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The Discount Dilemma:

The Announcement Effects of Seasoned Equity Offerings on the Short-Run Performance of South African-listed Firms

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Abstract

The rationale behind the SEO and the correct pricing are of utmost importance to the success of the SEO, the share price performance, and any subsequent corporate projects the firm wishes to undertake. The primary objective of this research paper is to investigate how the share price of South African-listed firms is affected by the management team's decision to announce the intention to undertake an SEO during the 2000 – 2022 period. To do so, we conducted an event study and found that the level of discounting and other firm-specific characteristics does can explain SEOs underperformance. We found that the negative price reaction post SEO announcement holds for South African firms. We also found that firm-specific and SEO-specific characteristics have a more powerful effect on SEO's performance than the level of discounting.

Key words: *Event Study, Seasoned Equity Offering, Cumulative Abnormal Returns, South Africa, Discount Rate*

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I. Introduction

Firms often undertake corporate activities such as restructuring their balance sheet, making acquisitions, or financing investment opportunities. Such projects require significant financial support, which comes through either debt or equity finance. The decision to issue equity is often made to maintain a stable capital structure and avoid further leverage within the firm (Abdullah and Zaby, 2021). When unlisted firms decide to employ such equity funding to finance their corporate activities, a private or public equity offer can be made to prospective shareholders. An example of one such highly publicised route to the equity capital market is the famed Initial Public Offering (IPO). After the firms list on a stock exchange and upon trading freely in the public market, any subsequent issuance of new equity to new and existing shareholders is referred to as a Seasoned Equity Offering (SEO). Examples of SEOs include rights issues and accelerate bookbuild offerings (ABO). Rights issues or rights offers are offers made to existing shareholders to buy new shares at a discount to the prevailing share price, typically in proportion to their current holding in the firm. ABOs on the other hand are a generic and overarching term used for different forms of follow-on offerings where new or existing shares are placed on the market and sold off in bulk to interested investors. Undertaking the so-called SEO is thus an important decision-making tool for corporate management teams.

The prevailing literature shows that SEO-announcing firms usually experience a negative short-run price reaction shortly after the announcement of the intention to conduct an SEO (McLaughlin, Safieddine and Vasudevan, 1996; da Cunha and Seetharam, 2018). Additionally, the profitability of firms announcing seasoned equity offerings significantly declines after the issue has taken place (McLaughlin, Safieddine and Vasudevan, 1996). Also, firms issuing SEOs tend to underperform in the long run, as Chen and Liu (2021, p.3) point out, "…the long-term performance of companies that issue seasoned equity … significantly underperform the benchmark over 5 years following the equity issuance." The rationale behind the SEO and the correct pricing thereof are of utmost importance to the success of the SEO, the share price performance, and any subsequent corporate projects the firm wishes to undertake.

SEOs are usually sold at a discount, where underwriters encourage shareholders to sell their shares at a lower price than their value to attract investors and increase demand (Mola and Loughran, 2004). The announcement of the intention to issue new equity and the associated prospectus for the issuance may define the discount as a percentage discount to; the prior day's closing price, the trailing 30- or 90-day weighted-average traded price (WATP) or volume-

weighted average price (VWAP), or some other constructed share price leading up to the announcement. To improve the messaging around the announcement these discounts can be constructed in such a way to look as favourable as possible and be conveyed as a lower discount than strictly true. Additionally, under-pricing grows proportionally with discounting, which is aligned with the findings of both Altinkiliç and Hansen (2003) and Mola and Loughran (2004) where SEOs priced at integer values traded at larger discounts compared to SEOs priced at fractional values.

Several possible models and reasons are provided to attempt to explain why offering shares at a discount during an SEO produces a negative price reaction. One such very simple model, as shown in Figure 1, is the Law of Supply and Demand – where the downward-sloping demand curve causes lower price expectations as the SEO increases the supply of shares entering the market (Goodwin, 2013). This theory may not be relevant if markets are efficient because investors would and should account for the supply changes and adjust their demand accordingly (Goodwin, 2013).

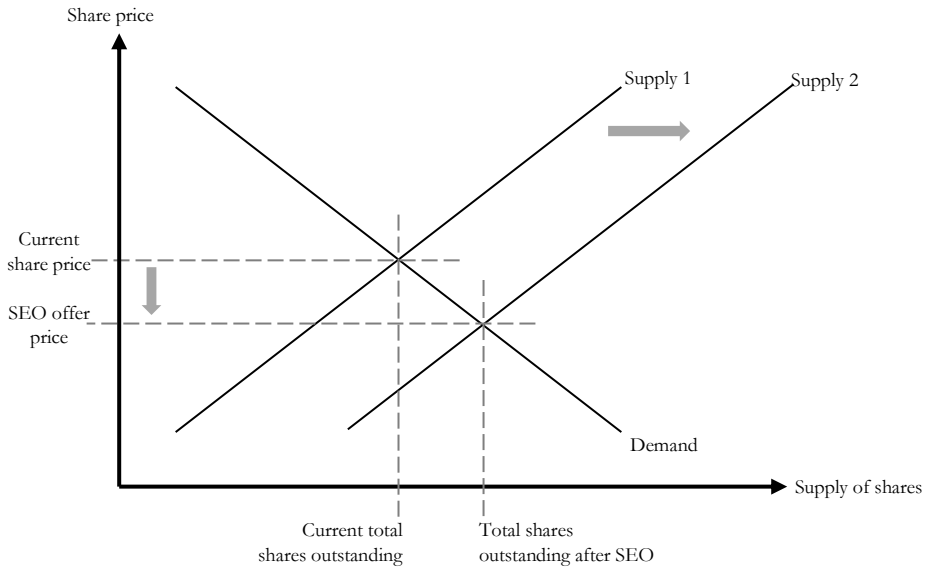

Figure 1. Law of Supply and Demand

More cited theories attempting to explain this negative price reaction include the Adverse Selection or Pecking Order Theory, Agency Theory, Trade-off Theory, and the Market Timing Theory (Jensen and Meckling, 1976; Myers and Majluf, 1984; Masulis and Korwar, 1986; Seetharam and da Cunha, 2018; Chen, Chou and Lin, 2019; Prasad, Bakry and Varua, 2021). According to the Pecking Order Theory, managers do not disclose all available information to investors which results in information asymmetries, similarly managers will only issue new

equity under the guise that the firm is overvalued – thus acting in the best interests of existing shareholders (Myers and Majluf, 1984; McLaughlin, Safieddine, and Vasudevan, 1996). The decision to issue new shares in an SEO is thus a signal to the market that the firm is currently overvalued which results in a negative price reaction.

In the Agency Theory, Jensen and Meckling (1976) postulate that, as utility maximising agents, managers will seek to expand their own utility and thus would only dilute their shareholding in the event that they view the firm as overvalued (Masulis and Korwar, 1986; Chen and Liu, 2021). The Agency Theory relies on the assumption that a secondary sell-down of management shares will often occur simultaneously and that management may not engage in the SEO (Masulis and Korwar, 1986).

The Trade-off Theory posits that after rallies in the share price happen, management teams use more debt to maintain optimal capital structures instead of conducting SEOs (Chen, Chou and Lin, 2019).

Due to the somewhat conflicting nature of the aforementioned rational models, the Market Timing Theory has emerged as a popular alternative Behavioural Finance model. This theory states that managers attempt to time the market by issuing new shares during periods of favourable market conditions and repurchasing shares during adverse market conditions (Seetharam and da Cunha, 2018; Chen, Chou and Lin, 2019). This theory further explains the benefits of continued investment in the firm whilst also showing that shareholders that may enter or exit their positions in the firm are at a detriment (Seetharam and da Cunha, 2018; Chen, Chou and Lin, 2019).

Though extensive literature exists that postulates about the impact of IPO under-pricing on firms' financial and operational performance, similar studies looking at the under-pricing displayed in and around the issuance of subsequent equity offerings, and the effect of decisions regarding the capital structure on firm performance is scarce (Seetharam and da Cunha, 2018). Scarcer yet is literature of a similar nature within the Sub-Saharan African context (Seetharam and da Cunha, 2018). South Africa is a particularly active capital market within this region and is where one of the world's largest stock exchanges by market capitalisation – the Johannesburg Stock Exchange (JSE) – is based (Refinitiv, no date).

The primary objective of this research paper is to investigate how the share price of South African-listed firms is affected by a management team's decision to announce the intention to

undertake an SEO during the 2000 – 2022 period. In this paper, we conducted an event study to capture the market's price reaction after SEO announcements for South African firms. We ran multiple regressions to explore the effect of the discount rate, firm-specific characteristics, and SEO-specific characteristics on SEO-announcing firms' performance.

We found that the trend of a negative price reaction post SEO announcement holds for South African firms. We also found that the level of discounting did not have a significant effect on SEO-announcing firms' performance compared to other characteristics. On the other hand, we found that firm-specific characteristics generally, significantly affect SEO-announcing firms' performance. For example, we found that a firm's size, ROE, and age positively affected the Cumulative Abnormal Returns (CAR), while a firm's volatility had a negative effect on CAR. Lastly, we found that SEO-specific characteristics also significantly affect the firm's performance. For instance, the relative offer size and certain use of proceeds had a negative effect on the CAR.

This paper contributes to the current literature in two ways. Firstly, by studying the share price performance of South African firms announcing issuances of equity during SEOs, this paper expands the geographic reach of the existing literature. Since much of the often-cited literature on this topic relates to country-specific studies, where most firms are listed on the NASDAQ and NYSE, a thorough investigation into the nature of firm performance post-SEO announcement within the South African context is thus a necessary addition to the literature. Secondly, this paper investigates discounting of SEOs and the impact thereof on the short-run share price performance. Knowledge of the company performance, the costs of equity, and the announcement effects of SEOs will help inform managers and shareholders alike of the extent to which SEOs and other forms of follow-on equity instruments are viable tools for achieving corporate goals.

The paper is divided as following: the next section is a review of the existing literature. The data and methodology descriptions are then presented, followed by the results and their discussion and then finally the conclusion thereafter.

II. Literature Review

To incentivise existing shareholders or encourage new shareholders to invest in the company, investment banks will often advise firms to issue new shares at a discount to the

prevailing share price, upon the equity issuance this discount gives rise to possible under-pricing as within the IPO context (Corwin, 2003; Goodwin, 2013). In IPOs, higher share prices after the launch of the IPO compared to the final pricing on the day of IPO give rise to the observed under-pricing. Some studies have shown that average discounts in the mid-1980s to 1990s were 3% but that a trend of increasingly higher discounts were also observed (Mola and Loughran, 2004). This is because, according to Altinkiliç and Hansen (2003), discounting is possibly necessary given the difficulty of attracting new sources of capital – referred to as the Placement Cost Theory. A firm may end up leaving 'money on the table' if shares could have been issued in greater quantities at the announced price or offered at a higher price, whilst maintaining an adequate level of demand (Mola and Loughran, 2004). Investment banks may sometimes advise firms on higher discounts than necessary to ensure deal completion (Corwin, 2003). This mispricing creates a massive opportunity cost to the firm and existing shareholders. A dual principal-agent problem can therefore occur when investment bank advisors act as agents to firm management teams and when, simultaneously, management teams act as agents to the shareholders (Chen and Liu, 2021). In either event, the risks borne from this repeated game and the mispricing fall almost entirely on the shareholders of the company. Getting the correct pricing and associated discount is therefore a very important area of research within Corporate Finance.

Generally, in the event of a dilutive seasoned equity issuance targeted at inviting so-called 'new money' from shareholders, existing shareholders may become disgruntled when shares are offered too cheaply. This means that, unlike IPOs, SEO returns tend to be negative due to the negative market perception (Abdullah and Zaby, 2021). Moreover, shareholder returns for SEOs allows for the observation of two pricing components namely the proposed pricing i.e., the announced price and the final pricing i.e., the actual price offered to investors on the day of the launch of the equity issuance (Altinkiliç and Hansen, 2003). Ideally, the pricing of SEOs should generate sufficient levels of demand whilst not being offered too cheaply. Thus, of particular interest of this paper is to investigate the SEO discounting and the potential reasons behind the underperformance of SEO-announcing firms. This was investigated by Altinkiliç and Hansen (2003) and Corwin (2003). Corwin (2003) specifically showed that on average, SEO firms underperformed by 2.2% during the 1980s and 1990s. Two of the prevailing theories explaining the underperformance of SEOs are the Agency Theory of Free Cash Flows and the Market Timing Theory. Other studies explore the effect that firm-

specific characteristics, SEO-specific characteristics, and the market's volatility have on SEO underperformance.

2.1 Short-run Performance

2.1.1 The Level of Discounting

Discounting in SEOs is defined as the negative percentage difference between the offer price and the closing price on the day prior to the announcement (Goodwin, 2013). Conversely, under-pricing is defined as the ratio between the offer price at the issuance and the closing price at the issuance (Goodwin, 2013). Discounting is divided across an expected discount that is predicted by shareholders and announced by banks in the lead up to the equity issuance and an unexpected discount that is revealed to the public when the final, possibly adjusted, offer price is announced (Altinkiliç and Hansen, 2003). The negative price reaction, or firm's underperformance, implies that investors expect discounting costs, and the larger the discounting, the more negative the price reaction (Altinkiliç and Hansen, 2003). The uncertainty surrounding the SEO issuance, offer sizes, and relative elasticity of stock demand are considered factors that are positively correlated with the level of discounting (Corwin, 2003).

2.1.2 The Agency Theory

Jensen (1986) suggests the principal-agent problem as a reason for SEO underperformance using the Agency Theory of Free Cash Flows. Since a firm's free cash flows are defined as the excess cash after paying for the main costs and operations, the Agency Theory of Free Cash Flows postulates that managers' exploitation of the shareholders combined with the free cash flows brought to the firm by SEOs would most likely lead to a mismanagement of these cash flows (Jensen, 1986). The Agency Problem of Free Cash Flows might be further exacerbated after an increase in cash flows after successful SEO announcements. Hence, investors might be concerned with the potential misuse of SEO cash flows, leading to a negative reaction of the market after SEOs announcements (Jung, Kim, and Stulz, 1996).

Using the above hypotheses, Chen and Liu (2021) applied the Fama-French three-factor asset pricing model to a hierarchical regression to test the effect of SEOs and Return of Capital (ROC) on company performance in Taiwan. They also assumed that the agency problem might

affect SEO's impact on the firms' performance. Chen and Liu (2021) found evidence that SEOs are a result of information asymmetry, signalling negative information to the market in Taiwan. Additionally, smaller firms tend to have less analyst and research coverage, leaving investors generally less informed, which further exacerbates Jensen's (1986) hypothesis of the agency problem (McLaughlin, Safieddine and Vasudevan, 1996).

Additionally, starting from the Agency Theory, Kim and Purnanandam (2014) dug deeper and argued that weak governance is the reason behind the unproductive use of SEO proceeds. They considered Business Combination Statutes (BCS) that were incorporated by some US states as an exogenous surprise that weakens external pressure for good governance (Kim and Purnanandam, 2014). These BCS regulate some transactions like asset sales and mergers and acquisitions between a firm and a shareholder for a determined period, since investors expect the capital raised to be of lower productivity (Kim and Purnanandam, 2014). Their results show that weak governance is the main reason behind investors' negative reaction to SEO announcements, and that investors react more negatively to SEOs of firms affected by the BCS. They also showed a large difference of 1.7 and 2.1% between firms located in states with BCS in place (the treatment group) and firms located in states where BCS is not applied (the control group), which indicates that investors' reaction is positively correlated with the governance's strength.

2.1.3 The Market Timing Theory

The Market Timing Theory emerged from Behavioural Finance argued that managers have internal information on the true fundamental value of their shares and tend to issue new shares only when the firm is overvalued (Seetharam and da Cunha, 2018). Shares tend to be overvalued within periods of high investor sentiment, which is defined as an investor's mood regarding a particular asset or market which plays an important role in indicating the window of opportunity for managers to time the market (Baker and Wurgler, 2006). The investors' mood is related to their psychology and revealed in the market by the price's movements (Baker and Wurgler, 2006). As a result, managers would be timing the market for these periods in a way that they could issue overvalued shares, as mentioned by Jung, Kim, and Stulz (1996).

Baker and Wurgler (2006) developed the investor sentiment index that is often used to test behavioural theories and capture periods of high sentiments. Seetharam and da Cunha (2018) investigated the short-run performance of South African-listed firms through the lens

of investor sentiment indices and used the index to test the Market Timing Theory within the South African context. The logic behind their argument is that uninformed traders tend to copy other investors, potentially enhancing stock mispricing. This indicates that stock prices are overpriced when investor sentiment is high since it attracts uninformed traders into the market and makes them bid for prices above the fundamental value. Since shares deviate from their fundamental value during periods of high investor sentiment and managers attempt to time the market and issue shares when they are overvalued, then investor sentiment significantly affects a firm's decision to conduct an SEO.

Likewise, Chen, Chou, and Lin (2019) examined the impact of investor sentiment on the probability of firms to conduct an SEO using a logit model, and on short-run performance using CAR, and long-run stock price performance using buy-and-hold abnormal returns around SEO announcements and issuances, respectively. They showed that firms undergoing an SEO in periods where investor sentiment is high, document less negative abnormal returns during their issuances. They also found that investor sentiment had a positive impact on the short-run abnormal returns, but a negative effect on the long-run abnormal return after SEOs. Thus, Chen, Chou, and Lin (2019) concluded that investor sentiment is an important factor for a firm to consider before issuing seasoned equity.

2.1.4 Market Volatility and Economic Disruptions

Prasad, Bakry and Varua (2021) implement a study over a similar study period as used in our paper to investigate the volumes and return volatilities of SEOs in Australia during three different economic disruptions (the Dot-Com Bubble, the Global Financial Crisis, and the COVID-19 pandemic). Their findings point towards different industry groups having different volatility and volumes during these economic disruptions – this is further supported by the often-cited work of Masulis and Korwar (1986) and Spiess and Affleck-Graves (1995). This uncertainty in the market during these periods is a potential cause for SEO underperformance since equity being issued in these periods experience high market volatility (Prasad, Bakry and Varua, 2021). In general, economic disruptions tend to result in a negative market reaction since they increase uncertainty in the economy (Prasad, Bakry and Varua, 2021). As an example, the COVID-19 pandemic of 2020 disturbed the market, created fear, and delayed production. Consequently, uncertainty in the market increased and investors became more conservative with their investment decisions. Therefore, some researchers explored the effect of market volatility during periods of uncertainty on the market reaction to SEO

announcements. They conducted their study during these economic disruptions on both an aggregate and industry basis, with the aim of examining the reactions of investors to SEOs throughout times of high volatility. To do so, they too performed an event study and calculated both the abnormal trading volume (AVOL) and the abnormal return volatility (AVAR). AVAR indicates the investors' changing consensus, while AVOL shows the investors' expectations towards SEOs (Prasad, Bakry and Varua, 2021). To account for the time-varying volatility in stock returns, they applied the generalized autoregressive conditional heteroskedasticity (GARCH) effects within the AVAR, which improved accuracy. They provided evidence of the abnormal return volatility being overvalued for some SEO types, while undervalued for others. For instance, standalone and restricted SEOs have higher abnormal returns than combined SEOs. This builds upon the work of Masulis and Korwar (1986) who found that the market reaction is more negative for industrial companies than for public utilities companies.

2.1.5 Firm-specific Characteristics

Studies investigating firm-level characteristics as a driver to SEO underperformance remain scarce (Corwin, 2003; Chen, Chou and Lin, 2019). Commonly studied firm characteristics include the market-to-book ratio, the firm's size, and trading volume. Brav, Geczy, and Gompers (2000) used factor mimicking techniques and portfolio construction methods with firm-level matching to generate a relationship between firms' book-to-market ratios and underperformance in firms issuing SEOs.

In addition, Jung, Kim, and Stulz (1996) showed that firms with high market-to-book ratios generate a much less negative reaction to SEO announcements since firms with high growth tend to manage the newly raised funds better. Similarly, Brav, Geczy, and Gompers (2000) found that small firms with low book-to-market ratios tend to generate the highest underperformance in firms issuing SEOs. Loughran and Ritter (1997) found that SEO-issuing firms are disproportionately represented by high growth firms, which contextually means smaller firms with room for growth, thus reinforcing the findings of Brav, Geczy and Gompers (2000). Likewise, Spiess and Affleck-Graves (1995) found that the smallest, youngest firms with low book-to-market ratios tend to experience the worst underperformance. They also investigated the impact of firm-specific characteristics in the long-run, where they showed that firm size, volume, and book-to-market ratio impact firm's performance in the long-run.

2.1.6 SEO-specific Characteristics

Moreover, a few studies exist that investigate the effect of SEO characteristics on the negative share price reaction. For instance, Akron (2013) conducted an event study on firms in Tel Aviv to investigate the effect of the firm's announced SEO package composition on the market reactions to these announcements. He suggested that the composition of the SEO package, i.e., whether it contains rights issues, options, or even common stocks, serves as a substantial signal to investors since SEOs that consist of only stocks give a no threat signal to existing shareholders. Similarly, the offering package's flexibility – or the combination of derivatives and stocks – sends the same signal as a common stock offering (Akron, 2013). The reason for that, according to Akron (2013), is that when it comes to the balance of power and ownership in Tel Aviv, it is not fully certain that there is a threat to existing shareholders. On the other hand, stock and options packages have a negative market reaction since they might benefit the existing shareholders (Altinkiliç and Hansen, 2003).

In their analysis of the market reaction around SEO announcements in Thailand, Abdullah and Zaby (2021) found that medium offer sizes and longer windows between announcement and issuance resulted in a high negative Cumulative Abnormal Return (CAR), which is the sum of all abnormal returns within the event window. The abnormal return is the difference between actual and expected return, making it the deviation from the expected return of an investment. In addition, they found that the share price performance declined after the announcement of an SEO but soon recovers in the lead-up to the issue.

2.2 SEO Performance in the Long Run

Lastly, many researchers investigated the share price performance of firms' subsequent SEO announcements in the long run. da Cunha and Seetharam (2018) investigated the long-run performance of South African firms after SEO issuances and found the results to be inconsistent with the existing literature where rational models were supported in the South African context but not the market timing model. da Cunha and Seetharam (2018) suggested that using a *use of proceeds* explanatory variable could improve and expand the literature within the South African context. They tried to understand the reason behind manager's exploitation by using long-run stock returns after SEOs to determine whether a rational or behavioural explanation exists for SEO underperformance. Their conclusion is consistent with the Pecking Order Hypothesis and supports the Agency Theory of Free Cash Flows.

2.3 Contribution to the Literature

Beyond the lack of a large body of literature on firm-level characteristics and SEOs, the literature on Africa and specifically South Africa is extremely limited and essentially restricted to two papers by the same authors da Cunha & Seetharam (2018) and Seetharam & da Cunha (2018). Therefore, our study adds to the literature by exploring the short-run performance of South African firms around their SEO announcements. Since event studies are mainly used to measure the economic effects on a firm's value by investigating the price changes before and after that period, we use this methodology to investigate SEO-announcing firms' underperformance by analysing the share price performance pre- and post-SEO announcement. Given the existing literature we expect to find a negative share price reaction around SEO announcements in South Africa, observed in a negative overall CAR. Given the strong firm and SEO characteristics effects shown in previous papers, we also expect to observe the effect of firm and SEO characteristics to be relevant to the SEO's underperformance. Again, the main aim is an investigation into the discount rate, where we expect to observe that an increase in the discount should result in a more negative price reaction.

III. Data and Methodology

3.1 Sample Selection and Data Collection

This paper uses the Bloomberg Capital Markets Screener function to source SEOs broadly announced in South Africa between the 1st of January 2000 until the 31st of March 2022. This period is chosen as it captures company announcements and performance across different relatively recent event periods. The 'Dot-Com Bubble' of the early 2000s, the Global Financial Crisis, and the SARS-CoV-2 or COVID-19 pandemic are all captured in this study period. This study period is potentially useful within the South African context because these economically disruptive periods have caused greater SEO abnormal return volatility and increased trading volumes during the event windows (Prasad, Bakry and Varua, 2021). Additionally, data on South African company announcements is also not reliably or easily available prior to 1998 (da Cunha and Seetharam, 2018). Similarly, we found that data pertaining to the estimation window prior to 2000 was difficult to come by, for this reason our sample includes SEO announcements from 2001 until 2022.

The Johannesburg Stock Exchange has enjoyed success as the unopposed and favoured listing destination in South Africa. Given the historic dominance of the JSE, the assumption in this paper is that shares listed on smaller, competing exchanges are inconsequential to the ultimate data collection. Given that many of the companies listed on the alternative exchanges are secondary listed or small and mid-cap companies, their use of capital raising techniques discussed in this paper is likely very limited.

All firms that made announcements within South Africa are included in the sample, regardless of their possible eventual delisting or whether they are secondarily listed in South Africa. The inclusion of firms that eventually delist according to da Cunha and Seetharam (2018) is preferable to avoid issues with survivorship bias in the data. Had we opted to include only firms still listed as at the time of writing this paper, we may have observed less negative price reactions, which would be a direct confirmation of survivorship bias in the sample. Subsequently, the performance of such firms is only included up until such a point that they remain listed on the Johannesburg Stock Exchange.

In selecting the screening criteria used to collect the data, "Additional Offering", "Rights Offering", "Primary Share Offering", "Best Efforts Offering", "At the Market", and "Bank Conversion Bank" were selected from the global screener. Bloomberg further allows for a "Local Market" screener which further narrows the possible deal types by geographic relevance. Many of the local market screening options overlap with other types of deals, like *Rule 144A* or *Reg* S placements being subtypes of accelerated bookbuild capital raises and not standalone transactions (Katz, 1998; SEC, 2013; ISIN, no date). Due to this overlap, the full scope of the local market criteria was included, since any local market criterion that was only relevant to say an IPO, would have already been excluded under the assumption that no IPOs were included in the data to begin with.

The sample sizes of similar research papers vary widely. In research delving into highly developed markets such as that of the United States of America or Western Europe, sample sizes are generally much larger. With a period starting in 1975, Spiess and Affleck-Graves (1995) and Brav, Geczy and Gompers (2000) use US-listed SEO announcement samples of 1,247 over a period of 14 years and 4,526 over a period of 17 years, respectively. Similarly, McLaughlin, Safieddine and Vasudevan (1996), use a sample of 1,296 SEO announcements for firms listed on the NASDAQ, NYSE, and AMEX for a period of 11 years starting in 1980, Corwin (2003) uses 6,637 announcements during 1980 – 1998 whilst Chen, Chou, and Lin

(2019) use a sample of 7,195 from the same exchanges for a 40-year period starting in 1970. Contrasted with developing markets, the sample sizes employed in developing economies are considerably lower. Seetharam and da Cunha (2018) and da Cunha and Seetharam (2018) use the same sample of SEO announcements on the JSE with 152 announcements from 79 firms. Using the Taiwanese market, Chen and Liu (2021), use a sample of 900 SEOs for 17 years starting in 2000. Chen, Chou, and Lin (2019) however use 149 announcements over a 10-year period starting in 2009 in their investigation of the short-run stock performance of firms announcing SEOs on the Stock Exchange of Thailand.

The resultant sample of firms announcing SEOs in South Africa, used in this paper, since 2000 is 493 – this is considerably higher than expected when compared to similar studies. It should be noted that Seetharam and da Cunha (2018) however exclude financial and regulated utility companies from their sample. Share price and firm-level data as well as data needed in the asset pricing modelling are sourced from Refinitiv Eikon, and Bloomberg. After cleaning and removing events with no information such as offer price or share price data and removing all SEO announcements made by the same firm within 2-years of another announcement, our sample size is reduced to 209 announcements from 153 companies – in line with similar literature.

Finally, in implementing the Capital Asset Pricing Model, we collected market return data from Bloomberg and risk-free interest rate data from the South African Reserve Bank website. The market return is represented by the FTSE/JSE Africa All Share Index, whilst risk-free rate is proxied by the daily-adjusted monthly 3-month Johannesburg Interbank Average Rate which is a money market reference rate (South African Reserve Bank, 2021). The FTSE/JSE Africa All Share Index represents 99% of the total pre-free float market capitalisation-weighted shares listed on the Johannesburg Stock Exchange (Bloomberg, no date).

3.2 Research Method

Like the approach employed in much of the prior literature on the performance of firms after undertaking SEOs, this paper also employs an event study methodology to the topic (Masulis and Korwar, 1986; Spiess and Affleck-Graves, 1995; Brav, Geczy and Gompers, 2000; Corwin, 2003). Using the event study methodology necessitates the selection,

identification, and comparison of the share price performance at the SEO announcement – the event window where actual returns are computed – against the expected share price performance in the normal course of business – the estimation window (Prasad, Bakry and Varua, 2021).

Prasad, Bakry and Varua (2021) use a meta-analysis approach to define the event window as 15 days prior to and after the announcement of the SEO or [-15, +15]. Abdullah and Zaby (2021), however, found that the event window's length does not follow any specific rules and defined their event window as 30 days before and after the SEO's announcement. In other words, abnormal returns 30-days prior to the event day are considered irrelevant, and, within 30-days of the event, all relevant price information had been accounted for by the market price (Abdullah and Zaby, 2021). Because of this, we specify the event window over four different time horizons namely [-5, +5], [-10, +10], [-15, +15], and [-30, +30]. These event windows look at the number of respective trading days on either side of the announcement date of the SEO to observe the SEO announcement's effect.

The choice of the SEO announcement date is not an ideal event for the purposes of a rigorous study as there may be multiple separate, but still related announcement dates (Abdullah and Zaby, 2021). Related to this is an issue of multiple announcements relating to the same transaction, namely "Rump Placements" are accelerated bookbuilds that are announced and placed post a rights issuance when sufficient investor demand is not met. Despite this, the purpose of this study is to investigate the short-run performance of firms based on the initial market reaction to the news of an expected SEO and the associated discount rate. The announcement date is therefore chosen as the most relevant event and is supported by previous literature on the subject (Masulis and Korwar, 1986; da Cunha and Seetharam, 2018; Seetharam and da Cunha, 2018; Prasad, Bakry and Varua, 2021).

The estimation window is determined independently but still in relation to the event window. The estimation window is chosen as a maximum of the preceding 180 trading days leading up to the event window – representing approximately six months' worth of stock market data as the basis for ascertaining the baseline share price performance. An estimation window longer than six months, though containing more observations, may be affected by noise of other significant company events (Abdullah and Zaby, 2021). The estimation window bounds are thus [-210, -31].

A common method for testing the effect of an explanatory variable is to use a cross-sectional regression that relates the abnormal returns observed, to issuance-, firm-, or industry-specific metrics (Masulis and Korwar, 1986; Brav, Geczy and Gompers, 2000; Corwin, 2003; da Cunha and Seetharam, 2018; Chen, Chou, and Lin, 2019). Within the contexts of this study, the discount rate is an issuance-specific characteristic and is also commonly related to the offer day under-pricing – the difference being that the discount is observed at SEO announcement, whilst the SEO under-pricing is observed at the actual launch of the SEO (Corwin, 2003).

Since companies announce their proposed SEO pricing in various ways, determining an exact discount or under-pricing is difficult. As discussed earlier, firms may choose to frame the discount on the current offering as a discount to the prior days' closing price, the 30-day VWAP or some other share price metric. To circumvent this, we define the SEO discount as the relative difference between the announced offer price and the previous days' closing price (Altinkiliç and Hansen, 2003; Goodwin, 2013). This is specifically chosen as some companies announce their SEO during the trading day where immediate price changes can occur, whilst other firms announce after the close of markets, resulting in changes only occurring on the following day.

The abnormal return of firm *i* at time *t* is the difference between the realised, actual return during the event window and the expected return at time *t* in the event window as estimated by the market model. The coefficients of α and β are calculated using the Capital Asset Pricing Model (CAPM). This market model of abnormal returns is therefore given by equation (1):

$$ar_{it} = r_{it} - E(r_{it}) = r_{it} - (\hat{\alpha} + \hat{\beta}(r_{mt} - rf_t)) \quad (1)$$

r_{it} represents the daily returns of each firm, r_{mt} market return, and rf_t is the risk-free rate.

An alternative to this CAPM market model is the Fama & French (1992) Three-factor Asset Pricing Model. As with the CAPM formula the expected returns are calculated during the estimation window and use the company risk premium, and α, which is like Jensen's alpha and is a measure of the excess return of the share. In addition to the market risk premium, the other two factors that make up this alternative model are the size premium (SMB), and the value premium (HML) (Chen and Liu, 2021). Chen and Liu (2021) compared the Fama & French (1992) Three-factor Asset Pricing Model and the Capital Asset Pricing Model (CAPM) and acknowledged that the explanatory power of the market risk premium improves from 70% to 90% when using the three-factor model. This model, however, comes at the expense of potential lack of data on the factors. The detailed breakdown of the factors on the South African

market are severely limited prior to December 2002, which occurs after the start of our sample period. Similarly, Kenneth French's Data Library does not provide a specific breakdown of these factors on the South African market and relies, instead, on more generic Emerging Markets factors. Whilst the manual calculation of the factors is possible, we believe this to be beyond the scope of this paper.

The explanatory power of this three-factor model is generally accepted as more comprehensive and better, but another alternative used by both Seetharam and da Cunha (2018) and Chen, Chou, and Lin (2019) is a reduced market-adjusted model based on the Sharpe and Lintner Capital Asset Pricing Model. This market-adjusted model assumes an α of 0 and β of 1. The reduced model of abnormal returns may however be too restrictive within the contexts of the assumptions underpinning the values of α and β – namely that there would be no expected excess returns and that the share price is perfectly correlated on a one-to-one basis with the market risk premium. Due to both the three-factor and reduced market models having their limitations, we have instead opted for the initial formulation of CAPM as presented in equation (1).

Accordingly, the dependent variable in the study is the Cumulative Abnormal Returns (CAR) defined by equation (2):

$$CAR_i = \sum_{t=k}^{m} ar_{it} \qquad (2)$$

The CAR for time periods *k* through *m* is the summation of the abnormal returns across all days within the specific event window for each of the n firms announcing SEOs in South Africa. Testing the CAR will allow for the observation of the overall market reaction to SEO announcements (Seetharam and da Cunha, 2018; Chen, Chou, and Lin, 2019). Buy-and-Hold Abnormal Returns are another commonly used return metric within the event study framework but is primarily used in studies investigating the long-run performance of firms (da Cunha and Seetharam, 2018; Chen, Chou, and Lin, 2019). Distributionally, CAR is also better understood and has more convenient test statistics (Brav, Geczy and Gompers, 2000). Similarly, buy-and-hold abnormal returns may magnify underperformance due to compounding as well as create more spurious rejections of market efficiency (Brav, Geczy and Gompers, 2000).

Finally, an OLS regression is used to determine the short-run impact of the SEO announcement and associated discount as well as other SEO-specific and firm-level characteristics on the share price. The associated regression equation is given by equation (3):

$$CAR_i = \boldsymbol{\alpha} + \boldsymbol{\beta} \times \boldsymbol{X} + \varepsilon_i \qquad (3)$$

Where CAR_i is the firm abnormal returns and **X** is a vector of factors including the likes of the constructed discount, the firm size, the use of proceeds, industry, and offer size as a percentage of market capitalisation as an indication of liquidity, in line with various prior studies on the topic (Masulis and Korwar, 1986; Spiess and Affleck-Graves, 1995; McLaughlin, Safieddine and Vasudevan, 1996; Brav, Geczy and Gompers, 2000; Seetharam and da Cunha, 2018; Chen, Chou and Lin, 2019).

3.3 Variable Selection

In this section, we explain the reason behind our choice of variables. We chose the variables that help us investigate the effect of equity issuance announcements, firm-specific, and SEO-specific characteristics on the share price performance.

First and foremost, since we are conducting an event study, we chose the CAR as our dependent variable to capture the firm's share price performance before and after equity issuance announcements. Since the main objective of this paper is to understand the level of discounting's impact on the share price performance, we included the discount rate as a key independent variable and considered it our primary variable. This variable is almost always used by studies investigating the effect of the discount rate on SEO performance (Goodwin, 2013; Altinkiliç & Hansen, 2003)

Furthermore, studies exploring the effect of firm-specific characteristics often investigate the effect of a firm's size on SEO performance. To do so, they used variables like book-to-market ratios and volume (Corwin, 2003; Chen, Chou, and Lin, 2019; Abdullah and Zaby, 2021; Jung, Kim, and Stulz, 1996). To test the effect of firm-specific characteristics such as firm's size and liquidity on SEO performance, we chose to use the natural logarithm of the market capitalisation, the free float, and the turnover rate (the trading volume on the day before the announced SEO scaled by the total market capitalisation). We also explored the effect of other firm characteristics on SEO performance and included the following variables: volatility, ROA (a profitability measure), and ROE (a profitability measure). In other words, these

variables will help us capture the effect of the firm-specific characteristics on firms when they announce SEOs.

As other studies investigated the effect of SEO-specific characteristics on SEO-issuing firms' performance, they controlled for SEO volume and composition package (Akron, 2013; Abdullah and Zaby, 2021). We decided to include SEO-specific characteristics, such as relative offer size, offer type, and the use of proceeds. The relative offer size is scaled by market cap and is measured as a percentage. The offer type is a categorical variable that distinguishes between rights issues and accelerated bookbuild offerings or ABOs.

Lastly, the use of proceeds distinguishes between different reasons that firms provide as a reason for why the need to issue equity. For example, some firms issue equity to conduct mergers and acquisitions, pay back debt, engage in mining and exploration, or other general corporate finance purposes. The use of proceeds categories encompassed many different and often inter-related descriptions. The descriptions were vague, other than the classifications that refer directly to only one offer type such as "M&A Financing" or "Repay Loan". To avoid issues of double counting and collinearity, announcements that mention M&A Financing or General Corporate Purposes as the first category for the use of proceeds were recoded to "M&A" and "General Corporate Finance", respectively. These two groups form the largest proportion of SEOs within our sample accounting for 33.3% and 35.2% of announced SEOs, respectively. Any use of proceeds that describes some form of repayment of debt or repayments due to selling shareholders were recoded into a single category. This new category for debt and shareholder repayments accounts for 22.2% of the announced SEOs. Finally, all announcements that specifically reference "Other" as the primary category or refer to "Mining & Exploration" as a use of proceeds were joined together to account for the final 9.3% of announced SEOs.

3.4 Descriptive Statistics and Correlation Matrix

Some researchers like Abdullah & Zaby (2021) (Akron, 2013)used an event window of [-30, +30] around the announcement days. Shorter windows like [-15, +15] have been used in previous studies such as Prasad, Bakry and Varua (2021). The market often needs more time to process an event, and some information leakage might occur before the estimation date. At the same time, longer event windows may carry more noisy data (Krivin, Patton, Rose, and Tabak, 2003).

Hence, to understand the most suitable event window we plotted the Average Abnormal Returns (AAR) in figure 2. This is the Abnormal Returns for each day across all firms within our sample and show us that although we would expect to only see one large negative movement close to the announcement date, we see many erratic movements. The largest price movement however comes approximately three and five days after the SEO announcement, with a positive and negative movement respectively. Figure 2 potentially shows us that all these event windows may provide some useful information and possible inference.

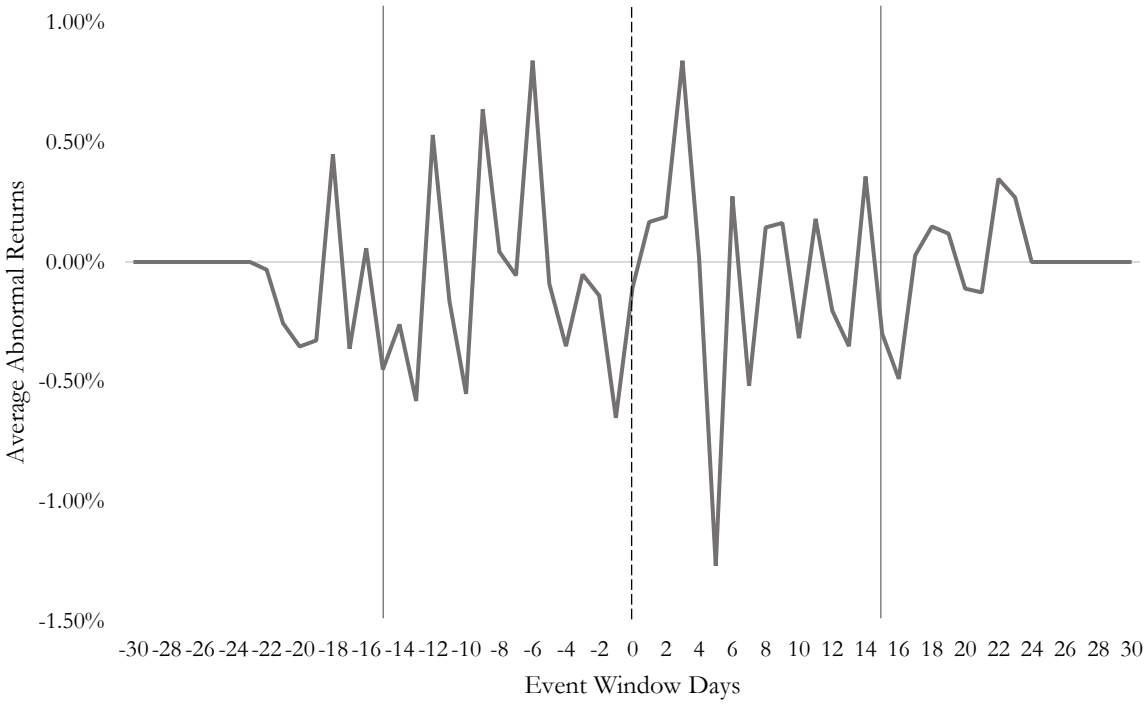

Figure 2. Average Abnormal Returns

As a result of this graphical investigation, we calculated the Cumulative Abnormal Returns within four event windows: [-5, +5], [-10, +10], [-15, +15], and [-30, +30]. We then ran different regression specifications on CAR within these different event windows. We refer to CAR with an event window of [-5, +5] as CAR 5, CAR with an event window of [-10, +10] as CAR 10, CAR with an event window of [-15, +15] as CAR 15, and CAR with an event window of [-30, +30] as CAR 30.

We ran the single sample t-test to check whether the sample CARs are significantly different from zero. The null hypothesis claims that the CAR is not different from zero, while three alternative hypotheses are provided stating that CAR is less than zero, that the CAR is different from zero, and that CAR is larger than zero. The results of these t-tests are presented in Table 1. We do not reject the null hypothesis for all four CARs, meaning that each one of

the CARs is not different from zero at the 5% level. The initial results of this test show that within the population of SEO announcements in South African firms we are unlikely to see a significant share price announcement effect in the short run.

Table 1. Single Sample t-test of Cumulative Abnormal Returns

	Degrees of Freedom	CAAR (mean)	Standard Deviation	t-statistic	Pr(T<t)	Pr(|T|>|t|)	Pr(T>t)
CAR5	208	-1.45%	0.1550	-1.3516	0.0890	0.1780	0.9110
CAR10	208	-0.79%	0.2687	-0.4252	0.3356	0.6711	0.6644
CAR15	208	-2.03%	0.3371	-0.8710	0.1924	0.3848	0.8076
CAR30	208	-2.67%	0.4220	-0.9148	0.1807	0.3614	0.8193

The mean of the CARs is referred to as the Cumulative Average Abnormal Return (CAAR) and is presented in both Table 1 and Appendix A. CAAR 5, CAAR 10, CAAR 15, and CAAR 30 were -1.45%, -0.79%, -2.03%, -2.67%, respectively. The standard deviations of the four CAARs are equal to 0.1550, 0.2687, 0.3372, 0.4220, respectively, showing a relatively large dispersion in the Cumulative Abnormal Returns around the mean, relative to the size of the mean. The CAR show large ranges. For instance, the CAR 15 had a minimum of -2.43 and a maximum of 2.07 – these large CARs were attributed almost exclusively to companies with low share prices and low liquidity. As mentioned above, the Cumulative Abnormal Return was computed by calculating the difference between the actual and expected return. This indicates that on average, the actual return was lower than the expected return for the companies included in our study – indicating a negative share price reaction to the announced news – though this reaction is not statistically significantly different from no abnormal return.

The Return on Equity (ROE) is a measure of financial performance calculated by dividing the net income by shareholders' equity. In our study, we had 209 observations with ROE values with a mean of -0.41%, signifying a net negative income and a standard deviation of 0.53. This contrasts with the Return on Assets (ROA), which is considerably low with a mean of 1.52% and a standard deviation of 0.15. ROA is considered a profitability ratio that shows how a firm best uses its assets to generate profits. In this case, the low ROA average indicates that the companies are not putting their assets to their best use to generate profits. This is somewhat aligned with the Agency Theory of Free Cash Flows where managers conduct an SEO as a source of free cash flows, but do not put the cash flows into productive use. In other words, the free cash flows generated by equity issuances might be used in the managers' best interest instead of being used in investments opportunities. Moreover, it is crucial to note

that some managers do undertake investment opportunities using the cash flows, but not in the best interest of the existing shareholders. For instance, some managers might acquire another company in the goal of building an empire, which allows them to become managers and/or CEOs of big companies. However, these acquired companies might not necessarily have a strong fundamental value, which is again reflected by the low ROA.

Discounting has become more prevalent throughout the years where underwriters convince firms' shareholders to issue shares at a discount to increase demand (Mola and Loughran, 2004). This would attract investors and push them to take a risk and invest in the firm. Accordingly, the discount had a mean of -0.098. This means that shares were sold at around a 10% discount: the offer price was around 10% less than the price prior to the announcement day. This is considerably higher than the approximately 3% observed by Corwin (2003) during the 1980s and 1990s. A possible reason for greater discounting in the South African context is the lack of a financial market that is as sophisticated as that of more developed countries and greater in-country Economic or political risks.

In terms of firm's characteristics, we use the natural logarithm of both the market cap and age variables. These two variables were highly skewed, and the logarithm function transformed this skewness in the dataset into a more normalized form. However, in the description, we stick to interpreting the original values. The firms' age has a range of 124 years, with a minimum of 0 (newly founded firms at the time of announcement) and a maximum of 124. This newly founded firm is a lost observation due to the natural logarithm of the firm age being the form of the variable used. The mean and median of our 209 companies' age was 28 and 17 years at the time of issuance, respectively, and had a standard deviation of 27.6 (Table 2). This indicates that among the companies listed on the JSE, those who issue equity tend to be more mature firms. In addition, these firms are large as reflected by the market capitalisation mean of ZAR17.98 billion. This is aligned with the relatively high mean free float these firms have (63.49%). Lastly, these firms had a low mean volatility and standard deviation of 0.043 and 0.048, respectively. This signifies that these firms' share price do not drastically fluctuate daily in the market.

It is crucial to note that we scaled some of the variables to provide better comparability across variables. For instance, we used the turnover rate, defined as the volume divided by market cap, and considered it as an alternative proxy for the firms' liquidity. This makes it more comparable and accurate as a liquidity measure. For 178 observations, the turnover rate

had a mean of 0.12% and a standard deviation of 0.67%. We also scaled the offer size by market cap to obtain the relative offer size. This measure had a mean of 38.97% of the market, a minimum of 0.06%, and maximum of 675% of the market cap, indicating a range of very small to very large offer sizes.

Overall, the main objective of our paper was to analyse the underperformance of firms post-SEO announcements. This can be done by tracking CAR and its relation to other variables. Thus, we turn to our correlation matrix to understand the correlation between the variables we have opted for in our paper, as shown in Appendix B. The four CARs in the four different event windows are all positively correlated with the market cap, turnover rate, ROA, and relative offer size. This means that as CAR increases, the other variables increase, and *vice versa*. However, we found no significant correlations. On the other hand, other variables like offer type, volatility, and the use of proceeds tend to have positive correlation with a CAR in one event window, yet a negative correlation with another CAR in another event window. The correlation matrix also allowed us to capture the correlations among the independent variables. This can help us avoid multicollinearity, where independent variables with high and significant correlation should not be included in the same regression. We found no such large and significant correlations between our variables.

Some of the correlations shown in the correlation matrix defeat our expectations. We expected to find a high correlation between ROA and ROE because both are profitability measures. Though these 2 variables had a significant correlation of 50%, we consider a high correlation to be above 70%, and thus we did not consider ROA and ROE to be highly correlated – therefore allowing the simultaneous inclusion of both variables in a regression specification. In contrast, other correlations did meet our expectations. For instance, we did expect ROA and CAR to be positively correlated. This is in accordance with the Agency Theory of Free Cash Flows. In other words, we believed that firms with high ROA tend to put their assets into the best use. As a result, they are expected to also manage the free cash flows in an optimal way, enhancing SEO performance. Despite this, we believe that it is not necessary to simultaneously include two profitability measures, so we opted to only investigate the effects of ROE. Similarly, the results of the correlation matrix met our expectations again when it came to the correlation between volatility and CAR. A firm with high volatility is considered risky, which negatively affects SEO performance.

Lastly, it is noteworthy to mention that even though many significant correlations were observed, none of them are considerably high. For instance, the log of market cap is significantly correlated with most of the variables. In particular, the log of market cap is significantly and positively correlated with the log of age, ROE, ROA, free float, and use of proceeds. Some of these results were expected since, for example, a bigger firm tends to be older. In contrast, the log of market cap is significantly and negatively correlated with turnover rate, relative offer size, and volatility. But, again, all these correlations are below 75%, so we do not consider them to be high.

3.5 Tests for Presence of Homoscedasticity

Appendix C presents the residuals of CARs 5, 10, 15, and 30 plotted against the fitted data. From the residual scatter plots, it is not immediately evident that homoscedasticity is present in our data. To ascertain the presence of heteroscedasticity more formally, we conducted the Breusch-Pagan test, as presented in Table 2. The null hypothesis states that the residual's variance is constant. The p-value is large for CAR 5; thus, we do not reject the null hypothesis of homoscedastic data. On the other hand, since the p-values we attained are small for the other event window sizes we reject the null hypothesis of homoscedasticity at the 1% level, in favour of heteroscedastic variance. In the presence of heteroscedasticity, OLS coefficients remain efficient and unbiased, but the standard errors' estimators become biased. To deal with heteroscedasticity we used robust standard errors. This allowed us to obtain unbiased standard errors for the estimated coefficients, in the presence of heteroscedasticity.

Table 2. Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity

	Chi squared	Pr (X>Chi2)
CAR5	0.23	0.6318
CAR10	7.66	0.0056
CAR 15	30.42	0
CAR 30	118.35	0

IV. Results

Firstly, we ran our first regression in Table 3 that includes CAR 5 as the dependent variable for the model. We reran the same model in regressions 2, 3, and 4, but with CAR 10, 15, and 30 as the dependent variable, respectively. In these four regressions, we only include

SEO-specific characteristics such as the discount rate, the relative offer size, use of proceeds and both industry and year (2001 until 2022) as fixed effects variables. The industry and time fixed effects do not change or change at a constant rate, making them constant across the firms in our sample. Therefore, the industry and time fixed effects control for the differences in a way that affects all firms, within the respective category, in the same way. Also, variables like age, size – proxied by the market cap, and volatility can change over time and across industries. These four models explain around c.40% to c.60% of the data. Model 4 has the highest R-squared of 58.7%, meaning that it explains nearly 60% of the variation in the data. Though the event window of [-30, +30] captures more data, it also contains a lot of noisy data since it is the longest compared to other windows. However, it is surprising that model 2 had a lower R-squared than the model 1 and 3. Yet, one can argue that an event window of [-5, +5] contains the least noisy data, which is why model 1 explains the data relatively well (42.6%). We believe that [-15, +15] is the most ideal event window since it captures a reasonably high amount of variation in the data without too much noise and consider model 3 as the best model to explain our data. This pattern of being one of the better performing event windows carries through to other model specifications too. As such the results discussion that follows focuses on this event window.

Among the independent variables, the level of discounting had a coefficient of 0.210, which is statistically significant at the 10% level but not at the 5% level. According to our discounting definition, which accounts for offer price premiums as positive numbers and discounts as negative numbers, there's less than a 10% chance that the "true" effect of the discount rate on the share price performance is zero. This means that SEO-announcing firms perform worse as their discounts increase. Our findings are in accordance with Altinkiliç & Hansen (2003) who showed that a higher level of discounting leads to a more negative price reaction. Furthermore, the relative offer size showed a coefficient of -0.013 that is not significant at the 5% level. This means that a 1 percentage point increase in the relative offer size would decrease CAR 15 by 1.3 basis points. This is somewhat aligned with Abdullah & Zaby's (2021) findings that medium sized SEOs tend to have the worst underperformance, followed by big sized SEOs. Moreover, use of proceeds for mining and exploration purposes had a positive coefficient. However, use of proceeds coefficients representing M&A and debt repayment purposes showed negative coefficients. This can be explained by the Agency Theory arguing that firms engaging in M&A activities do not always do so in the best interests of shareholders (Kim and Purnanandam, 2014).

Secondly, we ran four more regressions (5-8) in Table 3 that includes CAR 5, 10, 15, and 30 as the dependent variable for each model, respectively. This time we only control for firm-specific characteristics variables: free float, log of age, ROE, turnover rate, volatility, log of market cap and control only for the industries as a fixed effects variable. These four models explain around c.12% to c.26% of the data. Model 4 had the highest R-squared of 25.9%, meaning that it explains 25.9% of the variance in the data. However, as we previously discussed, the event window of 30 days before and after the announcement date contains a lot of irrelevant data. The 3rd model had the 2nd highest R-squared of 15.2%, and since it contains less irrelevant data, we consider it the best model to explain our data. Our results showed that the market cap variable had a null coefficient, indicating that the firm's size had no effect on CAR, within the context of this model specification. The turnover rate had a positive and significant coefficient of 5.495 at the 5% level. This indicates that firm's liquidity positively affects SEO-announcing firms' performance. Additionally, age showed a positive effect on CAR, where for every 1% increase in age, the CAR increases by 1.41 basis point. In other words, the results indicate that the more liquid and the older the firm is the more these factors enhance the SEO-announcing firm's performance, which is aligned with the finding of Spiess & Affleck-Graves (1995).

Furthermore, ROE's coefficient is significant at the 5% level. This relationship is in contrast with the Expectations Treadmill theory that states that firms cannot continue to outperform expectations and that if a firm has a good ROE relative to other firms, that their management and performance should be satisfactory enough to not require additional cash flows (Dobbs and Koller, 1998). In addition, volatility showed a negative coefficient of -1.623, which was not significant at the 5% level. This implies that a one percentage point increase in the daily volatility during the estimation window leads to a 1.623 basis point drop in CAR.

Afterward, we ran regressions 9-12 in Table 3, which are OLS regressions with CAR 5, 10, 15, and 30 as the dependent variable for each regression. The independent variables included the discount rate, some firm-specific characteristics (volatility, ROE, and turnover rate), and an SEO-specific characteristics (relative offer size). We did not include time nor industry fixed effects. For the same reasons previously discussed, we again considered the model with CAR 15 as the dependent variable (model 11) to be the best at explaining our data. This model showed the same effect of the aforementioned variables on CAR15 discussed in previous models, except for the discount rate. In this model, the discount rate had a negative coefficient of -0.035, but it was not significant at the 5% level.

Table 3. Regression Output

VARIABLES	(1) Fixed Effects on CAR5	(2) Fixed Effects on CAR10	(3) Fixed Effects on CAR15	(4) Fixed Effects on CAR30	(5) Industry Fixed Effects on firm CAR5	(6) Industry Fixed Effects on firm CAR10	(7) Industry Fixed Effects on firm CAR15	(8) Industry Fixed Effects on firm CAR30	(9) OLS on firm CAR5	(10) OLS on firm CAR10	(11) OLS on firm CAR15	(12) OLS on firm CAR30	(13) Fixed Effects on CAR5	(14) Fixed Effects on CAR10	(15) Fixed Effects on CAR15	(16) Fixed Effects on CAR30	(17) FE on firm CAR5	(18) FE on firm CAR10	(19) FE on firm CAR15	(20) FE on firm CAR30
Discount Rate	-0.014	0.195*	0.210*	0.307**					-0.039	-0.001	-0.035	-0.076	-0.044	0.002	-0.015	-0.064	-0.035	0.006	-0.027	-0.063
	(0.098)	(0.107)	(0.122)	(0.115)					(0.042)	(0.058)	(0.067)	(0.077)	(0.028)	(0.047)	(0.050)	(0.064)	(0.032)	(0.046)	(0.052)	(0.057)
Relative Offer Size	0.039	-0.017	-0.013	-0.079*					-0.004	-0.027**	-0.042***	-0.045***	0.014	0.025	0.011	0.032	0.004	-0.004	-0.025	-0.015
	(0.029)	(0.040)	(0.049)	(0.045)					(0.010)	(0.011)	(0.011)	(0.016)	(0.009)	(0.026)	(0.030)	(0.037)	(0.012)	(0.016)	(0.017)	(0.020)
Use of Proceeds: M&A	-0.051	-0.075	-0.131	-0.163*																
	(0.037)	(0.076)	(0.078)	(0.082)																
Use of Proceeds: Other	0.098	0.105	0.081	-0.091																
	(0.171)	(0.180)	(0.187)	(0.126)																
Use of Proceeds: Repay Debt	0.039	-0.045	-0.076	-0.213**																
	(0.044)	(0.064)	(0.067)	(0.085)																
Offer Type: Rights Issue													-0.042	-0.034	-0.035	-0.121				
													(0.030)	(0.045)	(0.064)	(0.082)				
Log Market Cap					0.003	0.005	0.000	0.009									0.005	0.015	0.006	0.015
					(0.007)	(0.007)	(0.009)	(0.010)									(0.007)	(0.010)	(0.011)	(0.013)
Log Age					0.006	0.022	0.014	0.017												
					(0.009)	(0.017)	(0.018)	(0.020)												
Turnover Rate					2.788***	1.512	5.495***	6.256***	2.535***	1.660**	5.857***	6.638***					3.459***	2.454**	7.129***	7.035***
					(0.798)	(0.939)	(1.584)	(1.940)	(0.900)	(0.726)	(0.937)	(1.531)					(0.816)	(1.163)	(1.298)	(1.906)
ROE					-0.024	0.023	0.071**	0.042	-0.007	0.022	0.071	0.082					-0.015	0.000	0.112*	0.110
					(0.033)	(0.039)	(0.035)	(0.039)	(0.035)	(0.043)	(0.047)	(0.054)					(0.049)	(0.048)	(0.063)	(0.070)
Volatility					-0.928**	-0.990*	-1.623	-2.793*	-0.838*	-0.888*	-1.498	-2.622*					-0.982**	-1.099**	-1.777	-2.886*
					(0.437)	(0.52)	(1.328)	(1.623)	(0.476)	(0.512)	(1.273)	(1.572)					(0.419)	(0.544)	(1.262)	(1.573)
Free Float					-0.049	0.008	0.015	-0.028												
					(0.036)	(0.044)	(0.054)	(0.059)												
Constant	-0.098***	-0.155***	-0.116***	-0.228***	-0.025	-0.109	0.008	-0.139	0.014	0.024	0.034	0.075	0.007***	0.087***	-0.099***	-0.142***	-0.064	-0.202	-0.160	-0.356
	(0.008)	(0.009)	(0.009)	(0.009)	(0.141)	(0.163)	(0.187)	(0.222)	(0.017)	(0.022)	(0.044)	(0.054)	(0.002)	(0.006)	(0.007)	(0.009)	(0.153)	(0.241)	(0.247)	(0.301)
Observations	51	51	51	51	177	177	177	177	178	178	178	178	199	199	199	199	178	178	178	178
R-squared	0.426	0.404	0.464	0.587	0.146	0.122	0.152	0.259	0.113	0.06	0.133	0.236	0.165	0.127	0.139	0.178	0.25	0.201	0.25	0.346
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes									Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Offer Type													Yes	Yes	Yes	Yes				

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Additionally, we ran regression 13-16 in Table 3 with CAR 5, 10, 15, and 30 as the dependent variable for each regression. In these four regressions, we included the discount rate, only 2 SEO-specific characteristics (offer type and the relative offer size), and both of industry and years (2001 until 2022) as fixed effects variables. This time, we considered the model with CAR 5 as the dependent variable (model 13) to be the best at explaining our data. Like the results in models 9-12, the discount rate had a negative effect on CAR – that is not significant at the 5% level. On the other hand, the offer size showed a positive coefficient of 0.014 that is not significant at the 5% level. This is opposed to the findings of previous model, showing a negative and significant effect of the offer size on CAR. Moving on, we included the offer type as a dummy variable and we set it equal to one if the SEO is a rights issue and equal to 0 if the SEO is an ABO. The relevant coefficient showed a negative yet not significant coefficient of –0.042. This means that the average CAR 5 difference between rights issue and ABO is -4.2%. This means that the share price performance is more negative for rights issues than for ABOs.

Lastly, we ran fully specified models in regressions 17-20 in Table 3 that included CAR 5, 10, 15, and 30 as the dependent variable for each model, respectively. In these models, we account for select variables included in the previous models: the discount rate, firm-specific characteristics (free float, ROE, turnover rate, volatility, log of market cap), SEO-specific characteristics (offer type, the relative offer size, use of proceeds), and both of industry and years (2000 until 2022) as fixed effects variables. The R-squared of these full models ranges between 20% and 35% where model 18 least explains the data, while model 20 best explains the data– explains around 35% of the data. Again, we conclude that the 19^{th} model is the best model at explaining the data. This model showed the same effect of the aforementioned variables on CAR15 in models 9-12. Like model 11, the discount rate had a negative coefficient of -0.027, but it was not significant at the 5% level.

It is important to mention that the R-squared for each of the regressions 1-4 are highest among all regressions. Since these regressions are the only ones that control for the use of proceeds variable, we can conclude that this variable likely captures most of the variance in CAR. We attempted to include both use of proceeds and offer type in our model specifications, but offer type is consistently omitted due to collinearity. The likely reason for this is that specific issuances can only be used for specific purposes and thus would result in the perfect collinearity. The coefficients on the use of proceeds categorical variables are, however, not significant. This is possibly due to the lack of a large sample size, as there are only 51 observations in these regressions.

V. Conclusion

In this paper, we investigated the effect of SEO announcements on the share price performance of South African firms listed on the Johannesburg Stock Exchange. To do so, we conducted an event study where we chose the announcement date of an SEO to be the most relevant event as is supported by previous literature on the subject (Masulis and Korwar, 1986; da Cunha and Seetharam, 2018; Seetharam and da Cunha, 2018; Prasad, Bakry and Varua, 2021). We used an estimation window of [-210, -31] and event windows that contained 5, 10, 15, and 30 days on either side of the announcement event.

To incentivise new shareholders to invest in the company, investment banks often encourage firms to issue new shares at a price below the prevailing share price, known as discounting. Corwin (2003) argued that this level of discounting negatively affects the CAR, exacerbating the SEO-announcing firms' performance. Our findings are in contrast with Corwin's (2003) conclusion since our discounting coefficient was not significant in most of the models. This indicates that the level of discounting had no effect on the Cumulative Abnormal Returns, hence not contributing to the firms' underperformance.

Literature relating firm-level characteristics as a driver of firm performance subsequent to SEO announcements is scarce (Brav, Geczy and Gompers, 2000; Corwin, 2003; Chen, Chou, and Lin, 2019). In our study, we investigated the effect of firm's characteristics, such as volatility, size, age, and ROE and most of our results were all aligned with the previous literature. We found that the firm's ROE, liquidity, and age had positive effect on CAR. On the other hand, the firm's volatility significantly decreased the share price performance, while the firm's size had no effect on it.

Other papers like Abdullah and Zaby (2021) argued that SEO-specific characteristics, such as the size and volume have an effect on SEO underperformance. Our findings support Abdullah and Zaby's (2021) results since we found that the offer size positively affects SEO performance. We also investigated the effect of use of proceeds on the price reaction. Our results showed that announcing an issuance of equity to engage in mergers and acquisitions or to pay back debt had a negative effect on SEO-announcing firms' performance. On the other hand, announcing an issuance of equity for mining and exploration purposes enhances SEO-announcing firms' performance.

Overall, our results are more consistent with one line of explanation over others. We expected to find a significant effect of the firm-specific characteristics (liquidity, age, and volatility) and SEO-specific characteristics (offer size, offer type, and use of proceeds) on firms' performance and our results agreed with our expectations. We also expected the level of discounting to have a significant effect on SEO-announcing firms' performance; however, our findings were opposed to our expectations. Therefore, we conclude that firm- and other SEO-specific characteristics tend to be more powerful determinants of SEO underperformance than the discounting level.

Further avenues that could potentially be investigated are the inclusion of more firms across more jurisdictions to potentially improve the representation of emerging or Sub-Saharan markets, generally. One shortcoming of our study was the lack of firm-level characteristics for all firms within the sample. Better or more extensive research into compiling a more complete dataset may yield more reliable and robust results. Additionally, the option to only investigate the short-run share price performance related to the announcement of SEOs is limiting in the inference that can be drawn. Many firms announce serially or announce without the true intention to issue new shares so any follow-up studies could potentially look at the subsequent performance of these firms that specifically announce and then issue and how the announcement effect differs from subsequent issuance performance.

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VII. Appendices

Appendix A: Descriptive Statistics

	Variable	Observations	Mean	Standard Deviation	Min	Max
Percentage/Relative	CAAR5	209	-0.0145	0.1550	-0.9756	0.8831
	CAAR10	209	-0.0079	0.2687	-1.5735	2.0148
	CAAR15	209	-0.0203	0.3371	-2.4262	2.0682
	CAAR30	209	-0.0267	0.4220	-3.4858	2.4215
	Discount Rate	209	-0.0975	0.4316	-0.9986	3.3787
	Log Market Cap	199	21.2035	2.3877	15.7965	27.4902
	Log Age	208	2.8704	1.0626	0	4.8203
	Turnover Rate	178	0.0012	0.0067	0	0.0850
	ROA	209	0.0152	0.1462	-0.5367	1.2100
	ROE	209	-0.0041	0.5294	-5.1319	2.1791
	Relative Offer Size	199	0.3897	0.7877	0.0006	6.7500
	Volatility	209	0.0426	0.0473	0.0081	0.4020
	Free Float	209	0.6349	0.2937	0	1
Categorical	Industry	209	4.4785	2.1350	1	8
	Offer Type	209	1.6459	0.4794	1	2
	Use of Proceeds	54	2.1852	1.1505	1	4
	Year	209	11.9091	4.3563	1	21

Appendix B: Pairwise Correlation Matrix

Variables	CAR5	CAR10	CAR15	CAR30	Discount Rate	Log Market Cap	Log Age	Turnover Rate	ROA	ROE	Relative Offer Size	Volatility	Free Float	Industry	Offer Type	Use of Proceeds	Year
CAR5	**1**																
CAR10	**0.674***	**1**															
	0																
CAR15	**0.605***	**0.892***	**1**														
	0	0															
CAR30	**0.588***	**0.823***	**0.909***	**1**													
	0	0	0														
Discount Rate	**-0.107**	**0.002**	**-0.020**	**-0.051**	**1**												
	(0.122)	(0.973)	(0.779)	(0.460)													
Log Market Cap	**0.042**	**0.055**	**0.051**	**0.082**	**0.062**	**1**											
	(0.551)	(0.441)	(0.474)	(0.249)	(0.381)												
Log Age	**-0.023**	**0.053**	**0.009**	**0.010**	**-0.107**	**0.303***	**1**										
	(0.738)	(0.443)	(0.892)	(0.888)	(0.124)	0											
Turnover Rate	**0.112**	**0.035**	**0.123**	**0.112**	**0.007**	**-0.206***	**0.095**	**1**									
	(0.137)	(0.646)	(0.102)	(0.135)	(0.927)	(0.006)	(0.210)										
ROA	**0.034**	**0.058**	**0.054**	**0.042**	**0.169***	**0.348***	**0.045**	**-0.195***	**1**								
	(0.621)	(0.405)	(0.434)	(0.542)	(0.014)	0	(0.522)	(0.009)									
ROE	**-0.044**	**-0.022**	**0.014**	**0.010**	**0.109**	**0.353***	**-0.046**	**-0.134**	**0.532***	**1**							
	(0.527)	(0.748)	(0.843)	(0.889)	(0.116)	0	(0.510)	(0.074)	0								
Relative Offer Size	**0.093**	**0.043**	**0.010**	**0.031**	**-0.145***	**-0.446***	**-0.092**	**0.114**	**-0.205***	**-0.124**	**1**						
	(0.193)	(0.543)	(0.890)	(0.662)	(0.041)	0	(0.198)	(0.131)	(0.004)	(0.080)							
Volatility	**-0.241***	**-0.142***	**-0.187***	**-0.281***	**0.019**	**-0.226***	**0.050**	**0.030**	**-0.142***	**-0.087**	**0.046**	**1**					
	0	(0.040)	(0.007)	0	(0.781)	(0.001)	(0.477)	(0.686)	(0.041)	(0.212)	(0.520)						
Free Float	**-0.024**	**0.013**	**0.029**	**0.027**	**0.077**	**0.364***	**0.087**	**0.003**	**0.011**	**0.061**	**-0.182***	**-0.130**	**1**				
	(0.729)	(0.848)	(0.681)	(0.703)	(0.268)	0	(0.211)	(0.968)	(0.876)	(0.384)	(0.010)	(0.060)					
Industry	**0.060**	**-0.006**	**0.047**	**0.071**	**0.042**	**-0.243***	**-0.228***	**-0.093**	**0.078**	**0.031**	**0.125**	**-0.182***	**-0.138***	**1**			
	(0.391)	(0.931)	(0.498)	(0.310)	(0.548)	(0.001)	(0.001)	(0.218)	(0.262)	(0.658)	(0.078)	(0.008)	(0.046)				
Offer Type	**-0.006**	**-0.007**	**0.012**	**-0.027**	**-0.042**	**-0.375***	**0.091**	**0.084**	**-0.110**	**-0.136***	**0.185***	**0.200***	**-0.184***	**0.091**	**1**		
	(0.929)	(0.918)	(0.860)	(0.698)	(0.546)	0	(0.190)	(0.267)	(0.112)	(0.049)	(0.009)	(0.004)	(0.008)	(0.189)			
Use of Proceeds	**0.212**	**0.116**	**-0.076**	**-0.149**	**0.124**	**0.186**	**-0.074**	**-0.076**	**0.104**	**0.050**	**-0.055**	**0.054**	**0.118**	**-0.228**		**1**	
	(0.124)	(0.402)	(0.587)	(0.283)	(0.371)	(0.191)	(0.594)	(0.606)	(0.453)	(0.721)	(0.699)	(0.696)	(0.395)	(0.097)	(.)		
Year	**-0.141***	**-0.151***	**-0.123**	**-0.127**	**-0.020**	**0.149***	**-0.009**	**-0.142**	**-0.067**	**-0.091**	**-0.006**	**0.018**	**0.077**	**0.131**	**-0.105**	**0.014**	**1**
	(0.042)	(0.029)	(0.076)	(0.067)	(0.769)	(0.036)	(0.900)	(0.059)	(0.337)	(0.189)	(0.932)	(0.801)	(0.268)	(0.059)	(0.129)	(0.918)	

*Significance levels in parentheses with * $p < 0.05$*

Appendix C: Scatter plots to show heteroscedasticity in Cumulative Abnormal Returns