UNIVERSITY OF KWAZULU-NATAL

THE IMPLEMENTATION IMPACT OF IFRS 16: *LEASES* ON JSE LISTED TECHNOLOGY AND TELECOMMUNICATION COMPANIES USING A CONSTRUCTIVE CAPITALISATION MODEL

By

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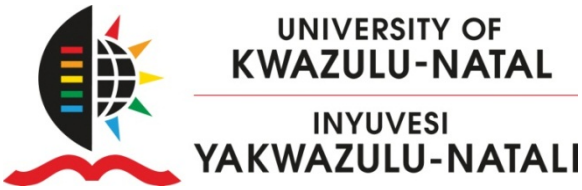

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ABSTRACT

In South Africa and globally, leasing forms part of a significant source of financing for companies. On the 13th January 2016, the IASB released the new lease standard, IFRS 16, which is effective for periods beginning on or after 1 January 2019. For entities that have a significant number of operating leases, IFRS 16 is anticipated to materially affect the figures in the financial statements, capital structure, as well as liquidity and profitability ratios. Numerous stakeholders' rely on these reported figures and ratios when making entity-related decisions. A constructive capitalisation model shows the likely impact IFRS 16 will have on a company's financial statements and ratios when implemented. This study analysed the likely impact that IFRS 16 is expected to have on the financial position, financial performance and market ratios for technology and telecommunication companies when a constructive capitalisation model is used. The audited financial statements were obtained for the population of JSE listed technology and telecommunication companies and the constructive capitalisation model applied. The analysis of the data reveals that when the constructive capitalisation model is applied it results in changes in the financial performance, financial position and market ratios for the technology population. However, the changes in the financial position, financial performance and market ratios for the telecommunication population when the constructive capitalisation model is applied, is not considered significant.

Keywords: constructive capitalisation, finance leases, IFRS 16, off-balance sheet financing, operating leases

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LIST OF ACRONYMS AND ABBREVIATIONS

EBITDA	earnings before interest, tax, depreciation and amortisation
FASB	Financial Accounting Standards Board
GDP	gross domestic product
IAS 17	International Accounting Standards 17
IASB	International Accounting Standards Board
IFRS 16	International Financial Reporting Standard 16
JSE	Johannesburg Stock Exchange
MLP	minimum lease payments
NPAT	net profit after tax
PwC	PricewaterhouseCoopers
PE	price earnings
ROA	return on assets
ROE	return on equity
SARB	South African Reserve Bank
SEC	Securities and Exchange Commission
WEF	World Economic Forum

CHAPTER 1
INTRODUCTION AND BACKGROUND

1.1. Background

In South Africa and globally, leasing forms part of a significant source of financing for companies. The 2016 global leasing report, by the White Clarke Group, ranked North America first as the world's largest leasing region for consecutive years. North America accounts for 39% of the world's leasing market volume. South Africa was placed 24th of the top 50 countries with $4.6 billion which shows the lease volume reached in 2016 (White, 2016).

A lease is a contractual arrangement, which transfers the right of an asset for an agreed time frame to one party (the lessee) by another party (the lessor) in exchange for an agreed series of payments or consideration (Stainbank, Oakes & Razak, 2012).

On 13 January 2016, the International Accounting Standards Board (IASB) issued the new lease standard, International Financial Reporting Standard 16: *Leases* (herein referred to as IFRS 16). The hotly debated and long anticipated IFRS 16 will become effective for all financial periods commencing on or after 1 January 2019 (IASB, 2016c; De Oliveira, 2016; Stainbank, Oakes & Razak, 2016). It is expected to have a far-reaching effect on companies both globally and in South Africa. For entities that have a significant number of operating leases, IFRS 16 is anticipated to materially change certain numbers in the financial reports, which in turn will impact the capital structure, liquidity and profitability. Numerous stakeholders including investors and lenders depend on these reported figures and ratios to make entity-related decisions (Dillion, 2014; IASB, 2013; Ernst & Young, 2016).

IFRS 16 is the outcome of a plan by the IASB and the Financial Accounting Standards Board (FASB) to enhance the accounting for leases in response to concerns over the deficiency in transparency of information about lease obligations. The old lease standard, International Accounting Standard 17: *Leases* (hereafter IAS 17), has been used in the past by entities to accomplish 'off-balance sheet' financing by a lessee, whereby the lessee can obtain the use of an asset and have

an obligation for lease payments to the lessor; however, is permitted under IAS 17 to not reflect these lease assets and liabilities in their financial statements (IASB, 2016a). The Securities and Exchange Commission (SEC) calculated that the United States had $1.25 trillion in off-balance sheet financing resulting from operating leases in 2005 (SEC, 2005).

Therefore, companies that reported material off-balance sheet leases under IAS 17 will now be forced under IFRS 16 to capitalise a lease asset based on the present value of the lease payments and will recognise a financial liability if lease payments are made over time (Koppeschaar, Rossouw, Sturdy, Van Wyk, Gaie-Booysen, Papageorgiou, Smith, Van der Merwe & Schmulian, 2016).

Lessor accounting under IFRS 16 essentially remains unchanged from IAS 17, where the lessor will continue to categorise its leases as either operating or finance leases. However, lessee accounting will be considerably different under IFRS 16 (Koppeschaar *et al*., 2016).

Under IAS 17 a lease was either categorised as an operating or finance lease for the lessee; however, IFRS 16 sets forth a single lessee accounting model that reveals that such leases should be capitalised as they result in an entity obtaining a right of use asset and a corresponding lease liability when the lease begins (Koppeschaar *et al*., 2016). The lessee's financial statements and ratios are expected to materially change when the single lease accounting model under IFRS 16 is applied. It is this anticipated change in financial statements and ratios resulting from the requirements of IFRS 16 that were investigated in this study.

1.2. Problem statement

The new lease standard which has been the subject of much deliberation and debate over the past decade has been researched globally in detail. The majority of research in South Africa has focused solely on a few key industries and has at times resulted in inconsistent findings. It is in this context that this study sought to answer questions of what effect the new lease standard will have on financial statement figures and metrics that stakeholders use when making important company-related decisions. Academic research will allow companies to predict what impact IFRS 16

is likely to have on the finacial position, financial performance and market ratios before it is implemented giving them time to react in advance.

1.3. Need and Focus of the study

'Constructive capitalisation' is a term frequently used by Dillion (2014) and describes the process of capitalising operating leases and accounting for the operating leases as if they were finance leases. Previous studies performed in South Africa, using a constructive capitalisation model, focused on certain industries such as the "General Industrials; Industrial Transportation; Food & Drug Retailers; General Retailers and Travel & Leisure" as these are expected to be impacted materially by the new lease standard (Dillion, 2014, p. 38). Furthermore, there are some industries for which it is unknown what the impact will be once IFRS 16 comes into effect. For example, no information could be found at the time of the study as to what the likely impact will be on the technology industry when IFRS 16 is implemented. Some sources indicate there is a relationship between the growth in the technology industry and growth in the economy, as measured by the gross domestic product (GDP) (World Economic Forum (WEF), 2013). Despite the importance of the technology industry in an economy, very little is known about the impact that IFRS 16 will inflict on Johannesburg stock exchange (JSE) listed companies operating in this industry. Therefore, the technology industry was included in this study. The financial position, financial performance and market ratios of many other industries are also anticipated to show a significant change once IFRS 16 is implemented. For instance, the telecommunication industry in the Middle East is expected to show a median increase in debt of at least 21% and a median increase in earnings before interest, tax, depreciation and amortisation (EBITDA) of at least 8% (PricewaterhouseCoopers (PwC), 2018). In addition, a graph included in a summary by Ernst and Young of the impact of IFRS 16 and its effect shows that companies in the telecommunications industry are expected to be one of the most highly impacted industries (Ernst & Young, 2016). However, it is unknown what the likely impact of IFRS 16 will be on the telecommunications industry in South Africa and it is for this reason that in this study, the constructive capitalisation model was applied to the telecommunication industry in addition to the technology industry.

1.4. Research question and objectives

There has been limited research performed investigating the possible effect of IFRS 16 when operating leases are recorded and treated as finance leases on Johannesburg Stock Exchange (JSE) listed entities. To date only a few industries on the JSE have been researched and the findings have not always been consistent (Dillion, 2014; De Villiers & Middleberg, 2013). As a result of this, the specific research question for this research was:

What impact will implementing IFRS 16 have on financial statements and financial ratios of listed technology and telecommunication companies when a constructive capitalisation model is used?

In order to answer the research question, the following research objectives were established:

- To assess what proposed impact IFRS 16 will have on the financial position ratios of technology and telecommunication JSE listed companies.
- To assess what proposed impact IFRS 16 will have on the financial performance ratios of technology and telecommunication JSE listed companies.
- To assess what proposed impact IFRS 16 will have on the market ratios of technology and telecommunication companies listed on the JSE.

1.5. Summary

Chapter 1 has outlined the background to the study as well as the need for the study and the objectives that the study set out to achieve. This study investigated the proposed impact that applying IFRS 16 will have on JSE listed companies in the technology and telecommunication industries when a constructive capitalisation model is used. This area of study is considered particularly relevant as companies in South Africa will have to apply IFRS 16 for periods beginning on or after 1 January 2019. This study will be useful as it will show companies in the selected industries the likely impact that IFRS 16 will have on their financial statements and financial ratios when it is applied. In the South African context there is a paucity of research

focusing on the impact of capitalising operating leases for listed companies operating in the technology and telecommunication industry.

Chapter 2 entails a review of applicable literature outlining the reasons that have resulted in a new lease standard being released as well as an analysis of prior studies performed on capitalising operating leases. Chapter 3 discusses the research methodology utilised for the study, whilst Chapter 4 presents the results and analysis of the data gathered. Chapter 5 summarises the research findings and highlights further areas of research.

CHAPTER 2
LITERATURE REVIEW

2.1. Introduction

Chapter 1 outlined the issue that was researched as assessing the implementation impact of IFRS 16 on JSE listed technology and telecommunication companies using a constructive capitalisation model. In this chapter, the deficiencies in IAS 17 which resulted in IFRS 16, the new lease standard, are examined. IFRS 16 has an effective date for periods beginning on or after 1 January 2019 and is expected to materially impact the financial statements as well as ratios for those companies that make extensive use of operating leases. This chapter also details the impact on financial ratios and financial statements that previous research has shown when operating leases are capitalised. The previous study performed by Dillion (2014) examined many different aspects and areas of leasing; however, this study concentrated on the impact of capitalising operating leases using a constructive capitalisation model on the technology and telecommunication companies listed on the JSE. Included in this chapter are findings from previous studies performed on the different lease capitalisation methods.

2.2. Certain deficiencies in IAS 17 have necessitated a new lease standard

In the past when a company required the use of an asset for its operations it would have to decide how to finance this asset, either through buying the asset or entering into a lease agreement. There are a number of reasons a lessee may choose to enter into a lease agreement rather than purchasing the asset, such as the following:

- A lease provides protection against the risk of technology obsolescence, since the lessee can get rid of the asset when the lease comes to an end.
- A company's cash flow position may prevent the outright purchase of the asset.
- There may be more tax benefits available to the lessee if the asset was leased.
- The company may only need the asset temporarily (for a specific job/venture of a short duration).

- The company may not want to have to issue additional shares or raise debt to fund the purchase of the asset, leaving leasing as the only alternative.
- The company may strategically plan to acquire the use of the asset off-balance sheet to achieve performance targets, maintain debt/equity ratios and adhere to existing loan covenants (Correia, Flynn, Uliana & Womald, 2011; Stainbank *et al*., 2012).

Evidence from a study carried out by Durocher (2008) on companies in the United States and Canada, shows that in the past entities have chosen to structure their lease agreements to bring about off-balance sheet financing by means of a lessee not having to record lease assets and liabilities in their statement of financial position, therefore resulting in an understatement in their debt balance and their assets employed. They prefer this treatment as it is perceived to prevent companies from breaching their loan covenants and improves incentive compensation. The lessee can accomplish this by arranging the lease agreement so that it is classified as an operating lease and treated as a rental agreement which results in rent expense being recorded in the statement of comprehensive income – with no corresponding effect on the statement of financial position. This situation is also inclined to infringe on the comparability of the financial statements of different companies. With this off-balance sheet finance, the company may look more favourable to various stakeholders who then use this information, among other things, to assess credit applications and make investment decisions (Stainbank *et al*., 2012).

In accordance with the qualitative characteristic of ‘faithful representation’ as set out in the conceptual framework and the asset and liability definition, certain leases in terms of IAS 17 are capitalised which results in a leased asset and corresponding liability being recognised in the statement of financial position by the lessee. The concept of substance over form results in the reality (substance) of the lease agreement being applied over the legal position (legal form). The lessee is seen as the beneficial owner despite the fact that they will never own the asset legally. The lessee will therefore record the asset and the corresponding finance as being effectively owned during the period covered by the lease (Stainbank *et al*., 2012)

As per IAS 17, a finance lease “is a lease that transfers substantially all the risks and rewards incidental to ownership of an asset.” Such leases must be capitalised by the lessee. The standard contains eight examples of situations that will result in the lease being classified as a finance lease (IASB, 2010).

A lessee shall record an expense in the statement of comprehensive income on a straight-line basis for operating leases, which the standard defines as those leases that are not finance leases, with no lease asset and liability being raised in the statement of financial position. Table 2.1 below sets out the differences between finance and operating leases from IAS 17 (IASB, 2010; Vorster, Koornhof, Oberholster, Koppeschaar, Coetzee, Janse van Rensburg, Binnekade, 2008).

Table 2.1: Outline of the financial statement line items under IAS 17

LESSEE ACCOUNTING IAS 1	
FINANCE LEASE	**OPERATING LEASE**
Statement of financial position	**Statement of financial position**
Finance lease asset	Asset or liability (prepayment or accrual-lease smoothing)
Finance lease liability	
Accumulated depreciation	
Deferred tax	Deferred tax
Statement of profit & loss and OCI	**Statement of profit & loss and OCI**
Finance charges	Rent expense
Depreciation	
Current tax	Current tax

Adapted from De Villiers & Middleberg, 2013

It has been debated for more than a decade that the rights and obligations formed by a lease agreement are being capitalised under finance leases, therefore operating leases should be treated in the same way. It can be argued that a non-cancellable operating lease results in the asset definition being met; however, IAS 17 prevents such assets from being capitalised (for operating leases) in the company’s statement of financial position. This then results in the company achieving off-balance sheet financing as it has the continued use of the operating

lease which is non-cancellable without having to recognise an asset and liability in its statement of financial position. It is no surprise then that the IASB has issued a new lease standard, IFRS 16, which companies need to apply from 1 January 2019 (Stainbank *et al*., 2012).

Lessor accounting under IAS 17 remains substantially the same under IFRS 16, where the lessor will continue to classify its leases as either operating or finance leases (Service, 2018). However, lessee accounting will change considerably under IFRS 16 as shown in Table 2.2.

The company that obtains the right to use an asset over a certain time frame in exchange for consideration is known as the lessee. The lessee is not required to take possession of the asset leased when the lease agreement comes to an end and is not legally the owner. However, the substance is that the lessee obtains the right of use asset that will result in economic benefits over the lease term. Therefore, under IFRS 16, the lessee will recognise both the right of use asset and a lease liability on its statement of financial position for all leased assets (Koppeschaar *et al*., 2016). According to the EY Summary of IFRS 16 and its effects this 'gross-up' of the statement of financial position is expected to result in the debt ratios and return on assets deteriorating. Companies will have to assess what impact this will have on compensation measures such as employee bonuses and debt agreements. Companies may also need to renegotiate debt covenants with loan providers to allow more leeway in meeting these covenants (Ernst & Young, 2016).

Table 2.2: Main differences between IAS 17 and IFRS 16 for the lessee

IAS 17 (FINANCE LEASE)	**IFRS 16**
Initial recognition	
When the lease term begins, the lessee will distinguish/classify the lease as an operating or finance lease.	No differentiation is made between operating and finance leases. All lease contracts are classified and recorded as finance leases.
Initially a finance lease asset is recorded together with a lease liability.	Initially a right of use asset is recognised with a corresponding lease liability.
Initial measurement	

Finance leases are initially recognised at the lower of the fair value of the asset and the present value of the minimum lease payments.	A lease liability is recognised at the present value of the lease payments and right of use asset is measured at cost.
The rate implicit in the lease is used to determine the present value of the minimum lease payments.	The lease payments are discounted using the interest rate implicit in the lease. If that rate cannot be easily determined, the lessee shall use its incremental borrowing rate.
Subsequent measurement	
Finance lease liability	
Apportioning of lease payments into the capital portion and portion relating to interest expenses.	Allocating the lease payments into the portion relating to capital and interest expenses.
Finance lease asset	
Subsequently measured in accordance with IAS 16: Property, plant and equipment.	Subsequently measured in accordance with IAS 16: Property, plant and equipment.
No revaluation of the asset per IAS 17.	If the right of use asset falls in the same class as other PPE items where the revaluation model is used, this model may be used for the right of use asset.
No impairment according to IAS 36: Impairment.	Impairment according to IAS 36: Impairment.

Adapted table taken from De Villiers & Middleberg, 2013

2.3. Financial statements and ratios

Financial statements are analysed by various stakeholders such as investors, employees, lenders, suppliers, customers, governments and the general public. Financial ratio analysis is used by stakeholders to make assumptions about an entity's financial stability and performance. Table 2.2 indicates the financial statement line items that are going to be impacted by the new lease standard IFRS 16. The financial statement line items are in turn expected to affect certain financial ratios that users compute and analyse (Fulbier, Silva & Pferdehirt, 2008).

Financial ratios provide a summary overview of a company and can be divided into three broad categories:

1) Ratios which display an entity's structural change;

2) Ratios which show company profitability; and

3) Ratios that have an effect on the valuation of a company and the perception of the market.

It is anticipated that IFRS 16 will have a knock on effect on various numbers making up the financial statements. For example, an entity's total debt is expected to increase and equity will also be impacted by the reversal of the previously recorded operating lease expense and the expensing of the amortisation and interest expense (Correia, Flynn, Uliana & Womald, 2015).

Extensive research has been performed globally on what the impact will be on financial ratios and financial statements when operating leases are capitalised and treated as finance leases by researchers such as Imhoff, Lipe and Wright (1991), Bennet and Bradbury (2003), Fulbier *et al.* (2008), Durocher (2008) and Jesswein (2009). Furthermore, different types of lease capitalisation methods have been developed from this study which show the likely impact on IFRS 16 when it takes effect.

2.4. Lease capitalisation

2.4.1. Lease capitalisation methods

One of the earliest constructive capitalisation models was invented by Imhoff, Lipe and Wright in 1991. Their method establishes the unrecorded lease liability by using the company's estimated incremental before tax borrowing rate that discounts the future minimum lease payments that are disclosed for operating leases. A calculation was performed of the total and remaining useful life of the lease asset which was then used to amortise the leased asset on a straight line basis, to derive the value of the unrecorded asset, which would be less than the lease liability. Six assumptions were made by Imhoff *et al*. (1991) in order to isolate the differences that result in future minimum lease payments when capitalising operating leases, specifically: a 10% interest rate was considered suitable for every entity, a 15-year average remaining life was used for the operating leases, all cash flows (i.e. minimum lease payments) would take place at the end of the year, the unrecorded lease asset would equate to 70% of the unrecorded lease liability and the effective rate of tax was estimated at 40%. The final assumption was that there was no impact

on the profit in the current year. The six assumptions were used to separate the differences that resulted in future minimum lease payments when capitalising operating leases and were considered necessary. Due to the six assumptions used, it was then possible to isolate any changes that occurred due to differences in the operating lease payments when the operating lease was capitalised (Imhoff *et al*., 1991).

In their study, Imhoff *et al*. (1991) also derived an equation that can be applied to the estimated unrecorded lease liability to calculate the unrecorded lease asset. This equation which has been termed the 'asset ratio' was shown in their study and is displayed below in Example 2.1 (Imhoff *et al*., 1991, p. 56).

Asset ratio = (RL/TL) x {(PV of annuity for TL at i) ÷ (PV of annuity for RL at i)}
Where RL = lease remaining life
TL = total lease life
i% = marginal borrowing rate

(Imhoff *et al*., 1991, p. 56).

The following are the three assumptions underlying the asset ratio equation:

- All lease assets are depreciated on a straight line basis over the remaining life of the lease.
- When the lease begins the unrecorded lease asset is equal to the unrecorded lease liability.
- After the last lease payment is made at the completion of the lease term, the unrecorded lease asset and liability are both zero.

Previous research by Dillion has confirmed the asset ratio formula and the example below was adapted from the research performed by Dillion (2014) and re-confirms its accuracy.

Example 2.1

An asset is leased for a period of four years under an operating lease contract which specifies yearly lease amounts, of R80 000, are received in arrears. A discount rate

(before tax) of 11% is deemed suitable resulting in an amount of R248 195.66 being the present value of lease payments. At the commencement of the lease, the leased asset will also be R248 195.66 provided there are no other costs that occurred relating to the lease. This will result in an annual amortisation amount of R62 048.92 over the period of the lease (adapted from Dillion, 2014).

Table 2.2(a): Balance of the lease liability and asset under a lease

	Lease liability	Leased asset	Ratio of leased asset to lease liability
Beginning of lease	248 195.66	248 195.66	100%
1st year	192 146.50	186 146.74	96.88
2nd year	135 204.08	124 097.82	91.79
3rd year	71 428.57	62 048.90	86.87
4th year	0	0	0

Table 2.2(b): On-balance sheet and off-balance sheet lease expense

	On-balance sheet expenses		**Off-balance sheet expense**
	Interest expense on lease liability	Amortisation on leased asset	Operating lease expense
1st year	27 301.52	62 048.92	80 000
2nd year	21 136.12	62 048.92	80 000
3rd year	14 872.45	62 048.92	80 000
4th year	7 857.14	62 048.92	80 000

To confirm the accuracy of the asset ratio formula, one can calculate the asset ratio using the formula which will result in an asset ratio formula of 95% and compare it to the ratio of the leased asset to liability at the end of year one being 96.88%, as in Table 2.2(a).

Asset ratio = (3÷4) x (3.1024) ÷ (2.4437)

= 95%

It can therefore be reconfirmed by this study that the asset ratio formula developed and used by prior researchers such as Imhoff *et al.* (1991) and Dillion (2014) is accurate as the difference in percentages is immaterial.

The assumption, made in prior research by Imhoff *et al*. (1991), in which the effect on profitability in the current year was zero was later re-examined when evidence arose in 1997 that the impact could be both volatile in direction and be of a material amount. The effect on profit was assessed by subtracting both the interest on the unrecorded lease liability and the amortisation on the unrecorded lease asset. The operating lease expense was then added to profit (Imhoff, Lipe & Wright, 1997). The impact on profit is said to be volatile due to the sum of the amortisation expense and interest expense being larger than the amount of the operating lease expense in the early period of the lease, whereas in the later years of the lease the operating lease expense will be greater than the total of the interest and amortisation as the lease liability gets smaller (Dillion, 2014). It was further determined by Imhoff *et al*. (1997) that the total change in net profit could be calculated by taking the movement in retained earnings instead of applying separate adjustments to profit. In addition to the other assumptions revised in 1997, Imhoff *et al*. (1997) replaced the assumption of using a 10% interest rate across the board with a firm specific interest rate.

Two different interest rates were outlined as being appropriate to use as entity specific interest rates.

The first is determined by taking the interest expense and dividing this by the amount of interest bearing debt that was calculated using book values which results in the implicit interest rate. It was further noted that when the interest expense is taken from the financial statements to determine the entity-specific interest rate, the interest income must not be netted off the interest expense. In some cases the implicit interest expense may be disclosed in which case it will not have to be determined (Imhoff *et al*., 1997).

Instead of calculating the entity-specific interest rate using the approach above, it is also possible to determine an implicit interest rate from the entity's finance leases (Imhoff *et al*., 1997). Dillion noted that this rate may be disclosed or the rate could be calculated from the disclosures made on finance leases (Dillion, 2014).

It was noted by Imhoff *et al*. (1991) that there is a lot of uncertainty around the determination of an appropriate lease period. The useful lives of the assets being leased are important due to some of the lease assets being equipment or machinery which have vastly different economic lives to buildings. A technique was also used in their paper in 1991 to provide an estimation of the individual entities' average remaining lease life. This was calculated by taking the future minimum lease payments outstanding later than five years and dividing it into the amount representing the minimum lease payments owing in year five. This estimate of the number of years would be rounded up. Imhoff et al. (1991) also advocated for the addition of one or two more years to the estimate where the estimate of the minimum lease payments was greater than 15 years. The reason for this would be due to minimum lease payments usually declining as the lease period carries on to a close. The number of years calculated representing the average remaining lease life was then utilised to calculate the minimum lease payments owing every year subsequent to the fifth year, the asset ratio, and the lease liability that was undiscounted (Imhoff *et al*., 1991.

The disclosures required under lease accounting in terms of IAS 17 specify that the total future minimum lease payments owing after the first year up until the end of the fifth year should be made in the financial statement note disclosure (Stainbank *et al*., 2012). However the method used by Imhoff *et al*. (1997) was based on US GAAP disclosure which is different to the disclosure required under IAS 17. US GAAP requires disclosure of the future minimum lease amounts owing every year for five years after year end. Due to this disclosure difference, Fulbier *et al*. (2008) developed a method whereby the total amount disclosed for the future minimum lease payment (MLP) owing after the first year up until the end of the fifth year, can be adapted into yearly lease payments that regress at a constant rate. In their study they determined a degression factor which is the same every period for five periods ($MLP_{t+1} = MLP_t * dg$). In other words, the MLP_1 that is identifiable will be used to calculate the MLP for each period, from period two ($MLP_{2)}$ to period five (MLP_5). The amount of $MLP_2 + MLP_3 + MLP_4 + MLP_5$ should total to the amount of the MLP_{2-5} as disclosed in the lease note disclosure (Fulbier *et al*., 2008). The constant digression factor was later used by other researchers such as De Villiers and Middleberg (2013) who included the constant degression factor in the Imhoff, Lipe, Wright

method when they were compiling research on the impact of capitalising long-term operating leases on the financial ratios of the top 40 JSE listed companies. More recent studies which incorporated the constant degression factor was performed by Dillion (2014). Despite the accuracy of the constant degression factor, some studies have been performed using a simpler approach whereby the yearly lease payment is estimated by taking the total future minimum lease payments divided by a determined period of time. However, this 'rule of thumb' method although easy to calculate does not result in the most accurate information and can result in the value of the lease liability being overstated. As a lease comes to an end, the future minimum lease payments are expected to decline which means that the constant degression method would result in more accurate figures (Bennet & Bradbury, 2003).

A study conducted by Jesswein (2009) compared different approaches for valuing operating leases so that the accuracy of each method could be determined. The Imhoff, Lipe and Wright present value method used to determine the debt and interest payments from capitalising the operating leases, was compared to three popular empirical models. The first empirical model multiplied the current operating lease expense by a factor of eight. The second empirical study involved taking the lease obligation in the next period and multiplying it by a factor of six. The final empirical approach took the total of the lease amounts owing for both current and future periods and multiplied it by two-thirds and one-third respectively. The one-third represented the interest cost of the leases. The findings showed that the one-third/two-thirds approach always results in an understatement of the value of the leases while the two multiplier method results in the value of leases being exaggerated (Jesswein, 2009).

It is clear from prior studies that the results using the Imhoff, Lipe and Wright method to capitalise operating leases based on the disclosures in the financial statements are more accurate than other methods that are based on a set 'rule of thumb'. Due to its accuracy, the Imhoff, Lipe and Wright method has been used widely in past studies and more recently by Dillion in 2014. The model used in this study, incorporates the Imhoff, Lipe and Wright method and is the same model that was used by Dillion in his study in 2014.

2.4.2. Results from prior research based on lease capitalisation

Imhoff *et al*. (1991) conducted a study into a total of 14 companies covering seven different industries to assess what impact the Imhoff, Lipe and Wright method would have on the operating leases. The industries covered in the study consisted of "home furnishings, food stores, fast food, semi-fast food, clothing, drug/food stores and airlines" (pp. 60-62). These sectors were chosen as they made use of a material number of operating leases that had long lease periods. The companies from the industries tested were companies with a large proportion of future minimum lease payments in relation to total assets and a company that was comparable in size that had a significantly lower proportion. The findings showed that when the operating leases were brought onto the balance sheet the debt/equity ratio increased by a mean 191% for high leases and 47% for low leases. In addition, the return on assets (ROA) ratio decreased by a mean of 34% for high leases and 10% for low leases. The companies operating in the home furnishings industry showed the biggest change in both the ROA ratio and the debt/equity ratio. In the study carried out, the assumption was made that the income statement adjustments were nil. This assumption was later relaxed when the impact on income from constructive capitalisation was investigated by Imhoff *et al*. in their 1997 paper. The findings showed that when operating leases were capitalised for four different companies in the United States and the income statement impact was assessed, there was a change in the ROA ratio and the return on equity (ROE) ratio (Imhoff *et al*., 1997).

Beattie, Edwards and Goodacre (1998) chose arbitrarily 232 commercial and industrial listed entities in the United Kingdom to determine the impact on key ratios when operating leases are capitalised using the Imhoff, Lipe and Wright method. They discovered that it was more accurate to incorporate entity-specific assumptions for such things as the residual life of the lease as well as the rate of tax and subsequently adjusted the Imhoff, Lipe and Wright method with these assumptions. Findings from their study showed once operating leases were capitalised it resulted in material changes in the profit margin, in addition to the return on assets ratio and deterioration in gearing ratios. Furthermore, it was found that on average the unrecorded long-term liability calculated consisted of 39% of the long-term debt reported by the company in comparison to the estimated unrecorded asset which consisted of 6% of the reported total assets. The results revealed that

the services industry showed the most significant changes in ratios when an analysis was performed between pre- and post-capitalisation ratios (Beattie *et al*., 1998).

Bennett and Bradbury (2003) conducted a study on 38 companies that were listed on the New Zealand stock exchange. When the operating leases were capitalised the results showed the total liabilities increased on average by 22.9%, assets increased by 8.8% and equity decreased by 3%. The operating lease capitalisation caused the leverage ratio to go from 0.469 pre-capitalisation to 0.519 post-capitalisation. The return on assets ratio decreased from 12.6% to 11.5% and the current ratio fell from 2.11 to 1.81.

A study performed by Fulbier *et al*. (2008) applied the Imhoff, Lipe and Wright constructive capitalisation method but added modifications for such things as the company-specific discount and tax rate, among other things. Ratios indicating the structural change, profitability and markets' perception were performed for 90 German companies that were selected for testing. The simulated results showed that when operating leases were capitalised the median debt equity ratio increased from 185% to 210%. In contrast, other ratios such as EBIT (earnings before interest and tax) and NI (net income) showed changes that were not significant. In addition, the market ratios were only marginally impacted with the EPS (earnings per share) and P/E (price earnings) ratio remaining stable. The findings also showed that the industries mostly impacted by the lease capitalisation were companies operating in the retail and fashion industry which further confirmed that some industries make more use of operating leases than others (Fulbier *et al*., 2008).

Durocher sampled 100 companies in Canada which were considered the largest by revenue based on fiscal information for 2002 and 2003. The ratios assessed were broken down into those ratios that show financial strength, management performance and investment return. The outcome of the study shows that when operating leases were capitalised it caused a significant amount of additional assets and liabilities to be recorded which would exceed the materiality threshold which was 10% of income before taxes and 0.5 percent of net revenues. The impact on the income statement was found to exceed the materiality threshold for not more than 25% of the companies tested. The ROA and ROE (return on equity) ratios were

used to evaluate the impact on management performance and were found to only have a statistically significant impact for the merchandising and lodging, oil and gas and financial services industries. The investment return for the same industries showed significant effects.

The prior study discussed was all based on studies in countries outside South Africa. One such study that took place in South Africa was performed by De Villiers and Middleberg in 2013. The sample was selected based on the market capitalisation in 2010 which resulted in 40 companies from the JSE being selected for testing. Companies were excluded from the sample if they did not have adequate disclosure of operating leases in their financial statements. Ratios that gave insight about the financial risk of the companies in the sample including the debt ratio, debt/equity ratio and interest cover ratio were tested. The debt ratio showed an increase of 8%, the debt/equity ratio revealed an increase of 9% and the interest cover ratio declined by 8% on average. The analysis of the profitability ratios revealed that the net profit % ratio fell by 32% on average, the return on equity declined on average by 21% whilst the return on assets ratio reflected a decrease of 20%. The earnings per share and price earnings ratio were used to assess if there was any change in market perspective before and after operating leases were capitalised. The earning per share ratio was impacted negatively and showed a decline after the operating leases were capitalised. The study further showed that the price earnings ratio on average was calculated as 26 pre-capitalisation which increased to 33 post-capitalisation. This increase of 26% was in line with expectations that if the earnings per share decreased and the market prices remained constant then the price earnings ratio should increase.

Dillion (2014) conducted a study on JSE listed companies operating in the “general industrials; industrial transportation; food & drug retailers, general retailers and travel & leisure” industries. A constructive capitalisation method was applied and the financial ratios calculated and compared for both pre- and post-capitalisation. The leverage ratios as a whole showed the most significant changes, namely the debt equity ratio which was calculated using book values, on average increased by 74.7 percentage points and the times interest earned ratio dropped from 111.2 times to eight times. In addition, debt on average increased by 33.7% while the median

increase was 18.1% when operating leases were constructively capitalised. Total assets showed an average and median increase of 11.3% and 8.1% respectively when unrecorded lease assets were raised. The companies included in the sample showed that the impact on net profit varied from company to company with some companies experiencing a decrease in net profit after tax by as much as 44.6% and some experiencing as much as a 21.6% growth. Other entities in the sample showed a smaller impact on net profit ranging from -4.6% to 4.3%. It was concluded that the financial ratios related to the balance sheet showed a greater change than the ratios that were related to the income statement. When analysing the five different sectors tested the results showed the food and drug retailers and general retailors ratios were impacted the most when the capitalisation of operating leases occurred. In contrast, companies operating within general industrials were found to be the least impacted by the operating leases being capitalised.

2.5. Conclusion

The literature review has identified the reasons and deficiencies in the old lease standard, IAS 17, that have resulted in the need for a new lease standard. IAS 17 allowed off-balance sheet financing which did not faithfully represent the rights and obligations resulting from the agreement. It is therefore apparent that IFRS 16 will result in better transparency and comparability in a company's set of financial statements when all leases are treated and capitalised as finance leases. The implementation of the new lease standard is expected to have a substantial impact on a company's financial statements and ratios. The impact that IFRS 16 will have on a company's financial statements and financial ratios can be assessed by constructively capitalising operating leases. The different methods for capitalising operating leases have developed over the last decade with the most recent model being that developed and used by Dillion in 2014. The constructive capitalisation model that was used in this study is outlined and explained in the research methodology chapter.

CHAPTER 3
RESEARCH METHODOLOGY

3.1. Introduction

The aim of this study was to assess the impact that IFRS 16 will have on the financial position, performance and market ratios of companies in the technology and telecommunications industry listed on the JSE by employing a constructive capitalisation model. Details about the companies forming part of the population are outlined in Section 3.2. The study that was conducted was quantitative in nature and experimental as the industries assessed in this study have never been tested using this model before. The model that was utilised was that developed by Dillion in 2014, which was developed using prior literature (Dillion, 2014). The steps in the model that were used in this study and the method of analysing data are outlined in Sections 3.3 and 3.4 respectively.

3.2. Sampling

The population of this study comprised all JSE listed entities. The sampling technique applied was a process of elimination using the following elimination criteria; entities operating in industries that have been included in prior studies have been eliminated as their results would not contribute to literature, entities in the financial services sector have been eliminated due to the nature of operations and unique reporting requirements, entities included in industries that do not have material operating leases and therefore would not be materially impacted by IFRS 16. Once the process of elimination was performed the technology and telecommunications industry of the JSE main board remained.

Technology and telecommunications industry

Various sources from the auditing and accounting profession indicate that the telecommunications industry is likely to be heavily impacted by IFRS 16. A publication by PricewaterhouseCoopers (PwC), which offers insight as to how IFRS 16 will impact the telecommunications industry, indicates that as leases in this industry are widely used there is likely to be a material impact when applied (PwC, 2016). Furthermore, a graph included in a summary by Ernst and Young of the

impact of IFRS 16 and its effect shows that companies in the telecommunications industry are expected to be one of the most highly impacted industries (Ernst & Young, 2016). The telecommunications industry in South Africa includes well known listed companies such as MTN, Vodacom and Telkom (Investec, 2018). According to Baker McKenzie's Global Transaction Forecast, activity in the technology and telecommunications industry is expected to increase in 2018 and 2019 by more than four times its current activity. Furthermore, some sources indicate there is a relationship between the growth in the technology industry and growth in the economy, as measured by the gross domestic product (GDP) (World Economic Forum (WEF), 2013). Despite the importance of the technology industry in an economy, very little is known about the impact that IFRS 16 will inflict on JSE listed companies operating in this industry. There is no study to date on the likely impact IFRS 16 will have on the technology industry in South Africa. Therefore, the companies listed in the technology industry of the JSE formed part of the population for testing. All the JSE listed entities in the technology and telecommunications industry listed on the main board were chosen to be tested and included in the population. On the 29th September 2018 there was a total of 21 entities in the technology and telecommunication industry that were registered on the JSE main board. This can be further broken down into 13 companies in the technology industry and six companies in the telecommunication industry. A list of the companies included in the population is shown in Table 3.1 and Table 3.2.

Table 3.1: Technology companies included in the population

Technology companies	
Adapt IT Holdings Limited	EOH Holdings Limited
Alaris	ISA
Allied	Jasco Electronics Holdings Limited
Alviva	Macromega Holding
Ayo Technology Solutions Limited	Mustek Limited
Capital Appreciation Limited	PBT Group Limited
Cognition Holding Limited	Total Client Services Limited
Datatec Limited	

Table 3.2: Telecommunication companies included in the population

Telecommunication companies	
Blue Label Telecoms Limited	Telemasters Holdings Limited
Huge Group Limited	Telkom SA SOC Limited
MTN Group Limited	Vodacom Group Limited

The steps in the constructive capitalisation model were applied for each company included in the population.

3.3. Constructive capitalisation model used

The constructive capitalisation model used in this study was the same as that applied by Dillion to assess what proposed impact the new lease standard would have on companies operating in five different sectors of the JSE. Dillion (2014) developed this model by integrating aspects of previous capitalisation models used, from founding researchers such at Imhoff *et al*. The steps in the model were set up in Microsoft Excel to ensure the model's accuracy.

Step 1: Obtain the latest audited financial statements

The latest audited financial statements were obtained from each company's website as was done by Dillion (2014). It was assessed by Dillion that it was not possible to obtain all the financial information required from sources such as McGregor BFA, Datastream and Bloomberg. Therefore a consistent approach to Dillion (2014) was used in this study whereby all the necessary financial information was obtained from the audited financial statements. As only audited financial statements were used in this study and the audited financial statements were obtained from reputable sources, this ensured that the information going into the model was as accurate as possible.

Step 2: Determine if the company has operating leases

Once the financial statements for each company had been obtained, a check was performed to assess if the company uses operating leases. If it was evident that the company does not have any operating leases, then that company was excluded from the remaining steps in the model (Dillion, 2014). If there was evidence that the

company has operating leases from the disclosure in the financial statements, then the next step was performed.

Step 3: Assess if the operating lease disclosure breaks down leases into property vs non-property

Step 3.1

Inspect the disclosures in the financial statements for the breakdown of the minimum lease payments that have been committed to in the following periods, into those amounts that relate to leases of land and buildings (i.e. property) and those items other than land and buildings (i.e. non-property) (Dillion, 2014). If it was clear that this had not been disclosed then Step 3.2 needed to be undertaken.

Step 3.2

The financial statements were inspected for the breakdown of the lease expense paid under contracts classified as operating leases into those that relate to leases for property and those that relate to leases for non-property. This was used to break down the minimum lease payments into lease payments that relate to property leases and those minimum lease payments that relate to non-property leases.

Step 3.2 was only performed if the disclosure under Step 3.1 had not been made in the financial statements. Dillion (2014) stated in his study undertaken in 2014 that the break down into the minimum lease payments that relate to property leases and those that relate to non-property leases is necessary as it will produce more accurate results. So although IFRS 16 does not make compulsory disclosure of leases into those that are property and those that are non-property, it was still performed in this study in the consistent manner that Dillion used. The model was set up by Dillion (2014) in a manner which requires this breakdown of lease information into property and non-property leases; therefore, if neither of the disclosures above had been made for a particular company, that company was excluded from the remaining steps below. For those companies in the population that included the disclosure under Step 3.1 or 3.2, the next step below was followed.

Step 4: Determining the unrecorded lease liability

Step 4.1 Determine the incremental borrowing rate for each company

The operating lease liability was calculated by discounting the future minimum lease payments by the entity's applicable incremental borrowing rate that is before tax. This rate was determined by using the approach outlined by Imhoff *et al*. (1997) and also applied by Dillion (2014). The interest rate that was used was the greater of:

- The interest rate implicit in the finance leases that the company has. This interest rate will sometimes be disclosed in the financial statements. If not disclosed, it can be calculated by taking the finance lease commitments due in one year and subtracting the current portion of the finance lease liability to obtain the interest portion. The interest rate can then be determined by dividing the interest by the total amount of the finance lease liability. Imhoff *et al*. noted in their paper in 1997 that a larger amount of ownership risk exists for lessors under operating leases than under finance leases. This would result in an expectation of the interest rate being higher for operating leases than the interest rate that was calculated for finance leases. Dillion (2014) noted that this risk would be diminished by the protection of the ownership right that the lessor has under the lease agreement.
- The implicit interest rate that may be disclosed from an entity's documented debt in the financial statements or the interest rate calculated by dividing the total finance expense into the book value of the total debt that yields interest (Imhoff *et al*., 1997).

If the entity did not have any recognised debt or leases that are classified as finance leases, then the South African prime lending rate of 10% was used, which was consistent with the approach followed by De Villiers and Middleberg in their study conducted in 2013 and Dillion in 2014. The prime lending rate was also used in situations where the interest rate calculated using the approach above was either abnormally high or abnormally low. Dillion (2014) assessed interest rates calculated below 3% as abnormally low and interest rates above 25% as abnormally high. If this situation arises where the interest rates calculated are abnormally low or abnormally high, the prime lending rate is considered appropriate as private banks use this rate when they lend money to the public (South African Reserve Bank (SARB), 2018). Despite the challenges that could arise in determining a discount rate that is entity specific, it was still believed to be better than using the same

blanket rate for all companies in the sample. Dillion (2014) and other researchers such as Durocher (2008) as well as Fulbier *et al*. (2008) applied an entity-specific discount rate for each company in their study.

Step 4.2: Split the operating lease asset and liability based on the minimum lease payments for property leases and non-property leases

In Dillion's study conducted in 2014, the model distinguished between leases for items such as land and buildings (Property) and those for other items (Non-property). This then resulted in a separate lease asset and corresponding operating lease liability being determined for each type. At the time of Dillion's (2014) study the proposed accounting treatment was to distinguish between leases that were property leases (Type B) and those that were non-property leases (Type A). However, the new lease standard, IFRS 16, makes no such distinction and treats both property leases and non-property leases the same (Stainbank *et al*., 2016). Despite both property and non-property leases being treated the same in the new accounting standard, the distinction between these two types of leases in the lease capitalisation model used is still considered relevant. This is due to the lease term of property leases usually being longer than the lease term of non-property leases, which in turn affect the amount determined for the leased asset and corresponding liability. In order to promote the accuracy of the lease capitalisation model used, the distinction made between property and non-property leases was retained in the model for this study.

The financial statements that were obtained for this study used financial disclosures based on IAS 17, as the new lease standard is only effective for financial periods beginning on or after 1 January 2019. IAS 17 does not force entities to disclose the MLPs for property leases separately from the MLPs for non-property leases. Despite not being compulsory, most entities disclose this split as it results in the information provided to users being more useful (Dillion, 2014).

If this non-voluntary disclosure was not made, the break down for property and non-property minimum lease payments could be made by using the disclosure relating to the rental expenses for property and non-property operating leases using the formula below:

$$\text{MLPs (property)} = \text{Total MLP x } \frac{Operating\ lease\ expense\ (property)}{Total\ operating\ lease\ expense}$$

$$\text{MLPs (non-property)} = \text{Total MLP x } \frac{Operating\ lease\ expense\ (non-property)}{Total\ operating\ lease\ expense}$$

Where, MLP = Minimum Lease Payments

Total Operating Lease Expense = Operating lease expense (property) + operating lease expense (non-property)

(Dillion, 2014, p. 42).

Step 4.3

Step 4.3 involved using the Goal Seek function available in Microsoft Excel to calculate a degression factor, which was used to ensure the minimum lease payments relating to the following period equated to the prior period's minimum lease payments multiplied by the digression factor (Fulbier, 2008).

Due to the accuracy that the degression factor method provides as proved by Dillion in his study (2014), the same method was followed in this study. The degression factor was calculated by using the Goal Seek function in Microsoft Excel and applied to the disclosure of the future minimum lease commitments under IAS17. The degression factor would then allow the minimum lease payments for the period that shows the minimum lease payments from year two up to and including year five as separate minimum lease payments for each period. To ensure the degression factor calculated and applied was accurate, a check was performed to ensure there was no material difference between the total of the minimum lease payments calculated using the degression factor model for each period from year two up to and including year five and the total disclosed in the financial statements for that same period under IAS 17 (Dillion, 2014).

Step 4.4: Calculate an estimate of the average remaining life after five years for both the property and non-property leases

According to the model used by Dillion in 2014 " the average remaining lease life after five years from reporting date is estimated by the model as the aggregate MLPs

due after five years divided by the MLP disclosed in respect of the fifth year with the result rounded up and another year added" (p. 42).

This step assumes that the amount of the minimum lease payment usually decreases as the lease period comes to a close. Imhoff *et al*. (1997) performed sensitivity testing on this assumption and found that deviations in this assumption did not have a material impact on the calculated lease liability. Furthermore, Dillion also used this assumption in his model developed in 2014.

Based on Steps 4.1 to 4.4 the operating lease liability could be determined.

Step 4.5: Adjust the operating lease liability calculated above using Steps 4.1 to 4.4 by any onerous contract provisions and lease straight-lining accruals

In 2014, Dillion advocated for an adjustment to be made to the operating lease liability for the situation where any provisions are present as a result of onerous contracts and operating lease straight-lining accruals. The deduction of the onerous contract provisions and straight-lining accruals from the unrecognised operating lease liability would be necessary to avoid overstating the operating lease liability (Dillion, 2014).

Onerous contracts

An onerous contract is defined by IAS 37 as a contract where the sum of the costs to satisfy the contract are greater than the benefit to be received under the contract (IASB, 2016b). When applying this definition to the context of leases, it is possible for an onerous contract to arise due to economic benefits anticipated in the future from the lease being less than the associated lease costs. As Dillion demonstrated in 2014, this situation could indicate that the asset under lease is impaired; however, as disclosure on information relating to onerous contracts is not mandatory the impairment cannot be calculated with accuracy. Consequently, for this study, adjustments were performed on the lease liability to take into account the onerous contract provision if the disclosure of this provision was made in the financial statements. It was also assumed that the effect on the Imhoff, Lipe and Wright method and Type B leases is immaterial and therefore the impact of onerous contracts on the leased asset could be ignored. These assumptions were considered reasonable and hence adopted in this study (Dillion, 2014).

Straight-lining provision

The adjustments made to the unrecorded lease asset due to capitalising operating leases were performed according to Step 5.3.

Step 4.6: The unrecorded operating lease liability must be split into the current and non-current portions

Certain financial statement ratios that had to be used in the model required liabilities to be split into their current and non-current portions. The current portion was determined by taking "the present value of the MLP due within one year after the reporting date adjusted by any current portion of the straight lining and onerous contract provisions, if applicable. The non-current portion is the difference between the unrecorded operating lease liability and the calculated current portion." (Dillion, 2014, p. 43).

Step 5: Calculate the unrecorded lease asset

Step 5.1: Determine the different contract baskets

The method used by Dillion in 2014 and used here in this study is to calculate the unrecognised lease asset by using the asset ratio formula under the Imhoff, Lipe and Wright method outlined in Section 2.4.1 of the literature review but adapting it to include the contract baskets method used by Fulbier *et al*. (2008). The contract basket method implement by Fulbier *et al*. (2008) used five baskets and calculated each basket by calculating the difference between the minimum lease payments for two successive periods. Dillion (2014) adapted this method by adding an extra basket to result in a more accurate calculated value of the unrecognised lease asset.

The model used by Fulbier *et al*. (2008) using five baskets calculated the fifth basket as MLP_5 and a remaining life of five plus (MLP_{5+}/MLP_5) years was assumed. As Dillion's (2014) study incorporated six contract baskets instead of five, the fifth basket consisted of MLP_5 minus MLP_{5+ILW} with a residual lease life equal to five years, whilst basket six consisted of MLP_{5+ILW} and had a residual lease life being the total average residual lease life determined when the lease liability was calculated in Step 4.4 above (Fulbier *et al*., 2008).

Step 5.2: Use the asset ratio to calculate the unrecorded lease asset

The lease liability for each basket was calculated by applying the Imhoff, Lipe and Wright method to the separate baskets. Once this had been done, the leased asset was calculated by applying the asset ratio formula to the lease liability determined for each basket. In the study conducted by Imhoff *et al*. (1991), it was assumed when determining the asset ratio that half (i.e. 50%) of the useful life of the asset leased had expired. This assumption was considered realistic by Dillion (2014) due to most entities that enter into leases doing so annually and considering it to be in the normal course of business. The percentage was originally recommended by Imhoff *et al*. (1991), but has since been applied by other researchers such as Dillion (2014), Tai (2013), Branswijck and Longueville (2011), Fulbier et al. (2008), Duke and Hsieh (2006), and Bennet and Bradbury (2003). Once the lease assets had been determined for all six baskets they were then added together to determine the total operating lease asset (Dillion, 2014).

Dillion (2014) then adjusted the outcome of the asset ratio formula where appropriate, to take into account any provisions relating to the operating lease that had arisen due to straight-lining provisions.

Step 5.3: Provisions relating to the straight lining of operating leases

When Imhoff *et al*. (1991) used the asset ratio formula, one of the assumptions made was that the payments relating to the lease liability were equal (i.e. a constant annuity). However, if the lease payments were increasing, the asset value calculated by means of the asset ratio formula in the Imhoff, Lipe and Wright method would be greater than the real asset value. In a situation where the lease payments are increasing, a more accurate lease asset balance can be determined by subtracting the straight-lining provision from the outcome of the asset ratio. Dillion noted in his study in 2014 that disclosure is not always made concerning the detailed information for each lease contract and the details relating to the straight-lining provision. Therefore it is not possible to improve the formula. However, in adapting the model by subtracting the straight-lining provision from the value of the leased asset it was agreed that it would result in a more accurate approximation of the leased asset. Due to the improved accuracy, the same approach was adopted in this study. For type A leases, the Imhoff, Lipe and Wright method of capitalising operating leases was used. However, type B leases were treated by taking the lease

liability determined in Step 4 less the straight-lining provisions that had already been recognised previously (Dillion, 2014).

Step 6: Calculate the effect of capitalising the operating leases on equity and deferred tax as well as the impact on profit relating to the current year

An adjustment had to be made to retained earnings which would in effect have an impact on equity and deferred tax, to take into account the difference in the unrecorded lease liability and lease asset that results from capitalising the minimum lease payments. This is as a result of the historic differences between the expense recognised for operating leases and the amortisation and interest that would have resulted if the operating leases had been capitalised and treated as a finance lease. South Africa has a current corporate tax rate of 28% which was utilised in the model to determine the deferred tax adjustments and all other tax amounts (Stiglingh, Koekemoer, van Zyl, Wilcocks & de Swardt, 2016). Dillion (2014) noted that as the companies included in the sample are JSE listed they are likely to pay tax on majority of their profits in South Africa making a rate of 28% appropriate. The difference between the equity adjustment for the prior year and the most recent financial year is the total after tax effect on profit as a result of capitalising operating leases in the most recent year. The amount is then determined on a gross basis before tax in order to calculate the amortisation expense relating to the operating lease asset (Dillion, 2014).

Step 7: Adjusting the relevant financial statement figures

The figures in the financial statements for the current year and relating to the previous year were adjusted once the changes had been made to the items from the statement of financial position and the statement of comprehensive income from Step 1 – Step 6 (Dillion, 2014).

Step 8: Detect the key financial ratios that will be computed and evaluated

The financial ratios that were included in the model are shown in Table 3B. These financial ratios were detected from the literature review in Chapter 2 as the main ratios that would reflect the effect of IFRS 16 when using a constructive capitalisation model. The ratios used in this study were consistent with ratios incorporated in prior studies performed on assessing the impact of capitalising

operating leases for JSE listed companies and allowed an appropriate comparison of the results among the varying industries to be made. These ratios were grouped together in a manner that corresponds with the research objectives. Therefore, the three categories that the ratios were grouped into were those that relate to profitability, those that show performance and those that relate to market ratios. The ratios have been defined carefully based on prior studies such as Fulbier *et al*. in 2008 and Dillion in 2014. Various academic sources were also consulted.

In Dillion's study in 2014, he included the debt equity ratio that used the market value for equity whereas other studies before his, calculated the debt equity ratio using the book value of equity. The key reasons for doing this were based on the fact that most well-known companies have a market value of equity that is higher than the book value and the effect of capitalising operating leases in terms of market value is more beneficial to participants in the market.

Table 3.3 Financial ratios

Ratio Category	Financial Ratios	Numerator	Denominator
Financial position ratios	Debt ratio	Total debt	Total assets
	Debt/equity (book value)	Total debt	Equity book value (including NCI)
	Debt/equity (market value)	Total debt	Market capitalisation + NCI
	Current ratio	Current assets	Current liabilities
Financial performance ratios	EBITDA margin	EBITDA	Revenue
	EBIT margin	EBIT	Revenue
	NPAT	Net profit after tax	Revenue
	Return on assets	NOPAT	Average total assets
	Return on capital employed	NOPAT	Average capital employed
	Return on equity	NPAT (excluding NCI)	Average equity book value (excluding NCI)
	Asset turnover	Revenue	Average total assets
	Times interest earned	EBIT	Interest expense
Market value ratios	Earnings yield	NPAT (excluding NCI)	Average market capitalisation
	Price earnings	Market capitalisation	NPAT (excluding NCI)
	Market to book	Market capitalisation	Equity book value (excluding NCI)

(Adapted table from Dillion, 2014, p. 56)

Step 9: Testing the constructive capitalisation model

When Dillion conducted his study in 2014, the constructive capitalisation model developed was tested by performing a pilot sample to gain comfort over the accuracy of the model. Due to the model for this study being recreated in line with the model used by Dillion (2014), certain steps were followed to ensure the accuracy of the model. Dillion included an example of the constructive capitalisation model

applied to Mr Price financial statements in 2014. In order to ensure that the model set up was consistent with the model used by Dillion, the audited Mr Price financial statements as at 31 March 2013 were obtained from a reputable source, being the company website, and the model set up in Excel following the steps in the research methodology detailed in Dillion's study in 2014. The Mr Price example that was recreated in Excel was compared to the Mr Price example included in Dillion's study in 2014 to ensure the numbers and results were the same. Once comfort had been gained over the accuracy of the model in Excel, a further test was performed to further refine the model by way of performing a pilot sample. The pilot sample was made up of the five largest JSE listed companies according to market capitalisation taken from the Sharenet website on the 15th September 2018 (Sharenet, 2018). The companies included in the pilot sample are detailed below.

Table 3.4: Companies included in the pilot sample

Name of company	**Sector of company**
Anheuser-Busch InBev SA NV	Brewers
British American Tobacco plc	Tobacco
Naspers Limited	Broadcasting and Entertainment
Glencore Xstrata plc	General Mining
Bhp Billiton Plc	General Mining

3.4. Data analysis

Once the model had been applied to each company included in the population, the data was evaluated to ensure the objectives of this study were met. The changes in the financial ratios that relate to the performance, position and market perception when the constructive capitalisation model was applied were analysed for each company. A two sample (paired) t-test was used to test the magnitude of the change that occurred in the financial statement ratios after applying the constructive capitalisation model. The two samples consisting of the financial ratios before operating leases were capitalised as compared to the financial ratios post-capitalisation. Dillion (2014) mentioned that a t-test is appropriate to use in examining the data as there is no normal distribution present. Therefore, a t-test

was applied in this study to assess the impact when the constructive capitalisation model is used.

3.5. Conclusion

The steps making up the constructive capitalisation model that was used in this study have been described in this chapter. The population that the constructive capitalisation model was applied to was detailed in Section 3.2 and comprised JSE listed companies in the technology and telecommunications industry. Once the data had been collected for each company in the population and the model applied, the data was analysed to address the research objectives. The succeeding chapter presents the data analysis and results when operating leases are constructively capitalised.

CHAPTER 4
RESULTS

4.1. Introduction

Chapter 4 details all the companies included in the population, being those listed in the technology and telecommunication industry on the JSE. The chapter then discusses how the constructive capitalisation model was applied to the companies in the population and the data examined. The data was examined and evaluated to ensure that the objectives outlined in Chapter 1 were fully addressed. Following that, the data examined allowed conclusions to be drawn for each objective.

4.2. Companies included in the population

As mentioned previously in Section 3.2 in the research methodology chapter, the population of this study comprised all JSE listed companies in the technology and telecommunications industry. At 29th September 2018 there were 21 companies forming part of the population, consisting of 15 JSE listed companies from the technology industry and six companies from the telecommunications industry. All the company names from the technology and telecommunications industry that made up the population are presented in Table 4.1 and Table 4.2 below.

Table 4.1: JSE listed companies in the population from the technology industry

Adapt IT Holdings Limited
Alaris Limited
Alviva Holding Limited
Allied Electronics Corp Limited
Ayo Technology solutions Limited
Capital Appreciation Limited
Datatec Limited
EOH Holdings Limited
Jasco Electronics Holdings Limited
Macrmega Holdings Limited
Mustek Limited
PBT Group Limited
ISA Limited
Cognition Limited
Total Client Services Limited

Table 4.2: JSE listed companies in the population from the telecommunications industry

Blue Label Telecoms Limited
Huge Group Limited
MTN Group Limited
Telemasters Holding Limited
Telkom SA SOC Limited
Vodacom Group Limited

When the operating leases were constructively capitalised for all of the JSE listed companies in the technology and telecommunication industry, it was found that not all the companies in the population had the necessary disclosure or conditions available to apply the full model. Detailed below are the companies in the population that the full constructive capitalisation model could not be applied to and the reason thereof.

Technology companies

Cognition Limited

Upon inspection of the audited financial statements for 2017, it was found that there was not sufficient disclosure made for the operating leases used by the company. Therefore it was impossible to use the constructive capitalisation model from Step 3 onwards as outlined in the research methodology in Section 3.3.

ISA Limited

The audited financial statements were obtained for the 2018 period and per inspection thereof it was noted that ISA Limited did not have operating leases. Therefore it was impossible to employ the constructive capitalisation model after Step 2.

Jasco Electronics Holdings Limited

When the annual report was obtained for 2017, it was found per Step 2 that no operating leases were present and therefore the remaining steps of the constructive capitalisation model could not be applied.

Mustek Limited

When the audited financial statements were obtained for Mustek Limited for the 2017 year and Step 2 was applied in the constructive capitalisation model, it was noted that the disclosure as required in Step 2 was not available.

PBT Group Limited

PBT Group Limited did not have the necessary operating lease disclosures in the audited financial statements and therefore it was impossible to employ Step 4 onwards in the constructive capitalisation model.

Total Client Services Limited

No audited financial statements were available for the 2017 and 2018 year on the company website or any other public domain at the time that the data collection was done for this study. Upon contacting Total Client Services Limited they confirmed that the audit for the last two years was still in the process of being wrapped up. Thereafter the years prior to the 2017 year were considered in applying the constructive capitalisation model. The reviewed condensed financial statements were obtained for the 2013 to the 2016 years. However, due to these financial statements being condensed, there was not sufficient disclosure of operating leases in the condensed financial statements to apply the constructive capitalisation model. Therefore, it was impossible to employ the constructive capitalisation model for this company in the population.

Telecommunication companies

Blue Label Telecoms Limited

The audited financial statements obtained for Blue Label Telecoms Limited did not have the necessary disclosure available for the operating leases used by the company. Therefore, it was not possible to apply Step 4 onwards of the constructive capitalisation model for this company.

Vodacom Group Limited

Once the audited financial statements for Vodacom Group Limited had been obtained for the year ended 31 March 2018, it was found that there was not

adequate disclosure made for operating leases to apply all the steps in the constructive capitalisation model. Therefore, only the first three steps were applied and thereafter it was not possible to apply the remaining steps in the constructive capitalisation model.

4.3. Analysis of data

The study was conducted with the intention of answering the research objectives as outlined in Section 1.4 in Chapter 1. The data from analysing the impact on the financial position ratios of the technology and telecommunication entities when a constructive capitalisation model is used was first summarised. Then the information relating to the change in the financial performance ratios when operating leases was constructively capitalised was outlined for the population. Lastly the effect on the market ratios was analysed for the companies in the population.

Research objective 1: To determine what proposed impact IFRS 16 will have on the financial position ratios of technology and telecommunication JSE listed companies.

Technology companies

When the constructive capitalisation model was applied to the population of technology companies listed on the JSE, all the financial position ratios changed. Once the paired, two tailed t-test was applied to the population of JSE listed technology companies it was possible to determine the statistical significance of each change.

The debt ratio experienced a mean absolute increase of 1.43% and a mean relative increase of 4.16% after operating leases were constructively capitalised. These changes were found to be significant at the 5% level when the p-value was calculated under the t-test.

When the debt/equity ratio was calculated using book values, the ratio increased from 128.12% pre-capitalisation to 135.39% post-capitalisation. The increase in the debt/equity ratio determined using book values caused a mean absolute increase of 7.27% which translated to a 7.94% relative increase. The absolute and relative changes that resulted from capitalising operating leases were discovered to be

significant at the 1% significance level for the debt/equity ratio. Additionally, the change in the debt/equity ratio was then calculated using market values instead of book values. The mean relative change that resulted post-capitalisation of operating leases was 7.07% which was slightly lower than the mean relative change of 7.27% which resulted when book values were used. The mean absolute change in the debt/equity ratio determined using market values was calculated to be 2.5% and under the t-test these changes were discovered to be significant at the 1% level. The current ratio deteriorated marginally from 83.07 to 82.53 for the technology companies in the population. This mean absolute decrease of 0.55 translated into a 4% mean relative decrease when the constructive capitalisation model was applied. This change was not found to be significant at the three different significance levels used in this study.

Table 4.3: The impact on the financial position of JSE listed technology companies when operating leases are constructively capitalised

Financial position ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-Value (T-Test)	Spearman's Rank correlation coefficient
Debt ratio	45.50%	46.94%	1.43% [b]	4.16% [b]	0.015	1
Debt/Equity (Book value)	128.12%	135.39%	7.27% [a]	7.94% [a]	0.007	1
Debt/Equity (Market value)	45.71%	48.56%	2.5% [a]	7.07% [a]	0.007	0.983
Current ratio	83.07	82.53	-0.55	-4%	0.284	0.998

The statistical significance of the paired, two tailed t-test is shown by using the following symbols:

(a) Significant at the 1% level, (b) significant at the 5% level, (c) significant at the 10% level.

If no symbol appears, then the figure is not statistically significant at any of the three significance levels used.

The Spearman's rank correlation coefficient shows that the ranking of companies did not change materially when the constructive capitalisation model was applied.

The ranking for the debt ratio and the debt/equity ratio calculated using book values have a ranking of 1 which shows there is strong positive correlation in the ratios pre-capitalisation and post-capitalisation. Furthermore, the debt/equity ratio determined using market values and the current ratio show a similar relationship despite being slightly below 1.

Telecommunication companies

When the constructive capitalisation model was employed to capitalise operating leases for the population of JSE listed telecommunication entities, it also resulted in increases in the three debt ratios as demonstrated in Table 4.4. However, these increases were slightly higher than the increases experienced for the same ratios for the JSE listed technology companies.

Post-capitalisation, the debt ratio shows a mean absolute increase of 4.51% and a mean relative increase 18.78%. The debt/equity ratio that was calculated using book values went from 57.38% to 76.57% due to the operating leases being capitalised. The mean absolute increase experienced by the population of telecommunication companies was 19.19% and the mean relative increase was 30.67% for the book value debt/equity ratio. Similarly, an increase in the debt/equity ratio computed using market values shows an increase of 22.98% and 5.91% relating to the mean absolute change and mean relative change respectively. The current ratio experienced a mean deterioration from 1.76 to 1.61 after operating leases were capitalised. This represents a slight mean absolute decrease of -0.15 and a mean relative decline of 9.45%.

Despite these changes in the financial position ratios experienced for the telecommunication companies under study, not one of these changes was statistically significant when comparing the p-values calculated to each significance level.

The Spearman's rank correlation coefficient was 1 for all of the ratios calculated which again shows there is an extremely strong positive correlation between the ranking in the pre-capitalisation ratios and those that were calculated post-capitalisation.

Table 4.4: The impact on the financial position of JSE listed telecommunication companies when operating leases are constructively capitalised

Financial position ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-value (T-Test)	Spearman's rank correlation coefficient
Debt ratio	29.60%	34.11%	4.51%	18.78%	0.134	1
Debt/Equity (Book value)	57.38%	76.57%	19.19%	30.67%	0.255	1
Debt/Equity (Market value)	22.98%	28.90%	5.91%	26.03%	0.155	1
Current ratio	1.76	1.61	-0.15	-9.45%	0.319	1

The statistical significance of the paired, two tailed t-test is shown by using the following symbols:

(a) Significant at the 1% level, (b) significant at the 5% level, (c) significant at the 10% level.

If no symbol appears, then the figure is not statistically significant at any of the three significance levels used.

The results derived to assess the impact in the financial position of the population of technology and telecommunication companies when operating leases are constructively capitalised are consistent with previous studies done. The results obtained by De Villiers and Middleberg (2013) demonstrated that when operating leases were capitalised the debt ratio and debt/equity ratio both increased by 9% and 8% respectively, making the companies in the sample appear to be more risky once operating leases were capitalised on the statement of financial position. When Dillion (2014) capitalised operating leases in a sample of 48 JSE listed companies, all of the three debt ratios calculated increased which is consistent with the results from De Villiers (2013) and this study. An increase in the debt ratios and debt/equity ratios are expected due to the increase in liabilities that occurs as a result of the capitalisation of operating leases onto the statement of financial position. Dillion

(2014) experienced the greatest increase when the debt/equity ratio was determined using book values as this ratio increased by a mean absolute 74.7% and a mean relative increase of 47.1% which was significant at the 5% level. The changes in the debt ratio and debt/equity ratio based on market values calculated by Dillion (2014) were significant at the 1% level whilst the mean change in the debt ratios for the telecommunication companies in this study were not considered significant at any of the significance levels. It is speculated that the changes in the debt ratios are not significant due to telecommunication companies being warned far in advance of IFRS 16 being effective for financial periods beginning on or after 1 January 2019 and having arranged their leases to avoid huge increases in their debt once IFRS 16 is applied. Dillion (2014) experienced a change in the current ratio calculated pre-capitalisation and post-capitalisation which revealed a mean absolute deterioration of 0.25 which resulted in a mean relative decline of 10.6% which was significant at 1%. A similar decrease was experienced in the current ratio by the technology and telecommunication companies which can be attributed to the current portion of the lease liability being capitalised under the constructive capitalisation model.

Research objective 2: To determine what proposed impact IFRS 16 will have on the financial performance ratios of technology and telecommunication JSE listed companies

The profitability ratios as shown in Table 4.5 and Table 4.6 all changed post-capitalisation for each technology and telecommunication company in the population.

Technology companies

From the EBITDA margin and EBIT margin both of these ratios improved marginally as can be seen by the mean absolute increase of 0.84% and 0.18% respectively. This mean absolute increase was accompanied by an increase in the mean relative change in the EBITDA margin of 3.43% and EBIT margin of 6.27%.

Once the constructive capitalisation model had been applied, the net profit margin after tax revealed a slight mean absolute decrease of -0.04% and a mean relative deterioration of -0.91%. The reason for the decrease in the net profit margin is due

to the additional interest expense on the finance lease liability that was recognised after treating the operating leases as finance leases. The return on assets ratio in addition to the return on capital employed ratio showed an improvement after the operating leases had been capitalised as can be seen by the mean absolute change of 0.99% and 2.48% respectively. The mean relative deterioration in the return on assets ratio as well as the deterioration in the return on capital employed ratios for the technology companies was 17.18% and 17.33% respectively after the constructive capitalisation model had been applied. Furthermore, the return on equity ratio showed a mean absolute and mean relative increase of 0.03% and 0.14% respectively. Conversely, the asset turnover ratio showed a mean relative decrease post-capitalisation for the asset turnover ratio of 2.34% and a mean absolute decrease of 0.03%. The times interest earned ratio deteriorated by a mean absolute decrease of 24.15 following the application of the constructive capitalisation model to the JSE listed technology companies. Additionally, the mean relative decrease experienced was a marginal 0.01%. The change in the EBITDA margin, return on assets and asset turnover ratio were found to be significant at the 5% level whilst the return on capital employed ratio was considered to be significant at the 10% level. The remaining ratios were not found to be significant at any of the significance levels used in this study. There is a strong relationship between the rankings in the ratios before applying the constructive capitalisation model compared to the ranking after applying the constructive capitalisation model as shown by the Spearman's rank.

Table 4.5: The impact on the financial performance of JSE listed technology companies when operating leases are constructively capitalised

Financial performance ratios	Pre-capitali-sation mean	Post-capitali-sation mean	Mean absolute change	Mean relative change	P-Value (T-Test)	Spearman's rank correlation coefficient
EBITDA margin	21.95%	22.79%	0.84%[(b)]	3.43%[(b)]	0.024	1
EBIT margin	17.08%	17.26%	0.18%	6.27%	0.302	0.983
NPAT	14.45%	14.41%	-0.04%	-0.91%	0.655	1
Return on assets	8.34%	9.32%	0.99%[(b)]	17.18%[(b)]	0.019	0.967

Financial performance ratios	Pre-capitali-sation mean	Post-capitali-sation mean	Mean absolute change	Mean relative change	P-Value (T-Test)	Spearman's rank correlation coefficient
Return on capital employed	14.05%	16.52%	2.48%(c)	17.33%(c)	0.050	1
Return on equity	15.53%	15.56%	0.03%	0.14%	0.842	1
Asset turnover	1.17	1.14	-0.03(b)	-2.34%(b)	0.003	1
Times interest earned	52.39	16.53	-24.15	-0.01%	0.240	0.950
The statistical significance of the paired, two tailed t-test is shown by using the following symbols: (a) Significant at the 1% level, (b) significant at the 5% level, (c) significant at the 10% level. If no symbol appears, then the figure is not statistically significant at any of the three significance levels used.						

Telecommunication companies

The EBITDA margin in Table 4.6 showed a drastic mean absolute increase of 28.63% subsequent to applying the constructive capitalisation model and a mean relative improvement of 79.23%. In contrast, the mean increase in the EBIT margin following the constructive capitalisation of operating leases was much lower at 0.99% in absolute terms and 1.67% in relative terms. The increase in these two ratios is due to the amortisation on the recognised lease asset being lower than the previously expensed operating lease rental. The net profit margin after tax was 27.74% pre-capitalisation and 28.07% post-capitalisation. The marginal mean absolute increase in this ratio was 0.33%, whilst the mean relative change was calculated to be 20.42%. The next three ratios presented in Table 4.6, being the return on assets, return on capital employed and return on equity all improved once the operating leases had been capitalised. The return on capital employed ratio showed the largest improvement of the three return ratios as can be seen by the mean absolute increase of 3.05% and mean relative increase of 111.75%. This can be attributed to the sum of amortisation and interest, which could be less than the operating lease rental previously expensed, which indicates that most of the leases

used by the JSE listed telecommunication companies are in their later years (Dillion, 2014). On the contrary, the asset turnover ratio marginally declined post-capitalisation by a mean absolute decrease of 0.08 and a mean relative decrease of 11%. The final ratio that was calculated to assess the change in financial performance post-capitalisation was the times interest earned ratio. This ratio declined from 12.27 times to 8.56 times. This is due to the increase in interest expense that resulted from the lease liability that was brought on the statement of financial position since the constructive capitalisation model was applied and is expressed as a mean absolute decrease of 3.71 times and a mean relative decrease 22.92%. It is clear that the telecommunication companies in the population have an increased financial risk due to the increase in debt that resulted from the operating leases being capitalised and treated as if they were finance leases. None of the ratios in Table 4.6 were considered to be statistically significant when compared to the three different significance levels. All of the financial performance ratios displayed a strong correlation in the ranking of the ratios pre-capitalisation and post-capitalisation, except the ratios relating to the return on capital and return on assets.

Table 4.6: The impact on the financial performance of JSE listed telecommunication companies when operating leases are constructively capitalised

Financial performance ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-value (T-test)	Spearman's rank correlation coefficient
EBITDA margin	69.87%	98.50%	28.63%	79.23%	0.332	1
EBIT margin	44.45%	45.43%	0.99%	1.67%	0.182	1
NPAT	27.74%	28.07%	0.33%	20.42%	0.736	1
Return on assets	8.82%	11.85%	3.04%	104.76%	0.354	0.4
Return on capital employed	11.08%	14.13%	3.05%	111.75%	0.318	0.2
Return on equity	14.44%	15.82%	1.38%	27.61%	0.326	1

Financial performance ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-value (T-test)	Spearman's rank correlation coefficient
Asset turnover	0.96	0.88	-0.08	-11.00%	0.276	0.8
Times interest earned	12.27	8.56	-3.71	-22.92%	0.205	1

De Villiers and Middleberg (2013) experienced a deterioration in all of the profitability ratios calculated once the operating leases had been capitalised for the sample of companies. One of the profitability ratios assessed was the net profit margin ratio which showed an average decrease of 32%, whilst the return on equity and return on assets ratio reflected a deterioration of 21% and 20% on average in that order. These differences in the movements in the profitability ratios between the study carried out by De Villiers and Middleberg (2013) and the results in Table 4.5 and Table 4.6 are reasonable, bearing in mind that the direction of the change in profit can be different depending on the stage that the lease is in. For example, if a lease is in its early stages the sum of amortisation and interest would be higher when compared to the operating lease rental which would result in profit decreasing when operating leases are capitalised. In contrast, profit will increase when operating leases are capitalised if the lease is in a later stage due to the sum of the interest and amortisation being less than the operating lease rental. Dillion (2014) experienced similar movements in the profitability ratios for the sample of 48 JSE listed companies and noted that the changes in the profitability ratios were smaller than the changes that impacted the statement of financial position ratios. Furthermore, the profitability ratio that showed the greatest impact was the EBITDA margin which increased by a mean relative 58.7%. Whilst most of the changes in the profitability ratios calculated by Dillion (2014) were assessed as being significant, only the return on assets, return on capital employed, asset turnover and EBITDA margin for technology companies were found to be significant in this study. This could be due to companies being informed long in advance of the implementation of IFRS 16 which would result in companies arranging their leases to avoid huge changes in the profitability ratios once IFRS 16 is implemented. This

is reasonable given that IFRS 16 is effective for periods beginning on or after 1 January 2019.

Research objective 3: To determine what proposed impact IFRS 16 will have on the market ratios of technology and telecommunication companies listed on the JSE.

When market ratios were calculated and compared both before and after applying the constructive capitalisation model, certain changes were noticed. These changes can be broken down into those that apply for the population of JSE listed technology companies as shown in Table 4.7 and those relating to the JSE listed telecommunication companies which are shown in Table 4.8.

Table 4.7: The impact on market ratios of JSE listed technology companies when operating leases are constructively capitalised

Financial performance ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-value (T-test)	Spearman's rank correlation coefficient
Earnings yield	9.11%	9.07%	-0.04%	-0.91%	0.549	1
Price earnings	43.65	44.04	0.39	0.99%	0.198	0.983
Market to book ratio	11.88[(c)]	11.91[(c)]	0.03	0.82%	0.063	1
The statistical significance of the paired, two tailed t-test is shown by using the following symbols: (a) Significant at the 1% level, (b) significant at the 5% level, (c) significant at the 10% level. If no symbol appears, then the figure is not statistically significant at any of the three significance levels used.						

Technology companies

The earnings yield deteriorated slightly from 9.11% to 9.07%, since the operating leases were capitalised by applying the constructive capitalisation model. A mean absolute decrease of 0.04 was reported for the earnings yield ratio. In contrast, a mean absolute improvement was calculated for the price earnings (PE) ratio of 0.39

which equated to a mean relative change of 0.99%. Both of these changes in the earnings yield and PE ratio are due to the earnings per share decreasing post-capitalisation. The market to book ratio shows a slight increase of 0.03 and a marginal mean relative increase of 0.82% after applying the constructive capitalisation model. This increase is due to the book value of equity decreasing post-capitalisation which in turn resulted in an overall increase in the market to book ratio. Furthermore, the increase in the market to book ratio was significant at the 10% level whilst neither the earnings yield or the PE ratio were significant at any of the three significance levels used in this study. All three market ratios for the population of technology companies showed a strong correlation in their ranking both before and after applying the constructive capitalisation model. This can be demonstrated by the correlation coefficient of 1 for the earnings yield and the market to book ratio whilst the price earnings ratio had a correlation coefficient of 0.983.

Table 4.8: The impact on market ratios of JSE listed telecommunication companies when operating leases are constructively capitalised

Financial performance ratios	Pre-capitalisation mean	Post-capitalisation mean	Mean absolute change	Mean relative change	P-value (T-test)	Spearman's rank correlation coefficient
Earnings yield	5.55%	5.87%	0.32%	20.42%	0.481	1
Price earnings	150.81	144.07	-6.74	-11.00%	0.368	1
Market to book ratio	10.62	10.71	0.09	3.58%	0.333	1

The statistical significance of the paired, two tailed t-test is shown by using the following symbols:

(a) Significant at the 1% level, (b) significant at the 5% level, (c) significant at the 10% level.

If no symbol appears, then the figure is not statistically significant at any of the three significance levels used.

Telecommunication companies

Once the constructive capitalisation model had been applied to the telecommunication companies it was evident that the mean post-earnings yield ratio showed an absolute increase of 0.32% whereas the mean relative increase was 20.42%. However, the PE ratio experienced an opposite change which is demonstrated by the mean absolute decrease of 6.74 and mean relative decrease of 11% post-capitalisation. This is due to the mean earnings increasing after the operating leases had been capitalised which in turn resulted in a mean increase in the earnings yield and a mean decrease in the PE ratio. The mean market to book ratio for the telecommunication companies experienced a marginal increase in a similar way that the market to book ratio increased for the technology companies. The market to book ratio increased by a mean absolute 0.09 and a mean relative increase of 3.58% once the constructive capitalisation model had been applied. None of the changes mentioned previously were considered significant when compared to the three different significance levels. Although these changes in the market ratios were not considered significant there was a strong positive relationship in the ranking of the ratios before the constructive capitalisation model had been applied and afterwards as can be seen by the Spearman's ranking calculation of 1 for all three market ratios.

Despite the mean change in the earnings yield and PE ratio moving in opposite directions for the technology and telecommunications population, both of these movements are considered reasonable. The impact on profit is determined by the stage in the lease that the company finds itself. At the beginning stages of the lease the sum of the interest and amortisation is greater than the operating lease expense which will result in the profit decreasing when the constructive capitalisation model is applied while the opposite occurs in the later period of a lease. This explains the mean decrease in the earnings yield for the technology companies and the reason for the mean increase in the same ratio for the telecommunication companies. The changes in the market ratios from prior studies such as Fulbier, *et al*. (2008) were marginal which is consistent with the changes shown in Table 4.7 and Table 4.8. Further studies (Dillion, 2014) confirm that the impact experienced on market ratios is mostly insignificant when operating leases are capitalised. Out of the three market ratios in Dillion's study only the mean market to book ratio showed a change that was considered significant at the 5% level, whilst the earnings yield and price

earnings ratio reported a mean relative change of 2.4% and 4% respectively. In addition, all of the market ratios assessed by Dillion showed a strong positive correlation both pre-capitalisation and post-capitalisation (Dillion, 2014).

4.4. Conclusion

This chapter has presented the research results and analysis to assess what proposed impact IFRS 16 will have on the financial position, financial performance and market ratios of JSE listed technology and telecommunication companies when a constructive capitalisation model is used. The results and analysis show that when operating leases were capitalised, it resulted in significant changes in the financial position for the population of JSE technology companies. Although the financial position ratios experienced changes when operating leases were capitalised for the population of telecommunication companies, none of these changes was significant.

Evidence is also provided in this study that when operating leases are constructively capitalised for JSE listed technology companies it resulted in significant changes for the return on asset ratio, asset turnover ratio, EBITDA margin and return on capital employed ratio. The remaining financial performance ratios for the technology companies experienced changes when the constructive capitalisation model was applied; however, these changes were not significant. None of the changes that occurred for the financial performance ratios was found to be significant for the population of telecommunication companies when operating leases were constructively capitalised.

The market ratios experienced changes for the JSE listed companies in the population of technology and telecommunication companies when the constructive capitalisation model was applied. The only change that was considered significant out of the market ratios was the change in the market to book ratio for the technology companies.

Chapter 5 presents the final conclusion and research limitations of this study.

CHAPTER 5
CONCLUSION AND LIMITATIONS

5.1. Introduction

The new lease standard IFRS 16: *Leases* is effective for periods beginning on or after 1 January 2019. This will materially change the way that companies record leases which in turn is expected to impact their financial position, financial performance and market ratios. Stakeholders rely on these ratios when making decisions and therefore it is crucial that the likely impact on these ratios be determined before IFRS 16 comes into effect. This study examined the proposed impact that IFRS 16 is likely to have on JSE listed technology and telecommunication companies' financial position, financial performance and market ratios when a constructive capitalisation model is applied. The preceding chapter detailed the significant findings from the study. This chapter summarises the research methods made use of in this study, after which the results contained in Chapter 4 will be concluded.

5.2. Research objectives and methodology

The research objectives of the study were to assess the impact of IFRS 16 on the financial position, the financial performance and the market ratios using a constructive capitalisation model.

The constructive capitalisation model developed and used by Dillion (2014) was used in this study and applied to the audited annual financial statements of JSE listed technology and telecommunication companies to assess the changes in financial position, performance and market ratios. Dillion's model was recreated in the study and consisted of nine steps that were applied in order to achieve the capitalisation of operating leases. The study employed a paired, two-tailed t-test to compare the financial ratios pre-capitalisation and post-capitalisation and assessed whether the changes obtained were significant. Furthermore, Spearman's rank was applied to assess the relationship in the financial ratios pre-capitalisation and post-capitalisation.

5.3. Key findings

5.3.1. Financial position

When the constructive capitalisation model was applied to the technology and telecommunication companies in the population all of the debt ratios increased as expected. However, the mean relative increase in the debt ratios for the telecommunication companies was much greater than the increase in the debt ratios for the technology companies. This could be due to the JSE listed telecommunication companies making use of more material operating leases than the JSE listed technology companies. The changes that resulted in the debt ratios due to the capitalisation of operating leases resulted in changes that were considered significant when compared to the three significance levels used for the JSE listed technology companies. In contrast, the increases in the debt ratios were not shown to be significant for the JSE listed telecommunication companies when assessed against the various significance levels. The last financial performance ratio calculated was the current ratio, which reflected a mean decrease for both the population of the technology and the telecommunication companies. All of the financial position ratios for both the technology and telecommunication populations experienced a strong correlation both before and after the capitalisation of operating leases.

5.3.2. Financial performance

The EBIT and EBITDA ratios revealed a mean absolute and relative increase for both the population of the technology and the telecommunication companies. In contrast, the net profit after tax (NPAT) ratio reflected a mean slight decrease for the population of technology companies whilst the NPAT ratio for the sample of telecommunication ratios experienced a mean increase. This difference in direction of the mean change in the NPAT ratios for the technology and telecommunication populations can be attributed to the period that the leases fall in. The return on assets, capital employed and return on equity ratios all reflected a mean absolute and relative increase for the technology and telecommunication populations. Moreover, the asset turnover ratio and times interest earned ratio both decreased for the population of the technology and the telecommunication companies. The mean changes in the EBITDA, return on assets, return on capital employed and

asset turnover ratio for the population of technology companies were regarded as being significant when compared to the significance levels used in the study. None of the mean changes for the financial performance ratios were found to be significant for the JSE listed telecommunication companies once the constructive capitalisation model had been applied. All of the financial performance ratios, except the return on assets ratio, along with the return on capital employed ratio experienced a strong correlation between the ratios both before and after the capitalisation of operating leases.

5.3.3. Market ratios

The earnings yield for the technology companies showed a mean relative decrease post-capitalisation whilst the market to book ratio reflected a mean relative increase. In addition the mean post-capitalisation earnings yield and market to book ratio both increased for the population of telecommunication companies. In addition the PE ratio reflected a mean increase for the technology companies in the population however a mean decrease was observed in the PE ratio for the telecommunication companies post-capitalisation. The only market ratio that experienced a significant change was the market to book ratio for the technology companies. All the market ratios for both the technology and telecommunication populations experienced a strong correlation pre- and post-capitalisation.

5.4. Limitations

A number of limitations were identified from the study carried out, which are presented below.

Firstly, the study was only conducted on the technology and telecommunication industries of the JSE and as all industries contained within the JSE have unique attributes, it is not possible to extrapolate the results from the two industries studied to all industries.

Secondly, as noted by Dillion (2014) but still relevant to this study, it was not always possible to establish an entity-specific discount rate to present value the future minimum lease payments. This is due to the entity-specific discount rate being calculated by using the disclosures in the financial statements – which are not always compulsory and available.

Lastly, operating lease onerous contract provisions and lease straight-lining provisions that are not considered material are not always disclosed separately in the financial statements. Furthermore, some companies may show these provisions cumulatively in their financial statements which would have prohibited the researcher from including these amounts in the study. Dillion (2014) concluded that the material provisions were all disclosed and taken into account and the same conclusion has been reached in this study.

The limitations mentioned previously do not have a material or significant impact to such a degree that they would alter the findings and conclusions reached.

5.5. Further research

As mentioned previously, leasing, especially using the constructive capitalisation model, is fairly under researched in South Africa. Therefore, the constructive capitalisation model could be applied to other companies listed on the JSE operating in other industries that were not included in this study and in Dillion's study in 2014.

5.6. Conclusion

The implementation and possible impact of a new lease standard has been highly debated internationally. In order to evaluate the proposed impact that IFRS 16 will have in South Africa, this study has added to prior studies performed by assessing this impact on the financial position, financial performance and market ratios of JSE listed technology and telecommunication companies.

The findings of this study have revealed that capitalising operating leases by using a constructive capitalisation model resulted in changes in the financial position, financial performance and market ratios of JSE listed technology and telecommunication companies. The population of JSE listed technology companies displayed material changes in the financial position, financial performance and market ratios post-capitalisation. However, the JSE listed telecommunication population did not experience material changes in the financial position, financial performance and market ratios.

These finding may be useful to companies that are in the process of applying IFRS 16 in the near future, especially in the technology and telecommunications industry.

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APPENDIX A:

ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

07 August 2017

Ms Carley Cumming (208504696)
School of Accounting, Economics & Finance
Westville Campus

Dear Ms Cumming,

Protocol reference number: HSS/1260/017M
Project title: Assessing the implementation impact of IFRS 16 on JSE listed companies using a constructive capitalization model

Approval Notification – No Risk / Exempt Application

In response to your application received on 26 July 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Mr Harold Galt
Cc Academic Leader Research: Dr Harold Ngalawa
Cc School Administrator: Ms Seshni Naidoo

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APPENDIX B:

TURNITIN REPORT

ASSESSING THE IMPLEMENTATION IMPACT OF IFRS 16: LEASES ON JSE LISTED TECHNOLOGY AND TELECOMMUNICATION COMPANIES USING A CONSTRUCTIVE CAPITALISATION MODEL

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