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Evaluating The Effect of Fair Value Adjustments to Investment Property Based on Profitability Ratios

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Abstract:
Research aims: The aim of the study was to determine whether fair value adjustments to investment property affect the profitability ratios of listed companies.
Design/Methodology/Approach: To investigate the problem, a brief literature overview of performance analysis through ratio calculations, as well as fair value measurement are discussed. These discussions are based on the International Financial Reporting Standards (IFRS), IFRS 13 and International Accounting Standards (IAS), IAS 40. IAS 40 addresses how the value of investment property may be recognised through the fair value model. To determine whether the recognition of fair value adjustments affect the profitability ratios of sampled companies, the Wilcoxon rank test and Cohen's d-value were used as statistical measures to fulfil this objective. The Top 40 companies as listed on the Johannesburg Stock Exchange (JSE) in South Africa were populated, and judgment sampling was applied to calculate the sampling frame.
Research findings: The results demonstrate that 50% to 75% of the sampled companies had profitability ratios, which were impacted by the recognition of fair value adjustments. These findings are relevant to potential investors who need to interpret financial ratios to improve investment decisions. Finally, the study recommends that the prospective investor eliminate fair value adjustments when profitability ratios are calculated.
Theoretical contribution/Originality: The contribution of the study is that fair value adjustments (favourable or unfavourable) relating to IAS 40 affect the decisions taken by users of the financial statements. Substantial changes to profit or loss and/or investment property significantly impact ratio analysis outcomes and, therefore, investor decision making. The research contributes to the use of fair value adjustments and its impact on profitability ratios.
Practitioner/Policy implications: Regulators may benefit from the findings when considering regulatory reforms of accounting practices as well as the disclosures required that assist the users of financial statements.
Keywords: Financial Ratios; JSE Listed Companies; Investor Decisions; Profitability Ratios; Fair Value Adjustments; Investment Property

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Introduction

This study is grounded by the principles issued by the International Accounting Standard Board (IASB) in 2019. In 2019 there were 16 International Financial Reporting Standards (IFRS) and 29 International Accounting Standards (IAS). Although this study is performed

on companies listed on the Johannesburg Stock Exchange in South Africa, it deals with International Financial Reporting Standards (IFRS) and specifically with IAS 40. According to Al-Khadash and Khasawneh (2014), some IFRS standards may pose a threat to distorting profits. Alves (2019) agreed with this argument that accounting choices based on IAS 40, make the comparability of the financial statements more difficult. The accounting theory to approach these kinds of decision-making choices is the Rational Choice Theory. The approach of this theory is based on the purpose to support decision-making. The rational choice theory will help in providing clear insights about why and how a few sections or principles are selective in accounting scenarios (Hoque et al., 2013).

The introduction proposed the importance of profitability analysis to investors and the profit distortion of Johannesburg Stock Exchange (JSE) listed entities by recognising fair value adjustments under IAS 40. From an accountancy standpoint, JSE listed companies are obliged to prepare financial statements based on International Financial Reporting Standards (IFRS) (PricewaterhouseCoopers (PwC), 2019). However, some IFRS standards may pose a threat to distorting profits (Al-Khadash & Khasawneh, 2014). The same argument was mentioned by Alves (2019) that accounting choices of the IAS 40, make the comparability of the financial statements more difficult. Investors analyse financial statements when making financial and investment decisions (Correia et al., 2011). Among such analyses, the investor may be especially interested in analysing the entity's profitability (Dillalo, 2015). Investors often consider profits generated by an entity to be the cornerstone of their decision, as a return on investment is required (Dillalo, 2015). Due to the inherent nature of accountancy, it is possible to influence profit generation through the application of accounting standards. One such instance is the recognition of fair value adjustments. Such adjustments may be recognised through profit or loss accounts, which, in return, may lead to increases or decreases in net profit for the year. Under these circumstances, it becomes evident that no cash was generated, yet profits may be affected. International Accounting Standard 40 (IAS 40) serves as an example where fair values are recognised through profit or loss when revaluations of investment properties occur (IAS, 2017a: A16). Based on the discussions above, the research gap identified was whether profitability ratios are impacted by the recognition of fair value adjustments on investment property.

Literature Review

IAS 40 allows an investment property to be evaluated by applying the fair value model. The fair value model permits fair value adjustments to investment property through profit or loss (IASPlus, 2019). Al-Khadash and Khasawneh, (2014), Trajkovska et al. (2016) and Andrews (2014) mentioned the following limitations of fair value measurements:

- It distorts profit, as it does not relate to day-to-day operations;
- It is not exact, as it relies on best estimates;
- Valuations may be manipulated through over-or underestimation;
- Valuations may be performed more than once annually; and
- It creates uncertainty for investors, as fair value changes may often occur.

Despite these limitations, investors are particularly interested in scrutinising the profitability of entities (Dillalo, 2015). Users of financial reports can analyse financial statements through ratio analysis to evaluate financial performance, including profitability (Correia et al., 2011). The above-listed limitations of fair value measurements can influence ratio analysis and investor decision making if items in the ratio calculations include fair value adjustments recognised through profit or loss. Based on the problem discussed above, the study's primary objective was to determine whether fair value adjustments to investment property affect the profitability ratios of sampled listed companies. To investigate the problem, a brief literature overview of performance analysis through ratio calculations, and fair value measurement through IFRS 13 and IAS 40 are discussed.

The scope of the literature review is limited to two variables: Investment property valuations and their effect on profitability ratios. Although this study is performed on companies listed on the Johannesburg Stock Exchange in South Africa, it deals with International Financial Reporting Standards (IFRS). Referring to a study by Wahyuni et al. (2020) on the adoption of IFRS in Indonesia, the study identified the theme of fair value implementation as dominant in 20 articles or 52.63% of the sample studied. According to the study, the implementation of the fair value principle in IFRS is expected to make the financial information more neutral. Due to the dominance of fair value in the study of Wahyuni et al. (2020), the next step is to discuss the concept of fair value in more detail.

The Concept of Fair Value

Since 1973, accounting regulators have proposed the application of fair value accounting rather than traditional accounting (Biondi, 2011). The International Financial Reporting Standard (IFRS) 13 defines fair value as the price to be received for an asset or paid to transfer a liability in an orderly transaction between market participants on measurement date (IFRS, 2017a: A635). Al-Khadash and Khasawneh (2014) highlight that fair value is subject to criticism. It leads to the distortion of profit; these adjustments are not exact; valuations are costly to generate; it leaves valuations subject to manipulation; and replaces historical accounting concepts which are well understood. Andrews (2014) adds to this view by stating that fair value accounting does not promote financial transparency. It goes against the fundamental purpose of accounting and creates uncertainty for investors (Andrews, 2014). This viewpoint is shared by (Wahyuni, 2011), which mentioned that the implementation of fair value is considered as the greatest challenge for accounting professionals, who have never practice fair value implementation in their Indonesian Financial Accounting Standards.

Trajkovska et al. (2016) agreed that fair value measurements have several disadvantages. Namely, they lead to significant changes in value and can occur more than once per annum. Low valuations create investor dissatisfaction as decreases in the value of assets lead to losses for the investor, and valuations depend on market situations. The opposite also applicable, high valuations create investor satisfaction and increase the value of assets and leads to profits for the investor.

In a study conduct by Alves (2019) the results indicated that firms with a higher leverage tend to select the fair value method when measure investment property. This implies that the higher the firm debt/equity ratio, managers might choose the accounting method that increase income. The implication of this decision is that the fair value method strengthens the companies' asset base, reduce the debt ratio, and then re-establish the companies' borrowing capacity.

Despite critique against fair value, several accounting standards allow for fair value measurement (Trajkovska et al., 2016). Calculation of specific financial ratios requires the incorporation of profit before interest and tax, profit for the year, as well as asset values (Zutter & Smart, 2015).

Fair Value Categories

IFRS 13 defines fair value as the price to be received for an asset or paid to transfer a liability in an orderly transaction between market participants on measurement date (IFRS, 2017a: A635). The fair value is measured in several ways. According to PricewaterhouseCoopers (PwC) (2008), three different levels of fair value measurement exist:

- Level 1 refers to quoted prices of identical assets or liabilities in an active market. These estimates are considered most reliable;
- Level 2 is quoted prices of similar assets or liabilities in an active market or identical or similar assets or liabilities that do not trade in a dynamic market. These estimates are considered less reliable than those of Level 1; or
- Level 3, which are unobservable inputs for assets and liabilities, are based on the available information. These estimates are most subjective and generally considered less reliable than levels 1 and 2.

This argument is consistent with the findings of the study performed by Mehnaz et al. (2022) which indicates that additional disclosures of fair value on Level 3 properties, specifically during uncertain times, enhance the value of the information for auditors and investors. These findings underwrite the debate about the informativeness of expanded fair value disclosures.

Analysis of IFRS 13 – Fair Value Accounting

In terms of accounting standards, fair value accounting is addressed by IFRS 13. According to Koppeschaar et al. (2016), the objective of IFRS 13 is to state a definition for fair value measurement, the measurement methods available and how fair value adjustments should be disclosed in the financial statements of an entity. The scope of IFRS 13 encumbers all accounting standards that permit fair value recognition but specifically exclude the following standards (Koppeschaar et al., 2016):

- IFRS 2: Share-based payment;
- IFRS 16: Leases;
- IAS 2: Inventories;
- IAS 36: Impairment losses;

- IAS 19: Employee benefits; and
- IAS 26: Retirement benefit plans.

Since IAS 40 is not explicitly excluded from the scope of this standard, it may be suggested that its fair value measurements are subject to IFRS 13. Accordingly, the measurement distinguishes between non-financial assets and financial assets and liability and equity instruments. Figure 1 was constructed to explain these concepts.

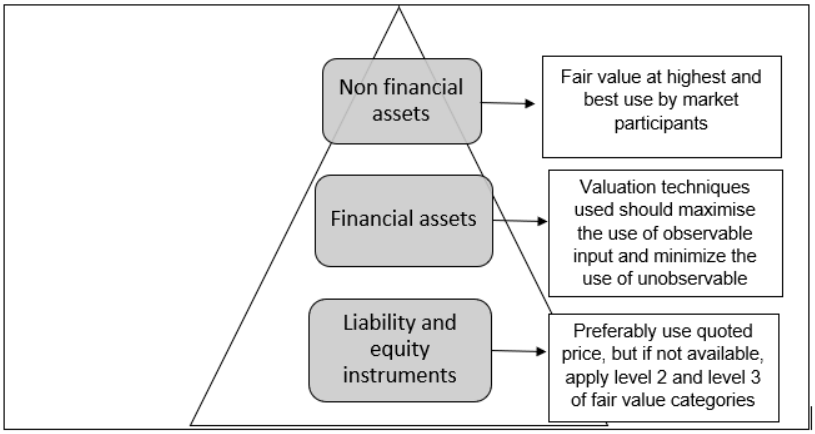

Figure 1 Measurement in terms of IFRS 13
Source: Adapted from Koppeschaar et al. (2016, p. 773)

Figure 1 demonstrates that non-financial assets, financial assets and liability and equity are measured differently. Non-financial assets necessitate that market participants determine the highest and best use. Financial assets should be valued by applying observable inputs rather than unobservable inputs. Liabilities and equity are valued per the fair value hierarchy, as explained in Figure 1. The initial measurement of all financial assets and liabilities should be done in terms of fair value when the transactions occur. Although the transaction value and fair value may differ, recognition is done at fair value (Koppeschaar et al., 2016). Initial recognition is done at cost for non-financial assets (such as investment property). Subsequently, accounting policies should indicate how and when re-measurement may occur to record the asset at its fair value.

Disclosure in terms of IFRS is affected by the fair value hierarchy level used to determine the fair value (refer to discussion above). If level 1 or level 2 are applied in valuation, the disclosure will consist of:

- Valuation techniques and inputs used to develop the fair value measurement; and
- The effect of fair value adjustments on profit/loss or Other Comprehensive Income (OCI).

If level 3 is applied in calculating the fair value, disclosure should be more comprehensive. Quantitative information relating to valuation techniques should be disclosed. Such valuation techniques may be based on the market, cost, and income approaches. The following explains these approaches briefly (Koppeschaar et al., 2016):

- Market approach: Relates to prices used in market transactions related to similar assets or liabilities. Such information may be extracted from an inactive market;
- Cost approach: Refers to the replacement cost when replacing an asset, as is in its current condition and form;
- Income approach: Refers to convert potential future cash flows to a single discounted present value. This present value should reflect the current market expectations and future amounts.

Furthermore, reconciliation should be performed between opening and closing balances. A description of the valuation process should be indicated, and sensitivity analysis should be performed if unobservable inputs are changed from previous estimates. In a study performed by Ma and Wells (2021) they argued that the value relevance of Level 3 fair values, is significantly reduced, specifically when the valuation assumptions were too optimistic.

Taplin et al. (2014) highlight that several accounting standards allow for fair value adjustment recognition. Among these are IAS 40. IAS 40 makes provisions for two valuation models: cost and fair value valuation models (IASPlus, 2019). If entities decide to apply the fair value model, profits and losses arising from valuation are recognised through profit or loss. They are listed in the Statement of Profit or Loss and Other Comprehensive Income (Koppeschaar, et al., 2014). Notably, the fair value of investment property should be disclosed in footnotes if the entity selects to carry investment property on the cost model (Taplin et al., 2014). Property is defined as land and buildings, part of a building or both. Undeveloped land may also be categorised as an investment property (Koppeschaar et al., 2014). IAS 40.30 states that it is unlikely that such property is fairer represented by the cost model than the fair value model. Therefore, switching from a fair value model to a cost model is prohibited (IFRS, 2017b: B112).

The application of the fair value model is contradictory to accounting principles applied to property, plant and equipment (PPE) in IAS 16. When PPE is revaluated, gains and losses are treated as other comprehensive income (OCI) (Koppeschaar et al., 2014). OCI is considered a non-distributable reserve, not forming part of profit or loss (Sowden-Service, 2019). It is submitted that both IAS 40 and IAS 16 deal with land and buildings, yet fair value adjustments to investment property are recognised through profit or loss. The differentiation in the treatment of gains and losses purely arises from the intention of use. Figure 2 was constructed to demonstrate the differences in treatment of fair value adjustments among IAS 40 and IAS 16.

Figure 2 illustrates that IAS 40 and IAS 16 treat fair value adjustments differently. IAS 40 only allows adjustments if the fair value model is applied. Under such circumstances, the fair adjustments affect the net profit or loss. Affecting the profit and loss figures is not the case when using IAS 16. This standard allows fair value adjustments if the revaluation model is applied and the asset's value increases above the historical carrying value. However, the adjustment is not recorded as part of net profit or loss but recognised as other comprehensive income (OCI). OCI is not considered as an inclusion when profitability ratios are analysed. On the contrary, net profit or loss is included in the

profitability ratio analysis. Therefore, fair value adjustments from IAS 40 affect profitability ratios, while IAS 16 does not.

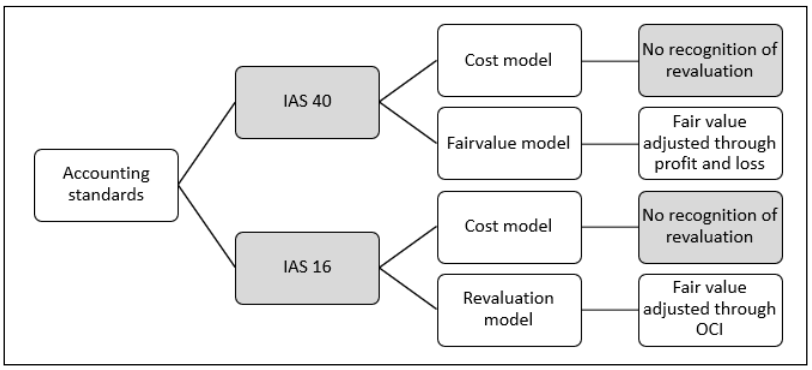

Figure 2 Differences in treatment of fair value adjustment

Financial Ratios and Analysis

Ratio analysis is a predictive tool for analysing the performance of prospective investments. It measures profitability, liquidity, operational performance, debt management and market performance (Marx et al., 2017). It is submitted that such ratio analysis may be helpful to investors who wish to invest in any company. The concept of duality requires debits and credits to be equal (Myburgh, et al., 2012). Therefore, fair value accounting transactions implicate consequences for the Statement of Profit or Loss and affect the Statement of Financial Position. Informed decision-making necessitates analysing financial statements by the calculation of ratios, in this study, specifically those that impact the profitability of an entity. Table 1 indicates the most important ratios that affect profitability.

Table 1 Profitability ratios

Category	Explanation of category	Ratios relating to the category
Profitability	The ability to apply the entity's assets to generate revenue and returns.	• Gross profit margin; • Operating profit margin; • Net profit margin; • Return on investment; • Return on equity; and • Return on net assets.

Source: Adapted from Lovemore and Brummer (2010) and Marx et al. (2017).

In their study, Taplin et al. (2014) found that fair value accounting is significantly related to earnings management since changes in fair value are recognised through profit or loss. Christensen and Nikolaev (2008) posit that debt-to-asset ratios are affected by fair value adjustments, as increases in asset values will lead to a decrease in such a ratio.

A South African study by Philander (2016) found that fair value adjustments affect five ratios: interest cover, financial leverage, net current assets per share, tangible assets

value per share and equity-to-debt. From these findings, it is apparent that fair value measurements may impact financial statement analysis for users. The focus of this study is directed towards profitability ratios, as investors are mainly concerned with the profitability of entities (Dillalo, 2015). After discussing the two main variables in the study, the following section addressed the research method, followed by the results.

Research Method

According to Pallant (2016), quantitative research aims to collect data expressed in numerical terms. Field (2009) adds to this view by positing that quantitative data necessitates statistical analysis. In the light of these opinions, it is submitted that this research is quantitative. According to Field (2009), data should be analysed for a minimum of five years if the researcher intends to obtain reliable research findings. The period under review was 2015 to 2019. This review period encumbers the most recent financial data published by the population of companies. In this research, the population consists out of the Top 40 listed companies based on their market capitalisation. Market capitalisation is calculated by multiplying the number of issued shares by the company's market price per share (Adkins, 2018). Several previous studies have made use of the Top 40 JSE. listed companies as population (De Villiers & Middelberg, 2013), Robbetze (2015) and Saunders (2016).

Non-probability sampling is applied in the form of judgement sampling. Judgement sampling entails that the researcher uses judgement in determining the sampling. This method requires the researcher to compile criteria with which the element must comply if included in the sample (Creswell, 2015).

The following criteria were set up for sampling selection:
- Data relating to the company should be made available by IRESS;
- Data relating to investment property value should be available on IRESS for all years under review to ensure consistency; and
- The companies should be JSE listed for the entire period of review. Companies listed after 2014 will be excluded, as five years' information will not be available.

After these criteria were applied, 12 companies remained in the sample.
The data collection is directed towards collecting the information about the different variables, namely:
- Profitability ratios (including fair value adjustments) of the sampled companies;
- Profitability ratios (excluding fair value adjustments) of the sampled companies;
- Share prices are collected from IRESS.

The researcher calculates profitability ratios to ensure that the same formulae are applied to calculate profitability ratios before and after, including fair value adjustments. These recalculations contribute to consistency in the study.

Statistical analysis was approached in four steps. In the first step, the financial data retrieved from IRESS were used to calculate profitability ratios, with fair value adjustment included in calculations. Subsequently, the financial data of the sampled companies were adjusted to exclude the fair value adjustments of the sampled companies. The profitability ratios were then recalculated to observe changes in the different ratios. The following profitability ratios were used in the study: Operating profit, Net profit margin, Return on Investment (ROI), Returns on Equity (ROE) and Return on Net Assets (RONA).

Two different statistical tests were performed, the paired t-test and the measurement of Cohen's d-value. Welman and Kruger (2011) state that paired t-testing is applied to establish whether mean scores differ significantly, while Cohen's d, measures how large (or small) the significant difference is. Cohen's d values could range between -1 and 1 (Welman & Kruger, 2011).

From the starting point the research variables were tested through paired t-tests. The type of t-testing performed was impacted by data distribution. If data are normally distributed, a paired t-test is performed. If data are skewed, the Wilcoxon rank test was calculated. In step one, the data was assumed to be non-normally distributed, as only five observations (i.e. five years' data per company) were collected. According to Field (2009), the assumptions of normality do not apply when the number of observations (N) is less than 30. A Wilcoxon rank test was performed in step two, as abnormality was assumed. Lastly, in step three, Cohen's d-values were calculated. Effect size (Cohen's d) expresses the magnitude of variables' effect on one another (Field, 2009).

In this research, the same ratios were applied in analysis, except for fair value adjustments being eliminated in the case of the ratio being calculated exclusive of the fair value adjustment. Thus, the researcher can posit that, objectively, the size effect of paired ratios should display a small effect size. If not, it can be proposed that fair value adjustments distort ratio measurements.

Result and Discussion

Sampled companies' data were processed and analysed, by three consecutive stages. The Wilcoxon rank test results were calculated and displayed for the first stage. Secondly, the Effect size tests were done and subsequently, a summary of the findings followed.

Results According to the Wilcoxon Rank Test

The Wilcoxon rank test determines whether mean scores differ significantly between profitability ratios excluding fair value adjustments and profitability ratios including fair value adjustments. In terms of this rank test, the significance score (i.e., 'P') indicates whether a significant difference exists among the mean scores of the paired profitability ratios. According to Pallant (2016), a P-value equal to or lesser than 0.05 reveals significance. Table 2 was constructed to demonstrate testing among the profitability ratios (including and excluding fair value adjustments).

Table 2 Wilcoxon rank test for all companies (2015 – 2019)

Company	Details	Operating profit margin before and after fair value adjustment	Net profit margin before and after fair value adjustment	Return on investment before and after fair value adjustment	Return on equity before and after fair value adjustment	Return on net assets before and after fair value adjustment
1.	Z score	-0.405	-0.405	-0.405	-1.483	-0.405
	P-value	0.686	0.686	0.686	0.038	0.686
2.	Z score	-1.069	-1.069	-1.069	-1.461	-1.069
	P-value	0.285	0.285	0.285	0.044	0.285
3.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	P-value	0.043	0.043	0.043	0.043	0.043
4.	Z score	-0.674	-0.674	-2.023	-0.674	-2.023
	P-value	0.5	0.5	0.043	0.5	0.043
5.	Z score	-1.826	-1.826	-1.826	-1.214	-1.826
	P-value	0.068	0.068	0.068	0.225	0.068
6.	Z score	-0.365	-0.365	-0.365	-1.753	-0.365
	P-value	0.715	0.715	0.715	0.080	0.715
7.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	P-value	0.043	0.043	0.043	0.043	0.043
8.	Z score	-2.023	-2.023	-2.023	-0.405	-2.023
	P-value	0.043	0.043	0.043	0.686	0.043
9.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	P-value	0.043	0.043	0.043	0.043	0.043
10.	Z score	-2.023	-2.023	-2.023	-0.405	-2.023
	P-value	0.043	0.043	0.043	0.686	0.043
11.	Z score	-2.023	-2.023	-2.023	-0.135	-2.023
	P-value	0.043	0.043	0.043	0.893	0.043
12.	Z score	-2.023	-2.023	-2.023	-1.214	-2.023
	P-value	0.043	0.043	0.043	0.225	0.043
TOTAL P-values equal or less than 0.05		58%	58%	67%	25%	67%

In Table 2 the Z-scores as well as the P values were identified. All the P values with a value equal to or less than 0,05 are printed in bold. By analysing the differences in Operating profit margin before and after fair value adjustment, seven out of the twelve companies (58%) showed a significant effect when fair value adjustments have been implemented. In the ratio's Net profit margin and Return on net assets (RONA), the significant difference in the before and after calculations were also evident in 58% of the companies. Return on Investment (ROI) ration has the highest effect of 67 % while the ratio Return on Equity (ROE) has the lowest effect with 25 %.

Results From the Measuring of Effect Sizes

Stage two necessitates the calculation of the effect sizes. The effect size measure was calculated by dividing the z-score by the square root of the number of observations,

namely 'N' (Pallant, 2016). In all the companies, N equals 5. The conventional frame of reference posits:

- An effect size measure smaller than or equal to 0.1 indicates a small effect;
- An effect size measure of 0.3 indicates a medium effect; and
- An effect size measure of 0.5 indicates a more significant effect.

Table 3 Effect sizes for all companies (2015 – 2019)

Company	Details	Operating profit margin before and after fair value adjustment	Net profit margin before and after fair value adjustment	Return on investment before and after fair value adjustment	Return on equity before and after fair value adjustment	Return on net assets before and after fair value adjustment
1.	Z score	-0.405	-0.405	-0.405	-1.483	-0.405
	Cohen d	-0.1811	-0.1811	-0.1811	-0.6632	-0.1811
2.	Z score	-1.069	-1.069	-1.069	-1.461	-1.069
	Cohen d	-0.4781	-0.4781	-0.4781	-0.6534	-0.4781
3.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.9047	-0.9047
4.	Z score	-0.674	-0.674	-2.023	-0.674	-2.023
	Cohen d	-0.3014	-0.3014	-0.9047	-0.3014	-0.9047
5.	Z score	-1.826	-1.826	-1.826	-1.214	-1.826
	Cohen d	-0.8166	-0.8166	-0.8166	-0.5429	-0.8166
6.	Z score	-0.365	-0.365	-0.365	-1.753	-0.365
	Cohen d	-0.1632	-0.1632	-0.1632	-0.7840	-0.1632
7.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.9047	-0.9047
8.	Z score	-2.023	-2.023	-2.023	-0.405	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.1811	-0.9047
9.	Z score	-2.023	-2.023	-2.023	-2.023	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.9047	-0.9047
10.	Z score	-2.023	-2.023	-2.023	-0.405	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.1811	-0.9047
11.	Z score	-2.023	-2.023	-2.023	-0.135	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.060	-0.9047
12.	Z score	-2.023	-2.023	-2.023	-1.214	-2.023
	Cohen d	-0.9047	-0.9047	-0.9047	-0.5429	-0.9047

Table 3 was constructed to display Cohen's d values. In Table 3 the effect sizes equal to 0,5 and more are highlighted in bold. From the possible 60 Cohen-d scores (twelve companies x five ratios per company), 42 scores have an effect size that indicate a significant effect. This an indication that an average of 70% of the ratios calculated and compared has significantly been affected by fair value adjustments. Stage three summarises findings that were obtained for the sampled companies. The Wilcoxon rank test was applied to measure whether significant differences existed within the mean scores of profitability ratios, including and excluding fair value adjustment. Following the chosen statistical measure (Wilcoxon rank test), the probability score should be 0.05 or less to result in a statistical significance. Table 4 serves as a summary to demonstrate the

significance (Sig.) or insignificance (Insig.) of the findings relating to the Wilcoxon rank test.

Table 4 Wilcoxon rank test results

Company name	Operating profit margin including and excluding fair value adjustments	Net profit margin including and excluding fair value adjustments	ROI ratio including and excluding fair value adjustments	ROE ratio including and excluding fair value adjustments	RONA ratio including and excluding fair value adjustments
Absa	Insig.	Insig.	Insig.	Insig.	Insig.
FirstRand	Insig.	Insig.	Insig.	Insig.	Insig.
Growthpoint	Sig.	Sig.	Sig.	Sig.	Sig.
Hammerson	Insig.	Insig.	Sig.	Insig.	Insig.
Investec	Insig.	Insig.	Insig.	Insig.	Insig.
Nedbank	Insig.	Insig.	Insig.	Insig.	Insig.
Nepi	Sig.	Sig.	Sig.	Sig.	Sig.
Old Mutual	Sig.	Sig.	Sig.	Insig.	Sig.
Redefine	Sig.	Sig.	Sig.	Sig.	Sig.
Remgro	Sig.	Sig.	Sig.	Insig.	Sig.
Sanlam	Sig.	Sig.	Sig.	Insig.	Sig.
Standard Bank	Sig.	Sig.	Sig.	Insig.	Sig.
% of companies significant	58%	58%	67%	25%	58%

As shown in Table 4, the percentage of companies that resulted in significant mean score differences range between 25% and 67%. For the operating and net profit margins and the RONA ratio, 58% of companies demonstrated substantial differences in mean scores. The ROI ratio provided the highest percentage significance, totalling 67% of companies sampled. The sampled entities proved to deliver the lowest significance rate in terms of ROE ratios. Thus, it can be suggested that fair value adjustments profoundly affect the mean values of ROI ratios. In addition, fair value adjustments least affect the mean scores of ROE ratios. The results of this study can be argued in context with the findings of Alves (2019) which stated that the fair value method strengthens the asset base of companies, reducing the debt ratio, while it increases the company's borrowing capacity.

Previously Table 3 has shown the calculations of the d values. The size effect ranged between small, medium or large, where 0.1 was small, 0.3 was medium, and 0.5 or more was classified as large. Table 5 was constructed to indicate the collective outcome of the d-values.

From Table 5, the effect sizes of the different profitability ratios can be observed. In terms of the operating and net profit margin, it can be derived that 25% of the companies demonstrated a small Cohen d-value, 8% showed a medium Cohen d-value and 67%

demonstrated a large Cohen d-value. The ROI and RONA ratios both indicated that 17% of the companies demonstrated a small Cohen d-value, 8% demonstrated a medium Cohen d-value, and 75% of the companies revealed a large Cohen d-value. For the ROE ratio, it was discovered that 33% of the companies demonstrated a small Cohen d-value, while 67% of the companies demonstrated a large Cohen d-value. No medium-size effect was recorded. From the above discussions, 67% to 75% of companies recorded a large Cohen d-value, which means that fair value adjustments resulted in a large difference in mean score values. In conclusion of the findings, Table 6 was constructed as a summary to determine whether fair value adjustments to investment property affect the profitability ratios of sampled listed companies.

Table 5 Cohen d-value results

Company name	Operating profit margin including and excluding fair value adjustments	Net profit margin including and excluding fair value adjustments	ROI ratio including and excluding fair value adjustments	ROE ratio including and excluding fair value adjustments	RONA ratio including and excluding fair value adjustments
Absa	Small	Small	Small	Large	Small
FirstRand	Medium	Medium	Medium	Large	Medium
Growthpoint	Large	Large	Large	Large	Large
Hammerson	Small	Small	Large	Small	Large
Investec	Large	Large	Large	Large	Large
Nedbank	Small	Small	Small	Large	Small
Nepi	Large	Large	Large	Large	Large
Old Mutual	Large	Large	Large	Small	Large
Redefine	Large	Large	Large	Large	Large
Remgro	Large	Large	Large	Small	Large
Sanlam	Large	Large	Large	Small	Large
Standard Bank	Large	Large	Large	Large	Large
% with small size effect	25%	25%	17%	33%	17%
% with medium-size effect	8%	8%	8%	0%	8%
% with large size effect	67%	67%	75%	67%	75%

In terms of the empirical analysis, as performed and discussed in the previous sections, it can be advised that 67% of the sampled companies had an operating profit margin that was affected by fair value recognition. Within the same sample, 67% displayed a net profit margin sensitive to fair value adjustment recognition. A total of 75% of the sampled entities had ROI and RONA ratios that were sensitive to fair value recognition. These results confirm the study of Christensen and Nikolaev (2008) that posits that debt-to-asset ratios are affected by fair value adjustments. Although 50% of the sampled organisations proved to be exposed to fair value adjustment recognitions, the ROE ratio seemed to be least affected.

Table 6 The effect of fair value adjustments on profitability ratios

Company name	Operating profit margin including and excluding fair value adjustments	Net profit margin including and excluding fair value adjustments	ROI ratio including and excluding fair value adjustments	ROE ratio including and excluding fair value adjustments	RONA ratio including and excluding fair value adjustments
Absa	x	x	x	✓	x
FirstRand	x	x	x	✓	x
Growthpoint	✓	✓	✓	✓	✓
Hammerson	x	x	✓	x	✓
Investec	✓	✓	✓	x	✓
Nedbank	x	x	x	✓	x
Nepi	✓	✓	✓	✓	✓
Old Mutual	✓	✓	✓	x	✓
Redefine	✓	✓	✓	✓	✓
Remgro	✓	✓	✓	x	✓
Sanlam	✓	✓	✓	x	✓
Standard Bank	✓	✓	✓	x	✓
% of companies affected	67%	67%	75%	50%	75%

Statistically, at least half of the selected companies were affected in terms of profitability ratios by the recording of fair value adjustments pertaining to IAS 40. This measurement can be as high as 75% when specific ratios such as ROI and RONA are studied. These results correlate with the findings of Bandyopadhyaya, Changling & Wolfeb in 2017 on Canadian firms who have adopted IFRS and in particular IAS 40. The study focusses on the usefulness of fair value adjustments and the role of accounting conservatism. They have measured the relevance of Canadian Real Estate Investment trust companies (REIT)s' fair value adjustments insofar as they are predictive of future outcomes (future cash flows). The findings indicated that arbitrary fair value measurements will likely lead to current accounting numbers such as asset revaluations, being less predictive of future cash flows.

Conclusion

In total, 50% to 75% of the sampled companies had profitability affected by fair value adjustments. Focus needs to be placed on the fact that fair value adjustments are estimations rather than tangible increases or decreases. The nature of fair value adjustments and the effect on profitability ratios resulted in managerial proof that profitability ratios should be calculated excluding fair value adjustments when IAS 40 is applied. Awareness should be brought to the investors that tangible returns, such as dividends, depending on the availably of cash and the necessary cash flow. Therefore, cash flow line items should also be analysed.

From a managerial perspective, the research findings have the following implications: (1) It assists in understanding how profitability, including and excluding fair value measures, affect investors when fair value accounting is applied. This study demonstrated that profitability ratios of sampled entities were indeed sensitive to fair value adjustments posted through profit or loss accounts. Between 50% and 75% of the companies sampled were affected by this recognition; (2) The research established an understanding that fair value is not a tangible increase/decrease due to business performance but rather an estimated change in the value of an asset held for capital appreciation or rental income. Due to the nature of this line item and the high probability of effect on profitability ratios, the investor should calculate these ratios excluding the fair value adjustment; (3) Research results can make investors aware that upward fair value adjustments can increase the entity's net value. However, this increase is 'artificial' as no guarantee exists that such an adjustment may materialise upon disposal of investment property. Thus, these adjustments are estimates only and should be ignored in the case of profitability analysis; (4) Research results can make investors aware that profits and cash flows are different. Profits contain non-cash items such as fair value adjustment and depreciation. (5) Furthermore, profits are calculated based on accrual accounting. Thus, increases in profitability do not reflect actual money balances; (6) From this research, it is apparent that investors value profitability measures in determining probable returns. Increases in fair value are not reflected in dividend payments, as dividend payments result from available cash flow rather than available profit. Therefore, it is suggested that investors also consider the analysis of cash flow measures when making investment decisions.

The recommendation based on this research is that profitability ratios of sampled entities were affected by the recognition of fair value adjustments and that the investor should eliminate fair value adjustment measures when profitability is analysed. Fair value adjustments are estimations of value increases or decreases relating to investment property. Fair value does not encapsulate any actual business performance. Therefore, investors are made aware that other measures, especially those that analyse cash flow, should be studied when estimating tangible returns. The result of this study correlates with a recent study of Olante and Lassini (2022) focusses on the management choice between fair value and cost for investment property under IAS 40 in Europe. Olante and Lassini's stated that the results of their study are important for standard setters, as it indicates that although the preparers of financial statements recently gained more experience by using fair value in Europe, this increased experienced may be insufficient to lead to adoption of fair value for investment properties.

Although investors may value profitability ratios a great deal, they are cautioned to eliminate fair value adjustments before calculating them. Other options include the analysis of cash flow to ensure that dividends can be paid. Ultimately, there is no ratio that guarantees investment decision success. This study has two limitations. Firstly, it only focuses on selected companies listed on the JSE in South Africa. Therefore, it might not be representative of other companies. The scope of the study is limited to two variables: Investment property valuation (IAS 40) and its effect on profitability ratios. Future research could add more ratio's to be investigated or to look at additional disclosures on

market liquidity and profitability. To conclude, the study conceivably allows a better understanding of the complexity of managerial decisions.

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