overall viability. Additionally, delisting results in a loss of liquidity as the company's stock is removed from major exchanges, making it less visible and accessible to investors. This reduction in liquidity creates difficulties for shareholders looking to sell their shares, resulting in a decline in demand and subsequent drop in stock price. Furthermore, the impaired access to capital poses challenges for the delisted firm to raise funds or secure financing. Lastly, the legal and regulatory implications arising from delisting introduce additional uncertainty and potential legal liabilities that contribute to the negative market reaction.

However, it is important to note that our study observed a lack of market reaction to the delisted companies in the financial sector, which contradicts existing literature. Several reasons could explain this discrepancy. Firstly, delistings can often be expected or anticipated, especially in cases where a company is facing financial or regulatory issues. Investors may have already factored in the potential consequences of delisting, resulting in a more muted reaction when it actually occurs. Additionally, if the overall market sentiment is positive and stable, investors may be less affected by the delisting of a single company and continue focusing on other investment opportunities. Moreover, if there are other companies in the same industry or sector that are performing well, investors may shift their attention and investments towards

them, further minimising the impact of the delisting event. Lastly, the size and significance of the delisted company in the overall market can also play a role. Smaller or less influential companies may have a limited impact on the broader market, thus reducing the market's reaction to their delisting.

The limited sample size of delisted companies in the Financial sector may have contributed to the lack of market reaction observed in this study. Focusing on a specific sector and a relatively small number of delisted firms might have resulted in a less pronounced impact on the overall market. Additionally, it is possible that the market may have already priced in the delisting event for these companies, leading to a more subdued reaction. Further research with a larger sample size across different sectors could provide additional insights into the market's reaction to delisted companies.

7.7 Factors that determine delisting Voluntary delisting and involuntary delisting

A logistic regression analysis was conducted to examine the factors that determine overall delisting probabilities, including voluntary and involuntary delisting. The results indicate that only cash flows (-0.2047137) are statistically significant ($p=0.039$) in predicting delisting probabilities, while profitability, gearing, and growth prospects are not statistically significant. These results indicate that the exponentiated odds ratio for cash flows profitability (0.1291) suggests that an increase in cash flows is associated with a higher likelihood of not delisting.

The positive relationship between the gearing ratio (0.325645) and the log of odds ratio (1.3849) suggests that an increase in the gearing ratio leads to a higher likelihood of delisting. However, this relationship is not statistically significant ($p=0.360$). Similarly, the exponentiated odds ratio (0.4453) for profitability (-0.809044) suggests that an increase in profitability is associated with a higher likelihood of not delisting, but this relationship is also not statistically significant ($p=0.268$). The same is true for growth prospects (-0.020533), where there is no significant ($p=0.510$) relationship with delisting probabilities.

The Cox & Snell R^2 and Nagelkerke R^2 values indicate that other variables not included in the model explain a significant portion of the dependent categorical variable's variation. The Hosmer-Lemeshow Test confirms the model's good fit to the

data, while the expectation-prediction evaluation demonstrates its ability to predict the probability of not de-listing, albeit with limited accuracy for de-listed firms. Thus, this mean our finding to be interpreted with causation.

In the context of delisting probabilities, the study's finding that cash flows have a significant impact suggests that the availability and management of cash flows can be seen as a mechanism to align the interests of shareholders and managers. When a firm generates strong and consistent cash flows, it indicates that the management is effectively utilising resources to generate profits, thereby aligning the interests of shareholders with those of managers. The implications of these findings suggest that firms should pay attention to their cash flow management to mitigate the risk of delisting. Cash flows can serve as a mechanism to align the interests of shareholders and managers, thereby reducing agency conflicts and enhancing the financial stability of the firm.

Our findings contradict literature as the study by Trang (2018) indicates that gearing is the main driver of delisting in general. What could possibly explain our find is the following reasons: it is possible that these variables do not have a direct and significant impact on the likelihood of delisting. Other factors, such as market conditions, industry-specific dynamics, and external shocks, may have a stronger influence on delisting decisions. Secondly, the sample of companies used in the analysis may not be representative of the overall population of firms. The specific characteristics and circumstances of the companies included in the study may have limited the variability and significance of these variables in predicting delisting probabilities. The significance of cash flows as a predictor of delisting probabilities suggests that it plays a distinct role in determining whether a firm will be delisted or not. Cash flows are a crucial indicator of a firm's financial health and stability. Adequate and consistent cash flows indicate that a company has the resources to meet its financial obligations and sustain its operations, reducing the likelihood of delisting. Conversely, insufficient or negative cash flows may indicate financial distress and increase the probability of delisting.

7.8 Factors that determine delisting-Voluntary delisting

The present study employed logistic regression analysis to investigate the factors influencing voluntary delisting of firms. The findings indicated that higher levels of gearing, profitability, growth prospects, and cash-flows were associated with a

decreased likelihood of voluntary delisting differed from those observed for involuntarily delisted firms, suggesting that the determinants of delisting may vary depending on the circumstances.

The logit parameter for growth prospects is -0.012, with a statistically insignificant p -value of 0.510. The odds ratio of 0.988 indicates that higher growth prospects significantly decrease the odds of delisting. The logit parameter for profitability is -1.507, which is statistically insignificant ($p = 0.233$). The odds ratio of 0.222 suggests that higher profitability is associated with a higher likelihood of delisting, although this association lacks statistical significance. The logit parameter for gearing is -0.070, which is statistically insignificant ($p = 0.903$). The odds ratio of 0.933 suggests a positive association between gearing and delisting, indicating that higher gearing ratios may increase the likelihood of delisting. However, this association lacks statistical significance. The logit parameter for cash flows is -1.554, which is statistically insignificant ($p = 0.675$). The odds ratio of 0.211 indicates that higher cash flows may be associated with a higher likelihood of delisting, although this association lacks statistical significance. The Nagelkerke R^2 test reveals that the included covariates account for approximately 68% of the variation in the probability of delisting, signifying a strong level of explanatory capability for the model. Although no individual variable emerged as a significant predictor of voluntary delisting, the model was considered reliable in explaining the odds of delisting at the stock exchange. The expectation-prediction evaluation revealed that the model accurately predicted the probability of not delisting, but its predictive power was lower for delisted firms, resulting in an overall predictive power of approximately 62%.

The implications of this study suggest that the traditional factors of gearing, profitability, growth prospects, and cash-flows may not be significant determinants of voluntary delisting decisions. This contradicts previous literature that has emphasised the importance of these financial factors. The studies by Pour and Lasfer (2013) and Kanno and Itoh (2018) provide evidence that firms that are highly geared voluntarily delist, while the study of Kang and Ang (2017) indicated that firms with high growth prospects are likely to voluntarily delist.

The insignificance of the variables gearing, profitability, cash flows, and growth prospects in determining voluntary delisting may be attributed to several factors.

Firstly, it is possible that the sample size of the study was not large enough to detect statistically significant effects. A larger sample size could potentially provide more power to detect significant relationships between these variables and voluntary delisting. Furthermore, market conditions play a crucial role in such decisions. Companies often choose to delist when they perceive the current market conditions to be unfavourable or when they anticipate better opportunities in other markets. In such cases, the aforementioned financial factors may not exert a significant influence as the decision to delist is primarily driven by external market factors. Additionally, strategic considerations can override the importance of financial factors. Companies may opt to delist to focus on core operations, reduce regulatory requirements, or pursue mergers and acquisitions. These strategic motives may supersede the significance of growth prospects, free cash flows, profitability, and gearing, as the decision to delist is guided by broader corporate objectives.

The study's contribution to the literature lies in challenging the existing understanding of voluntary delisting decisions. By finding that these financial factors are not statistically significant in determining delisting decisions, the study opens up new avenues for research and raises questions about the factors that truly drive companies to voluntarily delist.

Furthermore, the insignificance of these variables may also stem from limitations in sample size or methodology employed in the study. A larger sample size or the utilisation of alternative analytical techniques could yield different results. It is conceivable that the study did not encompass the full range of factors influencing voluntary delisting decisions. The findings also highlight the need for further investigation into the determinants of delisting decisions. Future research can build upon this study by exploring alternative factors or variables that may better explain voluntary delisting. This could include factors such as market conditions, industry-specific dynamics, or managerial preferences.

7.9 Factors that determine delisting – Involuntary delisting

The primary objective of this thesis was to investigate the accounting ratios that determine the likelihood of delisting for companies listed on the JSE. The results of the analysis revealed several significant accounting ratios that influence the probability of delisting.

One of the key findings is that growth prospects have a statistically significant relationship with delisting likelihood. The logit parameter for growth prospects is -5.580, with a statistically significant p -value of 0.0000. The odds ratio of 0.04 indicates that higher growth prospects significantly decrease the odds of delisting. The logit parameter for profitability is -0.401, which is statistically insignificant ($p = 0.8600$). The odds ratio of 0.670 suggests that higher profitability is associated with a lower likelihood of delisting, although this association lacks statistical significance. The logit parameter for gearing is 0.559, which is statistically insignificant ($p = 0.6180$). The odds ratio of 1.749 suggests a positive association between gearing and delisting, indicating that higher gearing ratios may increase the likelihood of delisting. However, this association lacks statistical significance. The logit parameter for cash flows is -1.554, which is statistically insignificant ($p = 0.675$). The odds ratio of 0.211 indicates that higher cash flows may be associated with a lower likelihood of delisting, although this association lacks statistical significance. Overall, the results highlight that the only variable exhibiting statistical significance in explaining delisting is growth prospects. Higher growth prospects significantly reduce the odds of delisting, while profitability, gearing, and cash flows do not demonstrate statistically significant associations with delisting. The Nagelkerke R^2 test reveals that the included covariates account for approximately 68% of the variation in the probability of delisting, signifying a strong level of explanatory capability for the model. Regarding the model's predictive capabilities, it accurately predicts both delisting and non-delisting outcomes with an overall accuracy of 97.7%. This high accuracy implies that the model is well-suited for estimating the probabilities of delisting and non-delisting, making it applicable for economic and policy purposes.

Our findings contradict literature; the studies by Algebaly *et al.* (2014) and Tutino *et al.* (2013) found gearing to be the main driver of delisting. In the case of Tutino *et al.* (2014), the main reason companies list is to rebalance their gearing. If the listed companies can rebalance their gearing, they will delist involuntarily. Algebaly *et al.* (2014) found that companies that list with substantial gearing ultimately delist. Gearing increases companies' financial risk consequently this has the potential to lead to financial distress.

It is important to consider the regulatory compliance aspect when one investigates involuntary delisting. As it is known that Involuntary delisting typically occurs when a company fails to meet regulatory requirements, such as financial reporting, corporate governance, or listing standards. The study by Chen and Schoderbek (1990) found evidence that accounting ratio are secondary. It is noteworthy that growth prospects were found to be statistically significant, indicating that investors and regulators may place emphasis on the future potential of a company to meet these regulatory obligations. Gearing, free cash flows, and profitability, on the other hand, may not have exhibited statistical significance as they may not directly reflect compliance issues or the ability to address them.

The market perception of the company plays a crucial role in involuntary delisting. A decline in investor confidence and a negative impact on the company's reputation are common consequences of delisting. The observed statistical significance of growth prospects suggests that investors may associate companies with strong growth potential as having the ability to overcome their compliance issues and regain market trust. Conversely, gearing, free cash flows, and profitability may not have exhibited statistical significance due to investors perceiving these financial metrics as less relevant or indicative of the company's potential to address compliance problems.

Moreover, future viability is an essential factor in the evaluation of delisted companies. Regulatory bodies and stock exchanges may prioritise companies that demonstrate the potential for future growth and value creation. The statistical significance of growth prospects implies that regulators and stock exchanges may consider such companies as having the ability to recover from compliance issues and benefit stakeholders in the long run. Conversely, the lack of statistical significance in gearing, free cash flows, and profitability may be attributed to these metrics not adequately reflecting the company's prospects for future success and recovery.

Furthermore, investor sentiment should be taken into account when analysing involuntary delisting. Companies with promising growth prospects may be viewed as more attractive to investors, who may be willing to provide additional support or funding to help the company resolve compliance issues. Gearing, free cash flows, and profitability may not have exhibited statistical significance due to their failure to capture

investor sentiment and the willingness to support the company during a challenging period.

However, it is important to note that these results may be influenced by the specific sample and time period considered. In terms of future studies, several avenues for research can be explored. Firstly, it would be valuable to replicate this study with a larger sample size to enhance the generalisability of the findings. Additionally, the inclusion of qualitative data or interviews with relevant stakeholders could provide deeper insights into the underlying reasons and mechanisms driving delisting. Moreover, investigating the impact of macroeconomic factors or industry-specific characteristics on delisting likelihood could further enrich our understanding of the phenomenon. Lastly, extending this research to other stock exchanges or countries would allow for cross-country comparisons and the identification of contextual differences in delisting determinants.

Despite these limitations, this study contributes to the existing literature on delisting by providing empirical evidence on the factors influencing involuntary delisting in the specific context of the JSE. The identification of growth prospects as a significant factor highlights the importance of considering a company's future growth potential when assessing the likelihood of delisting. This finding adds to the current body of knowledge and can inform policymakers, regulators, and investors in their decision-making processes.

In conclusion, while this study has shed light on the factors influencing involuntary delisting on the JSE, it is important to interpret the results within the limitations of the study. The significant associations between growth prospects and delisting, along with the robust predictive capabilities of the model, underscore the relevance and applicability of the findings. Nevertheless, future research can address the study's limitations and explore additional avenues to further enhance our understanding of delisting determinants.

7.10 Summary and Conclusions

The findings reveal significant negative impacts on shareholder wealth from delisting events, suggesting the presence of informed trading or delayed market response. Contrary to previous literature, voluntary delisting events do not exhibit significant

abnormal returns, indicating efficient market incorporation of delisting information or the presence of informed investors. Similarly, involuntary delisting events do not show significant abnormal returns, possibly due to efficient market incorporation or informed investor behaviour. Sector-specific analysis identifies the Consumer Non-Cyclical and Industrial sectors as particularly affected by voluntary delisting negatively as well as involuntary delisting impacting the technology sector adversely. In terms of determinants, cash flows are found to be significant in overall delisting, while growth prospects are significant for involuntary delisting. In the preceding chapters, we have explored and analysed various aspects of the topic at hand, shedding light on its complexities and implications. As we bring our discussion to a close, this chapter serves as the culmination of our exploration, offering a comprehensive conclusion. Through synthesising the findings and insights gathered throughout this study, we aim to provide a well-rounded understanding of the topic and its broader implications.

CHAPTER 8: CONCLUSION

8.1 Introduction

The objective of the study was to: identify the determinants of both voluntary and involuntary delisting, to also investigate the presence of asymmetric wealth effect of shareholders in firms that delist involuntarily and those that delist voluntarily and to empirically measure the differential impact on various sectors due to voluntary and involuntary delisting. The study, which comprehensively examined the wealth effect of delisting events, focused on both voluntary and involuntary delisting, as well as sectoral delisting. The event study methodology was employed to scrutinise the wealth effect, while factors determining delisting are investigated using the logistic regression. The study utilised a sample of 92 delisted companies to probe the overall wealth effect, further subdividing this sample to independently examine the wealth effect of voluntary and involuntary delisting. Sub-sector analysis was also conducted, with the sample divided into relevant sub-sectors, distinguishing between voluntarily and involuntarily delisted companies. For the factors that determinate delisting, the sample comprised 128 voluntarily delisted and 22 delisted involuntarily. The study was from 2007 to 2018. This chapter summarises the main findings of this study, implications, limitations of the study and policy recommendation and offers insight into future research direction. The chapter starts with the main findings for the wealth effect and then factors that determine delisting covering the implications. Secondly the limitations and policy recommendations, are discussed, and lastly the summary of the chapter.

8.2 Wealth effect of delisting

The findings of the study indicated a significant negative impact on shareholders for delisting in general before and after the announcement of delisting, as evidenced by statistically significant negative abnormal returns (table 4.2). This implies that delisting events, whether voluntary or involuntary, have a significant effect on abnormal returns and market reactions. The statistically significant and negative pre-event abnormal returns suggest the possibility of informed trading, insider trading, or information leakage, while the post-event abnormal returns may indicate a delayed market response.

Contrary to previous literature, the study revealed that voluntary delisting events do not exhibit statistically significant abnormal returns (table 4.3). This suggests that the delisting events did not significantly impact on the stock returns of the delisted firms. Possible explanations for this phenomenon include the efficient incorporation of delisting information into stock prices prior to its occurrence, or the presence of informed investors who anticipated the delisting and adjusted their positions accordingly, thereby dampening abnormal returns.

Similarly, the study found that involuntary delisting events do not show statistical significance in terms of abnormal returns (table 4.4), in contrast to previous literature suggesting negative significant abnormal returns. This implies that the delisting events did not have a significant impact on the stock returns of the delisted firms. Potential explanations for this finding include the efficient incorporation of delisting information into stock prices prior to its occurrence, or the presence of informed investors who anticipated the delisting and adjusted their positions accordingly, thereby dampening abnormal returns.

In terms of sector-specific delisting, statistically significant negative abnormal returns were observed in the Consumer Non-Cyclical (table 5.3) and Industrial sectors (table 5.6) for voluntary delisting events, as well as for the Technology sector (table 5.12) for involuntary delisted firms. This suggests that voluntary delisting in these sectors significantly affects shareholder wealth adversely. The negative abnormal returns observed in these sectors can be attributed to factors such as strategic misalignment, financial health issues, integration challenges, dilution of shareholder value, reduced liquidity, and limited access to capital markets.

8.3 Factors that determine delisting

Regarding involuntary delisting, the negative market reaction in the technology sector can be attributed to the uncertainty surrounding the financial health and regulatory compliance of the delisted company. The negative perception associated with involuntary delisting further exacerbates the sell-off and erodes trust in the company's management and overall viability. Additionally, the impaired access to capital poses challenges for the delisted firm to raise funds or secure financing. Lastly, the legal and regulatory implications arising from delisting introduce additional uncertainty and potential legal liabilities contributing to the negative market reaction.

In terms of delisting determinants, the study found that for overall delisting (table 6.30), only cash flows demonstrated statistical significance in predicting delisting probabilities, while profitability, gearing, and growth prospects did not. This suggests that an increase in cash flows is associated with a higher likelihood of not delisting. This finding implies that effective cash flow management can be seen as a mechanism to align the interests of shareholders and managers, contradicting previous literature.

For involuntary delisting (table 6.28), the results indicated that growth prospects are the only statistically significant variable in explaining delisting, contrary to existing literature. The statistical significance of growth prospects suggests that investors may view companies with strong growth potential as capable of overcoming compliance issues and regaining market trust. However, gearing, free cash flows, and profitability did not demonstrate statistically significant associations with delisting, possibly due to investors perceiving these financial metrics as less relevant indicators of a company's potential to address compliance problems.

For voluntary delisting (table 6.29), the factors determining delisting differed from those for involuntary delisting, suggesting that delisting determinants may vary depending on the circumstances. None of the observed accounting ratios were statistically significant, indicating that traditional factors such as gearing, profitability, growth prospects, and cash flows may not significantly determine voluntary delisting decisions. This contradicts previous literature emphasising the importance of these financial factors. The insignificance of accounting ratios could be due to various reasons, such as sample size and market conditions.

8.4 Limitations and policy recommendations

8.4.1 Limitations

While the study provides valuable insights into the wealth effects of delisting and the determinants of delisting, it is not without limitations. It is important to acknowledge the limitations of this study, for instance the small sample size may limit the generalisability of the results. Additionally, the study did not account for other factors such as market conditions, industry-specific dynamics, and external shocks that may influence

delisting decisions. Future research could address these limitations by incorporating a larger sample size and considering a broader range of contextual factors.

8.4.2 Policy recommendations

The study's findings will benefit various shareholders by offering policy recommendations to mitigate negative impacts and support delisted firms. Based on the findings and limitations of the study, several policy recommendations can be made to address factors that determine delisting and the wealth effect of delisting:

Firstly, to safeguard the investment process, it is imperative for investors to remain informed by consistently monitoring company announcements and financial reports, as well as utilising financial news services and investment analysis platforms. Diversifying investment portfolios across various sectors and asset classes is essential to mitigate the impact of any single delisting event. Incorporating more stable and less volatile assets can also help offset potential losses. Engaging the services of certified financial advisors can provide valuable insights into risk management strategies and necessary portfolio adjustments.

Secondly, for shareholders and companies, it is crucial to enhance financial transparency and communication. Companies should ensure the provision of clear, detailed, and timely disclosures regarding their financial health, strategic plans, and any potential delisting risks. Shareholders should actively engage in shareholder meetings and seek updates on the company's performance and compliance status. Strengthening financial health and compliance by maintaining robust cash flows and adhering to regulatory requirements can prevent involuntary delisting. Implementing internal controls and conducting regular audits are essential to detect and address potential financial or compliance issues proactively. Proactive investor relations can be fostered by establishing a dedicated team to communicate effectively with shareholders and providing regular updates on company performance and strategic initiatives. Sector-specific strategies should be employed, with companies in the Consumer Non-Cyclical and Industrial sectors prioritising stability and consistent performance, while those in the Technology sector should focus on innovation and compliance.

Thirdly, regulators and exchanges should implement clear and consistent regulations, developing and enforcing comprehensive guidelines for both voluntary and involuntary delisting to ensure transparency and fairness. Providing detailed criteria and timelines for companies to rectify non-compliance issues before delisting actions are taken is essential. Enhancing market surveillance and enforcement through regular audits and inspections can ensure compliance with listing standards and financial reporting requirements. Establishing a dedicated task force to monitor and address potential delisting risks, offering support and guidance to at-risk companies, is crucial. Promoting investor education and awareness through workshops, seminars, and online resources can help investors assess delisting risks and make informed decisions. Facilitating a smooth transition for delisted companies through a structured delisting process and clear communication with investors about the reasons and implications of delisting is also recommended.

Lastly, financial advisors and investment professionals should conduct thorough due diligence, performing comprehensive analyses of companies' financial health, compliance status, and growth prospects before making investment recommendations. Staying informed about market conditions and regulatory changes is critical for informed decision-making. Offering tailored investment strategies based on clients' goals, risk tolerance, and portfolio composition, and recommending diversification and long-term approaches, can mitigate delisting-related risks. Educating clients on delisting risks and the importance of proactive risk management, sharing insights on market trends, company performance, and regulatory developments affecting delisting activities, is essential. Regularly monitoring and reassessing client portfolios to identify and address delisting risks promptly and adjusting investment strategies as needed to align with changing market conditions and client objectives, are vital practices.

These specific policy recommendations aim to protect the investment process for investors, shareholders, companies, and regulators by addressing the determinants of delisting and mitigating the wealth effects of delisting events. Implementing such measures will contribute to enhanced market stability, increased investor confidence, and the overall integrity of the stock market.

The findings of this study have significant implications for both stock exchanges and investors operating within the sub-regions. Understanding the negative impacts of delisting events on shareholder wealth allows stock exchanges to develop strategies that mitigate these risks and protect the interests of investors. By analysing sector-specific impacts, stock exchanges can identify vulnerable industries and implement targeted measures to support companies within those sectors. This knowledge is particularly valuable for investors, as it enables them to make informed investment decisions and effectively manage risk. By understanding the specific determinants of delisting, such as cash flows and growth prospects, investors can assess the likelihood of delisting events and adjust their investment strategies accordingly. Overall, these findings provide valuable insights that enhance the decision-making process and help investors prudently manage risk in the sub-regions where they are active.

8.5 Summary and Conclusions

In conclusion, this study provides a comprehensive examination of the wealth effect of delisting events and the factors determining delisting. The findings highlight the significance of growth prospects (for involuntary delisting) and cash flows (for delisting generally) in predicting delisting probabilities, while also shedding light on the varying impact of delisting on different sectors. The findings show significant negative impacts on shareholder wealth from delisting events, but voluntary and involuntary delisting events do not exhibit significant abnormal returns. Sector-specific analysis reveals adverse effects in the consumer non-cyclical and industrial sectors for voluntary delisting, while the technology sector is impacted adversely by involuntary delisting. The study's limitations suggest the need for further research and the consideration of additional contextual factors. The policy recommendations outlined aim to mitigate the negative wealth effect and factors that determine delisting.

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APPENDICES

Appendix A: Sample of involuntary delisted companies

Involuntary Delisting- Sample Size 22						
Action Type	Security ID	Suspension Date	Announce/Declared Date	Companies	Reason for Delisting	Sectors
Delisting	KLK SJ Equity	2007-08-31	2008/07/18	Kelgran Ltd	Failure to Meet Listing Requirements	Basic Materials
Delisting	STI SJ Equity	2008-10-15	2009/04/03	Stilfontein Gold Mining Co Ltd	Failure to Meet Listing Requirements	Basic Materials
Delisting	TBX SJ Equity	2011-06-17	2013/06/21	Thabex Ltd	Failure to Meet Listing Requirements	Basic Materials
Delisting	EHS SJ Equity	2015-04-14	2017/07/25	Evrax Highveld Steel & Vanadium Ltd	Failure to Meet Listing Requirements	Basic Materials
Delisting	TIW SJ Equity	2008-10-15	2009/04/03	Tiger Wheels Ltd	Failure to Meet Listing Requirements	Consumer, Cyclical
Delisting	QHL SJ Equity	2011-06-17	2013/01/31	Queensgate Hotel and Leisure Ltd	Failure to Meet Listing Requirements	Consumer, Cyclical
Delisting	CVS SJ Equity	2008-10-15	2009/01/30	Corvus Capital SA Holding Ltd	Failure to Meet Listing Requirements	Consumer, Non-cyclical
Delisting	GDH SJ Equity	2008-10-15	2010/09/16	Good Hope Diamonds Kimberley Ltd	Failure to Meet Listing Requirements	Consumer, Non-cyclical
Delisting	BCH SJ Equity	2009-12-04	2011/05/27	Best Cut Ltd	Liquidated	Consumer, Non-cyclical
Delisting	DLG SJ Equity	2011-09-16	2012/01/27	Dialogue Group Holdings Ltd	Failure to Meet Listing Requirements	Consumer, Non-cyclical
Delisting	RNT SJ Equity	2005-09-01	2007/05/22	Rentsure Holdings Ltd	Failure to Meet Listing Requirements	Financial
Delisting	EMG SJ Equity	2008-10-15	2007/07/26	Emergent Properties Ltd	Failure to Meet Listing Requirements	Financial
Delisting	DIV SJ Equity	2008-06-20	2008/06/20	Diversified Property Fund Ltd/fund	Liquidated	Financial
Delisting	PFN SJ Equity	2008-10-15	2009/01/30	Consolidated Property and Finance Ltd	Failure to Meet Listing Requirements	Financial
Delisting	SJL SJ Equity	2008-11-25	2010/04/09	S&J Land Holdings Ltd	Failure to Meet Listing Requirements	Financial
Delisting	SBO SJ Equity	2011-06-17	2012/11/12	Saambou Holdings Ltd	Liquidated	Financial
Delisting	SHB SJ Equity	2014-09-15	2014/09/16	Sherbourne Capital Ltd	Insufficient Assets	Financial
Delisting	NEI SJ Equity	2008-10-15	2009/01/30	Northern Engineering Industries Africa Ltd	Failure to Meet Listing Requirements	Industrial
Delisting	ICC SJ Equity	2008-07-31	2011/03/03	Industrial Credit Co Africa Holdings Ltd	Failure to Meet Listing Requirements	Industrial
Delisting	BEE SJ Equity	2010-08-04	2011/05/27	Beget Holdings Ltd	Liquidated	Technology
Delisting	SQE SJ Equity	2014-09-15	2012/11/12	Square One Solutions Group Ltd	Liquidated	Technology
Delisting	MFI SJ Equity	2017-09-26	2017/08/30	M Fitec International Ltd	Liquidated	Technology

Involuntary Delisting -Final Sample Size						
Action Type	Security ID	Suspension Date	Announce/Declared Date	Companies	Reason for Delisting	Sectors
Delisting	ICC SJ Equity	2008-07-31	2011/03/03	Industrial Credit Co Africa Holdings Ltd	Failure to Meet Listing Requirements	Industrial
Delisting	BEE SJ Equity	2010-08-04	2011/05/27	Beget Holdings Ltd	Liquidated	Technology
Delisting	MFI SJ Equity	2017-09-26	2017/08/30	M Fitec International Ltd	Liquidated	Technology
Delisting	EHS SJ Equity	2015-04-14	2017/07/25	Evrax Highveld Steel & Vanadium Ltd	Failure to Meet Listing Requirements	Basic Materials
Delisting	SJL SJ Equity	2008-11-25	2010/04/09	S&J Land Holdings Ltd	Failure to Meet Listing Requirements	Financial
Delisting	DIV SJ Equity	2008-06-20	2008/06/20	Diversified Property Fund Ltd/fund	Liquidated	Financial

Appendix B: Sample of voluntary delisted companies

Raw data Voluntary Delisting- Sample Size 137						
Action Type	Security ID	Suspension Date	Announce/ Declared	Companies	Reason for Delisting	Sectors
Delisting	NMS SJ Equity	2007-01-19	2007/01/11	Namibian Sea Products Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	KEL SJ Equity	2014-11-07	2014/08/21	Kelly Group SA Pty Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	LHG SJ Equity	2015-01-30	2014/11/19	Litha Healthcare Group Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	PCN SJ Equity	2011-11-25	2011/11/16	Paracon Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	CMP SJ Equity	2013-07-05	2013/04/15	Cipla Medpro South Africa L	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	RGT SJ Equity	2013-07-19	2013/06/24	RGT Smart Market Intelligen	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	MVS SJ Equity	2013-11-01	2013/08/23	Mvelaserve Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	AFR SJ Equity	2014-03-20	2013/11/19	Afagri Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	LHG SJ Equity	2015-01-30	2014/11/19	Litha Healthcare Group Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	ILV SJ Equity	2016-06-17	2016/04/26	Illovo Sugar Pty Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	BEG SJ Equity	2016-09-20	2016/08/26	Beige Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	CVH SJ Equity	2018-05-29	2017/10/31	Capevin Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	CBS SJ Equity	2007-09-04	2007/10/17	CBS Property Portfolio Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	SUL SJ Equity	2008-05-16	2008/07/01	SAB&T Ubuntu Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	CVI SJ Equity	2012-08-02	2012/08/03	Capevin Investments Ltd	Reason for delisting: the Company's Req	Consumer, Non-cyclical
Delisting	LAF SJ Equity	2013-07-18	2013/08/05	Lonrho Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	CBH SJ Equity	2014-12-05	2014/12/03	Country Bird Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Non-cyclical
Delisting	BPL SJ Equity	2007-05-18	2007/03/01	Barplats Investments Pty Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	AFO SJ Equity	2009-05-15	2009/05/07	One Africa Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	TWP SJ Equity	2009-12-10	2009/12/01	TWP Holdings Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	MVL SJ Equity	2011-05-30	2011/02/08	Mvelaphanda Resources Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	FWD SJ Equity	2011-12-15	2011/10/17	Kansai Plascon Africa Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	MTX SJ Equity	2012-01-06	2011/11/14	Metorex Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	PAM SJ Equity	2014-02-07	2013/08/01	Palabora Mining Co Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	WGR SJ Equity	2014-04-04	2014/02/12	Witwatersrand Consolidated	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	VIL SJ Equity	2015-05-22	2015/04/21	Village Main Reef Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	GGM SJ Equity	2015-11-27	2015/10/15	Goliath Gold Mining Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	WAR SJ Equity	2007-03-15	2007/02/12	Gold Fields Operations Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	ELD SJ Equity	2007-11-16	2007/11/14	Eland Platinum Holdings Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	BRE SJ Equity	2009-10-30	2009/10/30	Braemore Resources Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	KWR SJ Equity	2010-01-29	2009/12/22	Kiwara Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	PLN SJ Equity	2011-12-21	2011/12/13	Sedibelo Platinum Mines Ltd	Reason for delisting: the Company's Req	Basic Materials
Delisting	UUU SJ Equity	2013-10-11	2013/10/22	Uranium One Inc	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	GDO SJ Equity	2014-01-16	2014/01/15	Gold One International Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	AQP SJ Equity	2016-04-01	2016/04/12	Aquarius Platinum Ltd	Reason for delisting: Acquired/Merged	Basic Materials
Delisting	MCP SJ Equity	2006-03-16	2007/04/03	MICC Property Income Fund	Reason for delisting: Acquired/Merged	Financial
Delisting	PRA SJ Equity	2007-03-15	2007/02/27	Paramount Property Fund Ltr	Reason for delisting: Acquired/Merged	Financial
Delisting	SRL SJ Equity	2007-05-11	2007/06/29	SA Retail Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	0861674D SJ Equity	2007-07-13	2007/02/22	Alexander Forbes Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	ATS SJ Equity	2007-08-17	2007/08/20	Atlas Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	IFR SJ Equity	2008-05-30	2008/05/30	iFour Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	RAH SJ Equity	2012-01-27	2012/03/12	Real Africa Holdings Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	MCU SJ Equity	2011-06-17	2012/10/30	m Cubed Holdings Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	IQG SJ Equity	2012-11-16	2012/11/27	IQuad Group Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	AIB SJ Equity	2015-08-06	2015/08/06	Ascension Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	CPF SJ Equity	2015-11-20	2015/11/17	Capital Property Fund Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	LGL SJ Equity	2008-11-21	2008/09/30	Liberty Group Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	CUH SJ Equity	2008-12-05	2008/10/15	Credit U Holdings Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	MYT SJ Equity	2009-01-09	2008/11/05	Monyetla Property Fund Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	ABT SJ Equity	2009-07-03	2009/06/26	Ambit Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	MDN SJ Equity	2009-08-06	2009/07/30	Madison Property Fund Man	Reason for delisting: Acquired/Merged	Financial
Delisting	APA SJ Equity	2009-08-06	2009/07/30	ApexHi Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	MAF SJ Equity	2010-01-29	2010/01/19	Old Mutual Insure Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	BJM SJ Equity	2010-12-23	2010/12/14	Barnard Jacobs Mellet Holdi	Reason for delisting: Acquired/Merged	Financial
Delisting	GMB SJ Equity	2011-04-14	2011/02/10	Glenrand MIB Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	NBC SJ Equity	2013-05-24	2013/03/28	New Bond Capital Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	ANP SJ Equity	2014-06-12	2014/04/07	Annuity Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	VIF SJ Equity	2014-07-25	2014/06/02	Vividend Income Fund Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	PMM SJ Equity	2014-09-15	2014/06/10	Premium Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	ACP SJ Equity	2015-04-17	2015/01/15	Acucap Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	FPT SJ Equity	2015-07-31	2015/07/02	Fountainhead Property Trust	Reason for delisting: Acquired/Merged	Financial
Delisting	ZSA SJ Equity	2015-09-11	2015/08/11	Zurich Insurance Co South Af	Reason for delisting: Acquired/Merged	Financial
Delisting	CDZ SJ Equity	2015-10-23	2015/08/31	Cadiz Holdings Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	PIV SJ Equity	2017-01-03	2016/12/20	Pivotal Fund Ltd/The	Reason for delisting: Acquired/Merged	Financial
Delisting	AIA SJ Equity	2017-04-18	2017/02/15	Ascension Properties Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	NEP SJ Equity	2017-07-11	2017/06/28	New Europe Property Investr	Reason for delisting: Acquired/Merged	Financial
Delisting	ROC SJ Equity	2017-07-11	2017/06/28	Rockcastle Global Real Estat	Reason for delisting: Acquired/Merged	Financial
Delisting	WNH SJ Equity	2017-10-03	2017/08/02	Winhold Ltd	Reason for delisting: Acquired/Merged	Financial
Delisting	FSP SJ Equity	2007-04-04	2007/03/14	Freestone Property Holdings	Reason for delisting: Acquired/Merged	Financial

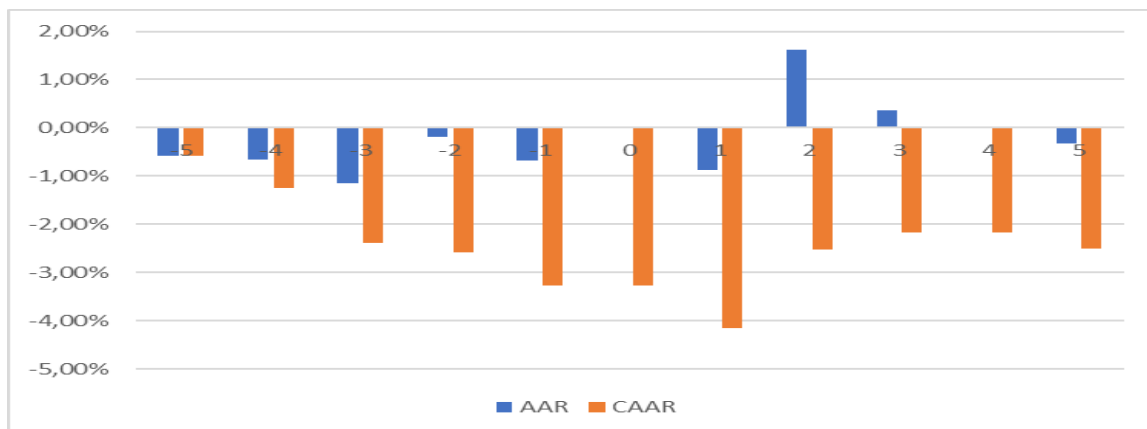
Delisting	OLI SJ Equity	2012-06-29	2012/07/02	O-line Holdings Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	CRM SJ Equity	2012-11-16	2012/11/27	Ceramic Industries Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	RAC SJ Equity	2013-10-25	2013/10/28	RACEC Group Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	DLV SJ Equity	2012-11-01	2014/04/22	Dorbyl Ltd	Reason for delisting: the Company's Req	Industrial
Delisting	DGC SJ Equity	2015-09-25	2015/08/05	DigiCore Holdings Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	IRA SJ Equity	2015-10-02	2015/07/29	Infrasors Holdings Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	MML SJ Equity	2015-10-16	2015/08/10	Metmar Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	ILA SJ Equity	2015-12-31	2015/08/28	Iliad Africa Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	RAR SJ Equity	2016-09-20	2016/08/24	RARE Holdings Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	AER SJ Equity	2016-10-25	2016/09/15	Amalgamated Electronic Cor	Reason for delisting: Acquired/Merged	Industrial
Delisting	APK SJ Equity	2017-06-12	2017/04/13	Astrapak Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	BDM SJ Equity	2018-01-30	2017/11/27	Buildmax Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	CSL SJ Equity	2007-03-23	2007/01/16	Consol Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	UTR SJ Equity	2007-05-18	2007/03/23	Unitrans Ltd/South Africa	Reason for delisting: Acquired/Merged	Industrial
Delisting	ENV SJ Equity	2008-10-24	2008/08/27	Enviroserv Holdings Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	ABK SJ Equity	2011-12-29	2011/12/20	African Brick Centre Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	BWI SJ Equity	2014-04-10	2014/02/14	B&W Instrumentation and El	Reason for delisting: Acquired/Merged	Industrial
Delisting	CNL SJ Equity	2014-05-09	2014/03/06	Control Instruments Group P	Reason for delisting: Acquired/Merged	Industrial
Delisting	SLL SJ Equity	2014-01-10	2013/11/11	Stella Vista Technologies Ltd	Reason for delisting: Acquired/Merged	Industrial
Delisting	PTG SJ Equity	2007-04-13	2007/04/04	Peermont Global Pty Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	ECO SJ Equity	2007-05-04	2007/03/16	Edgars Consolidated Stores L	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	ELH SJ Equity	2008-01-11	2007/12/20	Ellerine Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	KWS SJ Equity	2009-02-16	2008/12/18	Kwikspace Modular Buildings	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	VTL SJ Equity	2009-02-16	2009/01/16	Venter Leisure & Commercia	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	UNI SJ Equity	2011-10-21	2011/10/13	Universal Industries Corp Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	JDG SJ Equity	2015-06-26	2015/05/19	JD Group Ltd/South Africa	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	HSP SJ Equity	2017-10-31	2017/10/20	Holdsport Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	SFH SJ Equity	2012-11-23	2012/12/03	Torre Holdings Pty Ltd	Reason for delisting: the Company's Req	Consumer, Cyclical
Delisting	HHW SJ Equity	2013-02-15	2013/02/25	Hardware Warehouse Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	AMA SJ Equity	2013-06-21	2013/06/24	Home of Living Brands Holdi	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	IFH SJ Equity	2013-08-30	2013/09/10	IFA Hotels & Resorts Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	GDN SJ Equity	2017-01-31	2017/01/26	Gooderson Leisure Corp Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	IHL SJ Equity	2017-11-07	2017/08/28	International Hotel Propertie	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	TAL SJ Equity	2008-02-22	2008/03/04	Tiger Automotive Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	TRT SJ Equity	2008-08-29	2008/09/02	Tourism Investment Corp Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	BRC SJ Equity	2007-08-10	2007/08/14	Brandcorp Holdings Ltd	Reason for delisting: Acquired/Merged	Consumer, Cyclical
Delisting	PMA SJ Equity	2007-09-19	2007/07/17	Old Primedia Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	VOX SJ Equity	2011-11-04	2011/10/28	Vox Telecom Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	AVU SJ Equity	2012-09-14	2012/08/31	BlackstarTiso Pty Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	ALT SJ Equity	2013-08-08	2013/06/27	Allied Technologies Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	KGM SJ Equity	2013-11-29	2013/10/09	Kagiso Media Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	TMG SJ Equity	2015-05-29	2014/12/08	Blackstar Holdings Group Pty	Reason for delisting: Acquired/Merged	Communications
Delisting	MNY SJ Equity	2017-08-15	2017/07/11	Moneyweb Holdings Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	NAI SJ Equity	2011-06-17	2013/01/31	New Africa Investments Ltd	Reason for delisting: Acquired/Merged	Communications
Delisting	BTG SJ Equity	2008-01-04	2007/11/19	Bytes Technology Group Ltd/	Reason for delisting: Acquired/Merged	Technology
Delisting	DDT SJ Equity	2010-10-25	2010/12/13	Dimension Data Holdings PLC	Reason for delisting: Acquired/Merged	Technology
Delisting	SPS SJ Equity	2011-01-14	2010/12/15	Spescom Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	SDH SJ Equity	2014-03-07	2013/12/19	SecureData Holdings Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	GIJ SJ Equity	2015-04-30	2015/04/17	Gijima Group Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	MOR SJ Equity	2015-07-31	2015/06/09	Morvest Group Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	BCX SJ Equity	2015-08-14	2015/08/06	Business Connexion Group Lt	Reason for delisting: Acquired/Merged	Technology
Delisting	DRN SJ Equity	2016-09-20	2016/09/05	Kuuhubb Inc	Reason for delisting: the Company's Req	Technology
Delisting	DCT SJ Equity	2017-02-07	2017/01/16	Datacentrix Holdings Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	BTG SJ Equity	2008-01-04	2007/11/19	Bytes Technology Group Ltd/	Reason for delisting: Acquired/Merged	Technology
Delisting	SPS SJ Equity	2011-01-14	2010/12/15	Spescom Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	SDH SJ Equity	2014-03-07	2013/12/19	SecureData Holdings Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	GIJ SJ Equity	2015-04-30	2015/04/17	Gijima Group Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	MOR SJ Equity	2015-07-31	2015/06/09	Morvest Group Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	BCX SJ Equity	2015-08-14	2015/08/06	Business Connexion Group Lt	Reason for delisting: Acquired/Merged	Technology
Delisting	DRN SJ Equity	2016-09-20	2016/09/05	Kuuhubb Inc	Reason for delisting: the Company's Req	Technology
Delisting	DCT SJ Equity	2017-02-07	2017/01/16	Datacentrix Holdings Ltd	Reason for delisting: Acquired/Merged	Technology
Delisting	DDT SJ Equity	2010-10-25	2010/12/13	Dimension Data Holdings PLC	Reason for delisting: Acquired/Merged	Technology
Delisting	JNC SJ Equity	2008-08-04	2008/09/17	Johnnic Holdings Ltd	Reason for delisting: Acquired/Merged	Diversified
Delisting	CCI SJ Equity	2010-11-05	2010/10/29	CIC Holdings Ltd	Reason for delisting: Acquired/Merged	Diversified
Delisting	EXL SJ Equity	2012-09-28	2012/09/14	Excellerate Holdings Ltd	Reason for delisting: Acquired/Merged	Diversified
Delisting	CCL SJ Equity	2015-09-11	2015/07/29	Compu-Clearing Outsourcing	Reason for delisting: Acquired/Merged	Diversified
Delisting	IPS SJ Equity	2015-09-25	2017/06/20	IPSA Group PLC	Reason for delisting: Acquired/Merged	Utilities
Delisting	KEH SJ Equity	2017-06-27	2017/06/21	Keaton Energy Holdings Ltd	Reason for delisting: Acquired/Merged	Energy

Final Data - Voluntary Delisting- Sample Size 86						
		Announce/ Declared				
Action Type	Security ID	Suspension Date	Companies	Reason for Delisting		Sectors
Delisting	NMS SJ Equity	2007-01-19	2007/01/11 Namibian Sea Products Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	KEL SJ Equity	2014-11-07	2014/08/21 Kelly Group SA Pty Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	LHG SJ Equity	2015-01-30	2014/11/19 Litha Healthcare Group Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	PCN SJ Equity	2011-11-25	2011/11/16 Paracon Holdings Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	CMP SJ Equity	2013-07-05	2013/04/15 Cipla Medpro South Africa Li	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	RGT SJ Equity	2013-07-19	2013/06/24 RGT Smart Market Intelligen	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	MVS SJ Equity	2013-11-01	2013/08/23 Mvelaserve Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	AFR SJ Equity	2014-03-20	2013/11/19 Afagri Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	LHG SJ Equity	2015-01-30	2014/11/19 Litha Healthcare Group Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	ILV SJ Equity	2016-06-17	2016/04/26 Illovo Sugar Pty Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	BEG SJ Equity	2016-09-20	2016/08/26 Beige Holdings Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	CVH SJ Equity	2018-05-29	2017/10/31 Capevin Holdings Ltd	Reason for delisting: Acquired/Merged		Consumer, Non-cyclical
Delisting	BPL SJ Equity	2007-05-18	2007/03/01 Barplats Investments Pty Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	AFO SJ Equity	2009-05-15	2009/05/07 One Africa Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	TWP SJ Equity	2009-12-10	2009/12/01 TWP Holdings Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	MVL SJ Equity	2011-05-30	2011/02/08 Mvelaphanda Resources Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	FWD SJ Equity	2011-12-15	2011/10/17 Kansai Plascon Africa Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	MTX SJ Equity	2012-01-06	2011/11/14 Metorex Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	PAM SJ Equity	2014-02-07	2013/08/01 Palabora Mining Co Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	WGR SJ Equity	2014-04-04	2014/02/12 Witwatersrand Consolidated	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	VIL SJ Equity	2015-05-22	2015/04/21 Village Main Reef Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	GGM SJ Equity	2015-11-27	2015/10/15 Goliath Gold Mining Ltd	Reason for delisting: Acquired/Merged		Basic Materials
Delisting	LGL SJ Equity	2008-11-21	2008/09/30 Liberty Group Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	CUH SJ Equity	2008-12-05	2008/10/15 Credit U Holdings Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	MYT SJ Equity	2009-01-09	2008/11/05 Monyetla Property Fund Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	ABT SJ Equity	2009-07-03	2009/06/26 Ambit Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	MDN SJ Equity	2009-08-06	2009/07/30 Madison Property Fund Mani	Reason for delisting: Acquired/Merged		Financial
Delisting	APA SJ Equity	2009-08-06	2009/07/30 ApexHi Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	MAF SJ Equity	2010-01-29	2010/01/19 Old Mutual Insure Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	BJM SJ Equity	2010-12-23	2010/12/14 Barnard Jacobs Mellet Holdi	Reason for delisting: Acquired/Merged		Financial
Delisting	GMB SJ Equity	2011-04-14	2011/02/10 Glenrand MIB Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	NBC SJ Equity	2013-05-24	2013/03/28 New Bond Capital Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	ANP SJ Equity	2014-06-12	2014/04/07 Annuity Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	VIF SJ Equity	2014-07-25	2014/06/02 Vividend Income Fund Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	PMNM SJ Equity	2014-09-15	2014/06/10 Premium Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	ACP SJ Equity	2015-04-17	2015/01/15 Accupac Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	FPT SJ Equity	2015-07-31	2015/07/02 Fountainhead Property Trust	Reason for delisting: Acquired/Merged		Financial
Delisting	ZSA SJ Equity	2015-09-11	2015/08/11 Zurich Insurance Co South Af	Reason for delisting: Acquired/Merged		Financial
Delisting	CDZ SJ Equity	2015-10-23	2015/08/31 Cadiz Holdings Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	PIV SJ Equity	2017-01-03	2016/12/20 Pivotal Fund Ltd/The	Reason for delisting: Acquired/Merged		Financial
Delisting	AIA SJ Equity	2017-04-18	2017/02/15 Ascension Properties Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	NEP SJ Equity	2017-07-11	2017/06/28 New Europe Property Investr	Reason for delisting: Acquired/Merged		Financial
Delisting	ROC SJ Equity	2017-07-11	2017/06/28 Rockcastle Global Real Estat	Reason for delisting: Acquired/Merged		Financial
Delisting	WNH SJ Equity	2017-10-03	2017/08/02 Winhold Ltd	Reason for delisting: Acquired/Merged		Financial
Delisting	FSP SJ Equity	2007-04-04	2007/03/14 Freestone Property Holdings	Reason for delisting: Acquired/Merged		Financial
Delisting	DGC SJ Equity	2015-09-25	2015/08/05 DigiCore Holdings Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	IRA SJ Equity	2015-10-02	2015/07/29 Infrasors Holdings Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	MML SJ Equity	2015-10-16	2015/08/10 Metmar Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	ILA SJ Equity	2015-12-31	2015/08/28 Iliad Africa Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	RAR SJ Equity	2016-09-20	2016/08/24 RARE Holdings Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	AER SJ Equity	2016-10-25	2016/09/15 Amalgamated Electronic Cor	Reason for delisting: Acquired/Merged		Industrial
Delisting	APK SJ Equity	2017-06-12	2017/04/13 Astrapak Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	BDM SJ Equity	2018-01-30	2017/11/27 Buildmax Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	CSL SJ Equity	2007-03-23	2007/01/16 Consol Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	UTR SJ Equity	2007-05-18	2007/03/23 Unitrans Ltd/South Africa	Reason for delisting: Acquired/Merged		Industrial
Delisting	ENV SJ Equity	2008-10-24	2008/08/27 Enviroserv Holdings Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	ABK SJ Equity	2011-12-29	2011/12/20 African Brick Centre Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	BWI SJ Equity	2014-04-10	2014/02/14 B&W Instrumentation and El	Reason for delisting: Acquired/Merged		Industrial
Delisting	CNL SJ Equity	2014-05-09	2014/03/06 Control Instruments Group P	Reason for delisting: Acquired/Merged		Industrial
Delisting	SLL SJ Equity	2014-01-10	2013/11/11 Stella Vista Technologies Ltd	Reason for delisting: Acquired/Merged		Industrial
Delisting	PTG SJ Equity	2007-04-13	2007/04/04 Peermont Global Pty Ltd	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	ECO SJ Equity	2007-05-04	2007/03/16 Edgars Consolidated Stores L	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	ELH SJ Equity	2008-01-11	2007/12/20 Ellerine Holdings Ltd	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	KWS SJ Equity	2009-02-16	2008/12/18 Kwispac Modular Buildings	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	VTL SJ Equity	2009-02-16	2009/01/16 Venter Leisure & Commercia	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	UNI SJ Equity	2011-10-21	2011/10/13 Universal Industries Corp Ltd	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	JDG SJ Equity	2015-06-26	2015/05/19 JD Group Ltd/South Africa	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	HSP SJ Equity	2017-10-31	2017/10/20 Holdsport Ltd	Reason for delisting: Acquired/Merged		Consumer, Cyclical
Delisting	PMA SJ Equity	2007-09-19	2007/07/17 Old Primedia Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	VOX SJ Equity	2011-11-04	2011/10/28 Vox Telecom Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	AVU SJ Equity	2012-09-14	2012/08/31 BlackstarTiso Pty Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	ALT SJ Equity	2013-08-08	2013/06/27 Allied Technologies Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	KGM SJ Equity	2013-11-29	2013/10/09 Kagiso Media Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	TMG SJ Equity	2015-05-29	2014/12/08 Blackstar Holdings Group Pty	Reason for delisting: Acquired/Merged		Communications
Delisting	MNY SJ Equity	2017-08-15	2017/07/11 Moneyweb Holdings Ltd	Reason for delisting: Acquired/Merged		Communications
Delisting	BTG SJ Equity	2008-01-04	2007/11/19 Bytes Technology Group Ltd/	Reason for delisting: Acquired/Merged		Technology
Delisting	SPS SJ Equity	2011-01-14	2010/12/15 Spescom Ltd	Reason for delisting: Acquired/Merged		Technology
Delisting	SDH SJ Equity	2014-03-07	2013/12/19 SecureData Holdings Ltd	Reason for delisting: Acquired/Merged		Technology
Delisting	GIJ SJ Equity	2015-04-30	2015/04/17 Gijima Group Ltd	Reason for delisting: Acquired/Merged		Technology
Delisting	MOR SJ Equity	2015-07-31	2015/06/09 Morvest Group Ltd	Reason for delisting: Acquired/Merged		Technology
Delisting	BCX SJ Equity	2015-08-14	2015/08/06 Business Connexion Group Lt	Reason for delisting: Acquired/Merged		Technology
Delisting	DRN SJ Equity	2016-09-20	2016/09/05 Kuuhubb Inc	Reason for delisting: the Company's Request		Technology
Delisting	DCT SJ Equity	2017-02-07	2017/01/16 Datacentrix Holdings Ltd	Reason for delisting: Acquired/Merged		Technology
Delisting	CCI SJ Equity	2010-11-05	2010/10/29 CIC Holdings Ltd	Reason for delisting: Acquired/Merged		Diversified
Delisting	EXL SJ Equity	2012-09-28	2012/09/14 Excellerate Holdings Ltd	Reason for delisting: Acquired/Merged		Diversified
Delisting	CCL SJ Equity	2015-09-11	2015/07/29 Compu-Clearing Outsourcing	Reason for delisting: Acquired/Merged		Diversified

Appendix C- AARs and CAARs Graphs

Wealth effect of delisting generally

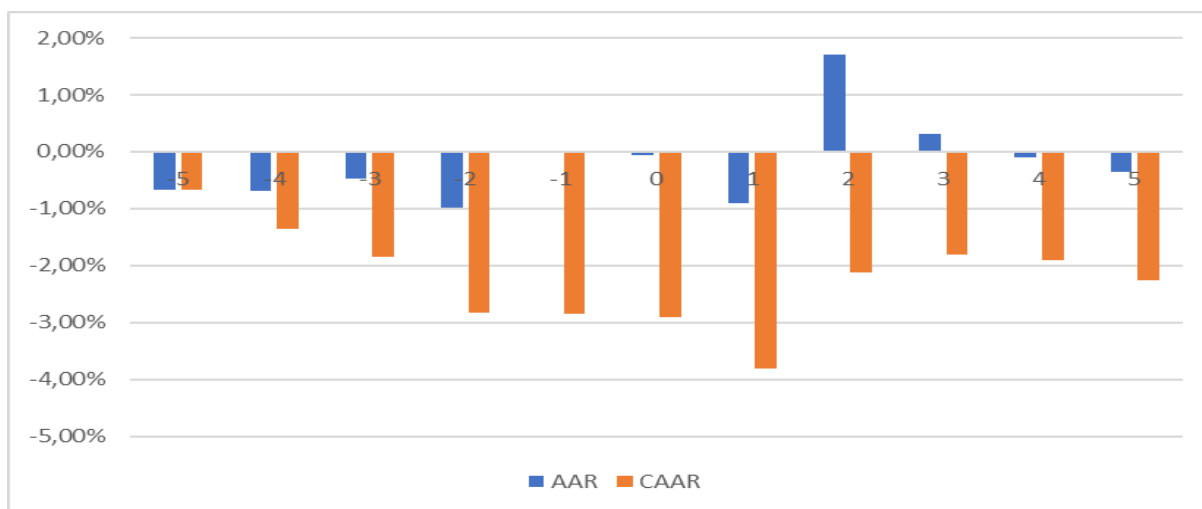
AARs and CAARs over the Event Windows for Delisted Companies (in all sectors)



Source: Author's own construct

Wealth Effects of Voluntary Delisting

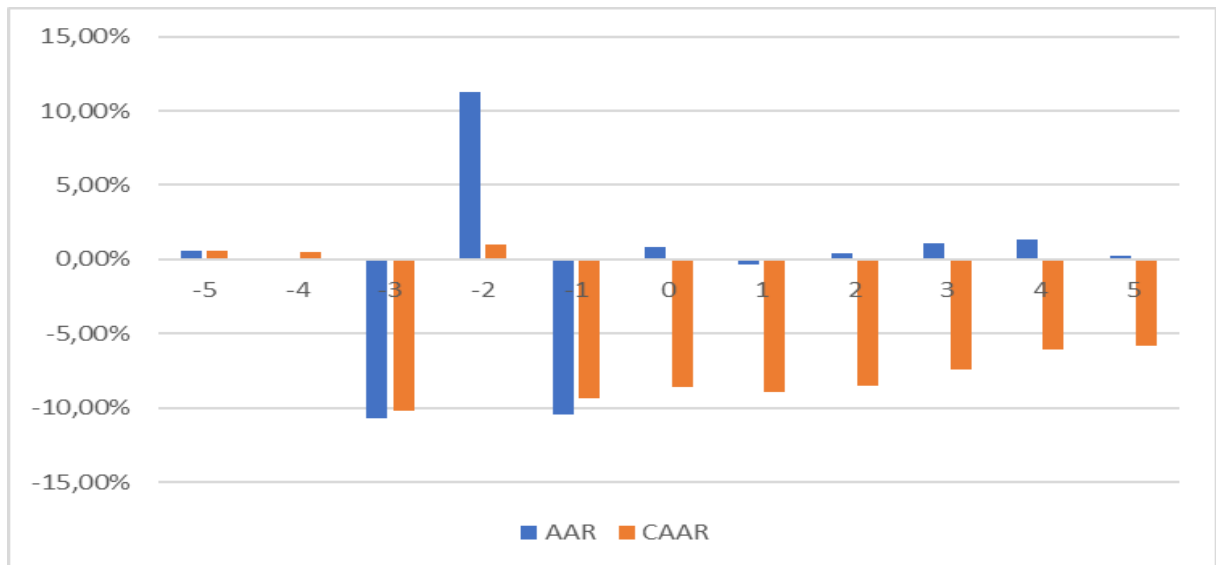
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (in all sectors)



Source: Author's own construct

Wealth Effects of Involuntary Delisting

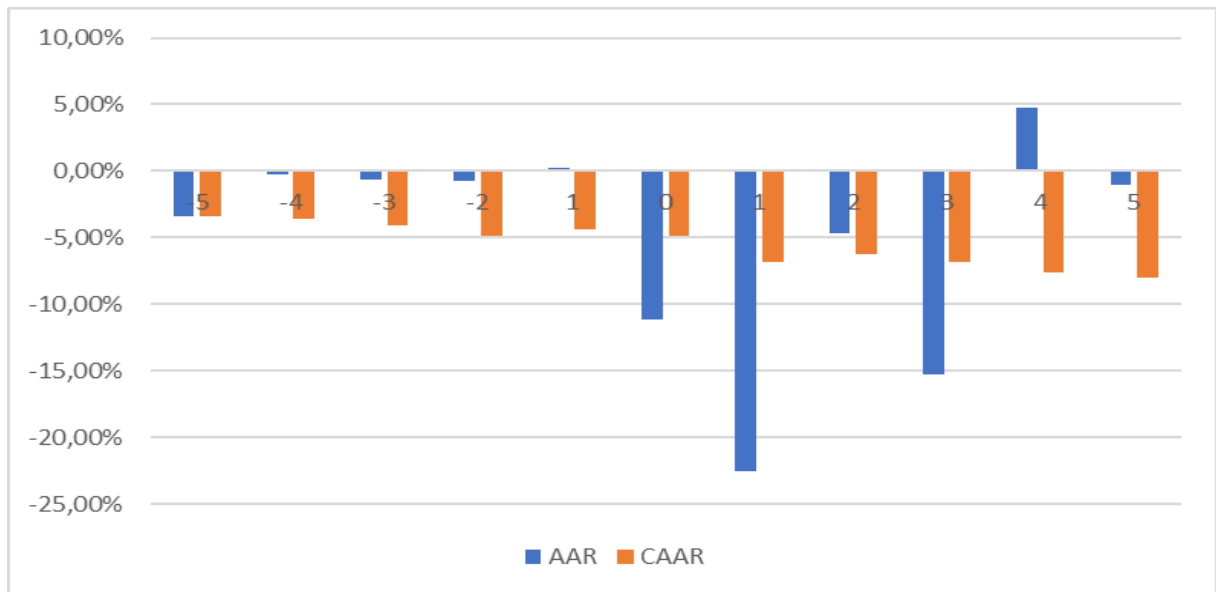
AARs and CAARs over the Event Window for Involuntarily Delisted Companies (in all sectors)



Source: Author's own construct

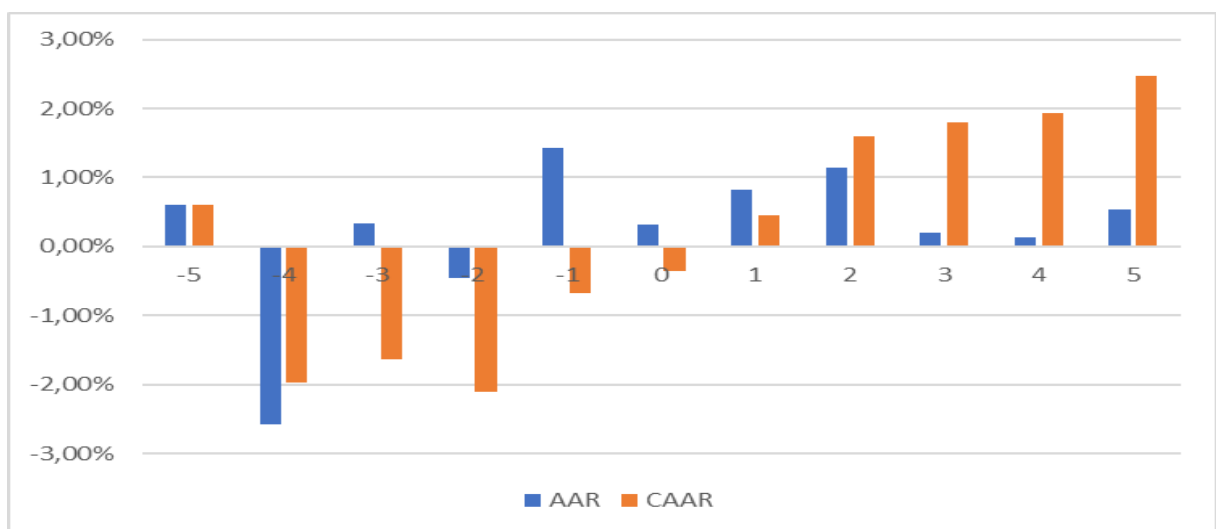
Voluntary Delisting across Various Sectors

AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Consumer Non-cyclical sectors)



Source: Author's own construct

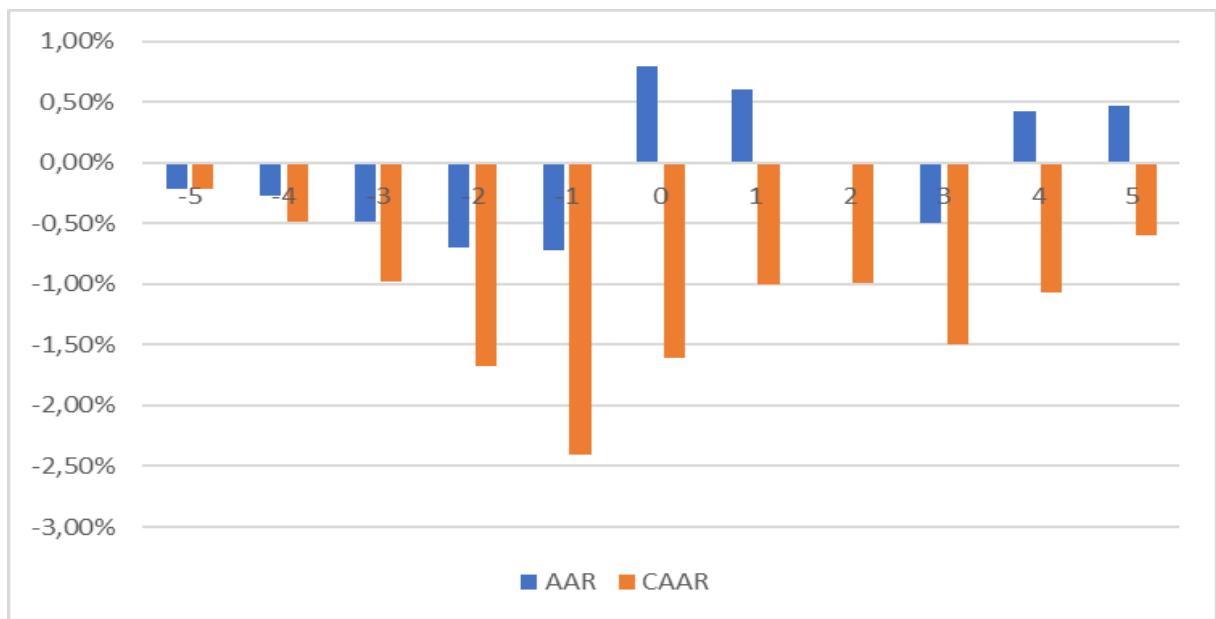
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Basic material sector)



Source: Author's own construct

Financial

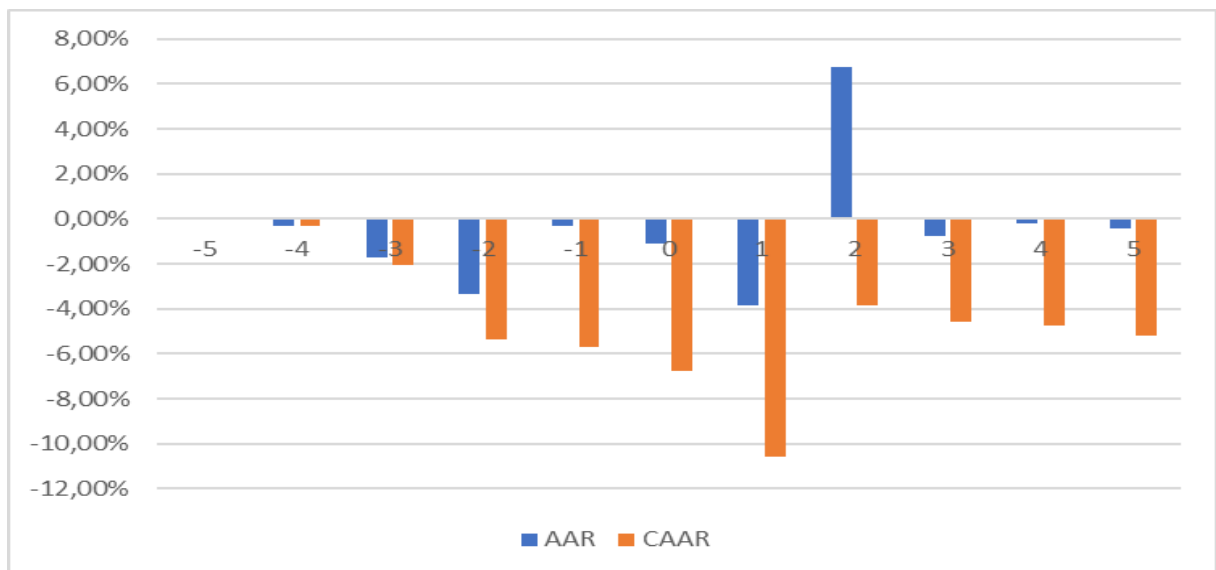
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Financial sector)



Source: Author's own construct

Industrial

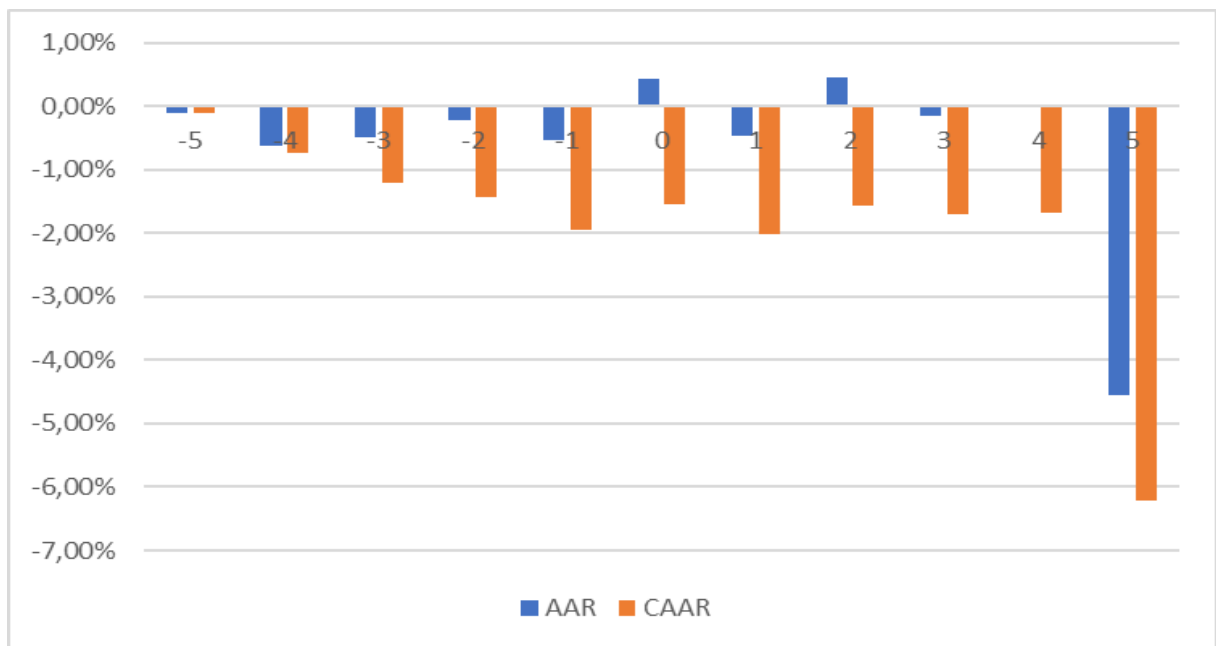
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Industrial sector)



Source: Author's own construct

Consumer, cyclical

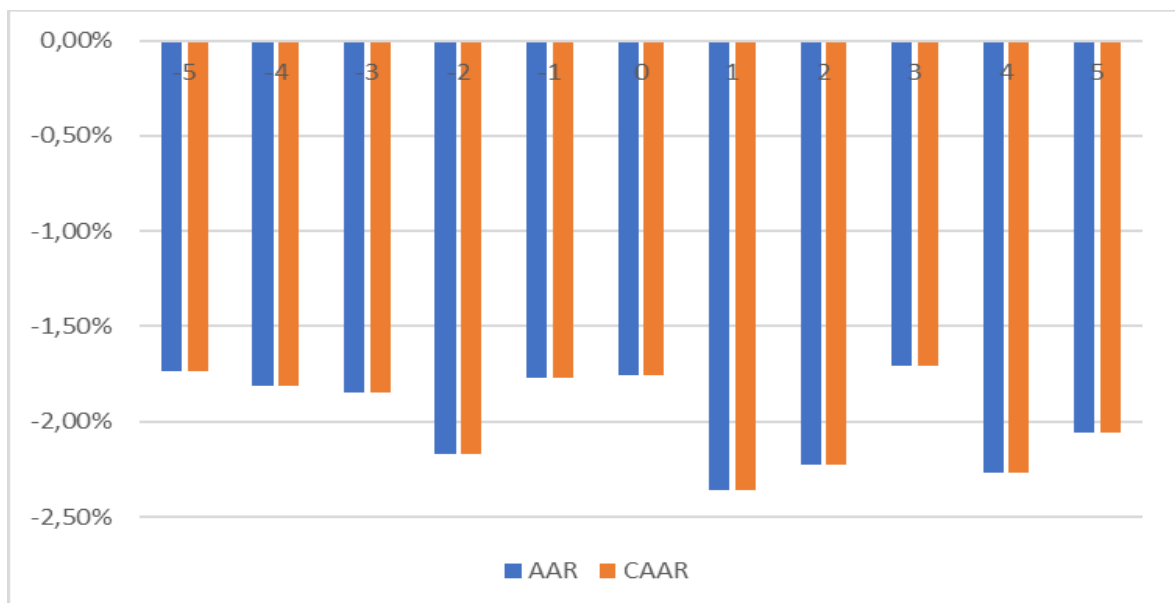
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Consumer cyclical sector)



Source: Author's own construct

Communication

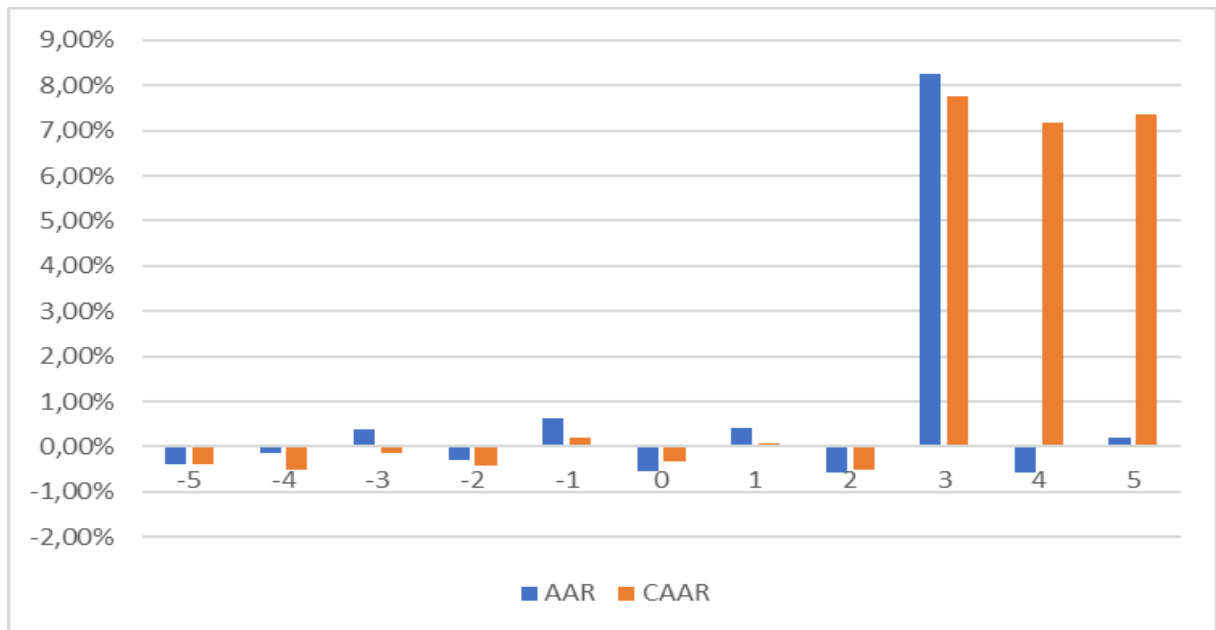
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Communication sector)



Source: Author's own construct

Technology

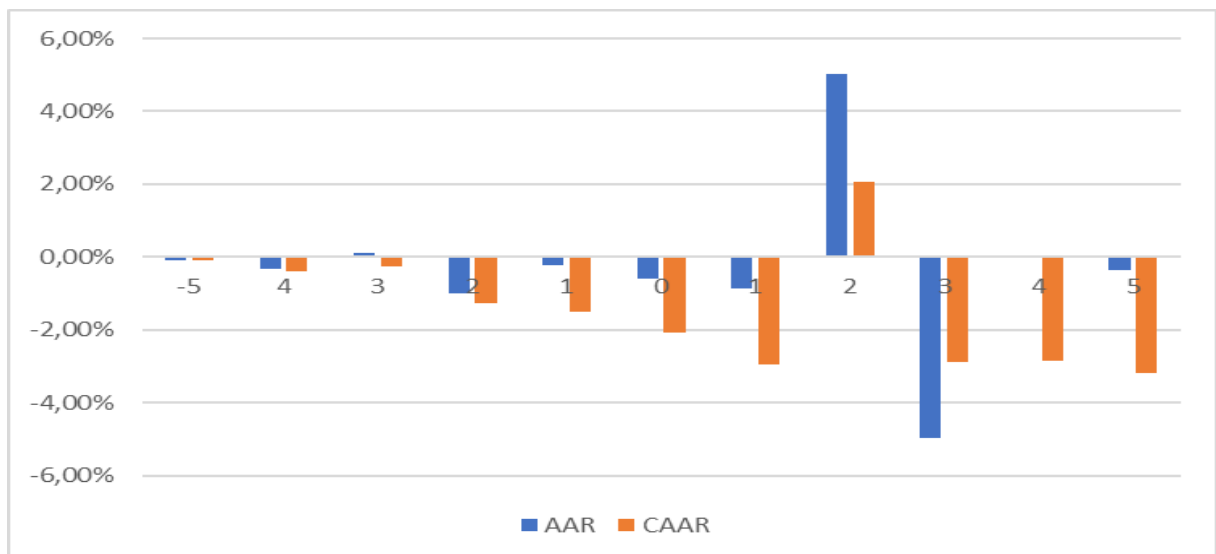
AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Technology sector)



Source: Author's own construct

Diversified

AARs and CAARs over the Event Window for Voluntarily Delisted Companies (Diversified sector)

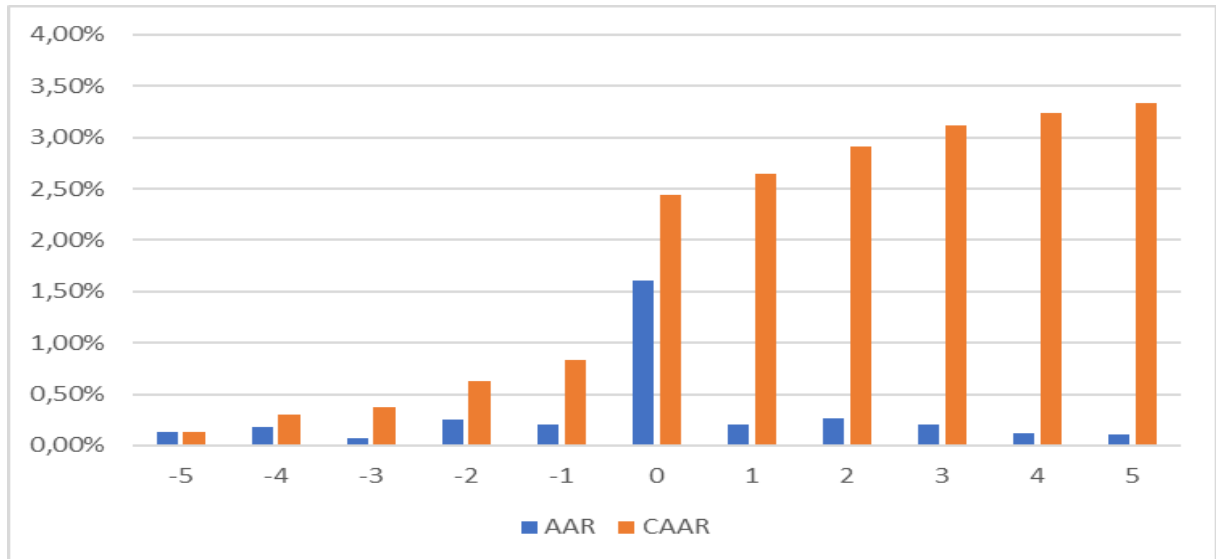


Source: Author's own construct

Wealth Effects of Involuntary Delisting across Various Sectors

Financial

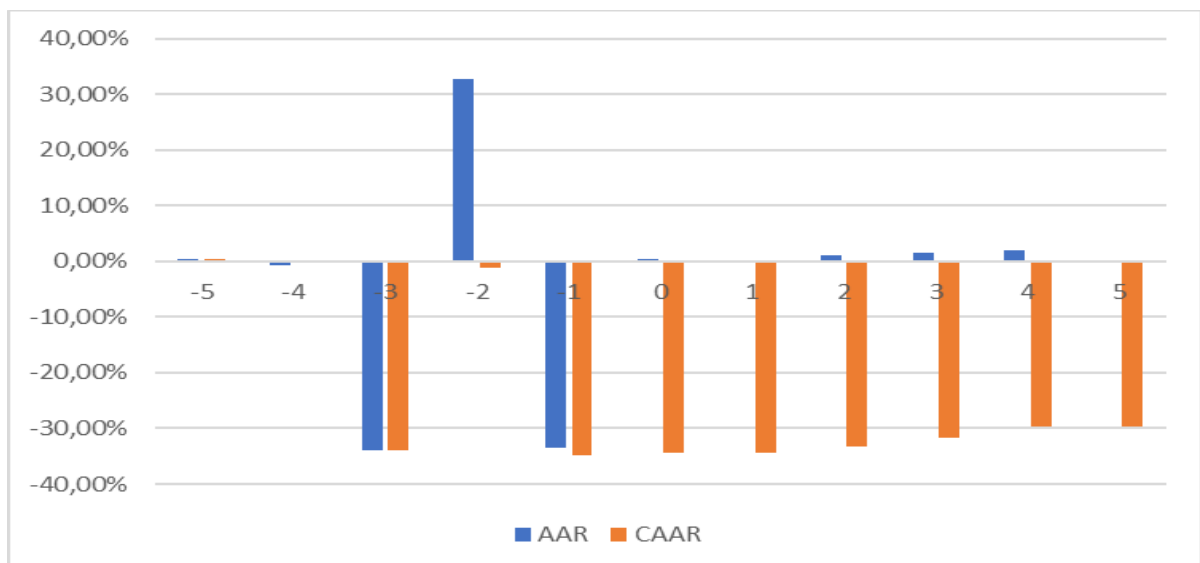
AARs and CAARs over the Event Window for Involuntarily Delisted Companies (Financial sector)



Source: Author's own construct

Technology

AARs and CAARs over the Event Window for Involuntarily Delisted Companies (Technology sector)



Source: Author's own construct