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South African Journal of Accounting Research

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rsar20

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To cite this article: Ramishka Nardhamuni, Kayleigh Greenslade & Wayne van Zijl (2023) An analysis of the use of share-based payments by the JSE Top 100 companies, South African Journal of Accounting Research, 37:2, 85-105, DOI: 10.1080/10291954.2021.2008610

To link to this article: https://doi.org/10.1080/10291954.2021.2008610

Published online: 19 Jan 2022.

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South African Journal of Accounting Research, 2023
Vol. 37, No. 2, 85–105, https://doi.org/10.1080/10291954.2021.2008610

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An analysis of the use of share-based payments by the JSE Top 100 companies

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(*Received 14 June 2021; accepted 18 November 2021*)

Limited research has been conducted on companies' use of share-based payments in a South African context. Where research has been performed, the focus has been predominantly on shared-based payments as part of executive remuneration packages. This paper extends this research by investigating all uses of share-based payments by the Johannesburg Stock Exchange's (JSE) Top 100 companies. A content analysis was used to capture the details of each scheme disclosed by the JSE Top 100 companies. This included at whom the scheme was aimed, the purpose of the scheme, the settlement type, the vesting period and conditions, and whether there had been any modifications or cancellations.

Descriptive and inferential statistics were used to analyse the data. Results reflected that 93 of the 100 companies investigated made use of share-based payments. Seventy-four per cent of all instruments were equity-settled. The few cash-settled schemes found were primarily used by the Basic Materials and Financials sectors. The average vesting period for all instruments was approximately 4 years, with Black Economic Empowerment-aimed schemes having the longest vesting period at 10 years. Non-market performance conditions were most prevalent at 87% while only 27% included market conditions.

Overall, the findings are in line with Agency Theory and prior papers. In addition, this paper found a significant number of modifications and cancellations of instruments. This may be because of poor economic conditions, where reduced economic activity and lower share prices result in share-based payments becoming unfavourable to holders.

Keywords: share-based payments; cash-settled; equity-settled; JSE Top 100; IFRS 2

1. Introduction

Share-based payment transactions (SBPT) became widespread during the 1990s in the US. During this period, Silicon Valley start-ups promised "astounding" returns for executives as company stock prices climbed steeply (Ravenscroft & Williams, 2009, p. 777). To illustrate, one US company awarded SBPT worth $1.1 billion to just three executives in 1998 (Ravenscroft & Williams, 2009). This equates to approximately $1.782 billion (R24.47 billion) in today's terms. The trend followed in other countries, with South Africa being no exception (Core & Guay, 2001; Steenkamp & Wesson, 2018).

SBPT are attractive as they *theoretically* better align the interests of executives with those of shareholders thereby alleviating agency costs (Watts & Zimmerman, 1990; Hall

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& Murphy, 2003). However, these claims have been disputed theoretically (Ravenscroft & Williams, 2009) and empirically, in a South African context (Motala & Fourie, 2014).

There are numerous studies focusing on SBPT globally. Both these and the few studies considering South Africa focus on SBPT as a form of executive remuneration and analyse only a few characteristics of those SBPT, focusing largely on the extent of use trends, the form of settlement, and the vesting period for executive remuneration schemes (Core & Guay, 2001; Steenkamp & Wesson, 2018). Specifically, these papers overlook whether SBPT are being used to benefit other employees. Importantly in the South African context, nothing is known about the role of SBPT to help transform the South African economy by addressing the lingering effects of the apartheid regime through Black Economic Empowerment SBPT. SBPT can be an effective tool to reduce the racial disparity of South Africa's capital market ownership, especially when targeting broader employees of companies. This paper makes important contributions by addressing these limitations. Firstly, it investigates all SBPT deployed by South African Top 100 Johannesburg Stock Exchange (JSE) listed companies and not only SBPT as executive remuneration. Secondly, it analyses more characteristics of those SBPTs to improve our understanding of how SBPT are utilised in a South African setting. This includes the settlement types, vesting conditions, cancellations, and modifications, to whom the schemes are directed at, and what methods are used to value these schemes. Thirdly, by analysing to whom the schemes are directed and the stated purpose per the integrated report, the paper identifies whether SBPT are being formally used to address the transformation agenda in South Africa. This investigation provides a multi-lens view of all SBPT with perspectives that may not have been investigated in previous theoretically positioned research (Hall & Murphy, 2003; Sanders & Hambrick, 2007; Steenkamp & Wesson, 2018).

The paper's insights will be useful to preparers, regulators, society, and academics. Preparers will be able to compare their use of SBPTs to their peers both in general and by industry. Regulators will be interested in understanding how SBPT are predominantly being used in South Africa. Society will be interested in knowing to what extent SBPTs are being used as a tool to achieve the crucial South African transformation agenda. Lastly, global academics will be interested in understanding whether SBPT are being used to effect social objectives as opposed to only being an executive remuneration tool.

2. Share-based payment transactions

A SBPT is an agreement between an entity and another party that entitles the other party to receive cash or equity instruments in the entity based on the price of the entity's equity instruments (IASB, 2004). These schemes were developed to address agency costs. Management and shareholders' interests are not inherently aligned. For example, management teams with fixed salaries may become complacent, negatively affecting firm performance. Management may also select investment opportunities that maximise their wealth as opposed to shareholder wealth (Frank, 1987; Eisenhardt, 1989; Boumosleh, 2012). Mechanisms such as SBPT link management compensation and share price, theoretically leading to better-aligned goals between shareholders and management. This reduces agency costs and enhances shareholder value (Watts & Zimmerman, 1990; Hall & Murphy, 2003).

Research has found that share-based compensation affects the risk appetite of management. Management may be more willing to take risks which can result in greater rewards for the company, shareholders, and management (Hall & Murphy, 2003). Apart from minimising agency costs, SBPT may also attract more entrepreneurial staff as employees can

directly influence their compensation through their efforts and share in the success of the company (Hall & Murphy, 2003). SBPT are also a convenient method of providing executives with highly lucrative remuneration packages with no cash outflow required in the case of equity-settled SBPT.

SBPT are not, however, a silver bullet. There is the risk that management may become risk-averse as their livelihood, to an extent, relies on the risks they take and could have potentially disastrous effects (Sanders & Hambrick, 2007). Some commentators also warn that management may be inadvertently compensated (or penalised) for factors not under management's control (Rappaport, 1999). Ravenscroft and Williams (2009) argue SBPT are meant to change management's behaviour such that future share prices should be different (greater) than historical share prices. This is the very premise upon which they address agency problems. But both the Black-Scholes Option Pricing Model (BSOPM) and Binomial Option Pricing Model (Binomial model) (1) do not include a variable for management and (2) base future prices on historic prices. They do approximate actual prices, but this is attributed to reflexivity as these inform the market prices and hence become a self-fulfilling prophecy.

Finally, SBPT have been blamed for creating a share price obsession that can lead to undesirable behaviour and, ultimately, corporate failures. SBPT linking remuneration to company performance may incentivise senior management to mislead investors about the true performance of the company with potentially disastrous results (Cassidy, 2002). Examples provided include WorldCom and Enron (Hall & Murphy, 2003; Haswell & Evans, 2018).

2.1 *Accounting for SBPT*

When SBPT first arose, they were not recorded in financial statements when granted. They were only disclosed. After failed attempts to introduce a SBPT expense owing to significant controversy over the issue, the US Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB) finally issued SFAS[1] 123R and IFRS 2 – Share-based Payment (IASB, 2004; Ravenscroft & Williams, 2009; Giner & Arce, 2012). These required an expense being debited over the life of the SBPT with a corresponding credit to equity or a liability (IASB, 2004).

SBPT are either cash-settled or equity-settled. Cash-settled SBPTs are typically Share Appreciation Rights, where cash is paid to the holder based on the difference between a strike price and the entity's share price on settlement date. Equity-settled SBPTs are settled by the issue of new shares, or by (buying and) selling existing shares, to the holder in exchange for the agreed strike price. For SBPT holders to exercise their options, the holder must satisfy specified vesting conditions. Vesting conditions may be performance conditions or service conditions. Service conditions typically require the holder to remain in the employ of the entity for the duration of the vesting period. Performance conditions may be market (vesting conditional on the entity's share price) or non-market (for example vesting conditional on achieving a profit target) (IASB, 2004).

The 'cost' of a SBPT is spread over the life of the instrument regarding the non-market vesting conditions. Cash-settled SBPT are trued-up to their year-end apportioned fair value at year-end with the required difference (positive or negative) recognised in profit or loss. Equity-settled SBPT are recognised at grant-date fair value, apportioned with regards to the non-market vesting conditions. In both types, the company must estimate the number of instruments it expects will meet the vesting conditions, and this is used in the annual calculation of the required expense and liability or equity amounts to be recognised (IASB, 2004).

Often the fair value of the good or service will not be available directly, especially when for employee services. In these cases, the entity must estimate the fair value of the equity instrument (equity-settled) or liability to pay cash (cash-settled). IFRS 2 is not prescriptive, but companies often use the BSOPM, Binomial model, or Monte Carlo Simulation (IASB, 2004; Bendob & Bentouir, 2019). In a European context, it was found that the most common pricing models used were the Binomial model and BSOPM. Although the BSOPM is viewed as slightly more complicated and sophisticated, no significant difference was found in the resultant value of options under these two models (Dar & Anuradha, 2018). Besides the technical complexity of these models, obtaining the necessary inputs can be challenging and may discourage companies from issuing SBPT (Palea, 2014). Companies with a smaller market capitalisation and that do not have dedicated technical departments and access to databases for inputs may fall into this category (Appelbaum & Shapiro, 1991).

Equity-settled SBPT are slightly less intensive to measure as only the grant-date fair value must be estimated whereas cash-settled must be re-estimated annually. This may make equity-settled SBPT more attractive, especially when coupled with the fact that no cash is required on settlement. They do, however, result in shareholder dilution which may or may not be significant (Hall & Murphy, 2003). Cash-settled SBPT do have the advantage of having no shareholder dilution effect. This may be attractive to family-owned companies or small entities where any meaningful issue of new shares may significantly impact the current shareholders if they are not also management (Keasey, Martinez, & Pindado, 2015).

The SBPT vesting conditions play an important role in determining their value and accounting recognition. Market conditions may render the SBPT unfavourable if, for example, the strike price exceeds the current market price for the entity's shares. In these cases, entities may cancel or modify the instruments. The accounting effects of cancellation and modification are punitive to the entity. This is because a cancellation results in accelerated vesting of the instrument, resulting in all of the unrecognised expenses being recognised immediately in profit or loss (IASB, 2004). Modifications offer some reprieve as the incremental increase in the fair value of the option is smoothed over the remaining vesting period (IASB, 2004). The impact of a cancellation of an option extends further than accounting. Cash payments are often made to the holders of the options to compensate them for the loss of remuneration.

Transformation and Black Economic Empowerment (BEE) are of paramount importance to South Africa and its companies to ensure their sustainability and success (al, 2005). These considerations may affect the method of settlement and vesting conditions imposed where the objective is the retention of BEE participants. The potential role of SBPT for transformation is discussed next.

2.2 *IFRS 2 and transformation*

The pre-1994 apartheid government prevented certain racial groups of people from meaningfully participating in the South African economy and generating meaningful wealth for themselves and their families. These laws were abolished post-1994 but the significant effects of those laws are still felt to this day (Maroun, Coldwell, & Segal, 2014; Stanford University, 2016).

Post-1994, companies were encouraged to sell at a discount, or donate, portions of their equity to Historically Disadvantaged South Africans (HDSA) and black economic empowerment groups as a means to address the effects of apartheid. These policies are aimed at transforming the ownership of privately-held entities to become representative of the racial

makeup of the country. Because of slow transformation, laws were eventually passed to force economic transformation via BEE laws, regulations, and charters. For example, the 2010 Mining Charter required a minimum of 26% ownership interest by HDSA in mining companies and affected mining companies' ability to access important mineral rights (Veeran, Dickinson, Spalding, & Booysen, 2018).

An issue with transferring equity in a company to HDSA individuals is that if and when HDSAs sold shares, they typically ended up selling those shares back to non-HDSAs. This negates the purpose of the initial transfer. This also created significant uncertainty around the concept of 'once empowered, always empowered[2]' (Lexology, 2020). Also, questions began to be raised regarding whether BEE was benefiting a few individuals or the majority. SBPT can play a useful role in addressing these issues and transforming the economy.

Firstly, SBPTs awarded broadly to all employees ensure wealth is distributed broadly and not only to a select few. This is in line with the purpose of BEE, which is to create a more inclusive corporate South Africa. It also serves to motivate all employees and may even alleviate the severity of labour disputes South Africa often experiences.

Secondly, by either requiring long vesting periods or by creating SBPT for a different class of share that can only be transferred to other qualifying HDSAs, they can help ensure desirable levels of ownership are maintained. In these ways, SBPT can be useful tools in a company's corporate social responsibility strategy and uplift previously disadvantaged individuals (Jackson et al, 2005; Alessandri et al, 2011).

The accounting for SBPT that are directed at HDSAs (BEE and BBEEE SBPT) fall within the scope of IFRS 2. The guidance provided by SAICA in AC503 indicates that where such instruments are granted, no asset may be recognised (SAICA, 2010). As is the case with other equity-settled SBPT, an expense will be recognised with a corresponding credit to equity.

2.3 *Prior research on the use of SBPT*

Australian, EU, UK, and USA studies reflected a decreased, but continued, use of SBPT following the introduction of IFRS 2 (Chalmers & Godfrey, 2005; Alhaj Ismail, Adwan, & Stittle, 2019) while South Africa and China's use of SBPT increased (Li et al., 2013; Pretorius & de Villiers, 2013). Interestingly, EU, UK, and Chinese firms saw increased use of cash-settled SBPT (Chalmers & Godfrey, 2005; Li et al., 2013; Alhaj Ismail et al., 2019). As is expected, the use of SBPTs under IFRS 2 / FSAS 23R negatively affects performance metrics and is argued to be the cause for reduced use of SBPT (Chalmers & Godfrey, 2005; Pretorius & de Villiers, 2013; Alhaj Ismail et al., 2019).

Smaller companies in their growth phase tend to place greater importance on retaining key staff, leading to longer vesting periods and a preference for market vesting conditions. Established CEOs tend to be able to negotiate shorter vesting periods with generally less risky vesting conditions (Cadman, Rusticus, & Sunder, 2013; Qu, Percy, Stewart, & Hu, 2018). This is mitigated to an extent as the efficacy of corporate governance increases (Qu et al., 2018).

The maturity of the issuing company and its available cash reserves also play key roles in determining the vesting conditions. Companies with a cash strain and that are under-performing appear to have options with longer vesting periods in an attempt to both reduce annual expenses and defer cash outflows either via cash-settled SBPT, forgoing cash receipts on the issuance of new shares, or paid to repurchase existing shares to transfer to SBPT holders (Cadman et al., 2013; Qu et al., 2018). Finally, vesting conditions are increasingly becoming better linked to factors under management's control to ensure SBPT appropriately compensate management for their performance (Qu et al., 2018).

3. Methodology

In line with prior exploratory studies, a quantitative method was adopted. A content analysis was conducted to capture data related to SBPT disclosed by South African listed companies. The population consisted of the Top 100 JSE listed entities, ranked by market capitalisation, at 31 May 2019. This is consistent with similar South African-focused studies (Willows & van der Linde, 2016; van Zijl, Wöstmann, & Maroun, 2017; Malola & Maroun, 2019; van Zijl & Hewlett, 2021). No sampling was performed.

The JSE Top 100 companies were selected as these companies (1) represent over 80% of the total JSE by market capitalisation, (2) are frequently covered on public financial and accounting forums, and (3) represent the companies that the largest institutional investors will have significant investments in (Willows & van der Linde, 2016; Malola & Maroun, 2019; van Zijl & Hewlett, 2021).

The 2018 (or latest available) Integrated Report and audited financial statements of each company were obtained directly from the respective websites. Initially, five random companies' reports were read in detail by the lead and assistant researchers to identify all instances where SBPTs are discussed or disclosed. Using IFRS 2 and the identified sections, keywords were developed and used to identify all relevant sections in the remaining companies' reports to be captured. Examples of keywords include share-based payment, equity-settled, cash-settled, vesting period, performance non-market condition, and market condition (van Zijl & Hewlett, 2021).

For each company, general information about each company was captured. This included the company's industry, type of listing, market capitalisation, total assets, total liabilities, share-based payment reserve, and share-based payment liability. Where companies' financials were disclosed in a currency other than ZAR,[3] the relevant figures were translated at the appropriate year-end spot rate. Companies listed on the JSE were classified into 7 broad industries, namely: Basic Materials, Consumer Goods, Consumer Services, Health Care, Financials, Industrials, and Telecommunications (JSE, 2013).

A content analysis was used to capture details of each SBPT. The unit of account was each distinct share-based scheme disclosed. The following was captured for each share-based scheme disclosed:

- To whom the scheme is aimed (for example, employees, directors, and executive management)
- The stated purpose of the scheme (for example, retention, long-term incentive, and bonus scheme)
- Whether the scheme formed part of a broader remuneration policy to meet strategic objectives[4]
- The type of scheme (equity, cash-settled, or hybrid)
- The number of instruments issued in that year.
- Whether the number issued in the current year was less than or greater than the period year's issuance
- The average vesting period
- The type of vesting conditions attached (market and performance non-market conditions)
- The details of the non-market performance vesting condition (for example, employment and performance targets).

Care was taken to capture data using consistent and appropriate names. For example, under the stated purpose of the scheme, "BBBEE", "BEE", and "transformation" were all

captured as "BEE". This facilitated subsequent data analysis. This is also why a single researcher captured the data for the remaining 95 companies (Creswell, 2009).

For ease of capturing, the data was captured in a table with each company in its own row. All the information captured was done in separate columns. For the above 9 scheme-specific items, these headings were repeated 15^5 times. For example, "SBPT 1: To whom the scheme is issued" and "SPBT 1: The stated purpose". Then, this repeated for SPBT 2; "SBPT 2: To whom the scheme is issued" and SBPT 2: The stated purpose". This method is appropriate for capturing data from sources that are not identical in format or structure (Krippendorff, 2018).

The data was then transformed into a table where each distinct scheme was presented in its own row with the related company as the key. This facilitated a detailed analysis using SPSS. Firstly, Kolmogorov-Smirnov and Shapiro-Wilk tests were performed. Results reflected the data are not normally distributed. Therefore, non-parametric tests were used to test for statistically significant differences. Kruskal-Wallis tests were used to test for differences between more than two independent groups. Mann-Whitney U tests were used when assessing two independent groups (McCrum-Gardner, 2008). An alpha of 1% was used for all tests to reduce the risk of Type-I errors (Malola & Maroun, 2019).

To address data validity and reliability, keywords were developed by the lead and assistant researcher. All subsequent coding was performed by one researcher to eliminate inter-coder reliability risk. The resultant data was reviewed by all authors. Any discrepancies were resolved before data analysis was performed (Creswell, 2009; Malola & Maroun, 2019). Finally, all reports were collected directly from the companies' websites and only audited financial statements were analysed.

4. Discussion of results

A summary of the descriptive statistics is provided in Table 1. Of the 100 companies analysed, 7 did not disclose any SBPT. Four of these 7 companies were in the Financial sector, 2 in Industrials and 1 was in Consumer Services. Five of these 7 companies were small based on market capitalisation, ranking between 71 and 98. One Industrial was ranked 28th while the remaining company was in the Financial industry and was ranked 45. Finally, 2 of the 7 companies were secondary listings on the JSE.

The overview indicates that JSE listed companies do make use of SBPT. This is in line with prior studies (Core & Guay, 2001). In addition, it seems that of the few companies that do not have SBPT, they are typically smaller companies with few exceptions. For those companies with SBPT, the mode and average were 2 and 2.9 schemes per company respectively. The maximum number of schemes disclosed by one company was 9 SBPT. Of the 32 companies with only 2 share-based schemes, 93.75% ($60/64^6$) were for retention purposes, 3.13% (2/64) for BEE and 3.13% (2/64) had no clearly disclosed purpose. Only 23.44% (15/64) were aimed specifically at directors with 20.31% aimed at non-director senior executives. The majority (56.25%) were disclosed as being aimed at 'employees'. This is important. Viewed as executive/senior employees compared to general employees, the split is encouragingly close to a 50/50 split (43.75%: 56.25%, respectively). This implies that companies feel the need to incentive both general and executive/senior employees. It may also indicate that SBPT are not used mostly to benefit senior executives. However, more research is required to investigate the nature and attractiveness of those schemes offered to senior versus general employees.

Equity instruments made up the majority of all SBPT disclosed at 74% as found in prior studies (Core & Guay, 2001). With the South African economy underperforming in general

Table 1. Descriptive statistics grouped by settlement method.

Description	Cash-settled	Equity-settled	Hybrid	No SBPT	Total	Percent
Companies with	43	88	7	7	*	
Instruments	44	198	27		**269**[7]	
Percent of settlement method	16%	74%	10%		**100%**	
Primary/secondary listing[8]					**269**	**100%**
Primary	40	152	18		**210**	78%
Secondary	4	46	9		**59**	22%
Cancellations and modifications					**212**	**100%**
Cancellations	18	139	18		**175**	83%
Percent of settlement method	10%	80%	10%		**100%**	
Modifications	6	28	3		**37**	17%
Percent of settlement method	16%	76%	8%		**100%**	
Vesting conditions					**309**	**100%**
Market	23	41	9		**73**	24%
Percent of vesting conditions	32%	56%	12%		**100%**	
Non-market performance	29	188	19		**236**	76%
Percent of vesting conditions	12%	80%	8%		**100%**	
Industry					**269**	**100%**
Basic Materials	10	50	4		**64**	24%
Consumer Goods	3	19	2		**24**	9%
Consumer Services	8	43	2		**53**	20%
Financials	18	53	13		**84**	31%
Health Care	2	8	4		**14**	5%
Industrials	2	17	1		**20**	7%
Telecommunications	1	8	1		**10**	4%
Number of instruments by company rank by market capitalisation					**269**	**100%**
Companies 1–20	7	46	18		**71**	26%
Companies 21–40	11	40	2		**53**	20%
Companies 41–60	7	53	3		**63**	23%
Companies 61–80	17	32	2		**51**	19%
Companies 81–100	2	27	2		**31**	12%

*As a company with cash, equity, and hybrid instruments would be included in all three columns, the total has intentionally been left blank as meaningless.

(White, 2020), opting for incentive schemes with no direct cash consequences is logical regardless of the other benefits (see Section 2.2). Finally, there were a significant number of cancellations and modifications (212/269) which may also be a consequence of general poor economic conditions (Table 1).

Most SBPT were equity-settled with a notable usage of hybrid instruments by the largest[9] 20 companies. This indicates that shareholder dilution is not a major deterrent when structuring SBPTs, irrespective of to whom they are directed. Similar findings were obtained by Keasey et al. (2015). In addition, equity-settled instruments require no cash outflow, protecting already-constrained reserves as the South Africa economy struggles (Omarjee, 2019). However, declining generic economic conditions also reduce the incentive attached to SBPT as is seen by the significant number of cancelations and modifications (see Section 4.1).

An interesting pattern in the percentage of cash-settled SBPT emerges when analysing the data by market capitalisation rank (see Table 2). The percentage of SBPT that are cash-settled alternates between below 12% and above 20% for the groups 1-20, 21-40, 41-60, 61-80, and 81-100. The low cash-settled percentage for companies ranked 1 -20 may be due to them having a more diverse portfolio of SBPT, where 25% are hybrid. This leads to a reduction in both equity and cash-settled figures. Companies ranked 21-40 have few hybrid-settled instruments and, being large, listed companies, these companies may have the cash resources to commit to cash-settled instruments. This may also differentiate them from other large companies to attract excellent management personnel.

In keeping with a resource-constraint perspective, one may assume most small and some medium-sized companies would avoid cash-settled instruments due to the risks related to their limited cash reserves. However, these companies may also be more closely held and, therefore, be more conscious of shareholder dilution. To further complicate the situation, the management teams of smaller companies may be more powerful and push for instruments more favourable to them (Cadman et al., 2013). In this case, cash-settled SBPT may be preferable as there are liquidity concerns over smaller companies' equity. Lastly, with smaller companies, more management teams may already be shareholders. These management teams may be willing to make 'additional equity investments' via equity-settled instruments to see the company grow. As these companies' share prices are typically lower, price changes of only a few cents can translate into substantial percentage changes. These perspectives appear to hold for the smaller groups and may explain the alternating pattern.

Notable is the group of companies ranked 61–80. This group has 33% (17/51) cash-settled SBPT. This is also the most cash-settled SBPT any group has. With the diversity of possible explanations, more research is required to fully appreciate whether this pattern is coincidental or why it is present.

It is inherently difficult to gauge the relative significance of SBPT among different companies, industries, and countries. Prior research has often used *total* assets as one means to provide relative comparisons (Chalmers & Godfrey, 2005; Pretorius & de Villiers, 2013; Alhaj Ismail et al., 2019). To begin documenting the significance of SBPT in South Africa, and for comparison to other countries, the share-based payment equity and liability reserves were compared to total assets.

From Table 3 we see that the Industrials and Financials' sectors have the highest average share-based equity reserve as a percentage of total assets at 6.6% and 4.0% respectively. This is well above the average for all companies of only 3.2%. This may indicate that these industries have fierce competition to attract and maintain staff. Most of the companies in these two sectors disclosed retention as the reason for the schemes and the schemes were aimed at a combination of directors, non-director senior executives, and employees. Curiously, only 1 company disclosed BEE as the reason for the scheme.

Table 2. SBPT breakdown by market capitalisation.

Number of instruments by company rank by market capitalisation	Cash-settled	Equity-settled	Hybrid	Total (per cent)	Total (SBPT)
Companies 1–20	10%	65%	25%	100%	71
Companies 21–40	21%	75%	4%	100%	53
Companies 41–60	11%	84%	5%	100%	63
Companies 61–80	33%	63%	4%	100%	51
Companies 81–100	6%	87%	6%	100%	31

Table 3. Share-based equity and liability reserve as a percentage of total assets.

Row Labels	Average of Share-based payment reserve as a percentage of total assets	Average of Share-based payment liability as a percentage of total assets
Basic Materials	1.9804%	0.0687%
Consumer Goods	2.9225%	0.1257%
Consumer Services	1.7070%	0.1177%
Financials	4.0458%	0.1768%
Health Care	1.3086%	0.0258%
Industrials	6.6331%	0.2222%
Telecommunications	1.6782%	0.1494%
Grand Total	3.2220%	0.1377%

On the liabilities' side, only the Industrials sector stands out at 0.2222% compared to the average of 0.1377%. As cash-settled instruments were far less frequent than equity-settled instruments, there is less dispersion in these figures.

4.1 *Cancellations and modifications*

The accounting for SBPT cancellations and modifications is relatively punitive with accelerated vesting negatively affecting the statement of profit or loss and other comprehensive income (see Section 2.2). These actions are not taken lightly, and the significant number of cancellations and modifications is cause for concern (see Table 1). A total of 78.9% (212/269) of all SBPT were cancelled or modified, with cancellations making up the majority of actions at 65% (175/269) compared to 14% (37/269) with modifications. This difference is statistically significant based on the settlement method, as confirmed by the results of the Kruskal-Wallis tests (Table 4).

SBPT are only beneficial if the company's share price increases relative to the grant-date price and set strike price. With the multitude of setbacks that South Africa has experienced, it is unsurprising to see substantial modifications and cancellations. It does prompt the question of whether the theory of initiating SPBT is prompting these schemes. If this were the case, then, arguably, if the company's share price is doing poorly there should not be amendments. On the other hand, if the declining share price is believed to rather be a consequence of non-controllable factors[10], the significant volume of amendments may indicate that companies largely believe their workforces are operating at a high level and are worthy of additional remuneration.

Owing to the finding of the majority SBPT being equity-settled, the majority of cancellations and modifications are also found in equity-settled SBPT (80% and 76% respectively, Table 1). Of the SBPT cancelled, equity cancellations as a percentage of total equity instruments issued were 70%, cash-settled instruments cancelled as a percentage of total cash-settled instruments settled was 41%, and hybrid instruments cancelled as a percentage of 67%. With the depressed economy and economic conditions, holders of

Table 4. Kruskal-Wallis test grouped by settlement type.

	Cancellations	Modifications
H-statistic	13.572**	0.184
Df	2	2

** Significant at the 1% level (2-tailed)

SBPT may be warier of equity-settled than cash-settled instruments as equity-settled instruments expose the holder to more uncertainty if exercised. The shares, once adopted, may decline further while at least cash-settled options are realised immediately and are mainly susceptible to inflation and theft risks. It may also be an indicator of holder confidence in either the specific company or the economy in general. More research is required on the psychology of SBPT-holder decision-making.

4.2 *Share-based payments and vesting conditions*

The mode of the average vesting periods for all three settlement types of SBPT is 3 years while the second most frequent vesting period is 5 years. These are fairly intuitive figures for SBPT. They are fairly balanced between not being too long to be ineffective but not too short to be short-term focused (Cadman et al., 2013; Qu et al., 2018). The spread of average vesting periods by SBPT settlement type is small. Equity-settled SBPT has the longest average vesting period at 4 years, followed closely by hybrid instruments at 3.94 years and cash-settled at 3.22 years. This is confirmed by the results of Kruskal-Wallis tests grouped by settlement type. Results revealed no statistically significant differences among the different settlement types[11]. Equity-settled instruments also had the longest maximum vesting period at 10 years, followed by cash-settled (7 years) and hybrid (6.5 years).

All 4 instruments with 10-year vesting periods relate to BEE SBPT and covered the Basic Materials, Healthcare[12] and Industrials industries. Owing to South Africa's BEE targets, the long vesting periods for these schemes can be expected. The extended vesting period may be a consequence of the controversial 'once empowered, always empowered'[13] court battle that spanned many years. This principle was resolved on 4 August 2020 by a declaratory order of the High Court of South Africa (Lexology, 2020). Before this, companies would have opted for longer vesting periods to reduce the likelihood of needing to 'top-up' BEE ownership while the principle was unresolved.

Table 5 provides a detailed look at the number of cancellations and modifications by vesting period. With the two highest frequencies being 3 and 5 years, these vesting periods have the highest number of cancellations and modifications. The mode vesting period for modifications and cancellations is 5 years and 3 years respectively. This may indicate that longer vesting periods were modified to reduce the vesting period.

The descriptive statistics reveal that 236 of 269 SBPT instruments included non-market performance vesting conditions. In contrast, only 73 instruments included market vesting conditions. This is in line with research conducted by Qu et al. (2018). Qu et al. (2018) noted that companies are increasingly making use of non-market performance conditions to ensure that management is evaluated based on factors within their control rather than on market measures that are affected by a variety of external factors. The average vesting period for market and non-market performance vesting conditions are similar at 3.91 and 4.17 respectively.

The substantial use of non-market performance conditions is also in line with agency theory and holding management accountable for their actions (Whittington, 2008; Pretorius & de Villiers, 2013). Performance conditions that include entity-specific targets and years of service help in combatting the agency problem and aligning management and shareholder goals and expectations.

South Africa is a developing country that has seen an economic decline in recent years (Stats SA, 2018). Given this decrease in economic growth and increased volatility of stock prices, it is likely that employees prefer, and are motivated by, non-market performance conditions more than unpredictable market conditions (Laux, 2012). Moreover, having

Table 5. Cancellations and modifications by vesting period.

Vesting period	Number of share-based payment transactions Modified	Number of share-based payment transactions with cancellations
<1 year	1.00	2.00
1 year	1.00	3.00
1.5 years	-	1.00
2 years	1.00	3.00
2.5 years	-	1.00
3 years	11.00	73.00
3.5 years	-	5.00
4 years	6.00	30.00
4.5 years	-	3.00
5 years	14.00	35.00
5.5 years	-	6.00
6 years	-	-
6.5 years	-	2.00
7 years	1.00	7.00
8 years	2.00	2.00
9 years	-	-
10 years	-	2.00
Grand Total	**37.00**	**175.00**

investigated the Top 100 listed companies, these management teams are established and likely pursue long tenures. As such, they may prefer non-market conditions over market conditions. This is consistent with research performed by Cadman et al. (2013).

Of note is that a greater percentage of cash-settled instruments include market conditions (52% | 23/44) than equity-settled instruments (21% | 41/198). This difference is statistically significant as confirmed by the results of Mann-Whitney U tests (see Table 6). Of further note is that a majority of companies with cash-settled SBPT with market vesting conditions lie outside the Top 40 companies (40% | 9/23). Thirty per cent (7/23) relate to companies ranked within the Top 20 companies and 30% (7/23) relate to companies ranked between 21 and 40. As smaller companies' share prices are lower, including cash-settled market conditions may indicate that shareholders (a) do not wish to dilute their shareholdings, (b) management and employees are more interested in cash incentives, and (c) wish to focus on improving their share price as a priority. Increased share prices provide increased access to capital, as it increases the pool of large (institutional and international) investors that can practically invest in the company[14]. Finally, smaller companies may prioritise growth, resulting in market conditions being appropriate vesting conditions (Cadman et al., 2013).

Table 6. Mann-Whitney U test grouped by presence of market vesting conditions.

	Settlement method
U-statistic	5554.000
Z	0.000**

** Significant at the 1% level (2-tailed)

4.3 *Share-based payments participants and stated purpose*

As most prior SBPT papers focus on executive remuneration (Steenkamp & Wesson, 2018), this paper considered the intended participants of all SBPT of the Top 100 companies. Table 7 presents a summary of the results. Fifty-six percent (152/269) of all schemes are aimed at 'employees' with the other schemes mostly aimed at management (non-director senior executives and directors). The remaining 7% are aimed at BEE participants. The stated purpose of each scheme captured from the integrated report (Table 8) identified that 7% of schemes are entered into with a BEE as the objective. On inspection of the integrated reports very few share-based payment transactions specifically noted BBE as their purpose.

The authors consider the significant number of 'employee' SBPT a great achievement. On the other hand, proponents of BEE and economic transformation may find the number of BEE-specific SBPT worrying. Such concerns may be premature. Because the majority of South Africans are non-white (Statista Research Department, 2019) and 78.9% of the South African economically active population is classified as African (South African Government, 2020), the significant extent of 'employee' SBPT likely achieves what specified BEE SBPT would. The low extent of BEE SBPT may also be due to the numerous other methods of achieving BEE ownership.[15] Lastly, the BEE SBPT have longer average vesting periods (10 years – Section 4.2) and, so, it may be better that socio-economic transformation, as far as share-based payments are concerned, is not undertaken by specific BEE SBPT but general 'employee' SBPT schemes.

Table 7. Participants of SBPT.

Participant	Cash	Equity	Hybrid	Total*
Employees	22	110	20	152
Non-director snr executives	12	40	3	55
Directors	7	32	3	42
BEE participants	3	15	1	19
Not disclosed	0	1	0	1
Total	**44**	**198**	**27**	**269**

*Descending order in terms of Total column

Table 8. Stated purpose of SBPT arrangements.

Stated purpose of the SBP arrangement	Number of SBPT arrangements
BEE	20
Not disclosed	6
Replacement	3
Retention	240
Total	**269**

Of the BEE SBPT schemes aimed at BEE participants, 79% (15/19) are equity-settled. This is in line with BEE's goals to transform the ownership of companies in South Africa to redress past discrimination and the consequential damage it caused (Al, 2005; Stanford University, 2016). These instruments will result in shares (or benefits of ownership of the company) resting in the BEE participants' hands.

Results from Kruskal-Wallis tests reveal only one statistically significant difference based on the participants of the SBPT (see Table 9). The vesting periods among the participant categories are statistically different from one another. As the average vesting

Table 9. Kruskal-Wallis results grouped by participant category.

	Settlement method	Primary or secondary listing	Industry	Average vesting period	Presence of modification	Presence of cancellation	Presence of non-market performance condition	Presence of market condition
H-statistic	1.192	9.034	4.638	26.255**	2.715	6.853	9.318	3.611
df	4	4	4	4	4	4	4	4

** Significant at the 1% level (2-tailed)

period for employees, directors and non-director senior executives are between 3.51 and 3.77 while for BEE it is 6.16, we may infer that BEE's average vesting period is statistically different from all other participant groups.

4.4 *Share-based payments and the industry effect*

From Table 1 the Financials industry has the most SBPT at 31% followed by Basic Materials (24%) and Consumer Services (20%). There is a statistically significant difference in the average vesting period at the 1% confidence level and the presence of non-market performance vesting condition at the 5% confidence level when grouped by industry (Table 10). There is no statistically significant difference in the settlement method by industry. As the majority of all instruments are equity-settled, this finding is expected.

The share-based payment reserve as a percentage of total assets was considered to assess whether there are any relative differences in the extent of SBPT use by industry (Dang, Li, & Yang, 2018). Table 11 reveals that there are statistically significant differences in the equity-settled and hybrid instruments by industry, and there are no statistically significant differences for cash-settled instruments by industry. This may be due to the relatively low extent of cash-settled instruments.

A Dunn-Bonferroni pairwise test was performed to identify the industries where the significant differences existed in the equity-settled and hybrid instruments existed. Significant differences were identified at a 5% significance level in the Financials and Consumer Services industries with a test statistic of 0.016 and the Financials and Basic Materials industries with a test statistic of 0.002. This is in line with the descriptive statistics, where these three industries were identified as having the highest number of share-based payment transactions.

These differences identified are in line with research asserting that industry and firm-specific factors affect performance (Hawawini, Subramanian, & Verdin, 2003). Research in a South African context recognised that Government, Transport, and Basic Materials have the lowest level of growth (Stats SA, 2018). Basic Materials and Consumer Services fall within these classifications. The decreased growth in these sectors, likely decreased cashflows, BEE charters, and the level of competition may have contributed to the relatively increased use of share-based payments. Moreover, the focus on equity-settled SBPT in these industries reduces pressure on cash reserves while still incentivising and compensating employees (Core & Guay, 2001). In addition, companies that fall within the Financial Services sector are inherently competitive and market-driven. This may contribute to the extent of their use of share-based compensation by these types of companies.

4.5 *Share-based payment measurement models*

The results reflect that SBPT primarily utilise 3 valuation models, namely Black-Scholes (Black-Scholes), Binomial, and Monte Carlo Simulations (Table 12). Being used in an accounting context, these three models may be most prevalent due to the training Chartered Accounting and Bachelor of Commerce students are taught. Most Universities' CA(SA) training syllabi focus on these three measurement models.[16]

The findings reflect that South African listed companies' selection and use of option pricing models are similar to those found in the European Union (Dar & Anuradha, 2018). The Black-Scholes model is most prevalent followed by the Binomial model. There is some use of the Monte Carlo Simulation model. Its lower frequency may be a

Table 10. Kruskal-Wallis results grouped by industry.

	Who is it aimed at coded	Average vesting period	Settlement method	Presence of modification	Presence of cancellation	Presence of non-market performance condition	Presence of market condition
H-statistic	10.48942	21.50889**	12.30453	3.268998	8.272023	16.1986*	7.906702
df	6	6	6	6	6	6	6

*Significant at the 5% level (2-tailed)
**Significant at the 1% level (2-tailed)

Table 11. Kruskal-Wallis results of share-based payment reserve as a percentage of total assets grouped by industry.

	Share-based payment reserve as a percentage of total assets	Share-based payment liability as a percentage of total assets
Total N	100	100
Test Statistic	25.347**	4.857
Degree of Freedom	6	6

**Significant at the 1% level (2-tailed)

Table 12. Measurement models used by companies listed on the JSE.

Model used	Number of companies that use this model
Black-Scholes	30
Binomial	24
Monte Carlo	14
Other[a]	25
None disclosed	7
Total	**100**

[a]Includes models that were not common and where companies described that various methods were used.

consequence of this model being more sophisticated and requiring more competencies and resources compared to the other models.

The predominant use of the Black-Scholes model may also be as it is specifically noted in IFRS 2 (IASB, 2004). By utilising a model specifically mentioned in the standards, companies may feel that this improves their compliance with IFRS.

5. Conclusion

This paper employed a quantitative method to investigate the extent of all SBPT used by the JSE Top 100 companies. This addresses a gap in the prior literature that has mainly focused on SBPT as a form of executive remuneration, considered only a few characteristics of those schemes, and did not investigate whether SBPT are being used to transform the South African economy (Steenkamp & Wesson, 2018). Results reveal that equity-settled SBPT are most prevalent (74%) with some cash-settled (16%) and very few hybrid (10%) instruments. It was also found that there have been extensive cancellations and modifications of SBPT (79% | 212/269).

The average vesting periods of the instruments are fairly consistent with a mode of 3 years, followed closely by 5 years as the second most frequent vesting period. The average vesting period for equity-settled instruments was 4 years with hybrid at 3.94 years and cash-settled at 3.22 years with no statistically significant difference in vesting periods when grouped by settlement method. It was noted that SBPT with BEE as their stated purpose had the longest vesting periods at between 8-10 years. All 4 of the 10-year vesting period instruments were for BEE purposes and were issued by the Basic Materials, Healthcare, and Industrials industries. BEE charters are important in these industries and the controversial "once empowered, always empowered" principle may have contributed to the long vesting periods.

While the number of SBPT formally designated as BEE SBPT is low, on the positive side, over half of all SBPT (56%) were targeting 'employees'. This indicates that in the

South African context, SBPT are not solely a means of increasing executive compensation. This may also be due to the dual-trigger of transforming the economy and incentivising employees during times when the South African economy has been performing poorly. This is supported by the fact that the majority of all SBPT are equity-settled. Additional research is required to determine why share-based payments are not being used more extensively for BEE and transformation purposes.

The JSE Top 100 companies' SBPT mainly included performance conditions (76% | 236/309) with few market conditions (24% | 73/309) (Table 1). Interestingly, cash-settled instruments have a statistically significant higher percentage of instruments that include market conditions at 52% compared to equity-settled instruments at only 21%. In addition, the finding that a majority of cash-settled SBPT that include market vesting conditions lie outside of the JSE Top 40 should also be investigated further. Finally, the fact that companies ranked within the 61-80 category issued the most cash-settled SBPT (33% | 17/51) is curious. These findings require more research to determine whether they are coincidental or have an underlying reason.

The paper has its limitations. Only 100 of the JSE's 384 listed companies were analysed. This does represent over 80% of the exchange by market capitalisation, but smaller companies may present with different patterns. In addition, only 1 year was considered to provide a snapshot of the JSE's Top 100 companies. Future research can extend the period to look for trends in SBPT use as well as include a sample of small-cap companies. Finally, interviews with company management teams, analysts, and holders of options would be useful. Specifically, this research could consider interviewing a range of holders in terms of employee categories and extent of financial knowledge to identify whether these factors play a role in how holders perceive the various instruments. Finally, interviews could consider investigating the psychology of decision-making with regards to SBPT from both management and holders' perspectives. Questions could include obtaining an understanding of, in the South African context, what makes one settlement method more or less attractive than others, under what conditions each type of SBPT is attractive, and why SBPT do not play more of a role in addressing the transformation agenda.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. Statement of Financial Accounting Standards.
2. The question arose that if a company achieves 26% Historically Disadvantaged South Africans (HDSA) ownership, and then HDSAs sell their ownership interests, does the company have a responsibility to constantly reattain the 26% ownership threshold. This issue was taken to court and settled in 2018 with a verdict that once a company is empowered, it will not have a responsibility to continuously maintain the 26% threshold (Lexology, 2020).
3. ZAR is the Republic of South Africa's local currency.
4. This is specific to the Institute of Directors of Sothern Africa's King IV Report on corporate governance.
5. This number was haphazardly selected knowing that if any company disclosed more share-based schemes, more columns could easily be added. If any company didn't disclose this many schemes, those cells were left blank.
6. There are 32 companies each with 2 schemes resulting in 64 schemes.
7. Many companies had more than one SBPT. For this reason, the total number of instruments of 269 is greater than the sample of 100 companies.

8. 77 Companies had a primary listing on the JSE while 23 had a secondary listing on the JSE.
9. By market capitalisation.
10. Such as a general declining macroeconomic environment and country or political risk.
11. H-statistic 5.956, df 2 and Asymp. Sig. 0.051 (2-tailed).
12. This company was the only secondary listing company with a 10-year vesting period. All other 10-year vesting period SBPT were from primary listed entities.
13. The 2010 Mining Charter required mining companies to achieve 26% ownership by HDSA. This was often achieved through Trusts and SBPT. An early issue arose that, once shares vested in HDSA's hands, if they sold those shares did the mining company have an obligation to top-up to re-attain the 26% ownership. The court found that mining companies 'once empowered [achieve 26% ownership by HDSA], always empowered'. The Minister of Mineral Resources and Energy fiercely opposed this principle. The court order is also only applicable to the 2010 Mining Charter. Clauses on mining right renewals and transfers in the 2018 Mining Charter may negate the principle of once empowered, always empowered. These clauses are being challenged via a judicial review.
14. Many large, institutional, and international investors have such significant investment needs that investing in smaller companies is impractical as it would often result in the investors owning too significant a stake (if not resulting in complete ownership). This is not ideal, and all the shares may not be available for sale. Finally, these classes of shares also typically have reduced trading volumes and liquidity making them less desirable to large investors (Amihud & Mendelson, 2000).
15. Common methods include forming Trusts or Special Purpose Vehicles that hold shares on behalf of BEE participants where the shares are paid for by the dividends declared on those shares to the Trust until the purchase price is paid up. Other methods include forming specific classes of shares for BEE participants. The JSE initiated a specific segment of the Main Board for BEE-only shares. Sasol Ltd was the first to participate in this segment in 2011 (*Financial Mail*, 2012).
16. Accounting students are typically taught the basics of these three valuation models, with a focus on utilising the valuation outcomes in an accounting context. The assumptions that must be satisfied before a model may be applied are not covered (SAICA, 2019, p. 129). An actuary is likely involved in the process to ensure the mathematical acceptability of the model applied.

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