AN INVESTIGATION INTO THE ABILITY OF NON-IFRS EARNINGS MEASURES' TO PREDICT FUTURE OPERATING CASH FLOWS FOR A SAMPLE OF SOUTH AFRICAN JSE LISTED COMPANIES

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I hereby declare that I have read and understood the regulations governing the submission of Master of Commerce dissertations, including those relating to length and plagiarism, as contained in the rules of the University, and that this dissertation conforms to those regulations.

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ABSTRACT

This study investigates whether or not non-IFRS earnings measures can predict future operating cash flows. Many companies consistently present non-IFRS earnings measures, being voluntarily disclosed earnings measures lacking in formal definition, in order to communicate a companies' core or sustainable earnings. Prior research into the usefulness of non-IFRS earnings measures has shown mixed results around the measures' ability to predict a company's future stock returns. Furthermore, there is some evidence that non-IFRS earnings measures have been used opportunistically to report a more favourable financial performance compared to IFRS earnings, questioning the usefulness and relevance of non-IFRS earnings measures. A linear mixed model was used to investigate the ability of non-IFRS earnings measures' to predict future operating cash flows [CF(T+1)] using the top 40 Johannesburg Stock Exchange (JSE) companies over the sample period from 2012 to 2016. The results of the statistical analysis showed that the non-IFRS earnings measure within the final model showed a positive and significant relationship with CF(T+1), which aligns with findings of a similar Australian study. Further to this, the inclusion of an indicator variable for mining companies was found to improve the model's ability to predict future operating cash flows using non-IFRS earnings measures. The results of this study add to the growing area of research surrounding non-IFRS measures by uniquely focusing on South African companies, with similar results to prior studies. These findings may be of assistance to analysts and investors for valuation purposes and to standard-setting bodies for consideration as part of their current research project on performance reporting. Finally, the results provide justification for non-IFRS earnings measures as valid and useful metrics for analysis of company performance.

INTRODUCTION

This study investigates whether or not non-IFRS earnings measures are useful predictors of a sample of South African companies' future operating cash flows. The findings of this study provide evidence of the usefulness of non-IFRS earnings measures, being voluntarily presented earnings metrics without formal definition.

Such measures are frequently reported by companies listed on various stock exchanges in both developed and developing countries, and have therefore attracted increased attention from analysts, academics, standard-setters and assurance providers (De Villiers, Rinaldi & Unerman, 2014; PriceWaterhouseCoopers, 2014; CFA Society of the United Kingdom, 2015). These measures are derived by adjusting the IFRS earnings measure to arrive at an earnings measure that managers often purport to be more useful to users in obtaining an understanding of company performance (Libby & Emett, 2014; CFA Society of the United Kingdom, 2015). The need for further academic research surrounding the usefulness of non-IFRS earnings measures has been raised by Hans Hoogevorst, the president of the International Accounting Standards Board (IASB) (2016a). The objective of this study is to contribute towards this.

Prior literature has found evidence of increasing reporting of non-IFRS earnings measures (PWC, 2016; Hoogervorst, 2016a); as well as the reporting of misleading measures that depict a more favourable measure of performance (Bhattacharya, Black, Christensen & Larson, 2003; Curtis, Mcvay & Whipple, 2014). Furthermore, research has been conducted on non-IFRS earnings measures' ability to explain movements in share prices (Bhattacharya et al., 2003; Entwistle, Feltham & Mbagwu, 2010). Recently, Sinnewe, Harrison and Wijeweera (2017) investigated non-IFRS earnings' measures ability to predicted future operating cash flows, using a sample of Australian companies. The present study extends the study conducted by Sinnewe et al. (2017) to the South African context, thereby broadening the evidence of non-IFRS earnings' usefulness in the context of a developing country.

A quantitative approach is adopted to investigate non-IFRS earnings' measures' ability to predict future operating cash flows. A regression analysis is used to examine the ability of non-IFRS earnings measures to predict one period ahead future operating cash flows ['CF(T+1)'] for a sample of South African JSE listed companies. The sample comprises five years of data for each of the Top 40 Johannesburg Stock Exchange (JSE) listed entities, identified at 31 December 2016. Non-IFRS earnings measures were restricted to those reported in the statement of comprehensive income by the respective companies, and excluded all 'margin ratios' (such as 'gross profit margin') and 'per share'

measures (such as 'operating profit per share'). In addition, headline earnings[1] was ignored, as this is not a voluntarily presented earnings measure for JSE companies; although additional voluntarily presented variations of headline earnings measures (such as 'normalised headline earnings') were included.

The findings show that non-IFRS earnings are useful predictors of future cash flows, which aligns with the findings of Sinnewe et al. (2017) in Australia; and suggests that such measures are not misleading nor used opportunistically to manipulate results favourably. The present study contributes to existing literature by providing South African-based evidence of the prevalence, nature and usefulness of these measures. These findings may be useful to investors and analysts of South African companies who use non-IFRS earnings as a metric for valuation purposes; as well as to the academic and standard-setting community currently investigating and deliberating upon the need for non-IFRS earnings measures to be embedded within performance reporting requirements.

A literature review follows, which includes an explanation of the standard setting environment and the emergence non-IFRS earnings measures; as well as evidence of the most common non-IFRS earnings measures per industry and common adjustments made in their calculation. The arguments made in prior literature both for and against the use of non-IFRS earnings measures are then provided; after which, research related to the usefulness of non-IFRS earnings measures in predicting both share returns and future cash flows is discussed. Thereafter, the data analysed and method adopted is discussed. The results and limitations of the study follow, and finally some areas for future research are identified.

LITERATURE REVIEW

Explanation of Non-IFRS earnings measures and standard-setting boards

IFRS earnings are used extensively around the world, as close to 125 jurisdictions of 149 (84 percent) require that all or most publically accountable companies must use IFRS standards (IFRS Foundation, 2016). This includes publically accountable companies that are listed on the JSE (Johannesburg Stock Exchange Limited, 2015).

The IASB is the independent standard setting board of the IFRS Foundation (IFRS Foundation, 2016). The IFRS Foundation aims to develop IFRS standards that will ensure transparency and accountability within accounting performance and presentation by enhancing the quality of financial information

[1] As defined in Circular 03/2009 Headline Earnings (South African Institute of Chartered Accountants, 2009).

(IFRS Foundation, 2016). In a similar manner, the IASB has the responsibility for the development of IFRS, interpretations, the conceptual framework and other guidance that are adopted by companies that report under these standards (IFRS Foundation, 2016). Similar to the IFRS Foundation, the Financial Accounting Standards Board (FASB) is an independent, not-for-profit organization that establishes financial accounting and reporting standards for public, private and not-for-profit organizations within the United States (FASB, 2013). The FASB is a standard setting board that is recognized by the Securities Exchange Commission[2] (SEC).

The terms 'GAAP earnings' and 'IFRS earnings' are used interchangeably within this report to refer to defined earnings terms that have been calculated in accordance with the FASB and IASB standards respectively. As a precursor to investigating the merits and criticisms of non-IFRS earnings measures, an analysis of the common adjustments made to IFRS earnings when calculating non-IFRS earnings measures ('non-IFRS earnings adjustments') and terms used to describe the earnings will be provided in the section to follow.

Common non-IFRS earnings adjustments and industries reporting non-IFRS earnings measures

Doyle, Lundholm and Soliman (2003) explained that the difference between IFRS earnings and non-IFRS earnings measures was due to two separate components, the first being that of special items and the second being other exclusions. Further to this, Whipple (2015) identifies that special items (or exclusions) relate to one-time items that are usually easy to identify, whereas 'other exclusions' relate to recurring components of earnings such as amortization and other related non-cash items. Within these two categories, prior research as explained below, suggests that certain adjustments may be favored by managers.

PriceWaterhouseCoopers (PWC) (2014) identified that common adjustments made related to non-cash flow items such as depreciation and amortization as well as tax related adjustments. Although there may be consistency in the common adjustments used by managers, the terms used to describe the non-IFRS earnings measure have not been consistent between companies, as explained below.

According to PWC (2016), earnings before interest, tax, depreciation and amortization ('EBITDA') was the most commonly used non-IFRS earnings measure by listed entities within the United Kingdom. This PWC report also identified that there was inconsistency relating to the non-IFRS earnings measure descriptions used by different companies listed on the Financial Times Stock Exchange (FTSE) 100.

[2] SEC is the primary overseer and regulator of the United States securities markets (SEC, 2016)

Apart from 95 percent of companies having reported non- IFRS earnings measure, the three most commonly used non-IFRS earnings measure descriptions were that of adjusted operating profit (39 percent), adjusted profit before tax (35 percent) and EBITDA (11 percent). The report explains that even within these measures, inconsistent adjustments were made. Xu, Bhuiyan and Rahman (2016) found a similar pattern in New Zealand where companies disclosed underlying profit, calculated in a variety of ways, with little consistency in underlying profit adjustments.

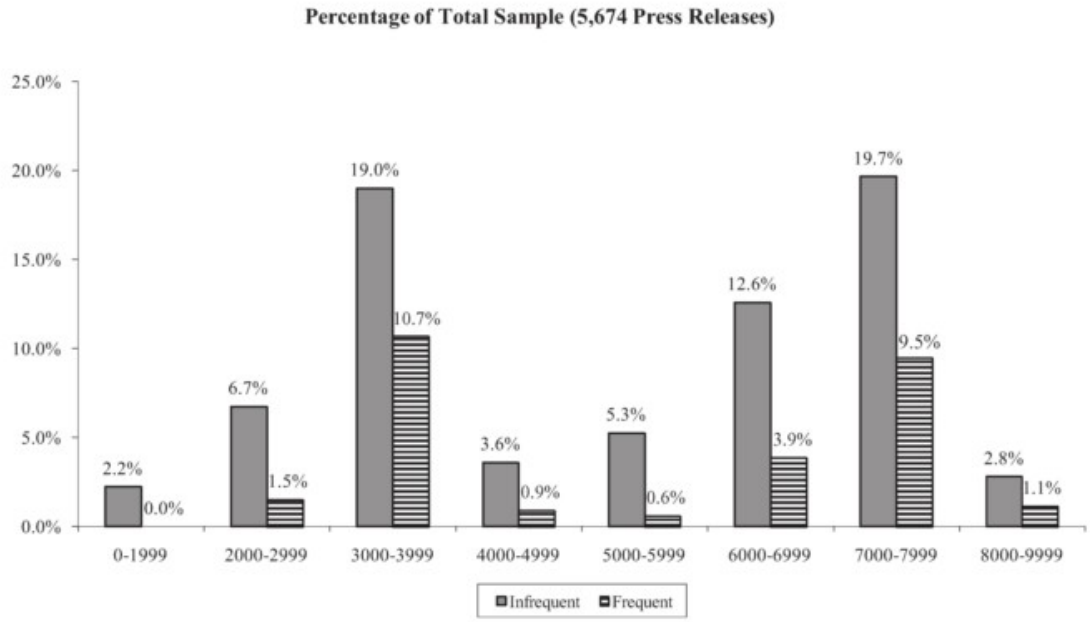
This raises the issue of consistency and comparability of the earnings measures used by companies. The inconsistency can partly be attributed to the subjective process by which the adjustments are chosen by management (Howard, Garnett & Maroun, 2017). Different perceptions of what constitutes core earnings for an entity exist (Curtis et al., 2013), and some industries use non-IFRS earnings measure more than others (Black & Christensen, 2009).

The study by Black and Christensen (2009) investigated which industries most commonly used non-IFRS earnings measures. The study searched the PR Newswire and Business Wire services on LexisNexis for key words[3] that related to non-IFRS earnings measures, for the years 1998 to 2003. Of the 83, 384 press releases identified, 21 percent of these were found to contain non- IFRS earnings announcements[4]. These 17, 511 announcements were then analyzed to determine whether complete financial information relating to the adjustment types were available. This requirement reduced the sample to 5,674 quarterly observations of 1,894 unique firms (Black & Christensen, 2009). Figure 1 below (extracted from Black and Christensen (2009))
classified the firms into industries (based on a SIC industry code) and attributed the earnings announcements to each of the different categories. 72 percent of the announcements are made by firms that announce non-IFRS earnings measures infrequently.

Focusing on the portion related to firms that report non-IFRS earnings frequently in Figure 1, the industry code related to Manufacturing of rubber, machinery, electronic and transportation equipment, as well as certain companies in the services industry, and financial services industry were the most likely to use non-IFRS earnings. These industries accounted for 10.7 percent, 9.5 percent and 3.9 percent respectively of the total (24 percent) frequently reported non-IFRS earnings announcements (that are also accompanied by detail of the non-IFRS adjustments made).

[3] The original search used 'pro forma,' 'pro-forma,', after which the search was expanded to include 'earnings excluding,' 'net income excluding,' 'adjusted net income,' 'adjusted loss,' 'cash earnings,' 'earnings before,' 'free cash flow,' 'normalized EPS,' 'normalized earnings,' 'recurring earnings,' 'distributable cash flow,' 'GAAP one- time adjusted,' 'GAAP adjusted,' 'cash loss' (Black and Christensen, 2009).

[4] "The other 65,873 press releases from the initial searches refer to such things as current period pro forma revenues, forward-looking pro forma forecasts, earnings after adding in results from firms acquired or merged in the current period, or statements referring to prior period pro forma earnings" Black and Christensen (2009: 303).



Notes:
SIC Code 0–1999 = Mineral and Construction Industries
SIC Code 2000–2999 = Manufacturing: Food, Tobacco, Textile, Lumber, Furniture, Paper, Printing, Chemicals, and Petroleum
SIC Code 3000–3999 = Manufacturing: Rubber, Leather, Stone, Metal, Machinery, Electronic Equipment, Transportation Equipment, etc.
SIC Code 4000–4999 = Transportation, Communications, and Utilities
SIC Code 5000–5999 = Wholesale trade (durable and non-durable) and Retail trade (building materials, general merchandise, food, automotive, apparel, home furnishings, dining, etc.)
SIC Code 6000–6999 = Financial services, Insurance, and Real estate Industries
SIC Code 7000–7999 = Service Industries: Hotels, Personal services, Business services, Automotive repair, Motion pictures, Amusement and recreation services
SIC Code 8000–9999 = Service Industries: Health, Legal, Educational, Social, Museums, Engineering, Accounting, Management, etc.

Figure 1: Industry Classification of non-IFRS press releases characterized by industry (Black and Christensen, 2009: 304)

The most recent study on the topic of non-IFRS earnings measures within South Africa by Howard, Maroun and Garnett (2017) used a sample consisting of 116 firms for the years 2010 to 2014. The original sample was decreased by removing 10 firm years that were not listed for that year, leaving a useful population of 570 firm years. Using these years, the earnings results and announcements were searched for evidence of non-IFRS earnings reported. It was identified that the financial services industry firms make up 23.9 percent of the companies that report non- IFRS earnings. This was followed by consumer services (22 percent) and basic materials (14.6 percent). Other industries frequently using adjusted earnings include retailers and mining/resources firms. These results by Howard et al. (2017) are consistent with the findings of Black and Christensen (2009).

Rank	Industry level	%	Super Sector level	%	Sector level	%	Sub Sector level	%
1	Financials	23.9	Basic resources	14.6	Life insurance	12.2	Life insurance	12.2
2	Consumer services	22	Insurance	12.2	Mining	11.2	Banks	7.3
3	Basic materials	14.6	Retail	11.7	General retailers	8.78	Apparel retailers	6.3
4	Consumer goods	11.7	Health care	8.78	Banks	7.32	Health care providers	6.3
5	industrials	10.7	Food & beverage	8.78	Travel & leisure	7.32	Gambling	4.9

Figure 2: Top five industries making up the proportion of companies using non-IFRS earnings measures (Howard et al., 2017: 54)

Non-IFRS earnings measures are therefore prevalent in practice, although the extent of this varies across industries, as does the description and nature of the non-IFRs adjustments made. The following section provides insight into the arguments in favour of, and against, the reporting of non-IFRS earnings measures.

Arguments in favour of and against the use of non-IFRS earnings measure

Weil (2001) describes non-IFRS earnings measures as earnings that are reported after the removal of non-recurring earnings, the goal of which is to provide an earnings measure that relates to the core operations of the business and is 'normalized' (Black & Christensen, 2009; Entwistle et al., 2010). During the period 2001 to 2003, Marques (2006) showed that out of the 500 companies on the United States Standard and Poor (S&P), 68 percent regularly disclosed and placed emphasis on non-IFRS earnings measures. This percentage has increased to 88 percent of S&P 500 companies as mentioned within a recent speech by Hans Hoogervorst (2016a). Bradshaw and Sloan (2002) provided evidence that the reporting of non-IFRS earnings measures is not a phenomenon that is only prevalent within the 21st century. His study noted that 20 years prior to 2002, the use of non-IFRS or 'street earnings' showed that management had played a proactive role in emphasizing non-IFRS metrics within financial results announcements. The study however did not investigate whether this emphasis was opportunistic behavior or to inform the financial analysts, increasing standard setting bodies and regulators concerns.

The Security Exchange Commission (SEC) issued regulation G to provide greater protection to stakeholders by monitoring the non-IFRS information that management provided to ensure that these measures were not misleading to ordinary investors (Bhattacharya, Black, Christensen & Mergenthaler, 2007). Lawrence Summers of the US Treasury cautioned users not to pay attention to non-IFRS earnings measures and to rather use the audited earnings when assessing entity performance (Bhattacharya et al., 2007). The SEC was not the only regulatory body to caution the use of non-IFRS earnings measures, as New Zealand Financial Markets Authority (FMA) issued guidance regarding the use of non-IFRS earnings measures (Rainsbury, Hart & Buranavityawut, 2015). This guidance was intended to ensure that entities are not using the discretionary adjustments opportunistically to increase earnings or beat investor's benchmarks by unjustifiably adding back to earnings amounts that were previously deducted as expenses (Rainsbury et al., 2015).

The skepticism and necessity for guidance stems from the fact that non-IFRS earnings measures are not being audited which has allowed management the discretion to potentially report overly optimistic performance (Bhattacharya et al., 2003; Curtis et al., 2014). The opportunistic nature of the non-IFRS earnings measure was further analyzed by Barth, Gow and Taylor (2012) who found that this opportunistic behavior extends to managers who exclude and reclassify certain expenses to achieve 'smoother' earnings or to meet earnings targets.

Prior research by Doyle, Lundholm and Soliman (2003) and Bowen, Davis and Matsumoto (2005) shows that managers may be using non-IFRS reporting to opportunistically reclassify recurring earnings adjustments as non-recurring adjustments. This allows earnings results to potentially beat benchmark returns and earnings performance targets (Bradshaw & Sloan, 2002; Doyle et al., 2003, Bhattacharya et al., 2003; Bhattacharya et al., 2007). Bray (2001) however found that management defended non-IFRS earnings measures by asserting that the measure is more representative of future sustainable earnings than that of GAAP earnings and provided a representation of a company's core earnings. The increasing use of non-IFRS earnings measures over the past decade highlights the need to understand the merits and concerns surrounding these earnings (Hoogervorst, 2016a; Black, Christensen, Ciesielski & Whipple, 2016).

The motive for these non-IFRS adjustments was investigated by Dichev, Graham, Harvey and Rajgopal (2015), who interviewed 375 Chief Financial Officers (CFO) within the United Kingdom. These CFOs were asked to identify factors that may influence the misrepresentation

of earnings by using discretionary non-IFRS earnings measures. The finding is presented below in Figure 3, showing that more than 80 percent of CFOs believe that the motivation for using non-IFRS earnings measures is to either meet or beat stock expectations, as well as influence their executive compensation.

Marques (2006) found that it was common for non-IFRS earnings measures to be announced in earnings reports before the annual results were released. It was also common practice to emphasize a positive non-IFRS financial performance when the GAAP earnings expectations were not met. Howard et al. (2017) confirmed that meeting earnings targets is a significant consideration by managers within the South African context, and is expected to be a common theme within other countries.

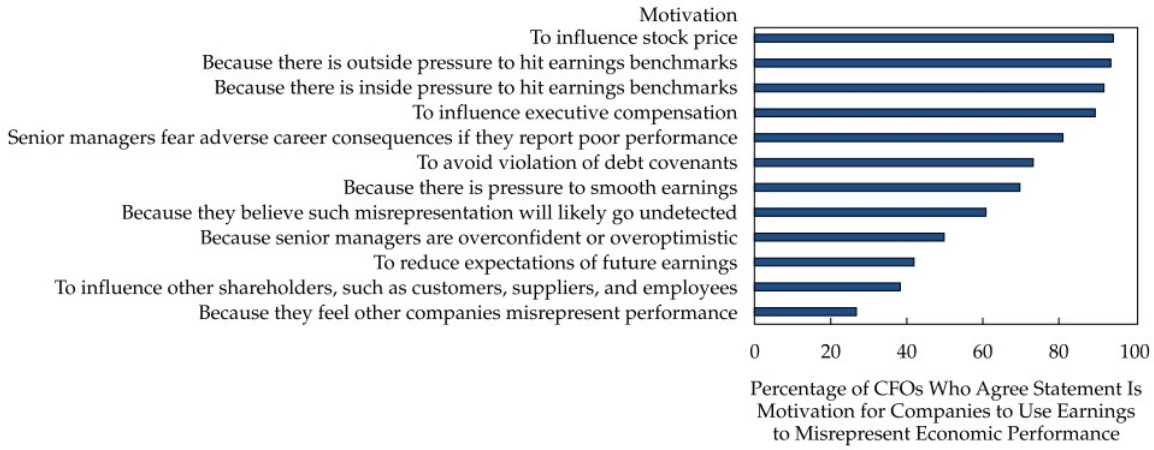


Figure 3: Motivations to use earnings to misrepresent economic performance (Dichev et al., 2015: 29)

The inability of investors to identify which adjusted items are recurring or non-recurring is an issue which was raised by Doyle et al. (2003). The SEC (2003) emphasizes the importance of a reconciliation of non-IFRS to IFRS earnings and that without the accompanied disclosure, non-IFRS earnings measures may contain material and misleading information (SEC, 2003; Brooke, 2006). A reconciliation is particularly useful and necessary where non-IFRS adjustments are not appropriately explained by management commentary (Black, 2016).

Brooke (2006) provided weight to the SEC statement by confirming the positive influence that the inclusion of a reconciliation had on investors' perceptions and understanding of non-IFRS earnings disclosures. This study found that the presence of the reconciliation increased investors reliance of the non-IFRS earnings measure as adjustments became more transparent and informative, as opposed to when the reconciliation was not presented. Thus, investors are

more inclined to use the non-IFRS earnings measure when a reconciliation is provided (Brooke, 2006).

The reconciliation is particularly useful when differing terms are used to describe non-IFRS earnings measures. The International Accounting Standards Board (IASB) (2015) published that they have commenced with a 'Disclosure Initiative' project to provide clarity regarding the definitions of common non-IFRS earnings measures such as 'underlying earnings', 'normalized profit', 'adjusted earnings', 'EBIT', 'EBITDA' and 'operating income'. The IASB believes that IFRS earnings measures that are clearly defined, provide the most appropriate starting point when assessing an entities financial performance. This shows that the IASB neither fully criticizes nor fully supports the use of non-IFRS earnings measures. Hoogervorst (2016a) provided clarity regarding the IASB's opinion of non-IFRS earnings measures in that:

"Cutting back the use of non-IFRS earnings measures is primarily the task of securities regulators. But the board should also look at its own role in this matter. We must acknowledge that non-IFRS earnings measures are also popular because we provide too little guidance in terms of formatting the income statement. The enormous flexibility under existing accounting standards is an open invitation for non-GAAP to step in." Hans Hoogervorst, (2016a: 6)

"Let me make clear that we do not intend to ban alternative performance measures, because some of them clearly have added value. Yet, we share the SEC's concern that non-IFRS generally paints a rosier picture of a company's performance than GAAP." Hans Hoogervorst, (2016c: 4)

A benefit of reporting a non-IFRS earnings measure is perceived to be due to the measure being a simpler and less complex representation of earnings. It has been argued that GAAP has become more complicated to understand and apply (Filzen & Peterson, 2015). The non-IFRS measure can be a useful mechanism for managers to communicate important financial information to shareholders in an entity-unique manner that the application of generic GAAP principles does not achieve (Black, 2016). One manager that has a similar view is that of Warren Buffett (2014) who included commentary related to non-IFRS earnings measures within his annual letter to Berkshire Hathaway shareholders. He argued that IFRS measures have become detached from reality:

> *"…the operating expense figures above are non-GAAP and exclude some purchase-accounting items (primarily the amortization of certain intangible assets). We present the data in this manner because Charlie and I believe the adjusted numbers more accurately reflect the true economic expenses and profits of the businesses… The concept of making charges against other intangibles, such as the amortization of customer relationships… arises through purchase-accounting rules and clearly does not reflect reality."* Warren Buffett (2014: 14)

The mixed opinions related to non-IFRS earnings measures highlights the issue that there may be two different types of manager mindsets when producing the non-IFRS earnings measures. The first being that which attempts to display a more sustainable measure to users of the financial statements and the second being that which aims to divert stakeholder's attention away from poor operating performance (Bhattacharya, 2007). Despite the criticisms of non-IFRS earnings measures, various research studies have shown that non-IFRS earnings measures are useful when used in valuations (Bradshaw & Sloan, 2002; Rainsbury, 2015) and may better reflect the fundamental value of the company's stock price (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Bhattacharya et al., 2003; Bowen et al., 2005).

The following section addresses the value relevance of non-IFRS earnings measures, including background into a study performed on the value relevance of headline earnings, which is a mandatory non-IFRS earnings measure unique to South Africa. Following this, the importance of cash flows in the equity valuation process for investor understanding of future performance will be discussed.

Value relevance of non-IFRS earnings measures

Saha and Bose (2017: 2) define value relevance as the "ability of accounting numbers to explain the underlying differences in stock prices in capital markets". This definition is an adaption of an earlier definition by Barth, Beaver and Landsman (2001) who explained that the value relevance characteristic of accounting information is the measures association[5] with equity market values. Prior studies have focused on the ability of various measures, including both IFRS and non-IFRS earnings measures, to explain the current market price of a company's share (Bhattacharya et al., 2003; Bowen et al., 2005; Entwistle et al., 2010; Gasbarro, Monroe, Schwebach & Thiam The, 2013).

Bhattacharya et al. (2003) conducted one of the first studies to investigate whether GAAP earnings were more value relevant than that of non-IFRS earnings measure in explaining market prices. This was performed by analyzing 1,149 LexisNexis press releases[6] for non-IFRS earnings measures on the US stock exchanges between 1998 and 2000. These measures were compared to the reported earnings in the financial statements and Institutional Broker's

[5] Association in Barth et al. (2001) study related to the ability of the accounting measure to explain the variance in future stock price excess returns.

[6] Earnings press releases provide managers with the platform to present their quarterly financial information in a manner that is not necessarily audited (Bowen et al., 2005)

Estimate Services (I/B/E/S)[7] in order to identify whether the non-IFRS earnings measures were more informative of the short-term surprises[8] when using forecast error[9] as the earnings expectation. The study found that non-IFRS earnings measures were significantly more informative than IFRS earnings when considering the short-window abnormal returns around earnings announcement dates. This was consistent with the results of a study performed by Bradshaw and Sloan (2002) which used long window[10] stock returns.

Following from the findings of Bhattacharya et al. (2003), the usefulness of non-IFRS earnings measures was further investigated by Entwistle et al. (2010) within the United States. The earnings releases of Standard and Poor's (S&P) 500 firms over the five-year period from 2000 to 2004 were analyzed for evidence of non-IFRS[11] earnings. The study used a price and returns model developed by Collins, Kothari, Shanken and Sloan (1994) to determine whether IFRS earnings or non-IFRS earnings measures provided the most representative measure of future performance. The measure of future performance was the ability of earnings to explain the variance in cumulative monthly market-adjusted abnormal return over a twelve-month period ending three months after the company's fiscal year end (Entwistle et al., 2010). The results used the adjusted R-squared measure to determine the value relevance of the three earnings measures. Although all three earnings measures were shown to be value relevant, non-IFRS earnings was found to have the highest explanatory power, followed by I/B/E/S earnings and GAAP earnings (Entwistle et al. 2010).

[7] Thomson Reuters (2009: 35) states that I/B/E/S earnings is defined as "the (earnings) that the contributing analyst considers to be that with which to value a security. This measure may include or exclude certain items depending on the contributing analyst's specific model."

[8] This study regressed short term abnormal returns separately on earnings surprise (forecast error) – using a three-day window centered on the announcement date (Bhattacharya et al., 2003)

[9] "Forecast errors are defined as reported earnings per share (either non-IFRS or GAAP) less the median consensus earnings per share forecast for the final month of the fiscal quarter, scaled by the stock price." Bradshaw and Sloan (2002: 51)

[10] Long window stock returns are returns from two days after the last quarterly announcement to after the current period earnings announcement.

[11] I/B/E/S was used a proxy for non-IFRS earnings.

The three studies presented thus far focused on the period up to 2006, prior to the financial crisis. Gasbarro et al. (2013) acknowledged this and tested the impact that the financial crisis had on the value relevance of non-IFRS and GAAP earnings. The same methodology as Brown and Sivakumar (2003) and Bhattacharya et al. (2003) was used to examine the value relevance of earnings measures. This being the regression of the short term cumulative abnormal returns (CAR) on earnings surprise based on the non-IFRS and GAAP earnings (Brown & Sivakumar, 2003; Bhattacharya et al., 2003). The sample period used by Gasbarro et al. (2013) differs by using US publicly traded companies results over a longer time-period from 2002 to 2010.

The results of Gasbarro et al. (2013) contradicted prior research conducted by Bhattacharya et al. (2003) and Entwistle et al. (2010) showing that GAAP earnings were more value relevant than that of non-IFRS earnings measure. These opposing results may be attributed to investors not fully understanding the financial implications of the non-IFRS earnings measure adjustments, resulting in inaccurate investment decisions and pricing errors (Doyle et al., 2003).

A more recent study by Venter, Emanuel and Cahan (2014) investigated the value relevance of non-IFRS earnings measure and was the first study of this kind using South African Johannesburg Stock Exchange (JSE) listed companies. This study used headline earnings, an earnings measure similar to the non-IFRS earnings measure reported in the United States (Venter et al., 2014). The range of adjustments required to calculate headline earnings include impairment adjustments, amortization, bargain purchase gains, gains and losses on disposal of property plant and equipment (The South African Institute of Chartered Accountants, 2009). Nonetheless, differences are apparent when comparing headline earnings to other non-IFRS earnings measures. The first difference is that headline earnings is a non-IFRS measure that has predetermined rules that must be applied when calculating the headline earnings (Venter et al., 2014). The second being that it is a JSE listing requirement since 2000 to calculate and disclose headline earnings within the annual financial statements in addition to the IFRS earnings measure (The South African Institute of Chartered Accountants, 2009). The final difference is that headline earnings is audited (Venter et al., 2014). Bhattacharya (2007) noted that for these

reasons, headline earnings may not suffer from the same consistency issues that voluntarily and undefined non-IFRS earnings measures do.

In assessing the value relevance of non-IFRS earnings measures, Venter et al. (2014) used the definition developed by Barth, Beaver and Landsman (2001), where value relevance was assessed as accounting information that plays a primary role for equity valuations of a company. Venter et al. (2014) used the McGregor BFA database for 424 firms listed on the JSE for the period ranging from 2002 until 2009. Real estate holding firms and development firms were excluded[13]. The research design was based on the theoretical foundation developed by Ohlsen (1995) which used a linear price-levels regression model[14]. The accounting earnings measure was regarded as value relevant if the regression coefficient of the earnings measure and market price of the security was statistically significantly different from zero. Using the share price four months after the companies' financial year end, headline earnings was shown to have a higher adjusted R-squared value than that of the comparable GAAP earnings. Therefore, within this study, headline earnings were a more value relevant measure in predicting share price performance than GAAP earnings. The significance of this finding is that although mixed results have been presented, both voluntary and mandatory non-IFRS earnings measures have been shown to be more value relevant than that of IFRS earnings.

It is apparent that the ability of non-IFRS earnings measures to predict future cash flow from operations is less researched. Prior studies have indicated that there are inconsistent views on which cash flow measure is the most relevant to company equity valuation (Kim & Kross, 2005). However, the most commonly used cash flow measure was cash flow from operations (CFFO) (Dechow, 1994; Barth et al., 2001; Kim & Kross, 2005). The following section will elaborate on the research related to the importance of CFFO in equity valuations and prior research on the ability of non-IFRS earnings measures to predict future CFFO.

Non-IFRS and IFRS earnings' ability to predict future cash flows

It is clear from the above that the majority of the value relevance research performed on non-IFRS earnings measures relates to the measures' ability to predict the future share price of an

[13] The exclusion was due to these firms typically listing linked units instead of ordinary shares on the JSE.

[14] $P_t = x_0 + x_1 BVE + x_3 EARN + e_t$

entity. The ability of non-IFRS earnings measures to predict cash flows is less researched (Venter et al., 2014).

The importance of CFFO as a relevant metric for evaluating company performance by investors was highlighted by the FASB: *"… an enterprise's ability to generate favorable cash flows*[15] *affect both its ability to pay dividends and interest and the market prices of its securities, expected cash flows to investors and creditors are related to expected cash flows to the enterprise in which they have invested...."* (FASB,1978)

Dechow (1994) reiterated this statement in describing that CFFO is central to the valuation models of finance, economics. The study further emphasized that many portfolio managers claim that operating cash flows are a meaningful basis of a company's value. The IASB similarly stated that a key objective of financial reporting is to enable investors, lenders and other creditors the ability to assess the 'prospects of future net cash inflows to an entity' (IASB, 2010. The relevance of cash flows as an indicator of company value does however have its limitations, as it ignores accounting accruals that have been shown to be value relevant (Cheng, Liu & Schaefer, 1997). However, since prior studies have shown non-IFRS earnings measures and cash flows to be value relevant for the purpose of predicting future share prices, this current study contributes to research in this field by investigating the relationship between non-IFRS earnings measures and future CFFO.

Francis and Schipper (1999) explained that for financial information to be regarded as value relevant, it must contain the variables that are used within a valuation model. This paper went on to explain that because a company's stock price is the present value of future cash flows[16], the value relevance of accounting earnings can be assessed by examining its ability to forecast future cash flows[23] or earnings. Kim and Kross (2005) used this insight and regressed the one-year-ahead operating cash flows against current earnings to investigate the ability of current year IFRS earnings to predict future cash flows. The study found that there had been an improvement regarding the ability of accounting earnings to predict future cash flows over the time from 1972 to 2001 on the US stock market.

15 "Cash flows" in this speech referred to the cash balance before distributions of the company.

16 Future cash flows were measured as net income before extraordinary items plus depreciation and amortization expenses plus deferred tax expense plus minority interest, less the change in working capital. Francis and Schipper (1999)

No research has been performed on the ability of non-IFRS earnings measures to predict future CFFO within the South African context. CFFO is used to test this relationship as it is a performance measure that relies less on accruals and deferrals and is a measure that incorporates less subjectivity than IFRS earnings (Barth et al., 2001).

Leung and Veenman (2016) were the first to perform a study on the loss making firms that were presenting non-IFRS earnings measures. The research was conducted to determine whether companies that make IFRS earnings losses, have more useful and value relevant non-IFRS earnings measures. The study focused on the extent to which the IFRS and non-IFRS earnings measures were able to forecast CFFO. The results found that:

> *"[For] firms that convert a GAAP loss to a non-GAAP profit ("loss converters"), we find that GAAP earnings are uninformative about future cash flows. Splitting GAAP earnings into non-GAAP and exclusion components, we find that non-GAAP earnings are significantly positively associated with future cash flows, while the items excluded from non-GAAP earnings are not."* Leung and Veenman (2016: 4)

These findings therefore support the ability of non-IFRS earnings measures (rather than IFRS measures) to predict future cash flows.

The most recent study conducted related to the value relevance of non-IFRS earnings measures predictive abilities for CFFO was conducted by Sinnewe et al. (2017). The study obtained data from 249 companies that were listed on the Standard and Poor's Australian Stock Exchange for the period 2006 to 2011. One of the main objectives of the study was to determine whether non-IFRS earnings measures could forecast future CFFO better than that of IFRS earnings using a linear equation that was adapted from the Ohlsen model (1996). An important finding of the study is that when the regression equations was performed, the results provided strong support that non-IFRS earnings measures forecast future CFFO better than IFRS earnings ($\beta = 0.125$; $p<.001$). This implies that IFRS earnings may include non-recurring or persistent items that contribute to a weakened association between IFRS earnings and future CFFO (Sinnewe et al., 2017), thereby providing impetus for the need for more research in this area.

An explanation of the relevance of the research

Hoogervorst (2016b), the chairman of the IASB, expressed his concern that there is a lack of academic research on the topic of performance reporting and the need for such research, as academic literature enables the separation of evidence from opinion. The use of non-IFRS earnings measures has attracted increased attention (De Villiers et al., 2014; CFASociety of the United Kingdom, 2015; PWC, 2016; Hoogervorst, 2016b). The measures have been believed

to enhance investors' assessment of a company's future performance by allowing management to present their interpretation of core or sustainable earnings (Bhattacharya et al., 2003; Rainsbury, 2015).

However, Hans Hoogervorst (2016a) highlighted that there is concern that non-IFRS earnings measures are not achieving the consistency and comparability that characterizes earnings based on GAAP principles and that there is the possibility that management may be using these unaudited measures to manipulate earnings to beat earnings targets.

A vast amount of research has been performed on the ability of non-IFRS earnings measures to predict the share price of firms and earnings surprises (Bhattacharya et al., 2003; Bowen et al., 2005; Entwistle et al., 2010; Gasbarro et al., 2013). The research found mixed conclusions, which highlights the uncertainty as to the usefulness of non-IFRS earnings measures. A topic less researched is the explanatory power of non-IFRS earnings measures in predicting future CFFO (Venter et al., 2014; Sinnewe et al., 2017). CFFO is useful for two reasons, the first being that it is a performance measure that relies less on accruals and deferrals and secondly, CFFO is central to the valuation of a company's share price (Dechow, 1994).

Conclusion

A review of past literature has provided insight into the mixed opinions regarding non-IFRS earnings as a measure of performance. The main criticisms raised relate to the lack of clarity in the adjustments made and comparability of non-IFRS earnings measures between companies within the same industry. An analysis of the industries that used the non-IFRS earnings measures most frequently were financial services, basic materials and consumer services. Analysis of past research identified that the vast amount of research relates to the value relevance of non-IFRS earnings measures in explaining the share price of companies around announcement date. The majority of these studies have shown that non-IFRS earnings measures may explain the abnormal returns of security prices better than that of its comparable IFRS earnings measure, however there may still be room for further research on this topic. A less researched topic, both internationally and within South Africa, is the ability of non-IFRS earnings measures to predict future CFFO. Sinnewe et al. (2017) provided evidence that non-IFRS earnings measures can be used to forecast future CFFO, for companies listed on the S&P Australian stock exchange. Whether this is the case for South African companies, is precisely what this study aims to investigate.

DATA AND METHOD

The sample is constructed by using the top 40 JSE listed companies on the main board of the JSE ranked by market capitalization[17] at 31 December 2016 using the DataStream Terminal. The scope of the sample is limited to these 40 companies as they make up close to 51 percent of the JSE market capitalization (Stafford, 2016), and are therefore a meaningful starting point for investigating the relationship between non-IFRS earnings measures and cash flow from operations in the year following the year that the non-IFRS earnings measure is disclosed, ('CF(T+1)').

The time-period used was from 2012 to 2016 inclusive (200 firm years). This period was chosen to prevent major overlap in non-IFRS earnings measures data used by other studies performed in South Africa. The first of which was by Venter et al. (2014) who used JSE listed data from 2002 to 2009, after which Howard et al. (2016) used a sample period covering 2010 to 2014. The period tested was therefore unique (compared to other studies) as well as the most recent.

The non-IFRS earnings measures and cash flow measures were obtained from the integrated reports of each company for each of the five years from 2012 to 2016. An integrated report is required to be prepared by all JSE listed companies and is the primary report used to communicate information to providers of financial capital (De Villiers et al., 2014; International Integrated Reporting Committee, 2013). The sample included companies that were dual listed and did not prepare integrated reports but rather used annual reports. For these companies, the annual reports were used as the source of non-IFRS earnings measures information. For both reports, there is flexibility for management to report additional discretionary performance measures (Libby & Emett, 2014), therefore making both the integrated report and annual report the most relevant sources of non-IFRS information.

Companies with foreign listings and those operating as a subsidiary under a larger foreign group had a presentation currency that was different to Rands. The currency that was used in these companies' reports was captured in addition to the year-end of each company. The presentation currency amounts were then converted into their Rand equivalent by using the average exchange rate for the 12-month period ending on the date of the financial year-end.

[17] INET calculates market capitalization by multiplying the number of authorized ordinary shares in issue by the market value of the security.

For each of the top 40 companies, the financial highlights and cover page of each integrated/annual report were analyzed to identify the non-IFRS earnings measure used by the company. This study did not include non-IFRS earnings measures that were provided as margin ratios or 'per share' measures. As some companies presented more than one non-IFRS earnings measure, the initial data set captured all non-IFRS earnings measures reported by the company. The non-IFRS measure was then identified as either a 'before tax' or 'after tax' amount, the reason for which is addressed in the following paragraph.

The next step was to identify the relevant operating cash flow measure that related to the company's non-IFRS measure. The statement of cash flows was examined. Where the non-IFRS measure was a 'before tax' measure, the cash generated from operations of the company was used (a pre-tax amount) and where the non-IFRS measure was an 'after tax' measure, the cash flow from operating activities (a post-tax amount) was used. This was necessary due to the potential materiality of the tax amount, for both the operating cash flow measure and the non-IFRS earnings measure. Consistency in the measurement of the independent variable and the corresponding dependent variable was therefore necessary. If ordinary dividend distributions had been subtracted from either cash flow measure (i.e. cash flow from operations or cash flow from operating activities), these amounts were added back, in order for the non-IFRS earnings measures to be comparable with the cash flow measure. Refer to Appendix A for a list of the non-IFRS earnings and cash flow measures identified per company.

As previously mentioned, some companies reported more than one non-IFRS earnings measure. In order to avoid statistical bias that may have arisen in the dataset from using more than one non-IFRS earnings measure for an individual company, only one non-IFRS measure per company was selected for the study. The selected measure was the first measure reported on the financial highlights page or cover page. Where a company reported both an adjusted EBIT[18] and EBITDA[19] measure, the EBITDA measure was used as it is the most comparable to CF(T+1) given that depreciation and amortization are non-cash items. Table 1 summarizes the companies that reported more than one non-IFRS measure and which non-IFRS earnings measures were either used within the study or excluded.

[18] Earnings before interest and tax

[19] Earnings before interest, taxes, depreciation and amortization

Table 1: Companies reporting more than one non-IFRS measure

Company	**Chosen non-IFRS earnings measure for study**	**Excluded non-IFRS earnings measures**
BHP Billiton	Underlying attributable profit	Underlying EBITDA and Underlying EBIT
Glencore	Adjusted EBITDA	Adjusted EBIT
Sanlam	Normalized Headline Earnings	Group Equity Value
Mondi	Underlying EBITDA	Underlying operating profit
Woolworths Holdings Ltd	Adjusted Profit before tax	Operating Profit (EBIT)
Investec	Adjusted attributable earnings	Operating Profit (EBIT)

Headline earnings is required to be reported and disclosed by all companies on the JSE (SAICA, 2009). The value relevance of headline earnings was previously investigated by De Villiers et al. (2014). Since the present study is concerned with voluntarily disclosed non-IFRS earnings measures, and these measures' ability to predict future cash flows, companies that reported no further non-IFRS earnings measures apart from headline earnings on their cover page or financial highlights page, were excluded from the sample. Table 2 below lists the nine companies excluded from the sample. This left 31 companies to be used within the data set for study.

Table 2: Companies that did not report a non-IFRS measure

1. Standard Bank Group
2. Remgro
3. Nedbank Group
4. Capitec Bank
5. Barclays Africa Group
6. Brait SA
7. Reinet Investments SCA
8. New Europe Property Investments
9. Redefine Properties

The final step was to obtain the relevant control variables for the regression analysis. Previous research found that mature firms had predictably higher cash flows than that of growing firms, as these growth firms had a tendency of re-investing cash flows within the business. The present study's investigation of the relationship between non-IFRS earnings measures and future cash flows may therefore be influenced by whether or not the company is mature or still growing. Consequently, a control variable for growth was included ($Growth_{it}$), calculated as the log transformation of the growth in the market value divided by the book value from 2012 to 2016, as per Entwistle et al. (2010).

In addition to this, larger companies have been found to be more likely to overstate non-IFRS earnings measures in order to beat analysts' forecasts (Doyle et al., 2013). The second control variable related to the size of the company ($Size_{it}$) represented as the natural log of the market value of each company in each year from 2012 to 2016 (Doyle et al., 2003; Doyle et al., 2013).

The final control variable included was that of the companies' comparable IFRS earnings i.e. net profit reported as the income statement. The IFRS earnings measure is used by managers

and adjusted in calculating the non-IFRS measure. Therefore, the inclusion of this variable will potentially aid in explaining part of the variability in the non-IFRS earnings measure.

Finally, an indicator variable was included to identify whether or not a company reported a non-IFRS measure that was either before or after tax. 19 out of the 31 companies (61 percent) used a before tax measure. This indicator variable therefore controls for some of the variance within the model that may be due to companies choosing to use before or after tax non-IFRS earnings measures.

To test the research question, the linear relationship used was an adaption of that used by Sinnewe et al. (2017). The model used in this study will regress non-IFRS earnings measures in time 't' ($Non\text{-}IFRS_t$) against the corresponding CF(T+1) to determine whether the non-IFRS measure is explaining a significance portion of CF(T+1).

Model 1.1

$$CF(T+1)_{i,} = \alpha + \beta_1 Non\text{-}IFRS_{it} + \beta_2 Growth_{it} + \beta_3 LnSize_{it} + \beta_4 IFRS_{it} + \beta_5 Tax_{it} + \mu_{it}$$

Table 3: Summary of variables included within model

Variable	**Definition**
CF(T+1)	CFFO in the period following the disclosure of the non-IFRS earnings measure
Non-IFRS	Non-IFRS earnings measure reported by company
Growth	Log of 1 plus the firm's growth in book value of equity over the five year period (2012 to 2016)
LnSize	Natural log of a companies the market to book ratio
IFRS	IFRS net profit as reported in Statement of Comprehensive Income
Tax	Indicator variable used to identify before and after tax non-IFRS earnings measures

μ	Error term

The data collected included repeated measures of 31 individual companies over a period of five years. This lead to the use of a repeated measures test design. This design meant that the response variable CF(t+1) of each individual company could be divided into three components. The first being a fixed effect, which is analogous to the linear predictor from a standard Ordinary Least Square (OLS) regression model, for which we are interested in how the response relates to or depends on the covariates. The second being a random effect used to express the variation between individual companies. A random effect is prevalent as the companies selected for this study were generated from a random selection from a population, and different companies would be selected if the study were repeated. Thus, a subject-specific random effect was added to the model that captured the unobserved subject-specific characteristics being the different companies within the sample. Finally, a linear mixed effect model of CF(T+1) on Non-IFRS, IFRS, LnSize, Growth and Tax with random intercepts by 'Company' performing restricted maximum likelihood (REML) was fitted.

By specifically fitting the model with random intercepts we are allowing the regression line to shift up or down according to each company. Each year within the specified time period (2012 to 2016) was treated as a categorical variable since the relationship with CF(T+1) was not found to not be linear over the time-period from 2012 to 2016.

A mixed effect model was chosen, which is akin to a random effects model. Although literature generally supports the use of the fixed effects model for panel data (Baltagi, 2005; Allison, 2011), a more recent study argues that the random effects model can be more useful in certain instances, in that it incorporates time-invariant variables, is readily extendable, with random coefficients, cross-level interactions and complex variance functions (Bell & Jones, 2015). As the data for the present study comprises a range of companies from different industries, where there may be company-specific factors that may influence operating cash flows and be correlated with non-IFRS earnings or IFRS earnings ('between company' variance), a random effects model was chosen.

Descriptive Statistics

Descriptive statistics were used to help identify whether there were abnormalities in the data

collected are shown in table 4 on the next page. The full list of descriptive statistics for all years are provided in Appendix B.

Table 4: Descriptive statistics

	CF(T+1)	Non-IFRS	IFRS	Growth	LnSize
Observations	123	121	124	124	124
Mean (R per million)	28362,85	22785,38	12639,93	8,986	25,580xf
Std. Deviation (R per million)	44494,92	35056,68	28941,94	11,529	1,009
Min (R per million)	-18829	-6377	-102460	0,163	23,214
Median (R per million)	8039,9	7406	6015,5	4,572635	25,33405
Max	245629	175352	142978,3	82,851	28,202
Range	226800	168975	40518,3	82,687	4,988

The number of observations varied due to the adjustment of the sample as explained above and due to companies not reporting a non-IFRS earnings measure or having recently listed on the JSE. The average number of observations across all the measures was 123 for the sample period. The non-IFRS earnings measure had a mean of R22 785 million and a standard deviation of R35 056 million. These were similar to that of the cash flow in the year following the non-IFRS earning disclosure with a mean of R28 362 million and standard deviation of R44 494 million. The maximum value for non-IFRS earnings measures and CF(T+1) reached R175 352 million and R245 629 million respectively. The minimum values were negative R6 377 million and negative R18 829 million. The negative results for the minimum were expected as a range of companies from various sectors were used within the sample and indicates that losses and negative CF(T+1) were reported. The standard deviation of these measures was large for both the non-IFRS measure (R35 056 million) and CF(T+1) (R44 494 million), which was expected given the heterogeneity of the companies within the sample.

The mean IFRS earnings measure of R12 639 million was smaller than the mean non-IFRS

measure (R22 785 million). This was consistent with prior studies that had found that non-IFRS earnings measures tended to be greater than IFRS earnings measures (Dichev and Skinner, 2002; Entwistle et al., 2010). However, the difference in the means may have been due to some companies reporting abnormally high non-IFRS earnings measures and low to negative IFRS earnings in the same year. An example of this phenomenon is the minimum IFRS measure of negative R102 460, relating to the IFRS loss reported by Glencore 2015 in the same year as a positive R110 855 million non-IFRS earnings measure. The difference is described and reconciled in detail within the company's 2015 annual report. This was not treated as an abnormality in the data set as this was seen to be a consistent occurrence for the Glencore's earnings.

With a minimum value of 0.163 and maximum value of 82.851, the variable used to control for the growth in companies (Growth) showed that there were large differences between the companies contained in the sample relating to their growth over the period (using market value as a factor of the company's book value). The median value of 4.572 indicated that a large group of the companies within the sample had a relatively low market-to-book ratio. The maximum value relates to Naspers in 2013 which has seen its market capitalization rise by over 612 percent in the past 5 years and share price close to double in 2013 (Kruger, 2014). The size variable associated with Naspers was not treated as an outlier as the company has seen similar growth in recent periods. The variable included in the sample to account for the differing sizes of the companies (LnSize) showed a low standard deviation of 1,009, relatively small range (4.987) and a mean and median of 25,580 and 25,334 respectively, suggesting a relatively symmetrical distribution.

The descriptive statistics above showed no significant issues with the data collected which lead onto the evaluation of the visual distributions of the data. The data results from the tests that were conducted to ensure the linear regression assumptions were met are included below. The linear regression assumptions are linearity of residuals, independence of residuals, normal distribution of residuals and equal variance of residuals.

Kernel density plots were tabulated to determine the normality of the variables included within the analysis. The results of such showed that non-IFRS, CF(T+1) and Growth showed a right skewed distribution with long tails, and the IFRS earnings showed both positive and negative tails. This indicated that the distribution of these variables may exhibit a normal distribution, however with large extreme data points. A normal Q-Q plot was generated with the data points falling along a line in the middle of the reference line and curving off in the extremities. This

indicated that the data had more extreme values than would be expected if they truly came from a normal distribution. The large tails (extreme values) may be explained by the heterogeneity of the size of companies within the sample. Log transforming the data did not show an improvement in the distribution of the data and therefore it is more beneficial to use the original data prior to the log transformation.

A correlation matrix was used to detect the presence of multicollinearity (highly correlated independent variables). Where multicollinearity is present, the results may become unreliable and lead to difficulty in assessing the individual importance of a variable within the model (Afrifa, 2013). Field, Miles and Field (2013) discussed that multicollinearity is a problem when the correlation coefficient exceeds 0.80. The correlation coefficients among the dependent and independent variable are presented in Table 5 below.

Table 5: Correlation coefficients

	CF(T+1)	non-IFRS	IFRS	Growth	LnSize
CF(T+1)	1,0000				
Non-IFRS	0,8237	1,0000			
IFRS	0,5263	0,4729	1,0000		
Growth	0,0115	-0,0416	-0,0485	1,0000	
LnSize	0,6272	0,6245	0,4244	0,2333	1,0000

The independent variables LnSize and non-IFRS had a moderate correlation of 0.6245, a result similar to that found by Doyle et al. (2013) where the correlation was found to be 0.501 and deemed to not be a problem. The correlations among all the independent variables suggest that multicollinearity was not an issue within the panel data regression, as all the coefficient values were below the limit (0.80) prescribed by Field (2005). The correlation between CF(T+1) and Non-IFRS variables were the highest (0.82), which was also found by Sinnewe et al. (2017) and supports the basis for the investigation of the relationship between the two measures to follow.

The correlation coefficients presented above showed that all four independent variables had a positive association with the dependent variables. The control variables LnSize and IFRS earnings were also shown to have moderate correlation to CF(T+1) which indicated that a company with a high market capitalization and larger IFRS earnings generated higher cash flows. Growth was the only independent variable that was not highly correlated with CF(T+1). This may indicate that the growth in the company's market value did not translate into greater future cash flows. The statistical results to follow show the outputs of the statistical models and will be used to determine whether non-IFRS earnings measures are significant predictors of CF(T+1).

RESULTS, DISCUSSION AND ROBUSTNESS CHECKS

Statistical model

The choice of model predictors and overall model specification were tested for reliability and goodness of fit. The relationship between the year (as a categorical variable) and CF(T+1) was tested using a chi-squared test, with a test statistic of 3.22 (3 degrees of freedom) and a p-value of 0.3590. The null hypothesis that there is no relationship between year and CF(T+1) would not be rejected shown by the large p-value. This confirms that there was no relationship present between the variables.

A likelihood ratio test comparing the mixed effect model with a one-level ordinary linear regression was performed (Venter et al., 2014). The test statistic of 65.88 and p-value (p-value < 0.001) indicated that the model specified was an improvement on the linear model. To confirm the validity of this result, the residual interclass correlation coefficient, which displays the correlation between measurements conditional on the fixed-effects covariates was used to test the assumption of independence within the data. The output of such test is presented in table 6 below, showing that the random effects compose approximately 79 percent of the total residual variance. This was expected given the diverse nature of the companies used within the sample. This confirms that using panel data analysis was necessary and that a mixed model in this case was the correct choice as opposed to the linear model, however the high variability between companies may have had an impact on the data output.

Table 6: Residual interclass

Level	ICC	Std. Err.	[95% Conf.	Interval]
CompanyName	.7971602	.0623251	.6486655	.8932236

correlation

The above tests confirmed that a linear mixed model was appropriate to be used and that at least one of the predictors was a significant predictor of CF(T+1). The output from the regression model is provided below in table 7. Note that the statistical package used does not provide a goodness of fit measure for the mixed effects model used.

Table 7: Model 1.1 Regression output

CF(T+1)	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval
NonIFRS	0,3548859	0,071786	4,94	0,000	0,214188	0,495583
IFRS	0,3291528	0,0748837	4,40	0,000	0,1823834	0,475922
Growth	-39,2568	175,6816	-0,22	0,823	-383,5864	305,0728
LnSize	9351,738	3293,484	2,84	0,005	2896,627	15806,85
1.Tax	-1112,202	9886,746	-0,11	0,910	-20489,87	18265,47
_cons	-224967,6	84668,84	-2,66	0,008	-390915,4	59019,68

The coefficient of non-IFRS was positively related to CF(T+1) and highly significant (<0.001). The magnitude of the coefficient is 0.3548, suggesting that a R1 increase in the non-IFRS measure, equates to a positive increase in CF(T+1) of R0.35 in the following period, holding all other independent variables constant. The low p-value (0.000) indicates that both non-IFRS and IFRS earnings were the most meaningful predictor within the model. This is similar to that found by Sinnewe et al. (2017), where the coefficient of non-IFRS earnings was also found to be positive (0.125) and highly significant (<0.001). The relatively lower non-IFRS earnings co- efficient (compared to the findings of the present study) may be attributed to some companies reporting non-IFRS earnings measures that contained non-cash items such as depreciation, impairment of assets and share-based payment costs (Howard et al., 2017).

The IFRS earnings coefficient was found to be slightly lower than that of the non-IFRS measure 0.329. This indicated that although the IFRS measure is a significant predictor (p-value = 0.000) within the model, the explanatory power may be less than that of non-IFRS earnings measures, confirming the findings of Sinnewe et al. (2017). The only other variable which was found to be a significant predictor was that of LnSize with a positive coefficient of 9351.7 and a significant p-value of 0.005. This indicated that as the size of the company increases, the CF(T+1) increased when keeping all other predictors at a constant level. The coefficients related to growth and tax were found to have a coefficient of -39.25 and -1112.2, both of which were not found to be significant predictors within the model (p-value = 0.832).

To ensure the output of the regression analysis was accurate, model 1.1 residuals were examined to ensure that they met the assumption of linearity and that the variance of the fitted residuals errors was constant across observations and did not display signs of heteroscedasticity. Where the errors are heteroscedastic (non-constant variance), standard estimation methods are inefficient (Field, 2005).

Scatter plots of the standardized residuals of each of the explanatory variables were used to test that the linearity assumption was met. The CF(T+1) was mapped on the y-axis with the standardized residuals on the horizontal x-axis for each explanatory variable. Both non-IFRS earnings measures and that of IFRS earnings showed relatively linear trends and marginal curvature, meeting the linearity assumption. The scatter plot using the standardized residuals of LnSize indicated small curvature in the residuals closer to the larger values. The curvature was not assessed as a problem in the regression, however further investigation as to the reason for this slight curvature could be investigated as an area of future research.

The scatter plot related to Growth showed that the residuals displayed non-constant error variance. The residuals were close to 0 for small x-values and were more spread out for larger x-values, displaying a pattern that fans out in a triangular fashion. This indicated that a non-linear relationship between CF(T+1) and Growth may exist and that the control variable did not have equal variance, a problem that may influence the model predictive ability.

The assumptions used within the model were that all variances were assumed to be equal and all covariance's were assumed to be zero. To test this assumption the standardized residuals (y-axis) were plotted against their fitted values for each company over the sample period. Heteroscedasticity does not exist if there is a random array of the standardized errors evenly dispersed around zero and within a band (Field, 2005). The plot testing this for model 1.1 is presented in figure 4 in Appendix C.

The plot in Figure 4 does not show signs of heteroscedasticity as the majority of the residuals form a cluster centered around zero, meaning that the companies had similar profiles in term of their residuals. A small group of companies were displayed on the right of figure 4 (Glencore, BHP Billiton, British American Tobacco and Steinhoff International Holdings) which indicated that these companies had large predicted cash flows. These companies are four of the six largest companies within the sample by market capitalization. This may mean that the model specification was not appropriate for companies that are above a certain market capitalization size or that further research should focus on only one sector.

The data point related to BHP Billiton for 2013 situated outside of the band and greater than three, may be an outlier that was causing the model predictors to not be reliable. BHP Billiton's annual report (2013) showed that unexpected exceptional items related to ceased operations, impairments of dry gas assets, contributed to a 29 percent decrease in attributable profit. The presence of such unexpected adjustments may have contributed to CF(T+1) differing significantly from the observed CF(T+1). To determine whether it has an influence on the model specification, the data point associated with BHP Billiton (Non-IFRS 2013) was excluded and new output results using model 1.1 were generated from the mixed model regression.

Model 1.1 Excluding BHP Billiton, 2013

The Wald chi-squared estimate (8 estimates) test statistic increased to 94.58 with the p-value remaining significant (p-value = 0.000). This would be expected as the model predictors had not changed and at least one of the regression coefficients in the model was still not equal to zero.

The residual interclass correlation coefficient increased from 79 percent to 82.58 percent. This means that once excluding the BHP Billiton data point above, greater variance in the CF(T+1) was explained by 'between company' variability. This indicated that the data point may have had an unfavorable impact on the predictive estimators. The analysis of the new regression output is provided below.

Table 8: Regression output for Model 1.1 when excluding BHP Billiton 2013

CF(T+1)	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval
NonIFRS	0,3339321	0,0609495	5,48	0,000	0,2144733	0,453391
IFRS	0,314811	0,0634357	4,96	0,000	0,1904792	0,439142
Growth	-34,97858	148,734	-0,24	0,814	-326,4918	256,5347
LnSize	10227,38	2862,435	3,57	0,000	4617,108	15837,65
1.Tax	-2673,326	9050,856	-0,30	0,768	-20412,68	15066,03
_cons	-246297,6	73657,78	-3,34	0,001	-390664,1	-101931

The Non-IFRS coefficient remained significant with a low p-value (0.000), however the coefficient decreased from 0.354 in Model 1.1 to 0.333 in Model 1.2. This showed that including BHP Billiton 2013 in the sample, may have resulted in an overestimation of the predictors coefficients. This makes sense due to the unanticipated adjustments made in calculating the non-IFRS measure by BHP Billiton in 2013. A similar decrease in the IFRS earnings coefficient occurs from 0.3291 to 0.3148 with the coefficient remaining a significant predictor of CF(T+1) (p-value = 0.000). There was no change in the signs of the explanatory variables' coefficients within the model with Growth and Tax both remaining with large p-values (p-value > 0.05). To assess whether the exclusion of BHP Billiton 2013 improved the model's ability to predict the CF(T+1) for all the companies, the plot of standardized residuals plotted against their fitted values for each company over the sample period is provided in figure 5 in Appendix C.

In comparison to figure 4, the exclusion of BHP Billiton 2013 had two meaningful effects on the distribution of the standardized residuals. The first of which was that no data points fall outside of the band ($-3 < Y < 3$) meaning that the standardized residuals were on average more closely centered around zero. This meant that the fitted values were more similar to the actual observed values, which indicated an improvement in the model coefficients. The second effect related to the dispersion of the companies within the figure. In figure 4, the companies which had large predicted cash flows with standardized residuals that were not close to zero included Glencore, BHP Billiton, British American Tobacco and Steinhoff International Holdings.

Glencore and BHP Billiton continue to show large cash flow predicted values with standardized residuals not centered around zero in figure 5. These companies were two of five mining companies in the sample. This suggested that the model may require the inclusion of an additional variable to better predict the mining companies' CF(T+1).

The five mining companies engaged in the extractive industries included within the sample were Anglo American PLC, Anglo American Platinum, BHP Billiton, Glencore and South 32. The financial reporting of mining companies differs from that of other industries in relation to the method used to account for the costs incurred by extraction companies (such as exploration and evaluation costs[20]) and can have a substantial impact on the reported profits (Cortese, Irvine & Kaidonis, 2010). In response to the need for an industry specific standard related to extractive industries, the IASB (2004) released IFRS 6, Exploration for and Evaluation of Mineral Resources. A second model (Model 1.2) was developed, with an indicator variable to identify whether or not a company is a mining company.

Model 1.2: Inclusion of Mining indicator

$$CashFlow_{i,\,t+1} = \alpha + \beta_1 Non\text{-}IFRS_{it} + \beta_2 Growth_{it} + \beta_3 Size_{it} + \beta_4 IFRS_{it} + \beta_5 Tax_{it} + \beta_6 Mining_{it} + \mu_{it}$$

The Wald chi-squared test statistic (now with 9 estimates) close to doubled (173.76) when including the mining estimate. The test statistic remained significant (p-value = 0.000) which indicated that the inclusion of the mining estimate, still resulted in at least one of the estimators' coefficients in the model not being equal to zero.

The residual interclass correlation coefficient for model 1.2 decreased to 61.49 percent. This indicates that the differences between companies decreased once accounting for some companies being mining companies within the sample. The analysis of the regression output for Model 1.2 is provided below.

[20] These costs are also referred to as pre-production costs and are those incurred "as a result of activities undertaken to explore the existence of mineral reserves and evaluate their commercial viability" (Cortese et al., 2010)

Table 9: Model 1.2 Regression output with mining indicator (including BHP Billiton, 2013)

CF(T+1)	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval
NonIFRS	0,3635919	0,069563	5,23	0,000	0,227251	0,499932
IFRS	0,3664962	0,0715165	5,12	0,000	0,2263264	0,506666
Growth	11,21998	166,3271	0,07	0,946	-314,7751	337,2151
LnSize	9777,157	2805,748	3,48	0,000	4277,993	15276,32
1.Tax	5455,476	6726,699	0,81	0,417	-7728,611	18639,56
1.mining	51152,21	9219,108	5,55	0,000	33083,09	69221,33
_cons	-247473,2	71605,43	-3,46	0,001	-387817,2	107129,1

The inclusion of a mining indicator resulted in both IFRS, Non-IFRS earnings measures and LnSize remain significant predictors of CF(T+1). The difference was that the although the coefficient for Non-IFRS (0.3635) had increased, it was now less than that of the IFRS coefficient (0.3665). This indicated that the inclusion of a mining indicator resulted in IFRS earnings being a marginally better predictor than that of Non-IFRS earnings measures, however more research may be required to assess this better.

The mining variable coefficient was found to be significant (p-value = 0.000), which meant that there was a difference between mining companies and non-mining companies in terms of their cash flows.

In analyzing the standardized residual plot against the fitted values, BHP Billiton 2013 remained outside the graph as seen in figure 6 (in Appendix C), indicating that even after including a variable for mining companies, the residual of the predicted CF(T+1) to the observed value was sufficiently different from zero, which suggested that the data point was an outlier within the sample.

Model 1.2: Inclusion of Mining indicator (excluding BHP Billiton, 2013)

BHP Billiton 2013 was thus removed from the sample with the new regression output (model

1.2) provided below in table 10, accompanied by the standardized residual plot against fitted values in figure 7 in Appendix C.

Table 10: Model 1.2 Regression output with mining indicator (excluding BHP Billiton, 2013)

CF(T+1)	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval
NonIFRS	0,3376719	0,0591593	5,71	0,000	0,2217217	0,453622
IFRS	0,3367192	0,0610281	5,52	0,000	0,2171063	0,456332
Growth	2,320989	142,1677	0,02	0,987	-276,3225	280,9645
LnSize	10412,89	2478,006	4,20	0,000	5556,082	15269,69
1.Tax	3243,574	6332,671	0,51	0,609	-9168,232	15655,38
1.mining	46724,72	8649,835	5,40	0,000	29771,35	63678,08
_cons	-261364,5	63320,43	-4,13	0,000	-385470,2	137258,7

The results presented in figure 7 showed the most evenly distributed residuals around zero with no companies outside of the band ($-3 < Y < 3$). This indicated that the results of the output, after excluding BHP Billiton 2013 in model 1.2, was the closest to meeting the assumption of equal variance and the most reliable of the two models. The coefficients of non-IFRS (0.337) and IFRS (0.336) were found to be similar, both of which were shown to be consistently significant predictors of CF(T+1). The inclusion of the variable to control for the effect of firm size (LnSize) and to differentiate mining companies from non-mining companies was still found to be positively correlated and significant predictors of CF(T+1).

Log Transformation

To ensure completeness, the data set was log transformed to investigate whether this would improve the diagnostics of the data and improve the output of the models discussed above. The benefit of log transforming the data set is that the respective data points are compressed, making datasets with different bases more comparable (De Jesus, 2016). The results of the tests on models 1.1 and 1.2 did not differ considerably from when the original data was used. The log transformation of non-IFRS, IFRS, LnSize and mining variables remained positively associated with CF(T+1) and shown to be significant predictors within the mixed model (p-value = 0.000).

LIMITATIONS OF STUDY

Whilst the research findings have important implications, like any other empirical studies, the following limitations need to be acknowledged. First, this study used the top 40 JSE listed companies ranked by market capitalization, of which only 31 of the companies reported a non-IFRS measure making the generalizability of our results limited. A larger sample size and sample period would have been preferable. The lower sample size is justified as prior studies used measures such as I/B/E/S[21] as a proxy for non-IFRS earnings measures (Bhattacharya et al., 2003; Entwistle et al., 2010; Leung and Veenman, 2016), whereas all 200[22] financial statements in the present study were analyzed for reference to a non-IFRS earnings measure.

The sample period length of five years was however consistent with prior literature on the topic of non-IFRS earnings measures (Venter et al., 2014; Sinnewe et al., 2017; Howard et al., 2016).

Secondly, some companies reported more than one non-IFRS earnings measure which resulted in high variance within the model, therefore the non-IFRS measure chosen for each company may not have been the most relevant with respect to their operations. Thirdly, headline earnings although defined as a non-IFRS measure, was not included within the sample as all companies on the JSE are required to report this measure and thus would result in the same issue as the second limitation.

The results of the descriptive statistics and statistical model presented the fourth limitation, being that the data collected did not display a symmetrical normal distribution. The kernel density plots showed large tails which may indicate the presence of outliers within the sample which may have had a detrimental effect on the variables coefficients within the model. Further to this, the variability between companies was shown to be large which may further have influenced the accuracy of the variable coefficients.

Finally, although LnSize was included as control variable, the individual variables were not scaled for size (for example, by using the market capitalisation of the company in the preceding year). Scaling the data for size may result in different findings.

[21] I/B/E/S attempts to exclude the same items from non-IFRS earnings measures that analysts exclude from their forecasts, thus making the measure an appropriate proxy for non-IFRS earnings measures (Bhattacharya et al., 2007).

[22] 40 companies, each issuing an integrated report or annual report for the period 2012-2016.

SCOPE FOR FURTHER RESEARCH

The limitations of this study, which are listed above present several potential avenues for future research and improvements. Firstly, a larger sample set of companies can be used within the analysis to include potentially the JSE top 100 companies over the same sample period. The potential issue to consider, however, is whether the 'between company' variance will increase significantly more than in this study with the inclusion of more companies. The second is that the ability to extend the time-period used beyond 5 years should be investigated to determine whether the ability to predict CF(T+1) using non-IFRS earnings measures over a longer period improves. Thirdly, it may be interesting to determine whether companies listed on other stock exchanges with different economic climates (for example London, using the FTSE) will have similar results as that of companies listed on the JSE.

Fourthly, one of the limiting factors of this research was related to the large variability in the variance between companies and the normal distribution of the data collected. A study that only focuses on a single sector (for example mining companies) within the JSE as opposed to mixed sectors may decrease the 'between company' variance and reduce the possibility of outliers. It is also recommended that the data be retested using a fixed effects model, to assess whether the results of this study are consistent in both cases.

As the model was adjusted to remove the effects of outliers, it was not considered necessary to winzorise the data as well. However doing so could provide further evidence to compare against the output of the tests conducted.

Finally, when the control variable for mining was added to the model, the variable coefficient was seen to be a significant predictor of CF(T+1). This meant that the difference between mining companies and non-mining companies in terms of their cash flow was significant and worth investigating. Further research which uses a control variables for all sectors in the sample may result in an improved model fit, more even distribution of the residuals and a model that is more informative as to whether non-IFRS earnings measures is a suitable measure in predicting CF(T+1).

CONCLUSION

The purpose of this paper was to investigate the extent to which non-IFRS earnings measures predict operating cash flows in the next year for a sample of companies listed on the JSE. The analysis of the literature reviewed provided a brief background surrounding the conflicting opinions related to whether non-IFRS earnings measures are useful measures for companies to disclose. The majority of the research that has been performed on this topic has related to the usefulness or ability of non-IFRS earnings measures to predict future stock returns. An area of research which has not been researched within South Africa is that of the predictive ability of non-IFRS earnings measures for future operating cash flows. The present study was an extension of a study conducted by Sinnewe et al. (2017), the focus of which was to determine the ability of non- IFRS earnings measures to predict future operating cash flows based on a sample of Australian firms.

A linear mixed model was used on the data collected from the top 40 JSE listed companies that reported non-IFRS earnings measures over the sample period from 2012 to 2016. The initial statistical model was adapted for findings throughout the study, with the non-IFRS earnings measure showing a positive and significant relationship with CF(T+1) in both variations of the model. The final adaption of the model presented (Model 1.2) included a mining control variable which was found to be significant, indicating the need to differentiate between mining and non-mining companies within the model. The non-IFRS earnings measures' variable coefficient (0.337) was shown to have a large and significant ability to predict one year ahead CF(T+1) in model 1.2. This result was consistent with a slightly lower coefficient of 0.125 (p-value <0.001) found by Sinnewe et al. (2017). Interestingly, the IFRS earnings' variable coefficient was also a significant predictor of future operating cash flows, and was slightly larger than non-IFRS earnings' variable coefficient (in the final version of the statistical model). This suggests that IFRS earnings measures may be used in predicting future operating cash flows with a similar degree of accuracy to non-IFRS earnings measures, and yet are not susceptible to the same degree of manipulation as non-IFRS earnings. This somewhat counteracts the usefulness of the non-IFRS earnings measures identified so far. More research on this issue is therefore encouraged.

The concern that management are using unaudited non-IFRS earnings measures to manipulate earnings and beat earnings targets has been raised by various parties as described previously. Hans Hoogervorst has called for more research on non-IFRS earnings measures in order to determine whether the measures are useful. The results presented in the present study provide

preliminary evidence that non-IFRS earnings measures may be a useful predictor of CF(T+1) and may be of assistance to analysts and investors within their valuations. The findings of this paper provided various insights into a previously unexplored aspect of non-IFRS earnings measures with South Africa, the predictive ability of non-IFRS earnings measures on CF(T+1), and can be used as a foundation for further research within South Africa and other countries.

REFERENCES

Afrifa, G. A. (2013). Working Capital Management and Aim Listed SME Companies Profitability: A Mixed Research Method Approach. *PhD Thesis, Centre for Finance and Risk. The Business School, Bournemouth University*, (March). https://doi.org/10.6007/IJARAFMS/v3-i4/390

Allison, P.D. (2011). Fixed Effects Regression Models. Sage. California.

Baltagi, B.H. (2005). Econometrics analysis of panel data. 3rd Edition. Wiley. Hoboken, New Jersey.

Barth, M. E., Beaver, W. H., & Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view. *Journal of Accounting & Economics*, 31, 77–104. https://doi.org/10.1016/S0165-4101(01)00019-2

Barth, M. E., Cram, D. P., & Nelson, K. K. (2001). Accruals and the Prediction of Future Cash Flows. *The Accounting Review*, 76(1), 27–58. https://doi.org/10.2308/accr.2001.76.1.27

Barth, M. E., Gow. I. D., & Taylor, D. J. (2012). Why do pro forma and street earnings not refelect changes in GAAP? Evidence from SFAS 123R. *Review of Accounting studies*, 17(3), 526 562 https://link.springer.com/article/10.1007/s11142-012-9192-9

Bell, A., Jones, K. (2015) Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data. Political Science Research and Methods. Available at: https://www.researchgate.net/publication/233756428_Explaining_Fixed_Effects_Random_Effects_Modeling_of_Time-Series_Cross-Sectional_and_Panel_Data (Accessed 7 August 2018].

Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R. (2003). Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics*, *36*(1–3), 285–319. https://doi.org/10.1016/j.jacceco.2003.06.001

Bhattacharya, N., Christensen, T. E., Black, E. L., & Mergenthaler, R. D. (2007). Who Trades

on Pro Forma Earnings Information?, *The Accounting Review*, 82(3), 581–619. Retrieved March 9, 2017, from http://www.af.polyu.edu.hk/files/Session_1.pdf.

BHP Billiton. (2013). *Annual Report 2013*. Retrieved March 29, 2017, from http://www.bhp.com/investor-centre//media/bhp/documents/investors/reports/2013/bhpbillitonannualreport2013_interactive.pdf.

Black, D. E., & Christensen, T. E. (2009). US managers' use of "pro forma" adjustments to meet strategic earnings targets. *Journal of Business Finance and Accounting*, 36(3–4), 297–326. https://doi.org/10.1111/j.1468-5957.2009.02128

Black, D. E., Christensen, T. E., Ciesielski, J. T., & Whipple, B. C. (2017). *Non-GAAP Reporting: Evidence from Academia and Current Practice* (No. 2966778). *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2966778

Black, E. L. (2016). The Ethical Reporting of Non-GAAP Performance Measures. *Revista Contabilidade & Finanças*, 27(70), 7–11. https://doi.org/10.1590/1808-057x201690090

Blitzer, D., Friedman, R. E., & Silverblatt, H. J. (2002). Measures of Corporate Earnings. *White Paper, Standard and Poor's*. Retrieved April 9, 2017, from http://faculty.babson.edu/halsey/acc7500/Earnings - S&P CoreEarnings.pdf.

Bowen, R. M., Davis, A. K., & Matsumoto, D. A. (2005). Emphasis on Pro Releases: Earnings in Quarterly Press Intervention, and Reactions. *The Accounting Review*, 80(4), 1011–1038. https://doi.org/doi:10.2308/accr.2005.80.4.1011

Bradshaw, M. T., & Sloan, R. G. (2002). GAAP versus The Street: An Empirical Assessment of Two Alternative Definitions of Earnings. *Journal of Accounting Research*, 40(1), 41–66. https://doi.org/10.1111/1475-679X.00038

Bray, C. (2001). SEC looking at pro forma earnings with "purpose in mind." *Dow Jones Newswires*.

Brooke, E. (2006). Are investors influenced by pro forma emphasis and reconciliations in earnings announcements? *Accounting Review*, 81(1), 113–133. https://doi.org/10.2308/accr.2006.81.1.113

Brown, L., & Sivakumar, K. (2003). Comparing the Value Relevance of Two Operating Income

Measures. *Review of Accounting Studies*, 8(4), 562–572. https://doi.org/10.1023/A:1027328418571

Buffett, W. (2014). Berkshire Letter to Shareholders. Retrieved June 29, 2017, from http://www.berkshirehathaway.com/letters/2014ltr.pdf [Accessed 17 July 2018]

CFA Society United Kingdom. (2015). *Non-IFRS Earnings and Alternative Performance Measures: Ensuring a Level Playing Field*. Available at https://www.cfauk.org/-/media/files/pdf/pdf/5-professionalism/3-research-and-position-papers/non-ifrs-earnings-and-alternative-performance-measures.pdf [Accessed 17 July 2018]

Cheng, A., Liu, C.-S., & Schaefer, T. (1997). The Value Relevance of Book Values, Earnings and Cash flows: Evidence from South Korea. *Accounting Horizons*, 11(3), 1–15. https://doi.org/10.5539/ijbm.v4n10p28

Collins, D. W., Kothari, S. P., Shankenb, J., & Sloane, R. G. (1994). Lack of timeliness and noise as explanations for the low contemporaneuos return-earnings association. *Journal of Accounting & Economics*, 18, 289–324. https://doi.org/10.1016/0165-4101(94)90024-8

Cortese, C. L., Irvine, H. J., & Kaidonis, M. A. (2010). Powerful players: How constituents captured the setting of IFRS 6, an accounting standard for the extractive industries. *Accounting Forum*, 34(2), 76–88. https://doi.org/10.1016/j.accfor.2008.11.003

Curtis, A. B., Mcvay, S. E., & Whipple, B. C. (2014). The disclosure of non-gaap earnings information in the presence of transitory gains. *Accounting Review*, 89(3), 933–958. https://doi.org/10.2308/accr-50683

De Jesus, C. (2016). Are there benefits to diversification across the largest African stock markets? Available at https://open.uct.ac.za/bitstream/handle/11427/20336/thesis_com_2016_de_jesus_carlos.pdf?sequence=1 [accessed 17 July 2018].

De Villiers, C., Rinaldi, L., & Unerman, J. (2014). Integrated Reporting: Insights, gaps and an agenda for future research. *Accounting, Auditing & Accountability Journal*, 27(7), 1042–1067. https://doi.org/10.1108/AAAJ-06-2014-1736

Dechow, P. (1994). Accounting & Economics The role of accounting accruals. *Journal of Accounting & Economics*, 18, 3–42. https://doi.org/10.1016/0165-4101(94)90016-

Dichev, I. D., Graham, J. R., Harvey, C. R., & Rajgopal, S. (2015). The Misrepresentation of Earnings. *Financial Analysts Journal*, 72(1), 1–23. https://doi.org/10.2139/ssrn.2376408

Doyle, J. T., Jennings, J. N., & Soliman, M. T. (2013). Do managers define non-GAAP earnings to meet or beat analyst forecasts? *Journal of Accounting and Economics*, 56(1), 40–56. https://doi.org/10.1016/j.jacceco.2013.03.002

Doyle, J. T., Lundholm, R. J., & Soliman, M. T. (2003). The predictive value of expenses excluded from pro forma earnings. *Review of Accounting Studies*, 8(2/3), 145–174. https://doi.org/10.1023/A:1024472210359

Entwistle, G. M., Feltham, G. D., & Mbagwu, C. (2010). The Value Relevance of Alternative Earnings Measures: A Comparison of Pro Forma, GAAP, and I/B/E/S Earnings. *Journal of Accounting, Auditing & Finance*, *25*(2), 288. https://doi.org/10.1177/0148558X1002500205

Field, A., Miles, J., & Field, Z. (2013). *Discovering Statistics Using SPSS*. *Sage* (Vol. 81). https://doi.org/10.1111/insr.12011_21

Filzen, J. J., & Peterson, K. (2015). Financial Statement Complexity and Meeting Analysts' Expectations. *Contemporary Accounting Research*, 32(4), 1560–1594. https://doi.org/10.1111/1911-3846.12135

Financial Accounting Standards Board (FASB). (2013). A Brief History. Retrieved May 12, 2016, from http://www.fasb.org/jsp/FASB/Page/SectionPage&cid=1176156304264

Financial Accounting Standards Board (FASB). (1978). *Statement of Financial Accounting Concepts No. 1: Objectives of Financial Reporting by Business Enterprises*. Stamford.

Francis, J. & Schipper, K. (1999). Have financial statements lost their usefulness? *Journal of Accounting Research*, 37(2), 319-352.

Francis, J., Schipper, K., Vincent, L., & Schipper, K. (2017). Expanded Disclosures and the Increased Usefulness of Earnings Announcements. *Accounting Review*, 77(3), 515–546.

Gasbarro, D., Monroe, G. S., Schwebach, R. G., & Thiam Teh, S. (2013). Comparative Value-

relevance of GAAP, IBES, S&P Core, Cash Earnings and Cash Flows. Retrieved from http://ssrn.com/abstract=2195959

Hoogervorst, H. (2016a). IASB Speech Performance reporting and the pitfalls of non-GAAP metrics. In *Performance Reporting* (p. 6). Maastricht.

Hoogervorst, H. (2016b). IASB Speech Latest developments and future focus IFRS Standards around the world, (September), 6.

Hoogervorst, H. (2016c). Safety in numbers. *IASB Speech Safety in Numbers*, (December), 6.

Howard, M., Maroun, W., & Garnett, R. (2017). *Nature and Misuse of Non-Mandatory Non-GAAP (Adjusted) Earnings by JSE-Listed Firms*.

IFRS Foundation. (2016). Who we are and what we do. Retrieved June 9, 2017, from http://www.ifrs.org/About-us/Documents/Who-We-Are-English.pdf

International Accounting Standards Board. (2004). IASB Publishes Proposals on Exploration and Evaluation Assets. Retrieved November 28, 2017, from https://www.iasplus.com/en/binary/pressrel/2004pr01.pdf

International Accounting Standards Board (IASB). (2010). *Conceptual Framework for Financial Reporting*. Retrieved June 2, 2017, from http://www.frascanada.ca/international-financial-reporting-standards/resources/unaccompanied-ifrss/item71833.pdf

International Accounting Standards Board (IASB). (2015). *Disclosure Initiative: Principles of Disclosure—Non-IFRS information*. Retrieved April 16, 2017, from http://www.ifrs.org/Meetings/MeetingDocs/IASB/2015/February/AP11B-Disclosure Initiative.pdf

Johannesburg Stock Exchange Limited. (2015). JSE Limited Listings Requirements, 1–494. Retrieved April 14, 2017, from https://www.jse.co.za/content/JSERulesPoliciesandRegulationItems/JSE Listings Requirements.pdf

Kim, M., & Kross, W. (2005). The ability of earnings to predict future operating cash flows has been increasing - Not decreasing. *Journal of Accounting Research*, 43(5), 753–780. https://doi.org/10.1111/j.1475-679X.2005.00189.x

Kruger, A. (2014). Naspers' astounding growth. Retrieved November 21, 2017, from

https://www.fin24.com/Companies/ICT/Naspers-astounding-growth-20140222

Leung, E., & Veenman, D. (2016). Non-GAAP Earnings Disclosure in Loss Firms. *Tilburg Spring Camp Working Paper*.

Libby, R., & Emett, S. a. (2014). Earnings presentation effects on manager reporting choices and investor decisions. *Accounting and Business Research*, 44(4), 410–438. https://doi.org/10.1080/00014788.2014.906121

Marques, A. (2006). SEC interventions and the frequency and usefulness of non-GAAP financial measures. *Review of Accounting Studies*, 11(4), 549–574. https://doi.org/10.1007/s11142-006-9016-x

Ohlson, J. A. (1995). Earnings, Book Values, and Dividends in Equity Valuation. *Contemporary Accounting Research*, 11(2), 661–687. https://doi.org/10.1111/j.1911-3846.1995.tb00461.x

PriceWaterhouseCoopers. (2014). IFRS news: Alternative performance measures, (September), 1–11. Available at: https://www.pwc.co.za/en/assets/pdf/ifrs-news-september-2014.pdf [Accessed 17 July 2018]

PriceWaterhouseCoopers. (2016). An alternative picture of performance. Available at: https://www.pwc.co.uk/audit-assurance/assets/pdf/an-alternative-picture-of-performance.pdf [Accessed 17 July 2018]

Rainsbury, L., Hart, C., & Buranavityawut, N. (2015). GAAP-adjusted earnings disclosures by New Zealand companies. *Pacific Accounting Review*, 27(3), 329–352. https://doi.org/10.1108/PAR-12-2013-0108

Saha, A., & Bose, S. (2017). The Value Relevance of Financial and Non-Financial Information: Evidence from Recent Academic Literature. *IGI Global*, 220–245. https://doi.org/10.4018/978-1-5225-1900-3.ch015

Sinnewe, E., Harrison, J. L., & Wijeweera, A. (2017). Future Cash Flow Predictability of Non-IFRS Earnings: Australian Evidence. Australian Accounting Review, 27(2), 118-128. https://doi.org/10.1111/auar.121Stafford, T. (2016, April 6). Managing value on the JSE. Business Day.

The South African Institute of Chartered Accountants. (2009). *Circular 3/2009: Headline Earnings*. Johannesburg. Retrieved May 16, 2017, from https://www.saica.co.za/Portals/0/Technical/auditing/documents/Circular3_2009_Headlined_Earnings.pdf

Thomas Reuters. (2009). Methodology for estimates: A guide to understanding Thomson Reuters methodologies, terms and policies for the first call and I/B/E/S estimates database, (October). Retrieved May 20, 2017, from https://www.library.kent.edu/files/TF_Methodology_for_Estimates_October_2009.pdf

U.S. Securities and Exchange Commission. (2016). About the SEC. Retrieved June 12, 2017, from https://www.sec.gov/about.shtml

Venter, E. R., Emanuel, D., & Cahan, S. F. (2014). The Value Relevance of Mandatory Non-GAAP Earnings. *Abacus*, *50*(1), 1–24. https://doi.org/10.1111/abac.12020

Vuong, Q. H. (1989). Likelihood Ratio Tests for Model Selection and Non-Nested Hypotheses. *Econometrica*, 57(2), 307–333.

Weil, J. (2001, August). Companies Pollute Earnings Reports, Leaving P/E Ratios Hard to Calculate. Retrieved June 24, 2017, from https://www.wsj.com/articles/SB998339424717089333

Whipple, B. C. (2015). The great unknown: why exclude “other” items from non-GAAP earnings calculations in the post-Reg G world? The great unknown: why exclude “other” items from non-GAAP earnings calculations in the post-Reg G world?, (September). Retrieved March 19, 2017 from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2480663

Xu, B., Bhuiyan, M. B. U., & Rahman, A. (2016). Underlying profit in New Zealand. *Pacific Accounting Review*, 28(2), 111–134. https://doi.org/10.1108/02656710210415703

Young, S. (2014). The drivers, consequences and policy implications of non-GAAP earnings reporting. *Accounting and Business Research*, 44(4), 444–465. https://doi.org/10.1080/00014788.2014.900952

APPENDICES

Appendix A: JSE Top 40 Companies used as the research sample

	Company	Non-IFRS earnings measure	Tax	Cash flow measure	Dividends adjustment
1	British American Tobacco	Adjusted profit from operations	Before tax	Cash generated from operations	
2	Naspers	Core headline earnings	After tax	Net cash generated from operating activities	
3	Richemont Securities	Operating profit	Before tax	Cash flow generated from operations	
4	BHP billiton	Underlying attributable profit	After tax	Net Operating cash flow from continuing operations	
5	Steinhoff International Holding	Adjusted operating profit	Before tax	Cash generated from operations	
6	Glencore	Adjusted EBITDA	Before tax	Cash generated from operating activities	
7	Sasol	Operating profit	Before tax	Cash generated from operations	

8	MTN Group	EBITDA	Before tax	Cash generated from operations	
9	Firstrand	Normalised Earnings	After tax	Cash Flow from operating activities	Add Dividend paid
10	Vodacom Group	EBITDA	Before tax	Cash generated from operations	Add Dividend paid
11	Old mutual	Adjusted operating profit	Before tax	Net cash inflow from operating activities	
12	Aspen Pharmaceutical Group	EBITA	Before tax	Net cash flows from operating activities	
13	Sanlam	Normalised headline earnings	After tax	Cash generated from operation	
14	Mondi	Underlying EBITDA	Before tax	Net cash generated from operating activities	
15	Bidvest Group	EBITDA	Before tax	Cash flows from operating activities	Add Dividend paid
16	Woolworths Holdings	Adjusted profit before tax	Before tax	Cash generated by operations	

17	Intu Properties	Underlying earnings	After tax	Cash flows from operating activities	
18	Anglo American	Underlying EBIT	Before tax	Cash flow from operations	
19	Capital & Counties Property	Underlying earnings	After tax	Net cash from operating activities	
20	Discovery	Normalised headline earnings	After tax	Cash flow from operating activities	
21	Shoprite	EBITDA	Before tax	Cash flows from operating activities	Add dividends
22	RMB Holdings	Normalised earnings	After tax	Net cash generated from operating activities	
23	Investec	Adjusted attributable earnings	After tax	Net cash from operating activities	
24	South32	Pro Forma Underlying EBIT	Before tax	Cash generated from continuing operations	
25	Growthpoint properties	Distributable Income	After tax	Net cash inflow from operating activities	

26	Tiger brands	Operating Income	Before tax	Cash available from operations	
27	Rand merchant investment holdings	Normalised earnings	After tax	Net cash inflow from operating activities	
28	PSG group	Recurring Headline Earnings	After tax	Net cash ow from operating activities	
29	Mr Price group	Operating Profit	Before tax	Cash generated by operations	
30	Anglo American platinum	EBIT	Before tax	Cash generated from operations	
31	Netcare	Operating Profit	Before tax	Cash generated from operations less tax paid and interest paid	

Appendix B: Descriptive Statistics

Year		CF(T+1)	Non-IFRS	IFRS	Growth	LnSize
2012	Observations	30	29	31	31	31
	Mean	23958,02	17269,01	12327,09	10,37841	25,64129
	Std Deviation	38781,58	27451,28	24683,03	15,50619	0,9934495
	Min	-18829	-6377	-117566	0,987942	24,0313
	Median	6324,5	5919	3907,404	4,60196	25,3517
	Max	161561	123835	119515,9	82,851	28,0873
2013	Observations	31	30	31	31	31
	Mean	30684,29	21326,28	11946,18	8,237901	25,61762
	Std Deviation	49713,87	32595,6	27604,58	10,09449	0,9333533
	Min	358,9	174	-67918,92	0,35169	24,186
	Median	7876	7243	5188,901	4,28294	25,3715
	Max	245629	126138	96180,13	40,3989	28,2018

2014	Observations	31	31	31	31	31
	Mean	31502	24032,47	18424,92	8,418196	25,58158
	Std Deviation	51198,33	38177,14	29837,47	10,52639	1,063908
	Min	-877,1175	251	-2810,168	0,220303	23,214
	Median	10616	7730,8	6356,5	5,06542	25,2916
	Max	203736	138418	142978,3	45,8354	27,8785
2015	Observations	31	31	31	31	31
	Mean	27165	28110,81	7861,529	8,913317	25,4822
	Std Deviation	38313,53	40811,02	33376,55	10,52639	1,084229
	Min	-11798,23	341	-102460	0,163674	23,6019
	Median	11531	8851	7332,405	5,26354	25,262
	Max	154184	175352	114122,7	53,4418	27,7577
Total	Observations	123	121	124	124	124
	Mean	28362,85	22785,38	12639,93	8,986956	25,58067
	Std Deviation	44494,92	35056,68	28941,94	11,52951	1,009802
	Min	-18829	-6377	-102460	0,163674	23,214
	Median	8039,9	7406	6015,5	4,572635	25,33405
	Max	245629	175352	142978,3	82,851	28,2018
	Range	226800	168975	40518,3	82,687326	4,9878

Appendix C: Scatter plots

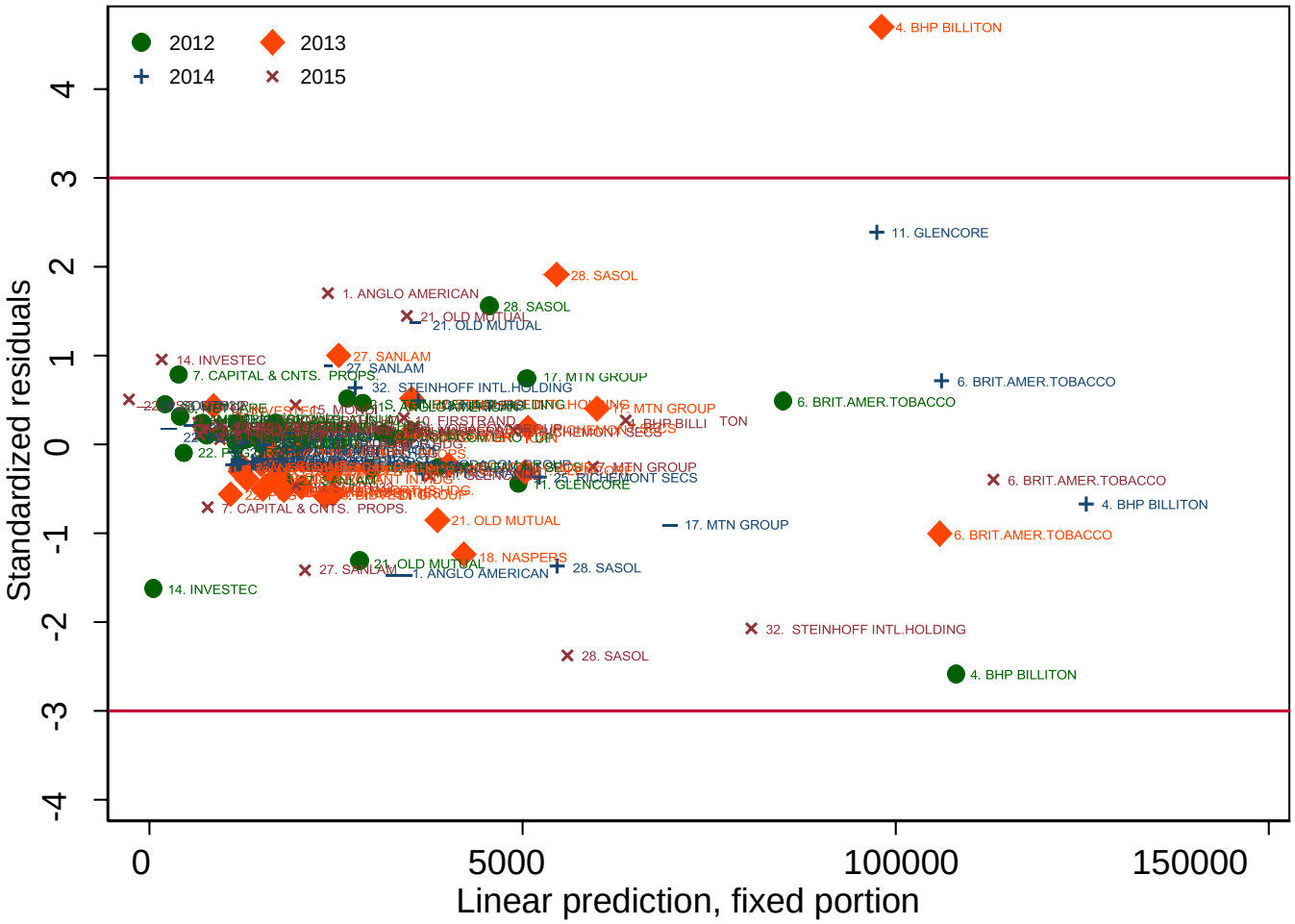


Figure 4: Plot of standardized residuals against fitted values using model 1.1

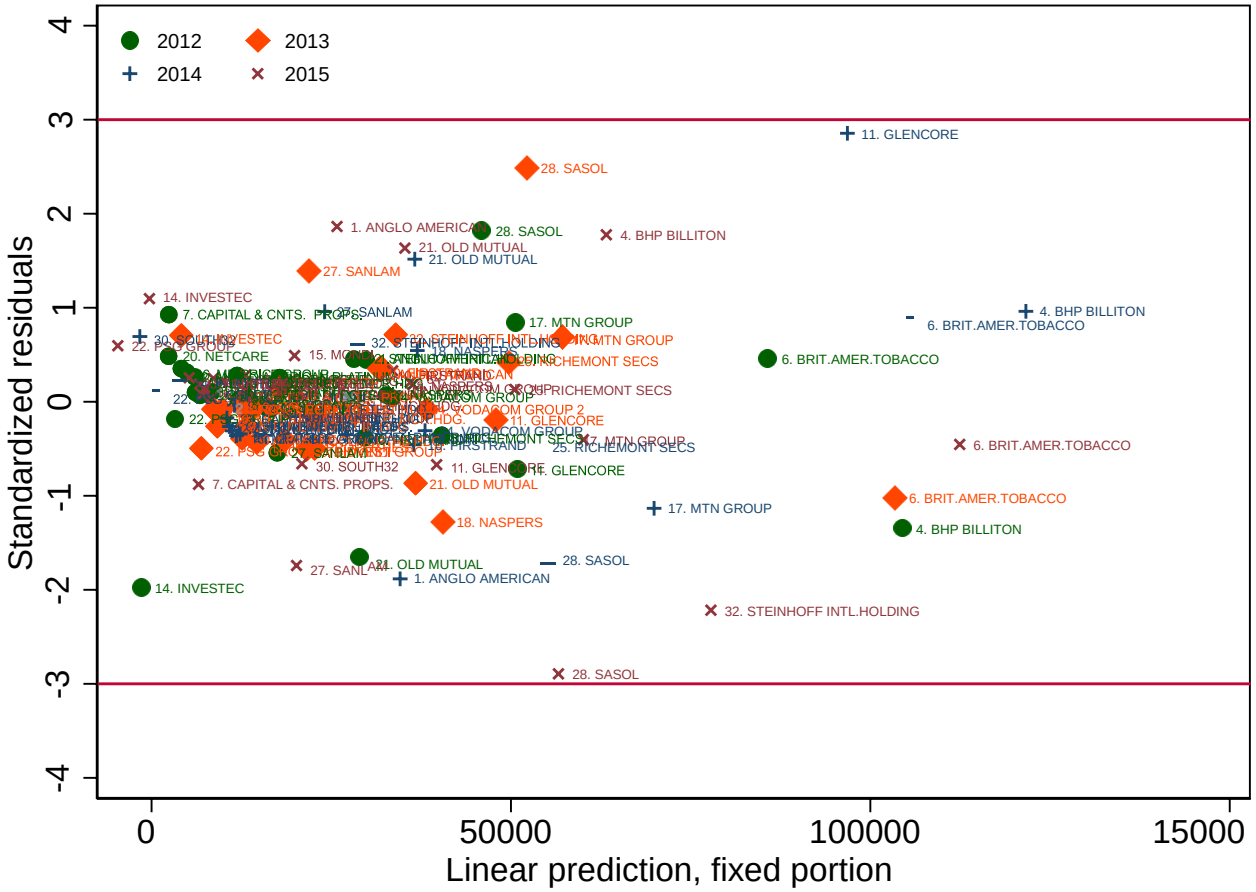


Figure 5: Plot of standardized residuals against fitted values using model 1.2

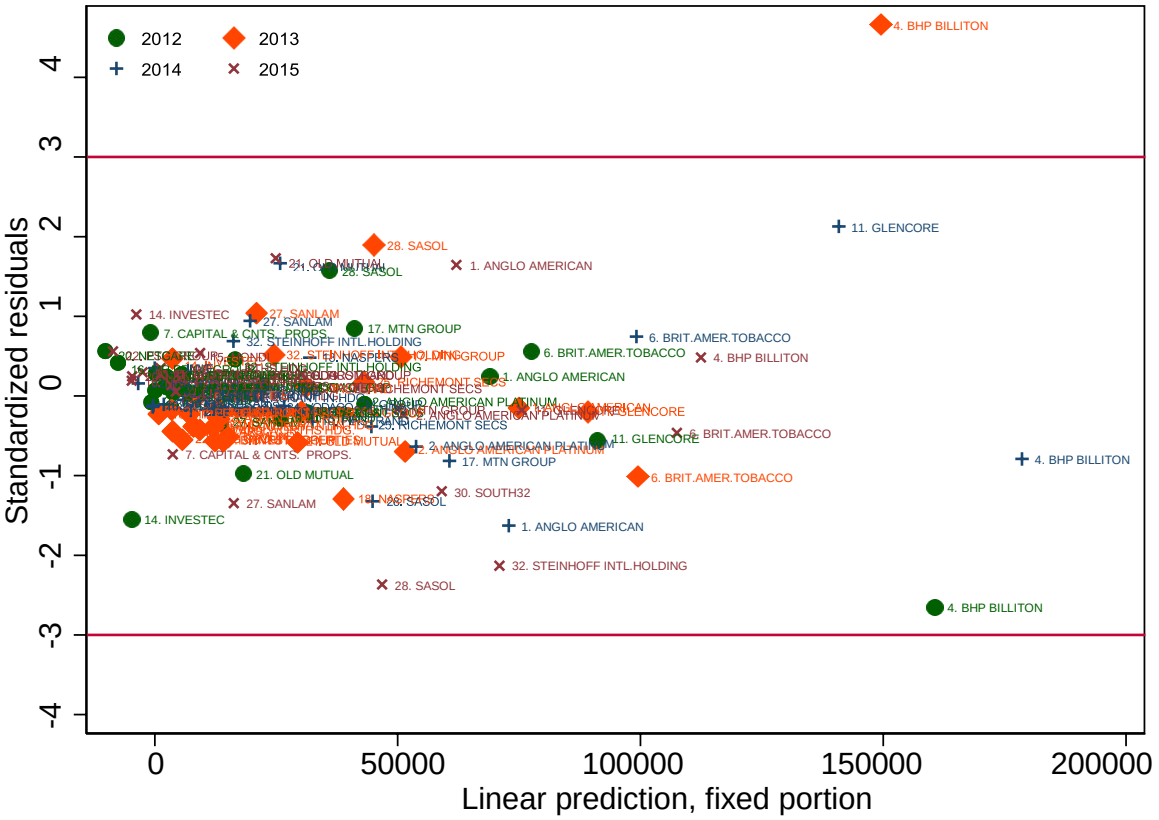


Figure 6: Plot of standardized residuals against fitted values using model 1.2

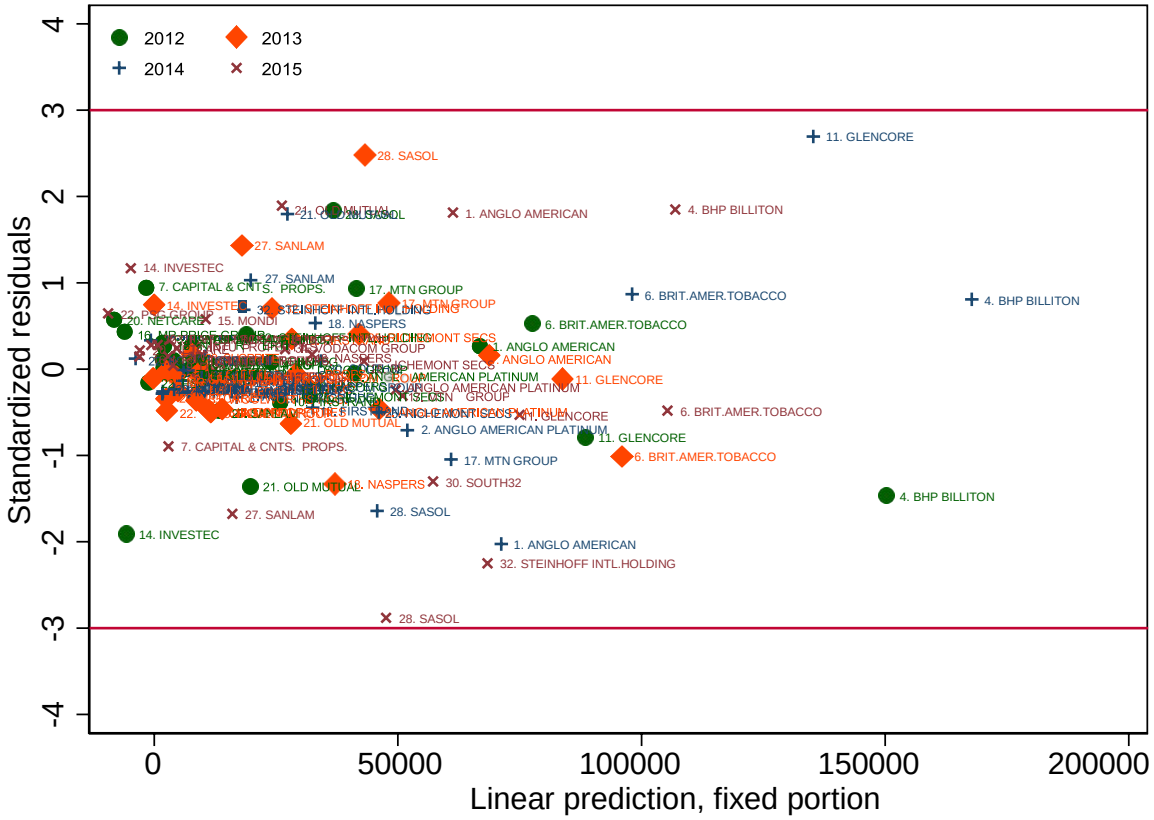


Figure 7: Model 1.2 standardized residuals against fitted values excluding BHP Billiton 2013