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Impact of the New Zealand Equivalent to the International Financial Reporting Standard 16 Leases (NZ IFRS 16) on Financial Statements of Listed Companies

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Impact of the New Zealand Equivalent to the International Financial Reporting Standard 16 Leases (NZ IFRS 16) on Financial Statements of Listed Companies

Abstract

In February 2016, the External Reporting Board (XRB) introduced the New Zealand version of IFRS 16 named the New Zealand Equivalent to International Financing Reporting Standard 16 *Leases* (NZ IFRS 16). Effective 1 January 2019, adoption of this accounting standard is compulsory for Tier 1 and Tier 2 for-profit entities (NZ IFRS 16, par. NZ 2.1).

A review of existing academic and professional publications indicated the impact of capitalization of operating leases varies significantly depending on country and industry. Therefore, the study's problem was linked to the impact of the NZ version of IFRS 16 (NZ IFRS 16) on the financial statements of the NZX listed firms. NZ IFRS 16 (*Leases*) requires companies to initially recognise right-of-use assets at cost and lease liabilities at present value (NZ IFRS 16, par. 22, 23 and 26). This study capitalizes the operating leases for a sample of 76 New Zealand listed firms using data obtained from the reported financial statements of these companies for 2017. The accounting treatment of the off-balance sheet operating leases is largely based on *Constructive Capitalization* by Imhoff, Lipe & Wright (1991), with several modifications based on the literature review. The findings are described by descriptive statistics and are tested with parametric and non-parametric statistical tools.

Application of NZ IFRS 16 will produce a statistically significant effect on the metrics and ratios depicting the financial position and financial performance of the sampled firms, except for *EBITDA* and *Interest cover*. In addition, based on quantitative benchmarks of materiality identified by Eilifsen & Messier (2015), the impact of NZ IFRS 16 is material for the *Profit before tax* and *Total assets* metrics of the sampled listed companies. The study provides specific New Zealand evidence on the impact of implementation of NZ IFRS 16. The results can be used by stakeholders interested in information about the lease-related assets and obligations of firms operating in the New Zealand economy. Some findings about the impact of capitalization of operating leases are useful to management and/or the decision-makers of New Zealand listed firms.

Keywords: NZ IFRS 16, capitalization, impact, financial statements

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Contents

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List of Abbreviations

EBIT is earnings before interest and taxation

EBITDA is earnings before interest, taxation, depreciation and amortization

EBITDAR is earnings before interest, taxation, depreciation, amortization and rental expense

EPS is earnings per share

FASB is the Financial Accounting Standards Board

FMLP is future minimum lease payments

D/E is the ratio of debt-to-equity

D/A is the ratio of debt-to-assets

IASB is the International Accounting Standards Board

IFRS 16 is the International Financial Reporting Standard (IFRS) 16 *Leases*

NZ IAS 17 is the New Zealand Equivalent to International Accounting Standard 17 Leases

NZ IFRS 16 is the New Zealand Equivalent to International Financial Reporting Standard 16 *Leases*

NZX is the New Zealand Stock Exchange

ROA is return on assets

ROE is return on equity

ROCE is return on capital employed

SFAS No.13 is the Statement of Financial Accounting Standards No.13

XRB is the External Reporting Board

List of Formulas

(3.1) Discount rate = Interest expense/Interest-bearing debt

(3.2) $FMLP_{t+1} = FMLP_t * df$

(3.3) $FMLP_{2\ to\ 5} = \sum_{t=1}^{4} FMLP_1 * df^t$

(3.4) $FMLP_{2\ to\ 5} = \sum_{t=1}^{4} FMLP_1 / (1+df)^t$

(3.5) $PV_A/PV_L = RL/TL * (PV_{TL} / PV_{FLP})$

(3.6) $PV_A/PV_L = RL/TL * (PVAF_{r\%,\ TL} / PVAF_{r\%,\ RL})$

(3.7) RL/TL = Accumulated Depreciation %/Gross amount of PPE

Chapter 1: Introduction

1.1. Nature of the study

In February 2016, the External Reporting Board (XRB) introduced the New Zealand version of the new international accounting standard devoted to the regulation of the accounting treatment of leases. From 1 January, 2019, the New Zealand Equivalent to International Financing Reporting Standard 16 *Leases* (NZ IFRS 16) is compulsory for Tier 1 and Tier 2 for-profit entities (NZ IFRS 16, par. NZ 2.1). The new accounting regulation brings major changes in accounting for operating leases by lessees, whereas the changes for lessors are seen as insignificant. Given that leasing is often regarded as a method of financing, the effects of the change provide a consequential interesting investigation topic.

The development in accounting regulations on leases is presented in Figure 1-1.

NZ IAS 17 *Leases*

Allows operating leases to be reported off-balance sheets.

NZ IFRS 16 *Leases* **(**Effective from 1.1.2019)

Commands all leases to be placed on balance sheets (with some exceptions).

Required for Tier 1 and Tier 2 for-profit organisations.
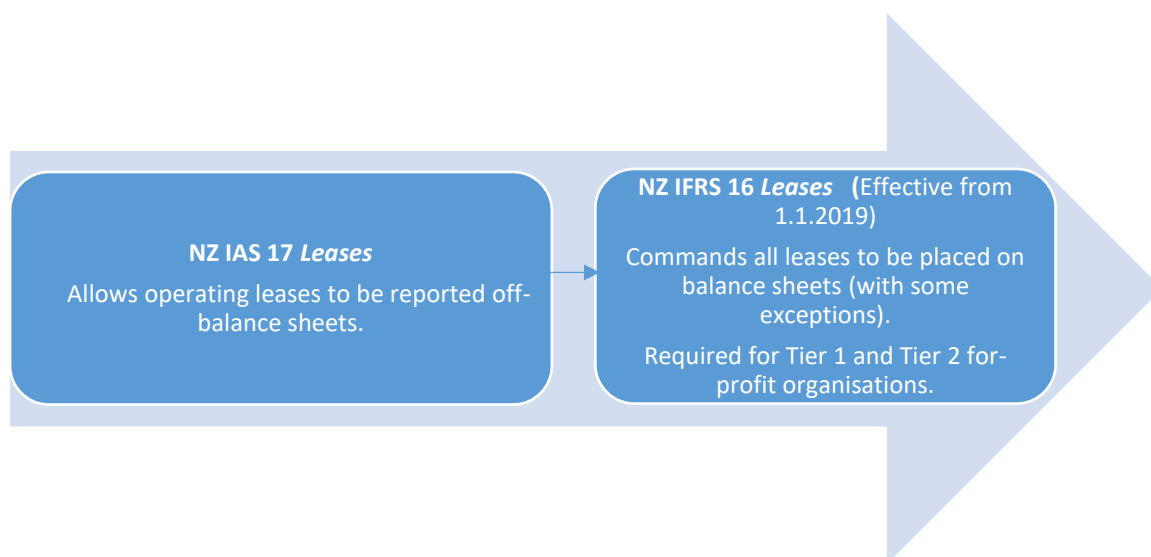
Figure 1-1 Changes in accounting regulations for leasing arrangements (compiled by the author)

The current accounting standard, NZ IAS 17 *Leases,* allows lessee companies to keep operating leases off the balance sheet, reporting them only in the notes to the financial statements. However, the new NZ IFRS standard requires a different treatment of operating leases. The standard paragraph 22 demands lessees recognise two elements: **right-of-use assets** at cost and **lease liabilities** at present value (NZ IFRS 16, par. 22, 23, 26). An accounting treatment of existing leases requires a procedure usually referred to as *capitalization* of operating leases. Hence, this study investigates the impact of the capitalization of operating leases, reported in the notes to financial statements of New Zealand listed companies, under the requirements of NZ IAS 17.

1.2. History and background of research into accounting for leases

The historical developments in accounting for leases can be divided into three phases: the birth of the problem; major developments in the academic pool of knowledge; and actualization of the problem of accounting for leases. Figure 1-2 illustrates the timeline of the background to research into accounting for operating leases.

1976 Statement of Financial Accounting Standards No.13 (the birth of the problem) → **1991-2015** Major developments in academic accounting thought - starts with the work by Imhoff, Lipe & Wrath (1991) → **January 2016 -** Actualization of the problem with the IASB announcing development of IFRS 16 *Leases*
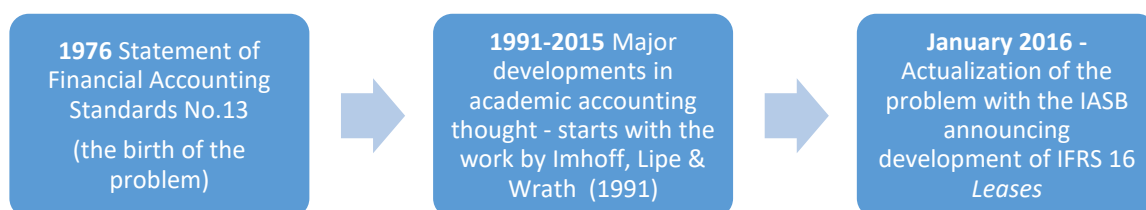
Figure 1-2 A timeline of the background of research into accounting for operating leases (compiled by the author)

1.2.1. Statement of Financial Accounting Standards No.13

The root of the problem relating to the treatment of operating leases can be linked to the SFAS No.13 released by the FASB in 1976. The document segregated leases into two types: *Capital leases* and *Operating leases.* In addition, the standard allowed different disclosure for each type of lease, with the possibility for operating leases to stay off-balance sheet (SFAS No.13, 1976).

Such an approach, in the opinion of academics, led to businesses having an incentive to get their rental arrangements adjusted to meet the criteria of an operating lease. For example, Abdel-khalik (1981) highlights the following points:

i.   firms' management tries to keep the leases off-the balance sheet; and

ii. financing is arranged so that leases are off-the balance sheet.

In addition, Abdel-khalik (1981) claims there is no evidence to think otherwise. Imhoff & Thomas (1988) indicate that companies substitute capital leases for operating leases by restructuring the leasing agreement terms. Imhoff, Lipe & Wright (1991) observe that managers avoid capitalization of leases to improve performance and leverage indicators. Beattie, Edwards & Goodacre (1998) note that lease contracts were designed so that the arrangements were classified as operating leases. Beattie, Goodacre & Thomson (2000) estimate operating leases to be about 13 times larger than finance leases and report a gap in taking operating leases into account in previous studies about capital structure and lease-debt substitutability. Goodacre (2003) finds that off-balance sheet operating leases are a major source of finance in the UK retail sector. Finally, Fulbier, Silva & Pferdehirt (2008) argue that the separation of leases into finance and operating provides incentives for firms to choose operating lease contracts over finance lease contracts. The authors claim that

such a tactic allows companies to avoid on-balance-sheet debt (Fulbier et al., 2008). Using a sample of 366 firms from the 2003 S&P 500 index, Duke, Hsieh, & Su (2009) conclude that firms with lease arrangements classified as operating leases were able to avoid showing lease-related liabilities equal to 11% of their *Total liabilities* and lease-related assets equal to 4% of their *Total assets.* In addition, the authors argue that by reporting leases as operating, a business can improve its *Debt/Equity ratio*, *Current ratio* and *Return on assets* (for firms that have their income[1] for year 2003 decreased if operating leases were classified as capital leases).

The significance of SFAS No.13 seems to be in its impact on the consequent accounting regulations. These include IAS 17 *Accounting for Leases* announced by the International Accounting Standards Committee (IASC) in 1982. After a number of modifications by the IASC and the IASB, the current version of IAS 17 was adopted by New Zealand. Thus, the currently used NZ IAS 17 *Leases,* released in November 2012, inherited the issues embedded in SFAS No.13 in 1976.

1.2.2. Developments in academic accounting thought

The shortcomings of SFAS No.13 could be seen serving as a factor that formed the demand for an accurate financial analysis of the off-balance-sheet assets and liabilities. Imhoff et al. (1991, 1997) provide a response to this challenge by offering a method of *Constructive Capitalization* of operating leases. This method had a direct impact on subsequent research on accounting for leases.

Table 1-1 shows the years, authors and countries of the core research devoted to the problem before the IASB announced the development of IFRS 16. Table 1-1 illustrates the impact of the capitalization of operating leases studied in different countries, the authors' assessment of the effect of treating off-balance sheet operating leases using different sets of benchmarks and their findings. These studies and the most recent Post IFRS 16 publications are discussed in detail in Chapter 2.

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[1] Although in their *Sample selection* subsection Duke et al. (2009) do not specify what type of income was meant, their reference to the work of Imhoff et al. (1997) in *Methodology,* the choice of variables in *Descriptive statistics* subsection and their further analysis in the *Empirical analysis* section allow us to infer that under "income" they mean *Net income.*

Table 1-1 A summary of pre-IFRS 16 studies on the effects of the capitalization of operating leases (compiled by the author)

Author(s)	Country(ies)	Result of capitalization
Imhoff, Lipe & Wright (1991)	United States	Significant decreases in ROA and D/E
Imhoff, Lipe & Wright (1997)	United States	Potentially major impact on profitability
Beattie, Edwards & Goodacre (1998)	United Kingdom	The major effect on profit margins, ROA, assets turnover, and gearing indicators.
Bennett & Bradbury (2003)	New Zealand	Effect on leverage, liquidity, and profitability.
Goodacre (2003)	United Kingdom	Effect on operating margins, ROA, assets turnover, and gearing.
Durocher (2008)	Canada	Major impact on financial position and financial performance
Fulbier, Silva & Pferdehirt (2008)	Spain	Significant impact on financial position, but lesser effect on financial performance
Duke, Hsieh & Su (2009)	United States	Increases in D/E, D/A, ROA. Decreases in Interest and rent expense coverage ratio and Current ratio.
Branswijck, Longueville & Everaert (2011)	Belgium & The Netherlands	Major impact on D/E, ROA, Current ratio.
de Villiers & Middelberg (2013)	South Africa	Significant impact on financial ratios.
Fito, Moya & Orgaz (2013)	Spain	Impact on financial position and performance, significant effect on leverage.
Tai (2013)	China	Effect on ROA and D/E.
Wong, Joshi & Manesh (2015)	Australia	Major impact on ROA, D/E, D/A. Non-significant impact on ROE.

1.2.3. International Financial Reporting Standard 16 Leases

In January 2016, the problem of accounting for operating leases developed further because the IASB announced the issue of IFRS 16 *Leases*. The standard-setting body claimed the objective was the enhancement of transparency of information about lease obligations (IASB, 2016). This regulation eliminated the division of leasing into different types and treated all leasing arrangements as finance leases. Such a transformation in the understanding of leases meant significant changes to accounting practices and the financial statements of companies. Table 1-2 explains the effects of IFRS 16 on balance sheets.

The IASB clarified that compliance with IFRS 16 required firms to recognise lease assets and lease liabilities on the balance sheet (IASB, 2016). Therefore, the arrows in Table 1-2 depict the

classification and movement of assets and leases from the notes to financial statements to the balance sheets of firms.

Table 1-2 Changes in a company's balance sheet (adapted from the IASB, 2016, p. 4)

Item	IAS 17		IFRS 16
	Finance leases	**Operating leases**	**All leases**
Assets	$$$	---	$$$
Liabilities	$$$	---	$$$
Off balance sheet rights and obligations	---	$$$	---

* The table shows the IASB's view of the changes to a company's balance sheet.

Table 1-3 explains the effects of IFRS 16 on income statements.

Table 1-3 Changes in a company's income statement (adapted from the IASB, 2016, p. 4)

	IAS 17		IFRS 16
	Finance leases	**Operating leases**	**All leases**
Revenue item	$$$	$$$	$$$
Operating costs *(excluding depreciation and amortisation)*	---	Single expense	---
EBITDA*			⬆ ⬆
Depreciation and amortisation	Depreciation	---	Depreciation
Operating profit			⬆
Finance costs	Interest	---	Interest
Profit before tax			⬌

* The table shows the IASB's view of the changes to a company's income statement.

To comply with IFRS 16, companies needed to recognise *Depreciation* of lease assets and *Interest* on lease liabilities of operating leases. Hence, the arrows show the movement of outlays from *'Single (rental) expense'* under IAS 17 to *Depreciation* and *Interest* expenses under IFRS 16.

Although the IASB acknowledged the effect of the new regulation on financial statements, as shown in Tables 1-2 and 1-3, the standard-setting board concluded that IFRS 16 would bring a more accurate representation of firms' assets and liabilities[2]. In addition, the IASB expected the standard to result in greater transparency of information about companies' leverage and capital structure. Thus, the standard-setter expected the benefits of the change to outweigh the costs (IASB, 2016). The summary of costs and benefits discussed by the IASB are provided in Section 2.4.3 via Table 2-7.

The impact of IFRS 16 was reviewed in Section 6 *Effects on a company's financial statements* of the *Effects Analysis,* a paper for IFRS 16 produced by the IASB (see Table 2-8). For example, **leverage** was

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[2] The standard-setter makes this conclusion in the subsection named *Conclusion – do the benefits outweigh costs?* In this subsection of the *Effects Analysis* of the standard, the IASB discusses the benefit of a more accurate representation only for firms' assets and liabilities and does not elaborate on the impact of IFRS 16 for other elements of financial statements.

expected to increase because of the growth in liabilities and a decline in *Equity*[3]; **current ratio** was expected to decrease because of growth in *Current liabilities*; **asset turnover** was expected to decrease because of the positive change in the amount of *Total assets*; and, finally, **EBIT** should grow because of depreciation being charged instead of a single rental expense (IASB, 2016).

Since the announcement of the new regulations in January 2016, the pool of knowledge has been enriched by a number of publications by academics and accounting practitioners. However, few studies involve empirical research and none has a focus on the New Zealand commercial environment. This study is an attempt to bridge that gap.

1.3. Problem statement, research design and research question

A review of existing academic and professional publications indicated the impact of capitalization of operating leases varies significantly depending on geographical location and industry. Therefore, the problem for this study was linked to the impact of the NZ version of IFRS 16 (NZ IFRS 16) on the financial position (balance sheet) and financial performance (income statement) of the NZX listed firms. Adopting the terminology and the financial metrics used by the IASB, the study focusses on three particular areas: Liquidity, Long-term solvency and Profitability.

The study design includes the:
- purpose of the study;
- extent of researcher interference;
- study setting;
- research strategies;
- analysis unit; and
- the time horizon (Sekaran & Bougie, 2013).

This study involves obtaining the financial statements of the NZX listed companies for the financial year 2017. To apply the requirements of NZ IFRS 16, this study performs an accounting treatment of operating leases for the sampled listed firms. This is to establish the cause-and-effect relationships between the requirements of the new accounting standard and the financial position/performance of the sampled companies.

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[3] The forecasted decrease in *Equity* is explained by the standard-setter as the result of the carrying amount of leased asset reducing at a faster rate than the carrying amount of leased liability. This is expected because, for each lease period, the leased asset will be reduced by depreciation, whereas the leased liability will be reduced by payment, but increased by interest paid on the lease. The strength of the effect on *Equity* is seen by the IASB as conditional on a number of factors: financial leverage, the terms of leases and the ratio of lease liabilities/equity. Finally, the standard-setter does not expect the effect on *Equity* to be significant for most firms (IASB, 2016).

The research questions are:

i. What is the impact of NZ IFRS 16 on the key financial metrics of lessees, as identified by International Accounting Standards Board, on NZX listed companies?

ii. Does the effect of NZ IFRS 16 on the financial statements of the NZX listed firms, which use operating leases, vary within the sample?

This study largely uses the financial metrics/ratios used by the IASB in Subsection 6.5 *Effects on key financial metrics* of the Effects Analysis. The list and discussion of the tools used by this study is provided in Section 3.4 *Financial metrics and ratios* and in Table 3-2.

1.4. Thesis structure

This thesis is organised as follows:

Chapter 2 discusses previous studies on the effect of capitalization of operating leases on the financial position and financial performance of firms.

Chapter 3 presents the research design and methodology used in the study.

Chapter 4 discusses the results of the study.

Chapter 5 summarises the results, discusses the limitations of the study, the practical implications and future research opportunities.

Chapter 2: Literature Review

This chapter systematises and explains the sources and information relating to the problem of accounting for leases. In addition, the review aims to demonstrate the gap in current knowledge that represents an opportunity for a contribution to the literature.

2.1. Introduction

Most of the literature review is devoted to the most relevant set of publications starting with the development of the *Constructive Capitalization* method by Imhoff et al. (1991; 1997). This decision, to start the literature review with the 1991 and 1997 publications was made because the Imhoff et al. studies represent a methodological basis for treating off-balance sheet operating leases. The subsequent academic research uses the *Constructive Capitalization* method and presents evidence of the impact(s) of capitalization of operating leases on the financial position and financial performance of companies across a number of countries.

The next part of the review largely focusses on academic publications, the standard-setter's and practitioners' contributions after IFRS 16 *Leases* was announced by the IASB in January 2016. The final part of the review consists of several observations based on the initial collection and search of the financial statements of the NZX listed companies. Figure 2-1 shows the major parties that have contributed to the current pool of knowledge about accounting for leases.

Academic evidence about the effect of capitalization on financial statements of the firms obtained from a number of different countries (1991-2015).

The most recent studies devoted to the impact of IFRS 16 from academic and business accounting sources (years 2016-2018).

Initial observations from the financial statements FY2016-FY2017 of NZX listed companies.
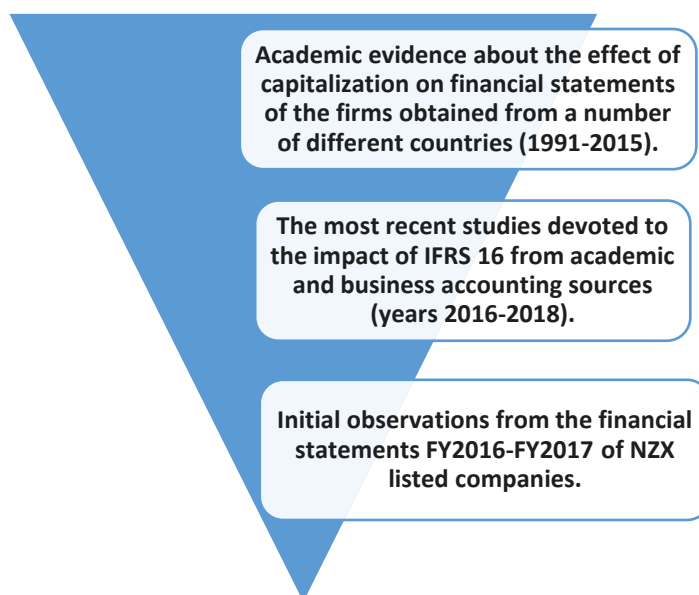
Figure 2-1 The organisation of the literature review (compiled by author)

2.2. The major contributors to knowledge about accounting for leases

Knowledge on accounting for leases can be classified in terms of contributing parties. Figure 2-2 shows the major contributors to the knowledge of accounting for leases.
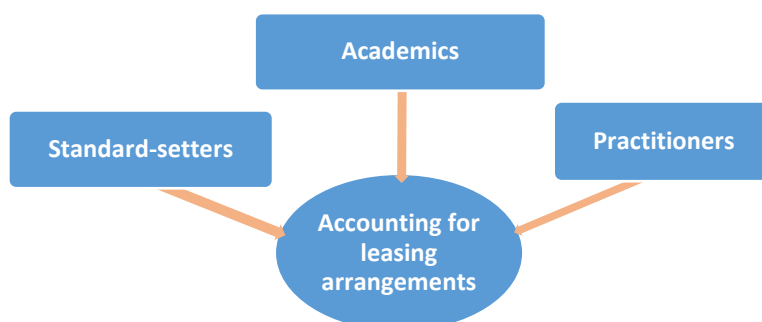
Figure 2-2 The major contributors to knowledge about accounting for leases (compiled by author)

In the *standard-setters* group, there are several major standard-setting organisations. First, there is the FASB, the body that issued SFAS No.13, which directly influences the current regulations on accounting for leases not only in the US but worldwide. The IASC and its successor, the IASB, adopted the division of leases into operating and financing as suggested by the FASB. Secondly, the IASC and the IASB, the regulators that issued and modified the current international accounting standard, IAS 17, produced the new regulation, IFRS 16, and issued the *Effects Analysis* paper that explains the costs and benefits of implementing IFRS 16.

The last major contributor to this group is the XRB that provides the New Zealand-specific version of the accounting standards. The power of the XRB comes from the Financial Reporting Act (FRA) 2013, which assured the continuation of the External Reporting Board (XRB) as a Crown entity and successor to the Accounting Standards Review Board (FRA, 2013, s11). In addition, the XRB has been given authority to implement a strategy for tiers of financial reporting (FRA 2013, s. 30).

The role of XRB should not be underestimated since it appoints the New Zealand Accounting Standards Board of the XRB (NZASB) to issue accounting standards based on the standards issued by international bodies (Financial Reporting Strategy Parameters for the NZASB, 2011. s 21). However, the XRB can impose additional requirements in the standard, e.g., the applicability to Tier 2 for-profit organizations. This was a requirement in the initial variant of the New Zealand version of IFRS 16 standard. The board amended the standard in July 2018.

Academics represent the second group of contributors to the pool of knowledge. Durocher (2008) suggests a classification of academic research devoted to the effect of capitalization of operating leases into three types of study:

    i.   bankruptcy prediction studies;

ii.   market-based studies; and

iii.   behavioural studies (Durocher, 2008).

However, it seems that this classification does not contain the type of empirical studies that focus on the direct impact of capitalization of operating leases on the financial position and financial performance of companies. This study reviews such academic studies and attempts to provide New Zealand-specific evidence on the impact of bringing off-balance sheet operating leases on to firms' balance sheets.

The last group of contributors to the field of accounting knowledge on leases are business practitioners. The *Big 4* accounting firms, various other accounting organisations and professional accounting bodies have provided contributions aimed at understanding and predicting the impact of IFRS 16. However, only a few of those papers satisfy the requirements of an empirical study[4].

2.3. A summary of the information sources

Information about the problem in this study originates from a number of sources. Table 2-1 summarises the data sources that could be used for a study on accounting for leases.

Table 2-1 The sources of information used in this study (compiled by author)

Source	Description
Accounting Standards	SFAS No.13, NZIAS 17, IFRS 16, NZIFRS 16, AASB 16
Additional materials/ Effects analysis	Effects Analysis IFRS 16 *Leases* by the IASB, Additional material for IFRS 16 by the IFRS Foundation.
Textbooks	Various research books and accounting for leases books.
Peer-reviewed journals	Academic and professional journal articles
Business publications	Research, accounting alerts and guides provided by accounting practitioners, including materials placed on firms' websites.

Importantly, Table 2-1 indicates the availability of a range of information sources. However, some information sources, such as the mass media and popular internet channels, are not included because they do not meet the hallmarks of research and therefore lack credibility.

2.4. The development of IFRS 16 *Leases*

An important stimulus for this study devoted to accounting for operational leases was the process for the development of the new *Leases* standard by the IASB. Figure 2-3 presents the timeline for the development of IFRS 16 that influenced the studies devoted to the problem of accounting for leases.

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[4] For example, purposiveness, rigour, testability, replicability, precision and confidence, objectivity, generalizability and parsimony (Sekaran & Bougie, 2013, p. 19).
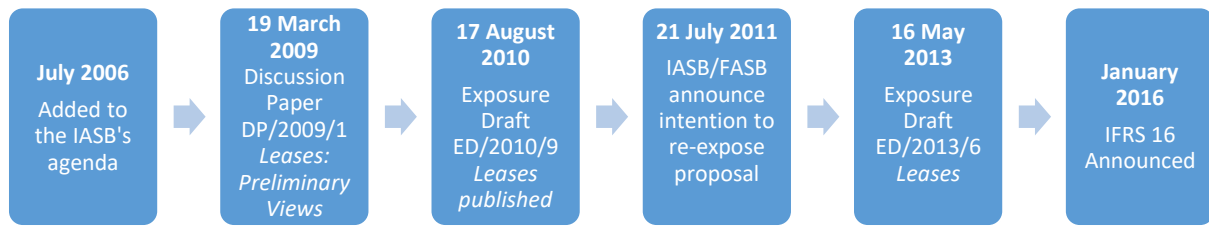
Figure 2-3 The timeline for the development of IFRS 16 Leases (adapted from Deloitte, IASPlus)

Academic studies of prime interest during this phase of accounting for leases are summarised below.

2.4.1. Pre-IFRS - 16 publications

Imhoff et al. (1991) set a milestone in academic research on accounting for operating leases that provided a method for capitalizing operating leases reported off the balance sheets of businesses. The significance of the study came from prior research lacking such methodology. The literature review shows that all the academic studies we include in this section and in the section below had used the *Constructive Capitalization* by Imhoff et al. (1991), though some authors modified it to make it suitable for their studies[5]. Imhoff, Lipe & Wright (1993) provide evidence that, compared with their method of capitalization, heuristics used by analysts tended to overstate unrecorded lease liabilities. Bennett & Bradbury (2003) and Pardo & Giner (2018) also find that heuristic methods compare unfavourably with the *Constructive Capitalization* method of Imhoff et al. (1991); they led to an overstatement of lease-related assets and liabilities.

According to Imhoff et al. (1991, p. 51), their *Constructive Capitalization* allows the calculation of important financial ratios as "if the operating leases had been capitalized at their inception". Such an accounting procedure provides a basis for accurate financial analysis via an estimate of the off-balance sheet assets and liabilities. The demand for an accurate analysis can be explained by the authors observing a number of businesses that were using more assets than their balance sheets were reporting and these businesses were more leveraged than their investors/owners might assess from the *Debt-to-Equity* ratio (D/E) ratios of such firms. In addition, Imhoff et al. (1991, p. 51) note the presence of a significant number of entities reporting "very large non-cancellable operating lease commitments extending many years in the future". Importantly, their study uses a sample of companies in seven industries to examine the effects of constructive capitalization of operating leases on assets, liabilities, ROA, leverage ratios and net income benchmarks (Imhoff et al., 1991).

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[5] A study by Moralez-Diaz & Zamora-Ramirez (2018) is an exception; these authors suggest their own method of capitalizing off-balance sheet leases. However, they compare their developments with *Constructive Capitaliation* by Imhoff et al. (1991).

Imhoff et al. (1991) observe mean decreases in *ROA* varying from 34% for lessees that had a significant volume of operating leases relative to *Total assets* (high lessees) to 10% for lessees that were using a lesser volume of operating leases relative to *Total assets* (low lessees). In addition, the authors note the mean decreases in the D/E from 191% for high volume lessees to 47% for low volume lessees. The conclusion indicates that users of financial statements ought to capitalize operating leases if their analysis involves firms that have material leasing arrangements (Imhoff et al., 1991).

Imhoff, Lipe & Wright (1997) claim their study in 1991 focused largely on the *balance sheet effect* of capitalization. Hence, there was a need to discuss the impact of capitalization on income statements of firms. The 1997 study used the following variables: ROA, ROE, *Net income* and *Operating income*. These metrics were obtained from the financial statements of Southwest Airlines for 1990 to 1994.

In addition, the income effects of *Constructive Capitalization* reported by the authors has been further illustrated by application to and comparison of the *balance sheet* and *income statement effects* of capitalizing operating leases. Such a comparison was achieved using the financial results of several iconic retailers: K-Mart Corporation, Weis Markets Inc. and National Convenience Stores. Imhoff et al. (1997) find *Constructive Capitalization* impacts the comparability of the financial results of the companies. The study reports intercompany differences in *ROA* of Weis Markets Inc. and National Convenience Stores decreasing from 69% before capitalization to 29% after capitalization Imhoff et al. (1997) argue that pre-capitalization of Weis Markets Inc. showed its *ROE* is 9% higher than the *ROE* of National Convenience Stores but, having the operating leases capitalized made the *ROE* of Weis Markets Inc. 35% lower than the *ROE* of National Convenience Stores. The main results of Imhoff et al.'s (1997) study show that adjustments to operating leases produce a significant effect on the profitability metrics (ROA and ROE) of firms. However, these changes were seen by the authors as "unpredictable in their direction" (Imhoff et al., 1997, p. 31).

One of the first seminal academic publications based on the method suggested by Imhoff et al. (1991; 1997) was by Beattie, Edwards & Goodacre (1998). They use the financial statements of 232 randomly sampled companies listed on the UK stock exchange. The paper assessed the impact of capitalization of operating leases on the following financial ratios: *Profit margin*; *ROE*, *ROA*, *Return on capital employed* (ROCE); *Asset turnover*, *Interest cover* and three variants of the *Gearing ratio*. The authors note their capitalization method is similar to *Constructive Capitalization* suggested by Imhoff et al. (1991). However, the authors argue that *Constructive Capitalization* was invented and tested in the US environment. Therefore, the authors 'developed' Imhoff et al.'s (1991) method further to accommodate "company-specific assumptions in respect of the remaining lease, the asset proportion, and the effective tax rate" (Beattie et al., 1998, p. 241).

The findings include a number of important conclusions:

- operating leases represent a major source of long-term financing;
- capitalization of operating leases could result in recording additional long-term liabilities equal to 39% of reported long-term debt;
- capitalization of operating leases represented unrecorded assets of 6% of total assets[6]; and
- capitalization has a significant impact (at the 1% level) on the following factors: *Profit margin*, *ROA*, *Asset turnover* and gearing indicators (Beattie et al., 1998).

Beattie et al.'s (1988) study used the paired *t*-test and the Wilcoxon signed rank test to establish the statistical significance of the findings. In addition, the authors performed sensitivity analysis for the core assumptions: discount rate and lease lives. Beattie et al. (1998) also performed an industry analysis to find that the magnitude of the impact of capitalization varied for different industries. The greatest effect was for the services sector (Beattie et al., 1998).

Bennett & Bradbury (2003) studied a number of effects of capitalization of operating leases using a sample of financial statements of 38 companies listed on the New Zealand Stock Exchange. The study uses the *Constructive Capitalization* method developed by Imhoff et al. (1991) with the aim of providing non-US evidence on the impact of capitalizing off-balance sheet operating leases. More importantly, Bennett & Bradbury (2003) compare the use of *Constructive Capitalization* with the treatment of operating leases using the 'rule of thumb' heuristics methods, noted in the study as *RENT8* and *RENT6*[7]. One limitation of the study could be the assumption of 0.81 assets to liability ratio for all the firms in the study sample. The authors report median increases of 11.7% in *Total liabilities*, median increases of 5.2% in *Total assets* and median decreases of 1.6% in *Total equity*. Bennett & Bradbury (2003) also discuss increases in the median *Debt-to-Assets* ratio (D/A) from 0.463 to 0.525, decreases in the median *Current ratio* from 1.752 to 1.693 and decreases in the median *ROA* from 0.117 to 0.109. The authors used the Spearman correlation to validate the capitalization procedure and performed a sensitivity analysis for the calculated periods of remaining lease life. Bennett & Bradbury (2003) conclude that capitalization of operating leases produces a

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[6] Table 6 titled *"Estimated mean capitalized value of operating lease assets and liabilities for 1994"* presented by Beattie et al. (1998) in their study allows us to conclude that they meant the percentage representation of total assets for the sample mean.

[7] *RENT8* was explained by Bennett & Bradbury (2003) as a treatment of operating leases when the current lease rent expense is multiplied by a constant of 8. For this method the authors refer to Cottle, Murray & Block (1988), Imhoff et al. (1993) and Imhoff, Lipe & Wright (1995). Whereas, *RENT6* is explained by Bennett & Bradbury (2003) as a procedure where the lease-related assets and lease-related obligations are found by multiplying the lease payment for the next year by 6. For this approach, Bennett & Bradbury (2003) refer to Ely (1995).

material impact on reported liabilities, which is linked to the effect on leverage[8]. In addition, they reveal that capitalization affects the liquidity and profitability ratios of the sampled firms. As discussed in this section, the comparison of *Constructive Capitalization* with heuristic methods allowed the authors to conclude that the heuristic methods tend to overstate lease-related assets and lease-related liabilities.

Bennett & Bradbury's (2003) study was preceded by Bennett & Bradbury (1998) that examined the effect of the adjustment of operating leases on the 1997 financial statements of Air New Zealand. The study discusses the following changes to the financial position of the company: a 10.5% increase in *Total assets*, a 25% increase in *Total liabilities* and a 4% decrease in *Total equity*. In addition, in assessing the impact on the financial performance of Air New Zealand, the authors report that there was a 17.7% increase in *EBIT*, an increase in *D/A* from 49.9% to 56.5%, a decrease in the *Current ratio* from 0.878 to 0.763, an increase in *ROA* from 5.6% to 5.9% and, finally, an increase in *ROE* from 9% to 9.3% (Bennett & Bradbury, 1998). Thus, the authors find capitalization of operating leases produces a significant effect on two particular performance ratios: *Leverage* and *Short-term liquidity* (Bennett & Bradbury, 1998). To relax the effect of the assumptions about the discount rate, a sensitivity analysis using the interest rates for secured loans reported by the company was performed.

Goodacre (2003) presents a study of operating lease financing in the UK retail sector. The study provides a number of observations on the significance of operating leases for the industry. The author finds the volume of off-balance operating leases was 3.3 times higher than on-balance sheet long-term debt, but the volume of finance leases was non-significant. In addition, Goodacre (2003) argues the size of operating leased assets equals 28% of the total reported assets.

In the discussion of the impact of the capitalization of operating leases, Goodacre used the set of nine ratios used by Beattie et al. (1998). In addition, the author adopts the modifications to *Constructive Capitalization* by Beattie et al. 1998) as follows: company-specific assumptions of the total and remaining lives of the operating leases, the proportion of assets/liabilities and an effective tax rate (Goodacre, 2003). This allowed the author to find that adjustments to off-balance sheet operating leases produce a considerable effect on balance sheet values. To illustrate, the study finds that the UK retail industry had an average ratio of **long-term operating lease liabilities** over **on-balance sheet long-term debt** of 1.6 for food retailers and up to 5.1 for general retailers. The study also finds operating lease liabilities were, on average, about 37 times the size of finance leases

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[8] The Summary section of the study by Bennett & Bradbury (2003) does not describe the impact on reported assets; we may conclude the authors found it to be immaterial.

(Goodacre, 2003). On the asset side, Goodacre (2003) notes that off-balance sheet assets, based on mean values, equal 16% of *Total assets* for food retailers and 37% of *Total assets* for general retailers. Finally, the study makes a number of observations on the impact of capitalization on the performance ratios of the sampled companies. The author reports median increases in operating margins from 8.1% to 11.5%, decreases in *ROA*, decreases in *Asset turnover* and increases in all three gearing ratios. Goodacre (2003) gives an example of the net *Debt-to-Equity* metric growing from 17% to 157%. The study also reports increases in the *ROE*, *ROCE* and *Interest cover* ratios. Goodacre (2003) used Pearson and Spearman correlation tests to measure the relationship between the pre- and post-capitalization ratios. In addition, *t*-tests and the Wilcoxon signed rank test were used to establish statistical significance. The author concludes that the requirement to capitalize operating leases can produce a major effect on the operating performance of firms working in the UK retail sector.

Durocher (2008) provides empirical evidence of the effects of capitalization of operating leases in Canada. The study was based on a sample of the 100 largest (by revenue) Canadian public companies and uses a set of ratios aimed at assessing the impact of accounting adjustments within the three areas presented in Table 2-2. Durocher claims that his method of capitalizing leases included refinements to the method of *Constructive Capitalization.* The author also notes that the studies preceding his work applied *Constructive Capitalization* using sample-wide assumptions for the following: the interest rate, length of the remaining lease and total lease lives, proportion of assets to lease liabilities[9] and tax rates (several studies, according to Durocher). Durocher's study justifies recording the company-specific tax rates by the fact that studies preceding his work did not consider the effect of capitalizing of operating leases on future taxes.

Table 2-2 shows the ratios used in Durocher's (2008) study to assess the effect of capitalization on financial strength, management performance, and investment return. Durocher claims the major impact of capitalization on the benchmarks of financial position with *Total assets* demonstrating a mean increase of 5.6% and a median increase of 2.6%. In addition, *Total liabilities* show a mean increase of 11.5% and a median increase of 5.5% (Durocher, 2008). Referring to the effects on financial performance, Durocher (2008) observes a 2.66% increase in the *D/A* ratio; a slight decrease in the *Current ratio* from 1.37 to 1.3; a slight increase in *ROA* from 4.21% to 4.24%; a decrease in *ROE* from 10.98% to 10.24% and a decrease in *EPS* from 1,451.14 to 1,450.69. Durocher's study provides

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[9] Under this proportion, Durocher means the ratio of remaining lease life to total lease life. The author suggests calculating this ratio, as follows: RL/TL = Accumulated Depreciation %/Gross amount of PPE; where RL is the remaining lease life, TL is the total lease live and PPE is the product, plant and equipment.

an industry analysis based on 12 sectors. Based on the author's conclusions, adjustment of operating leases has a major effect on *Leverage* and *Liquidity* of the sampled companies across all industries.

Table 2-2 The choice of ratios to assess the effects of capitalization of operating leases (adapted from Durocher, 2008)

Financial strength	Management performance	Investment return
Leverage (D/A ratio)	ROE	Earnings per share (EPS)
Liquidity (Current ratio)	ROA	

The effect on income statements and, thus, the effect on financial performance was significant for only a few sectors, including merchandising and lodging, oil and gas and financial services. For the statistical analysis, Durocher used the Spearman and Pearson rank correlation tests to test the ratio relationships before and after capitalization. Durocher uses the *t*-test and Wilcoxon signed rank test to establish the statistical significance of the findings.

Fulbier, Silva & Pferdehirt (2008) present more evidence on the impact of lease capitalization on financial ratios. To measure the effect, the authors use a sample of 90 German listed companies. Fulbier et al. (2008) perform their treatment of off-balance sheet operating leases using a method based on *Constructive Capitalization* by Imhoff et al. (1991; 1997). However, the authors report some modifications to that methodology. They use specific interest[10] and tax rates for every sampled firm, when possible, and separate FMLP into five contract baskets[11].

Table 2-3 shows the set of financial ratios used by Fulbier et al. (2008) to measure the effect of capitalizing operating leases on the following areas: the structure of balance sheet; profitability and expenses, and firm valuation from the capital perspective. Fulbier et al. (2008) conclude that modified constructive capitalization of the off-balance sheet operating leases produces a substantial impact on the financial position of firms. The strength of this effect varies depending on the industry

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[10] Fulbier et al. (2008) note the lack of availability of data for lease-related interest rates, therefore the authors use the rates for pensions and/or other provisions as the interest rate required for capitalizing operating leases.

[11] The authors explain that the latter modification of dividing the FMLP into five baskets was needed because the original *Constructive Capitalization* method of Imhoff et al. (1991) used one asset-to-liability ratio to the whole portfolio of operating leases, whereas Fulbier et al. (2008 p. 60) point out that such an approach "accepts misspecified asset values and equity impacts". In addition, the authors identified existing studies that attempted to overcome this issue by calculating the weighted average for the remaining and total lives of operating leases. Fulbier et al. (2008) chose a different approach, the use of five contract baskets with different lifetimes from "*within 1 Year*" to "5 *Years or more*" and perform capitalization for each basket before aggregating the results and adjusting the financial statements. This allows Fulbier et al. (2008) to take into account that operating leases within the portfolio of a firm's leases, which may expire in different periods. (See *Appendix 3* of this study for an illustration of capitalization performed using the "five contract basket" approach).

of the sampled companies. However, the authors see the impact of capitalization on the ratios of financial performance as minor. The robustness of the study was achieved with the "use of company-specific discount and tax rates". In addition, the study's results were enhanced by

Table 2-3 The choice of ratios to assess the impact of capitalization of operating leases (adapted from Fulbier et al., 2008)

Structural changes in balance sheets	Profitability and expense structure	Firm valuation from the capital perspective
The intensity of investment (NCA/TA)	Profit margin (PM)	EPS
Equity-to-Assets (E/A)	ROA	Price-earnings (P/E)
Debt-to-Equity (D/E)	ROCE	Book-to-market (B/M)
Capital Employed (CE)	ROE	
	Time interest earned (TIE)	
	Turnover capital employed (TCE)	

sensitivity analysis based on the following assumptions used in the process of capitalizing operating leases:

- the ratio of remaining lease life to total lease life; and
- the rates for discounting future operating lease payments.

These assumptions and the consequent sensitivity analysis are used in this study. More importantly, Fulbier et al. (2008) use the *Standard & Poor's CreditStats* factor model as a control model to test and compare the adjustment of the off balance sheet operating leases with the effect of capitalizing these operating leases using the *Constructive Capitalization* method. The authors observe a number of flaws in the *CreditStats* factor model, in contrast with the *Constructive Capitalization* method, e.g., it views lease assets equal to lease liabilities. The authors find *CreditStats* and *Constructive Capitalization* produce "only slightly different results" (Fulbier et al., 2018, p. 138). The statistical significance of the findings in Fulbier et al. (2008) was confirmed using parametric *t*-tests and non-parametric Wilcoxon signed rank tests.

Duke et al. (2009) investigated the impact of capitalization of operating leases for a sample of 366 firms from the S&P 500 index in 2003. The authors divided the sample into two subgroups: negative income and positive income. The criterion for the division was based on the effect of reporting operating leases as capital leases on income of the sampled firms in 2003. Duke et al. (2009) acknowledge that their capitalization of operating leases of the sampled firms is based on Imhoff et al.'s (1991) method. The authors note that preceding studies used company-specific assumptions[12]

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[12] Among the exemplified studies were Beattie et al. (1998) and Bennett & Bradbury (2003), which have been discussed.

for lease lives, discounting rates, proportions of assets to liabilities and tax rate. However, Duke et al. (2009) chose a different tactic and did their capitalization using uniform assumptions for the above mentioned variables, except the tax rate[13]. The study describes the effect of capitalization using five financial ratios with the results reported using the means for both income groups of the sample. Duke et al. (2009) find capitalization of operating leases results in a mean increase of 13.4% and a 12.2% in *D/E;* in a 5.2% increase and a 3.3% increase in *D/A*; in a 8.3% decrease and a 3.8% increase in *ROA* percentage; 1.21% decrease and a 1.5% increase in *Interest and rent expense coverage ratio*; and a 6.4% decrease and 5.2% decrease in *Current ratio* for the negative and positive income subgroups, respectively. The statistical significance of their findings was confirmed with paired *t*-tests.

Branswijck, Longueville & Everaert (2011) discuss the financial outcome of the capitalization of operating leases in two different countries: Belgium and The Netherlands. The authors, taking into account the exposure draft (ED/2010/9) *Leases* issued by the IASB, focus their study on assessing the magnitude of the effect of capitalization in relation to factors such as the industry, size and accounting culture (country) of the firm. To capitalize operating leases, Branswijck et al. (2011) adapt the *Constructive Capitalization* method of Imhoff et al. (1991, 1997). The authors modified the stage of capitalization procedure that involves the estimation of the remaining lease life. This modification is explained by the constraints on the financial information in the annual statements of Belgian and Dutch listed firms. One hypothesis tested in the study related to the possibility of the process of capitalization of operating leases having an effect on financial ratios of a business. This was achieved using a sample of 128 listed Belgian companies and 116 listed Netherlands companies. The findings show capitalization of operating leases produces a major impact on the following ratios:

- D/E;
- ROA; and
- Current ratio (Branswijck et al., 2011).

The statistical significance of these results was obtained using a paired sample *t*-test. In addition, Branswijck et al. (2011) claim that the industry effect of capitalization varies across the six examined sectors of the two economies. For the impact on the *D/E*, *ROA*, and *Current ratio*, the authors

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[13] The authors explain such an approach in their study is because of the lack of data for the remaining lives of operating leases and 'the implicit discount rates' for US firms. In addition, Duke et al. (2009) note that the tactic of using uniform assumptions was used with the purpose of including as many firms as possible in the study sample. Finally, the authors argue that the results from the preceding studies indicate that the application of both company-specific and uniform assumptions for the variables required for capitalization of operating leases, return similar estimates for lease-related assets and liabilities (Duke et al., 2009). To enhance this idea, Duke et al. (2009) provide references to the following studies: Ely (1995), Beattie et al. (1998) and Bennett & Bradbury (2003).

provide an example of the manufacturing industry being affected by capitalization more than the telecom industry. Finally, Branswijck et al. (2011) compare the impact of the accounting adjustments for both countries. The authors conclude that the effects of capitalization would be different for Belgium and The Netherlands.

De Villiers & Middelberg (2013) provide evidence of the impact of capitalization of operating leases on the financial ratios of 29 companies from the top 40 firms listed on the Johannesburg Stock Exchange. The authors focus on the metrics associated with firms' profitability for their shareholders. De Villiers & Middelberg's (2013) study was influenced by the exposure draft (ED/2010/9) *Leases* and adopts the Fulbier et al.'s (2008) modification to the *Constructive Capitalization* and their set of financial metrics. The ratios used in the study cover three broad aspects of financial activities:

   a) structural changes in balance sheets;
   b) profitability and expense structure; and
   c) firm valuation from the capital "perspective" (de Villiers & Middelberg, 2013) (see Table 2-3 for an illustration.)

De Villiers & Middelberg (2013) claim a major effect of capitalization in the form of an increase or decrease in the financial ratios of the sampled companies. The authors also discuss the possibility of a firm adjusting its strategy to mitigate the accounting changes and their effects on the share prices and business rating. One such strategy involves restructuring the firm's financing policy.

Fito, Moya & Orgaz (2013) examine the effect of the capitalization of operating leases on the financial ratios of Spanish companies listed on the Madrid stock exchange. In the course of the study, the authors attempt to assess the effect of the changes to the accounting treatment of leases proposed by the IASB in its discussion paper (DP/2009/1 *Leases: Preliminary Views*). Fito et al. (2013) base their capitalization method on Imhoff et al.'s (1991) method. However, several assumptions were made, such as the interest rate, lease-related cash flows after year 5, total duration of the leases and tax rate. In addition, the authors adopt the modifications to the *Constructive Capitalization* method introduced by Fulbier et al. (2008)[14]. The findings, based on a sample of 52 companies, show that recognition of operating leases would impact on both the financial position/structure and financial performance of the firms. The industry analysis shows the effects of capitalization differ considerably among industries. The authors claim energy, technology, retail goods and services as most affected by capitalization (Fito et al., 2013). The authors use the non-

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[14] For example, the use of a decreasing factor in calculating the lease-related payments between years 2 and 5 of the lease and disaggregation of the FMLP in five contract baskets with different remaining lifetimes.

parametric Wilcoxon test to establish the statistical significance of their results. Sensitivity analysis was performed to test the assumptions about the discount rate and the ratio of remaining lease life to total lease life. Fito et al. (2013) conclude that capitalization of operating leases would have significant effects on leverage ratios and both *ROA* and *ROE* are affected substantially.

Tai (2013), with reference to the Exposure Draft (ED/2010/9) on *Leases,* provides an insight into the impact of *Constructive Capitalization* of operating leases on two fast-food chains based in Hong Kong. Data from the financial statements of the sampled companies allowed the author to establish the remaining lives of the operating lease commitments was equal to ten years for both fast-food chains. Tai notes that FMLP of the both companies for the period beyond Year 5 were relatively low; he views this as a result of a possible expiry of numerous operating leasing contracts within the first five year period. However, Tai notes that renewal of the lease arrangements of the sampled companies was expected. Therefore, the author assumes that the minimum lease payments for Year 5 will be paid by the companies during each of the next five years after Year 5. Tai's study reports the use of a rounded Hong Kong prime rate as a discounting rate because of the lack of disclosure of the data related to the incremental borrowing rate for both sampled firms. The author indicates decreases in *ROA* and the *Debt-to-Equity* (D/E) ratios as the result of having off-balance sheet operating leases capitalized. These findings were enhanced by sensitivity analysis with the use of interest/discount rates. Tai (2013) concludes that capitalization has a substantial negative effect on the financials of both companies. The author views capitalization as potentially producing a negative impact on the stock prices, cost of capital, bonuses for executives and, ultimately, the ability to operate as a going concern (Tai, 2013).

Wong & Joshi (2015) observe the developments in accounting for leases with the IASB producing Exposure Drafts on Leases (ED/2010/9) and (ED/2013/6). Taking the requirements of these documents into account, their study uses the financial statements of 170 companies listed on the Australian Stock Exchange with part of the analysis using the final sample divided into positive and negative subgroups[15]. Wong & Joshi note there is an insufficient volume of data for the remaining periods of life of operating leases and the implicit interest rates used by the sampled companies. Therefore, having based their capitalization of operating lease on Imhoff et al.'s (1991) method, the authors make sample-wide assumptions, such as: 10% discounting rate and a 15-year period of remaining lease life. In addition, Wong & Joshi use a 75% ratio of the assets/liabilities and a 30% rate as the effective tax rate for all sampled firms.

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[15] The authors follow the approach by Duke et al. (2009), which has been already reviewed and explained.

The authors highlight that capitalization of off-balance sheet operating leases of the sampled of listed firms results in a positive mean change of 3.47% in *Total assets,* a mean increase of 4.34% in *Total liabilities* and a mean decrease of 0.27% in *Total equity.* The authors highlight a major impact of the capitalization of operating leases on the performance ratios: *ROA*, *D/E* and *D/A*. However, changes in *ROE* were insignificant (Wong & Joshi, 2015). Wong & Joshi report that the results of their studies are consistent with the findings of Beattie et al. (1998) and Bennett & Bradbury (2003) for the direction of the post-capitalization impact on the ratios of financial position and performance. However, the authors note the strength of the effect of capitalizing operating leases is lower than the impact reported by prior studies. More importantly, Wong & Josh (2015) analyse and compare the effect of capitalization of the off-balance sheet operating leases for positive and negative income subgroups of the sampled listed firms. Table 2-4 shows the differences reported by the authors.

Table 2-4 The differences in the effect of capitalization of operating leases on positive and negative income subgroups (adapted from Wong & Joshi, 2015, p. 39).

Ratio	Positive income subgroup	Negative income subgroup
	Post capitalization change (indexed)	
D/E	16.46%	1.03%
D/A	10.30%	8.67%
ROA	-12.59%	3.07%
ROE	-1.94%	-0.48%

The table shows that the difference in the strength of the impact of capitalizing operating leases is noticeable. However, the authors report a limitation of the study, which could affect the findings. The number of the sampled companies disaggregated by Wong & Joshi (2015) into income subgroups is not equal, 16 firms were in the negative income subgroup and 91 firms were in the positive income subgroup. The overall robustness of the findings was checked using one-sample, paired-samples and independent sample *t*-tests.

2.4.2. Post IFRS - 16 academic publications

In January 2016, the development of IFRS 16 *Leases* was announced. A change in the volume of publications devoted to the problem of accounting for leases allows one to view the development of the new international accounting standard as a major event with a demand for the refinement of the relevant knowledge. Given the relatively short time since the change was communicated by the IASB, most information is from accounting practitioners. However, some academic papers have appeared. One most relevant study was by Xu, Davidson & Cheong (2017). These authors tried to measure the impact of the Australian version of IFRS 16 (AASB 16) using a sample of the top 200

companies listed on the Australian Stock Exchange filtered by total assets. Xu et al. (2017) report the application of several modifications to the original *Constructive Capitalization* method of Imhoff et al. (1991)*,* as follows:

- calculation of unequal FMLP beyond year 5[16],
- estimation of the company- specific proportion of the remaining lease life to total lease life adopting the method of Durocher (2008)[17], and
- calculation of company-specific discount rates, using the formula: Discount rate = Interest expense/Interest-bearing debt[18].

The authors admit that although several refinements to the Imhoff's capitalization method were made, the basic assumptions are the same (Xu et al., 2017). Table 2-5 shows the chosen financial metrics and ratios used by Xu et al. (2017). These tools were grouped into three areas: financial position, balance sheet, and income statement indicators.

Table 2-5 The choice of financial metrics and ratios for assessing the impact of capitalization of operating leases (adapted from Xu et al., 2017)

Financial position metrics	Balance sheet ratios	Income statement ratios
Total assets	Gearing (D/E)	ROE
Total liabilities	Asset turnover	ROA
Total interest-bearing debts (IBDs)		ROC
		Interest cover
		Profit margin

The authors report the following effects of capitalization on financial position: increases in *Total assets* and *Total liabilities* of 4.2% and 8.82%, respectively, and over a 20% increase in *Interest-bearing debt* (Xu et al., 2017). For the key balance sheet ratios, they observe a 41.87% increase in *Debt-to-equity* and a 9% decrease in *Asset turnover*. The impact on financial performance was 8.42% growth in *ROA*, 9.74% growth in *ROC* and 11.53% increase in *Profit margin*. However, *Asset turnover* and *Interest cover* decreased by 8.85% and 23.14%, respectively (Xu et al., 2017)[19]. To demonstrate the statistical significance of these results, the study uses a combination of methods: a parametric *t-*

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[16] Xu et al. (2017) explain that many prior studies assume equal FMLP for the operating leases beyond year 5. The authors exemplify these prior studies as: Beattie et al. (1998); Bennett & Bradbury (2003); Durocher (2008) and Fulbier et al. (2008).

[17] As mentioned above, Durocher (2008) suggests calculating such a proportion via the formula: RL/TL = Accumulated Depreciation %/Gross amount of PPE.

[18] This formula was also suggested by Imhoff et al. (1997) as one way to estimate the required interest rate.

[19] It is not clear from Xu et al. (2017) whether the results are median or in mean values, since the authors deliver the results of both parametric and non-parametric testing in one table.

test, a non-parametric Sign test and the Wilcoxon signed rank test. The authors also put the variables used in their research through 5% winsorisation. They conclude that capitalization of operating leases produces a major impact on assets, liabilities, interest-bearing debt and financial ratios of the sampled companies. However, the effect on *ROE* was not statistically significant.

A notable study was published in Turkey in November 2016. Ozturk & Sercemeli (2016) use a case study to assess the effect of IFRS 16 on the financial position and key performance ratios of Pegasus Airlines. This is a Turkish airline company that, according to the authors, obtained 60 planes during the financial years 2013, 2014 and 2015 that are financed by financial and operating leases. To capitalize the operating leases, the authors adopt the *Constructive Capitalization* method of Imhoff et al. (1991) with the following assumptions:

- equal FMLP between year 1 and year 5,
- equal FMLP for the two remaining years after year 5, and
- a discount rate of 10%.

Ozturk & Sercemeli (2016) conclude that adoption of IFRS 16 would cause a significant impact on the financial position of the firm, its *Liability-to-Equity* and *Total liabilities-to-Total assets* ratios. However, the impact would differ; *Liabilities-to-Equity* would be affected more than *Liabilities-to-Assets* (Ozturk & Sercemeli, 2016).

Sari, Altintas & Tas (2016) analysed the effect of capitalization of operating leases on companies operating in the Turkish retail sector. A sample of 13 companies listed on the Istanbul Stock Exchange was initially selected, but the number was reduced to seven. Like the studies reviewed above, the authors use the *Constructive Capitalization* method of Imhoff et al. (1991). Sari et al. (2016) report constraints in the availability of data for the remaining life of the off-balance sheet operating leases and implicit/discount rates required for capitalization procedure. Therefore, the authors use a number of assumptions that they view as consistent with Imhoff et al. (1991) and prior research[20].The authors conclude that capitalization of operating leases would not have a major impact on the *D/A* ratio. However, the *D/E* ratio would change positively because of major increases in liabilities. The statistical significance of the findings was demonstrated by the Wilcoxon signed rank test. Although the study claims a minor impact on *ROE* and *ROA*, this finding was limited by the relatively small sample (7 companies). Hence, the authors recommend using a larger sample in future research (Sari et al., 2016).

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[20] For example, Sari et al. (2016, p. 141) use the compound interest (9%) rate of government bonds issued on December 14, 2009 as a discount rate for capitalization and the asset is depreciated using the straight-line method of depreciation and expected useful life of 15 years.

Two relevant publications were published in 2018 in Spain. Morales-Diaz & Zamora-Ramirez (2018) investigated the impact of IFRS 16 on a set of financial ratios in a sample of 646 European listed companies. The authors claim the invention and application of a new methodology for capitalizing off-balance sheet operating leases. Table 2-6 illustrates the metrics used in the authors' study; they were grouped into the following categories:

- balance/leverage sheet ratios;
- leverage ratios;
- profitability ratios; and
- coverage ratios.

The new approaches consist of a model to determine the interest/credit rate and the technique used to establish the remaining period of lease life. Moralez-Diaz & Zamora-Ramirez (2018) explain that their study combines information from financial statements and information provided to them by "certain companies". In addition, the authors design and discuss a method to establish *Lease liabilities* and *Lease assets.*

Table 2-6 The metrics used to assess the impact of IFRS 16 (from Morales-Diaz & Zamora-Ramirez, 2018, p. 121)

Balance sheet ratios	Increase in assets
	Increase in liabilities
	Lease expense on liabilities (lease intensity)
Leverage ratios	Leverage on equity before IFRS 16 adoption
	Leverage on equity after IFRS 16 adoption
	Comparability index of leverage on equity
	Leverage on assets before IFRS 16 adoption
	Leverage on assets after IFRS 16 adoption
	Comparability index of leverage on equity
Profitability ratios	ROA before IFRS 16 adoption
	ROA after IFRS 16 adoption
	Comparability index of ROA
Coverage ratios	Financial expenses coverage before IFRS 16 adoption
	Financial expenses coverage after IFRS 16 adoption
	Comparability index of coverage of financial expenses coverage after IFRS 16 adoption

lease intensity =lease expense/total liabilities

In calculating the required interest rate, the authors employ a model using the Bloomberg Euro interest rates per sector ratings: AAA/AA/A/BBB/BB/CCC and bonds' quoted yields to maturity curves. In calculating the remaining period of lease life, the authors use the financial statements of the companies they appoint as "representatives" for each industrial sector. Morales-Diaz & Zamora-Ramirez's (2018) study uses at least five of the most prominent (by lease expense) firms for every sector. The authors obtain information they call "restricted" from several companies about the

estimated maturity of their leases. The study claims such information was acquired from at least one business for every major sector in the study. As the result of such data collection, the authors construct an average value of remaining lease life per sector. To provide industry-specific analysis, Morales-Diaz & Zamora-Ramirez (2018) introduce a criterion of *Lease intensity*, which is the ratio of *Lease expense* over *Total liability*.

For the whole sample, the authors find capitalization results in mean increases of 9.96% in *Total assets*, 21.4% in *Total liabilities*, 9.28% in *Leverage* and 3.07% in *ROA*. However, the coverage ratio used shows a 13.6% decrease (Morales-Diaz & Zamora-Ramirez, 2018). For the sector-specific results, the main finding relates to *Lease intensity*; industries with higher *Lease intensity* experience a higher impact from the implementation of IFRS 16. For example, the largest increases in *Total assets* and *Total liabilities* were in the retail, hotel and transport sectors. The lowest changes were in the banking/insurance, real estate, consumer durables and financial firms (Morales-Diaz & Zamora-Ramirez, 2018). The authors conclude that adoption of the IFRS 16/capitalization of operating leases would have a significant impact on the balance sheet, leverage and solvency of listed companies. However, the magnitude of the change depends on the industry (Morales-Diaz & Zamora-Ramirez, 2018). The statistical significance of these results was assessed using a *t*-test for comparability indexes and the Wilcoxon signed rank test for the ratios.

Pardo & Giner (2018) studied the impact of capitalization on a sample of 20 non-financial companies in the Spanish Exchange Index 35 (IBEX 35). According to the authors, their study follows Imhoff et al. 's (1991) method and the refinements by Fulbier et al. (2008)[21]. The authors observe the following changes in balance sheet elements: a mean increase of 7% in liabilities, a mean increase of 3.5% in assets and a mean decrease of 2.3% in equity. In addition, Pardo & Giner (2018) find capitalization of leases for the sampled firms results in a 2.31% increase in *Leverage*, a 1.02% increase in *Intensity of investment* and a 1.33% increase in *ROE*. However, some benchmarks show a negative change: a 5.37% decrease in *Debt quality*, a 6.56% decrease in *Non-current asset turnover* and a 2.15% decrease in *ROA*. Statistical significance was established using the non-parametric Wilcoxon test. Sensitivity analysis was performed for the discount rate to test the results of capitalizing operating

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[21] These refinements included the following:
  i.   estimation of FMLP between years 1 and 5 using a decreasing factor;
  ii. disaggregation of FMLP into five contract baskets with different remaining lifetimes and running the model for each, before aggregating the total numeric effect of capitalization;
  iii. usage of company-specific interest rates applied to pension and/or other provisions, as discount rate for capitalizing operating leases (Pardo & Giner report that they could not obtain the interest rates for five companies in their sample; for these companies they use the median rate within the sample) and,
  iv. in line with prior research, use a 50% ratio assumption for the ratio of the remaining to total life of operating leases.

leases by using a 5% and 10% interest rates and the heuristic factor method (Pardo & Giner, 2018). Agreeing with the trend shown by previous research, the authors suggest that the impact of capitalization would vary for firms operating in different industries. To illustrate, using the ratio of *EBITDA* over *Total assets*, the authors find retail goods firms were most affected and energy companies least affected (Pardo & Giner, 2018). Although the authors attempt to strengthen the robustness of their study by using multivariate regression analysis, they admit the sample of 20 companies is too small for a cross-industry analysis (Pardo & Giner, 2018). In conclusion, they find capitalization to have a significant effect on the financial metrics of businesses.

As discussed above, the literature review of the capitalization of operating leases shows that different authors focus on different aspects and areas of impact of capitalizing off-balance sheet operating leases. In addition, the approach to capitalization ranged from closely following the *Constructive Capitalization* method of Imhoff et al. (1991) to making substantial modifications to this method. Given there are no unanimous findings for the direction and strength of the effect of capitalizing operating leases on key financial ratios of businesses, a New Zealand-specific study seems justified.

2.4.3. Post IFRS - 16 professional publications

One of the most important publications from the non-academic field is the *Effects Analysis to IFRS 16* paper produced by the IASB. The standard-setter thoroughly discusses the background and purposes and explains the impending changes. The IASB indicates the existence of about US$3b in off-balance sheet commitments linked to operating leases. Therefore, the regulator estimates about half of IFRS or US GAAP reporting listed companies would be affected by the new standard. More importantly, the board predicts some industries will be affected more than others (IASB, 2016). In addition, the document provides a cost-benefit analysis that firms and their stakeholders face with implementation of IFRS 16. Table 2-7 summarises the costs and benefits of the implementation of IFRS 16 as discussed by the IASB in its *Effects Analysis* document.

Table 2-7 The costs and benefits of IFRS 16 as discussed by the IASB in the *Effects Analysis* paper (adapted from the IASB 2016, p. 5)

Costs (companies)	Benefits (users of financial statements)
Increase in the cost of borrowing for firms	For investors, reduction of the need to adjust the numbers reported on a lessee's balance sheet and income statement.
Risk of breaching debt covenants	For companies, improved quality of financial reporting through a reduction of the need to provide 'non-GAAP' information about leases.
Implementation costs	For the statement users, improved comparability of financial statements between companies that use credit to buy assets and companies that use leasing to acquire assets.
Ongoing costs	For market participants, the provision of transparent information about leases.
	Better capital allocation through improved credit and investment decision-making by reporting entities and investors.

Table 2-8 The impact of IFRS 16 on company financial metrics (from the IASB, 2016, pp. 53-54)

Metric	What it measures	The expected effect of IFRS 16
Leverage (gearing)	Long-term solvency	Increase
Current ratio	Liquidity	Decrease
Asset turnover	Profitability	Decrease
Interest cover	Long-term solvency	Depends
EBIT/Operating profit	Profitability	Increase
EBITDA	Profitability	Increase
EBITDAR	Profitability	No change
Profit or Loss	Profitability	Depends
EPS	Profitability	Depends
ROCE	Profitability	Depends
ROE	Profitability	Depends
Operating cash flow	Profitability	Increase
Net cash flow	Profitability and liquidity.	No change

The IASB study reviews the impact of IFRS 16 on the following features: effects on financial statements, effects on notes to financial statements, the impact on financial metrics and other effects. Thus, from the IASB's perspective, the new accounting standard impacts key financial metrics. Table 2-8 lists the effects of IFRS 16 on financial statements expected by the IASB, measured by a set of metrics chosen by the standard-setter. Such an assessment of the impact of IFRS 16 by the issuer serves as a benchmark for this study, because it allows us to compare New Zealand-specific effects with the outcomes perceived by the standard-setting board.

In February 2016, PricewaterhouseCoopers (PWC), in collaboration with the Rotterdam School of Management, presented a study about the impact of capitalization of operating leases, the process required under IFRS 16. The paper used a sample of year 2014 financial statements produced by 3199 publicly listed entities called *IFRS reporting companies*. This dataset was acquired from businesses operating in 51 countries (excludes the United States) across 20 main industries.

PWC communicated the following key findings, which are expressed in median numbers:

- firms' debt increases by 22%;
- firms' EBITDA increases by 13%;
- leverage increases from 2.03 to 2.14; and
- 53% of the companies would have to bear increased debt of over 25% (PWC, 2016).

However, the study showed the results vary substantially across different geographical regions. For example, for Australia and New Zealand, PWC expects a 10% median increase in *EBITDA*, but for Asia they forecast only a 4% median increase in this metric. In addition, PWC shows the impact of the new accounting standard differs across industries; they name six particular industries that would be most affected by the changes in accounting regulations:

- retail,
- airlines,
- orofessional services,
- health care,
- textiles and apparel,
- wholesale (PWC, 2016).

2.5. Observations on financial statements of NZX listed companies for financial years 2016 and 2017

Initial surveying (September-October 2017) of the financial reports of the NZX listed companies revealed the following:

- About half of the population reported operating leases.

- The number of total operating lease commitments reported by the NZX companies varied significantly (from under 1 million New Zealand dollars (NZD) to over 1 billion NZD).
- Not a single early adopter of NZ IFRS 16 was identified.
- Most companies reporting operating leases had yet to assess the full impact of NZ IFRS 16 on their financial statements.
- A number of prominent New Zealand companies already reported that the impact of NZ IFRS 16 would be significant or material for their business.

Table 2-9 shows the number of operating leases reported by well-known New Zealand firms. The list is not all inclusive but aims to indicate the importance of operating leases for the local economy.

Table 2-9 A list of New Zealand companies reporting a significant/material impact of NZ IFRS 16 on their financial statements (not all inclusive) (compiled by author)

Name	Gross commitments under operating leases (NZ$M)
Spark New Zealand Limited	419
Fletcher Building Group	799
Air New Zealand Limited	1 007
Chorus Limited	64
Mercury NZ Limited	110
Ebos Group Limited	155
Mainfreight Limited	431
Kathmandu Holdings Limited	224
PGG Wrightson Limited	116
Metro Performance Glass Limited	54

As can be seen, Table 2-9 lists a number of prominent entities reporting millions of NZD in off-balance sheet commitments related to operating leases. Chapter 4 further analyses the whole sample via descriptive statistics.

Chapter 3: Research Design and Methodology

This chapter explains the data collection and the methodology used in this study.

3.1. Data selection and data source

It is important to remember the requirements of the current accounting standard on leases (NZ IAS 17) demand the sampled companies report the following information:

1. Lease payments recognised as an expense on a straight-line basis (NZ IAS 17, par.33).

2. Future minimum lease payments for the following payments:

    i. not later than one year;

    ii. later than one year and not later than five years; and

    iii. later than five years (NZ IAS 17, par. 35a).

3. The total of future minimum sublease payments to be received at the end of the reporting period (Tier 1 only) (NZ IAS 17, par. 35b).

NZ IAS 17 requires companies to report the above information in notes to their annual financial statements. Needing to access the notes to the financial reports, this study used manual data entry. This involved screening and assessing the annual reports of NZX listed companies. As a result, this study uses operating leases-related information retrieved and recorded for every sampled listed company that reported the existence of operating leases. Most research in this field used sample-wide calculations and assumptions. Our company-specific capitalization approach adds to the study's reliability.

3.2. Sample size

The 167 NZX listed equities were obtained in September 2017 from the main board of the New Zealand stock exchange. Companies that did not report operating leases were excluded from the study. In addition, adopting the approach of Xu et al. (2017) and the IASB, banks, financial companies, funds and insurance firms were excluded from the sample because of the nature of their operations and industry regulations. The standard-setter in its *Effects Analysis* for IFRS 16 excluded banks and insurance companies because of the disproportionate size of their balance sheets compared with other firms. These exclusions result in 88 NZX listed companies that reported long-term operating leases in their financial statements for 2017. However, an additional 12 exclusions had to be made when the sampled firms did not report the following elements:

- an appropriate interest rate that could be used as a discount rate for the future lease payments;

- *Interest expense*; and

- *Interest-bearing liabilities*.

The latter two elements are required for calculating the discount rate, as suggested by Imhoff et al. (1997) and Xu et al. (2017), with the formula as follows:

(3.1) Discount rate = Interest expense/Interest-bearing debt

However, given that NZ IFRS 16 provides the firms an exemption for capitalization of *short-term* leases[22], to use the above formula we need to obtain a non-current *Interest-bearing debt*. Our analysis shows a number of New Zealand listed companies lack such an element on their balance sheets, hence the 12 exclusions included in our initial sample. Seven of these twelve companies did not report any non-current liabilities and the rest did not have the *Interest-bearing* elements required to enable us to use the formula (3.1). For example, **Moa Group Limited** (MOA), a brewing company, did not report any *Interest expense* for the period reviewed. Instead, it reported a net *Finance income* of $ 7 000, and a *Gross profit* of over $3 million. In addition, MOA's balance sheet has only two elements under *Non-current liabilities, Employee benefits* and *Deferred tax liabilities.* Based on the financial report of this company we conclude that, in 2017, MOA financed its operations and off-set its *Loss for the year* with equity financing instead of taking loans, because this entity issued new shares worth over $4 million. Similarly, **Pacific Edge Limited** (PEB), a cancer diagnostics company, did not report any *Interest expense* but showed an *Interest income* of $248 601. In addition, this entity did not report any *Non-current liabilities* for the year. Finally, PEB discloses that the company had no borrowing costs for the year ended 31 March 2017 and also for the prior reporting period. Like MOA, PEB used equity financing in the reporting period. A good illustration of the exclusions to our initial sample is **Briscoe Group Limited** (BGP), a well-known retailer. This company reported *Interest expense* for the review period, but the company disclosed in Note 5.1 in its annual report that it mainly uses borrowings that fall under the element of *Current liabilities.* For the financial year 2017, BGP reported only one element of balance sheet under *Non-current liabilities, Trade and other payables.* Although the company discloses that the interest payable for the used short-term borrowings it uses is based on a "BKBM rate", it did not explained how this rate is obtained. In addition, BGP mentions an unknown margin added to the base "BKBM" rate. Such a lack of numeric information and the short-term character of the borrowings seems to be ineadequate for a reliable establishment of the discount rate required for a prudent capitalization procedure. Such a capitalization procedure is needed given that, according to BGP's financial statements, its operating leases last beyond year 5. To complete exemplifying the exclusions to our initial sample, **Hallenstein Glasson Holdings Ltd** (HLG), another well-known retailer in New Zealand. For the 2017 financial year, this company did not report any *Non-current liabilities*. In addition, HLG

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[22] Short-term leases are defined as *"a lease that, at the commencement date, has a lease term of 12 months or less"* (NZ IFRS 16, Appendix A).

did not report any *Interest expense*, but showed *Finance income* for the year. Therefore, as can be seen from the above examples, there are New Zealand listed firms that did not disclose elements of financial statements that would allow us to use the formula (3.1) and calculate the required capitalization rate. As our intention is to avoid unsubstantiated sample-wide assumptions, these companies were therefore excluded from the final sample in the study. Table 3-1 details the final sample.

Table 3-1 The composition of the final sample for the study (compiled by author)

Category	Number of Equities on the Main Board of NZX
Initial sample size	167
Multiple equities of the same firm	-8
Annual report not available	-1
Banks, insurance companies, financial companies or funds.	-65
Newly listed company (revealed and screened during additional data check in August 2018)	+1
No operating leases reported by the companies	-6
No interest rate, interest expenses and interest-bearing debts information reported	-12
Final sample size	**76**

The study includes a sample of 45% of the NZX listed companies. The *de facto* size of the sample relative to the total population is larger because the Main Board of NZX shows listings for equities, not companies. According to Roscoe (1975), a successful study with experimental controls, such as matched pairs, can be conducted with a sample of 10-20 subjects. However, Roscoe (1975) recommends a sample size of 30 or more for *ex-post facto* research and for most experimental research. Gay & Diehl (1992) consider a sample of 10% of the population as the bare minimum or, if the population is small, 20% or more of the population is required for a descriptive study. A sample of at least 30 subjects is needed to establish a relationship in correlations study. For a causal-comparative and experimental study, the desired minimum is 30 subjects per group (Gay & Diehl, 1992). Quinlan (2011) suggests for a small population under 1000, a study would require a sample of about 30 %. Finally, a small sample is deemed appropriate for a small economy, when it is not

economically feasible to collect or analyse a large data sample (Isaac & Michael, 1995). From these perspectives, the sample of 76 listed firms from a population of 168 listed equities is considered sufficient for our study. In addition, compared with previous research on New Zealand, the sample size of this study is significantly larger than the 38 NZX listed firms used by Bennett & Bradbury (2003).

3.3. Requirements of NZ IFRS 16

NZ IFRS 16, paragraph 22, explains that lessees need to recognise two elements: a *right-of-use asset* and a *lease liability*. It is important to note that the regulator allows using NZ IFRS 16 for a *portfolio of leases* with similar characteristics if the entity reasonably expects that the effects on the financial statements of applying the standard to the portfolio would not differ materially from applying this accounting standard to the individual leases within that portfolio (NZ IFRS 16, par. B1). This means that entities would not be required to assess each lease contract individually; instead the capitalization technique could be applied to a group/portfolio of leases that possess similar characteristics. For example, if business has a fleet of leased corporate cars, NZ IFRS 16 permits the company to apply capitalization to the whole fleet (given the leasing contracts for these cars have similar characteristics).

NZ IFRS 16, paragraph C3, clarifies that an entity is *not required to reassess* whether a contract is, or contains, a lease at the date of initial application. XRB permits the application of NZ IFRS 16 to contracts that were previously identified as leases under NZ IAS 17 (*Leases)* and NZ IFRIC 4 (*Determining whether an arrangement contains a lease).*

Justification for the capitalization procedure used in this study lies in the fact that XRB specifies two ways that may be used in applying the new accounting standard:

   I.   retrospectively to each prior reporting period presented apply NZ IAS 8 *Accounting Policies, Changes in Accounting Estimates and Errors;* or

  II.   retrospectively with the cumulative effect of initially applying the standard recognised at the date of initial application (NZ IFRS 16, par. C5).

The latter condition relates to the nature of this study, when:

   a)   Financial statements prepared in accordance with the requirements of NZ IAS 17 were obtained.

   b)   The set of financial values that reflect the financial position and financial performance of the sampled firms were derived from these reports (*before capitalization* values).

   c)   The financial statements of the sampled companies were treated in accordance with the requirements of NZ IFRS 16, which involved capitalizing operating leases.

d) Another set of financial values had been obtained (*after capitalization* values).

e) The *before capitalization* ratios/metrics were compared with *after capitalization* ratios/metrics.

The above steps allow one to observe the differences in the financial position and financial performance of the companies. Such differences were attributed to the impact of implementing the requirements of the new accounting standard, NZ IFRS 16 *Leases*.

3.4. Financial metrics and ratios

Given the reviewed literature exhibited no uniform approach in using financial metrics and ratios to assess the impact of capitalization of operating leases, this study adopts the selection used by the IASB in its *Effects Analysis* for IFRS 16 (see Table 2-8). However, working with the actual financial statements of the sampled companies highlighted that some modifications were required in the selection. Thus, the *Operating cash flow* and *Net cash* flow metrics were excluded from the set because the reviewed financial reports did not contain a level of detail that would allow investigation of these particular effects of capitalization without making broad assumptions. This contradicts the study's intention to avoid making assumptions, where possible, and to use the sampled financial statements to the fullest.

It is important to mention that, at this stage, there is no way of reliably predicting how capitalization of operating leases affects current tax-related policies and practices. Therefore, for the purposes of this study, *Profit/loss before tax* was used as a metric and for calculation of the *Earnings per share* (EPS), instead of *Net Profit/loss* benchmark used by the IASB. This allowed isolation of the taxation effect, which could be the subject of a separate study.

As discussed in Section 3.1, the financial statements of the sampled listed companies were prepared in accordance with NZ IAS 17. This standard requires the companies to report:

1. Lease payments recognised as an expense on a straight-line basis (NZ IAS 17, par.33).

2. Future minimum lease payments for the following payments:

    i. not later than one year;

    ii. later than one year and not later than five years; and

    iii. later than five years (NZ IAS 17, par. 35a).

3. The total of future minimum sublease payments to be received at the end of the reporting period (Tier 1 only) (NZ IAS 17, par. 35b).

The available information does not allow one to distinguish whether the future minimum lease payment "*not later than one year*" is done for a long-term lease or for a short-term lease, unless an unsubstantiated assumption is made. In case it is for a short-term leasing arrangement, NZ IFRS 16

provides an exemption to capitalization for *short-term* leases, which are defined as *"a lease that, at the commencement date, has a lease term of 12 months or less"* (NZ IFRS 16, Appendix A). In addition, paragraph 6 of the NZ IFRS 16 standard directs lessees to recognise short-term leases as an expense; this leads to a potentially significant short-term effect of NZ IFRS 16 on rental expenses and *EBITDAR,* if firms have leases that expire within 12 months, from the moment the standard is effective. If it is for a long-term arrangement, it cannot be expensed but must be capitalized.

However, the standard-setter forecasts capitalization of operating leases results in no change to *EBITDAR*, since all lease-related expenses will be excluded when IFRS 16 is implemented. Such a difference in expectations for the impact of this accounting standard could have two major explanations: first, this study focuses on the effect of capitalization if NZ IFRS 16 were applied to financial statements of the sampled firms for financial year 2017. Hence, the time horizon of the study is only 12 months. Second, the IASB in its *Effects Analysis* admits that it had access to information supplied by the firms, whereas our study relies on only publicly available data. Table 4-7 lists a number of sampled companies reporting large payments within one year for commitments related to operating leases. However, there is no a reliable way to know how many leases within the lease portfolio of the companies would expire within 12 months and, thus, qualify for an exemption to capitalization. Such information is not required by NZ IAS 17, hence is not disclosed by the companies.

Given the literature review indicates *EBITDAR* is not used in prior academic studies, this benchmark is excluded from the set of metrics used in our analysis. The additions to the set of ratios and metrics adopted in this study are:

- *Total assets*;
- *Total liabilities*;
- *Current liabilities*; and
- *ROA*.

The first three metrics are not ratios but elements of financial statements that have been included in the set of financial metrics to assist in measuring the impact of the implementation of NZ IFRS 16 on the financial position (*balance sheet effect*) of the sampled firms. The justification for adding *ROA* to the list was its role as one of the most common measures of return. *ROA* was added to assess the effect of capitalization of off-balance sheet leases on the financial performance (*income sheet*) of the sampled companies. To further justify the above inclusion, the following studies use elements of assets and liabilities and/or the *ROA* metric in their analysis of the impact of capitalization on the financial statements of businesses: Imhoff et al. (1991, 1997); Beattie et al. (1998); Bennett &

Bradbury (1998, 2003); Durocher (2008); Fulbier et al. (2008); Branswijck et al. (2008); Fito et al. (2013); de Villiers & Middelberg (2013); Tai (2013); Wong & Joshi (2015); Ozturk & Sercemeli (2016); Sari et al. (2016); Xu et al. (2017); Morales-Diaz & Zamora-Ramirez (2018); and Pardo & Giner (2018).

Table 3-2 shows the refined set of metrics adapted from the IASB *Effects Analysis* report modified to serve the purposes of this study.

Table 3-2 The set of elements of financial statements and financial metrics/ratios used in this study (modified from Effects Analysis IFRS 16, IASB, 2016, pp. 53-54)

Elements of financial statements	Metric/Ratio	
Total assets	Leverage (gearing)	ROE
Total liabilities	Current ratio	Profit/loss before tax
Current liabilities	Asset turnover	ROA
	Interest cover	EBITDA
	EBIT/Operating profit	EPS
		ROCE

This set of metrics allows assessment of the effect of implementing the standard and allows a comparison with the effects perceived by the standard-setter in its *ex-ante* study.

3.5. Capitalization method with required modifications

Taking into account the requirements of NZ IFRS 16, capitalization is largely based on the method of *Constructive Capitalization* by Imhoff et al. (1991, 1997). The main benefit of this approach to the accounting treatment of off-balance sheet operating leases is that it complies with the requirements of NZ IFRS 16. In addition, as the literature review showed, since the 1991 *Constructive Capitalization* method has been adopted by most previous studies on capitalization of operating leases. This includes the most recent studies produced after the IFRS 16 announcement. The studies include Beattie et al. (1998); Bennett & Bradbury (1998, 2003); Goodacre (2003); Durocher (2008); Fulbier et al. (2008); Branswijck et al. (2011); De Villiers & Middelberg (2013); Fito et al. (2013); Tai (2013); Wong & Joshi (2015); Ozturk & Sercemeli (2016); Sari et al. (2016); Xu et al. (2017) and Pardo & Giner (2018). Morales-Diaz & Zamora-Ramirez (2018) is the exception; these researchers claim that they designed a new capitalization method.

Therefore, the following capitalization steps are undertaken in this study:

I.   determine the discount rate;

II.   estimate the lease liability via a calculation of the future lease payments;

III.   estimate the unrecorded assets using the ratio of assets to liabilities; and

IV.   adjust the Income statement.

It is important to note that the original capitalization method of Imhoff et al. (1991, 1997) went through a number of refinements and modifications by different researchers. This was necessary to suit the varying needs of different studies. Such changes mostly focus on the two fundamental assumptions of the *Constructive Capitalization* method:

1) Assumption 1 - obtain/calculate the needed discount rate; and

2) Assumption 2 - estimate the remaining life of operating lease(s).

Both assumptions are crucial for appropriate, prudent calculation of the lease-related liabilities and assets. This is further discussed in Section 4.4, where sensitivity analysis is performed for both assumptions.

3.5.1. Determination of the discount rate

NZ IFRS 16 explains that a lease liability should be measured at the **present value** of the outstanding lease payments. In addition, the lease payments themselves should be discounted using the **interest rate implicit in the lease,** if such a rate can be determined. Importantly, if the rate cannot be determined, the *lessee's incremental borrowing rate* should be used (NZ IFRS 16, par. 26).

The literature does not provide a uniform approach to finding a proper discount rate *(see Appendix 1 for the approaches used by 15 different studies)*. The existing methods can be categorized in two major ways:

i.   calculations/assumptions of a single rate for the whole sample; and

ii.   calculation of an individual rate for each company within the sample.

This study calculates an individual rate for each company. That approach avoids a broad generalization of discount rates made in prior studies. It seems that, if a study uses a single rate for discounting future operating lease payments, then it would be fair to say the authors consider the sampled companies have the same **interest rates implicit in the lease** and/or **incremental borrowing rates.** An analysis of the financial statements of the NZX listed companies shows this is not true for the sampled listed companies. In addition, Section 4.4 discusses interest rates in detail and demonstrates the sensitivity analysis used to check the robustness of the calculations. Appendix 7 lists the 76 individual discounting rates of the listed firms. The approach using individual discounting rates over a sample-wide rate was taken to add credibility and reliability to this study.

In compliance with NZ IFRS 16, it is important to know how XRB explains the **incremental borrowing rate:** "The rate of interest that a lessee would have to pay to borrow over a similar term, and with a similar security, the funds necessary to obtain an asset of a similar value to the right-of-use asset in a

similar economic environment." (NZ IFRS 16, Appendix A "Defined terms", p. 20). Therefore, a number of elements of financial statements had to be taken into account, for example:

- loans;
- financial leases; and
- bonds.

The reviewed financial statements reveal some challenges associated with differing reporting policies, varying volumes of operations and the different capital structures/financing policies of the sampled companies. Some firms did not disclose any interest rate for their debt and a number of businesses report a complex profile of numerous different loans, bonds, financial leases and overdraft facilities located in several countries/institutions. For example, for financial year 2017, Telstra Corporation Limited (TLS) reported the following debt profile:

- domestic borrowing;
- offshore borrowing;
- bank loans;
- bank overdraft;
- commercial papers; and
- financial leases.

Each financing facility had a different interest rate. In addition, some enterprises preferred not to show the interest rates for their debt, but disclose their risk management for interest rates with the help of interest rate swaps.

Therefore, referring to the actual data as reported by the sampled listed companies, the following rates of the firms were used in rank order:

a) weighted average rate for all reported debt, including financial leases, whenever they were disclosed;

b) the highest interest rate for debt, if reported and the weighted-average rate if it were not available (a conservative assumption was made that in case of unfavourable events the interest rate will change in the direction of an increase); or

c) the upper rate in the range of the current interest rate swaps if the top two were not disclosed.

Finally, where none of the above information was obtainable from the statements, the required discount rate was calculated by dividing *Interest expense* by *Interest-bearing debt*, as suggested by Imhoff et al. (1997) and Xu et al. (2017). The (3.1) formula was implemented:

(See Appendix 2 for illustrations of the decision-making for selecting the discount rate required for the process of capitalizing operating leases.)

To counter the assumptions made and to achieve a level of robustness for the statistical tests, this study uses a sensitivity analysis for the discount rates. This is discussed in Section 4.4.

3.5.2. Estimation of lease liability via a calculation of future lease payments

Referring to the Estimation of Lease Liability stage, under the current NZ IAS 17, companies are supposed to report future minimum lease payments for the following periods (see Table 3-3).

Table 3-3 The future minimum lease payments as required by NZ IAS 17, par. 35a (Compiled by author from NZ IAS 17)

Payment	Period of time for FMLP	Capitalization formula
$FMLP_1$	Not later than one year	Known
$FMLP_{2\ to\ 5}$	Later than one year and not later than five years	$FMLP_{2\ to\ 5}=\sum_{t=1}^{4}FMLP_1\ /\ (1+df)^{\ t}$
$FMLP_{5+}$	Later than five years	$FMLP_{5+}$

This study adopts the approach employed by Fulbier et al. (2008); de Villiers & Middelberg (2013); Fito et al. (2013) and Xu et al. (2017). These studies use the following formula:

$$(3.2)\ FMLP_{t+1}=FMLP_t\ *\ df$$

Where:

$FMLP_t$ is future minimum lease payments in year t;

$FMLP_{t+1}$ is future minimum lease payments in the year after; and

df is the decreasing factor.

This method considers $FMLP_2$, $FMLP_3$, $FMLP_4$ and $FMLP_5$ as functions of $FMLP_1$, which is known from the financial statements, because it is required by the current accounting regulations. Therefore, for periods greater than one year and no more than five years, the formula of annualised payments is:

$$FMLP_{2\ to\ 5}=FMLP_1*df^1+ FMLP_1*df^2* FMLP_1*df^3* FMLP_1*df^4$$

This is expressed as:

$$(3.3)\ FMLP_{2\ to\ 5}=\sum_{t=1}^{4}FMLP_1\ *\ df^{\ t}$$

Xu et al. (2017) follow the approach of Fulbier et al. (2008) but implement it using a slightly different method to establish the annual payment for $FMLP_{2\ to\ 5}$. Xu et al.'s (2017) study used a trial and error technique discounting lease payments by (1 +df). Hence, the formula for the required calculations was: $FMLP_{2\ to\ 5}=FMLP_1/(1+df)^1+ FMLP_1/(1+df)^2* FMLP_1/(1+df)^3* FMLP_1/(1+df)^4$.

This can be expressed as:

$$(3.4) \ FMLP_{2 \ to \ 5} = \sum_{t=1}^{4} FMLP_1 \ / \ (1+df)^t$$

Although the methods produce different decreasing factors, the annualised payments are identical. This study uses equation (3.4) in most cases, but in some cases it could not be calculated because of increasingly small values. In such cases, equations (3.3) was used.

For periods *more than five years,* the remaining life of the leases was found with the formula $FMLP_{5+}/FMLP_5$, used by Fulbier et al. (2008) and Fito et al. (2013). This led to the next step, which is the calculation of the future lease payments for the period after year 5 by disaggregating the reported (as NZ IAS 17 requires) $FMLP_5$ during the calculations with the above formula $FMLP_{5+}/FMLP_5$ for the period of unexpired life of the lease after Year 5. Such a calculation agrees with the original model of Imhoff et al. (1991, 1997). Xu et al. (2017) disagree with this solution and suggest using a decreasing factor as is done for the period $FMLP_{2 \ to \ 5.}$ This approach seems to be more justified than the assumption of equal payments after year 5. Hence, a decreasing factor, as suggested by Xu et al. (2017), was used for the payments of any remaining lease after year 5.

Finally, in organizing the calculations, the future minimum lease payments over the remaining life of leases is divided into five contract baskets. The discussed formulas are used on each basket and the results are summed and applied to the balance sheet. This is to take into account the effect of the different life times of leases within the portfolio of leases employed by a firm. In other words, such a model shows that leases could be expiring at different stages of the firm's life (Fulbier et al., 2008; Fito et al., 2013; Pardo & Giner, 2018).

An assumption was made that the difference between the outstanding FMLP in two consecutive years is the FMLP for the earlier year (Fulbier et al., 2008; Fito et al., 2013; Pardo & Giner, 2018). See *Appendix 3* for an illustration of the capitalization process modified from Fito et al. (2013). This is further discussed in Section 5.3.

A challenge to the data collection came from numerous firms voluntarily reporting additional periods for their future operating lease payments. For example, Fisher & Paykel Healthcare Corporation Limited, Turners Automotive Group Limited, The Colonial Motor Company Limited, Metro Performance Glass Limited reported future lease payments for the following periods:

- within 1 year,
- within 1 and 2 years,
- between 2 and 5 years, and
- over 5 years.

In such cases, an additional calculation was required to establish which payments were supposed to be for which future period. It is important to note that often it was not possible to determine these periods firmly from the statements because of the confusing wording of the disclosure notes.

In addition, the *five basket approach* in such a situation delivers negative values for year one. A situation when the difference between payments in Years 1 and 2 was negative could be explained by the fact that firms might have multiple lease contracts within their lease portfolio. Finally, the sampled companies might have different expiry terms for their leases. Here, absolute values were used to assess the changes in current liabilities.

3.5.3. Estimation of unrecorded assets using the ratio of assets to liabilities

As suggested by Imhoff et al. (1991, 1997) and used by subsequent studies, the unrecorded liabilities or off-balance assets are calculated with the help of the ratio of assets over liabilities. This is expressed as:

$$(3.5)\ PV_A/PV_L = RL/TL * (PV_{TL}/\ PV_{FLP})$$

Where:

PV_A is the present value of the unrecorded asset;

PV_L is the present value of unrecorded liability;

RL is remaining lease life;

TL is total lease life;

PV_{TL} is the present value of the total payments expected for the lease life; and

PV_{FLP} is the present value of the future lease payments.

Beattie et al. (1998) offer a similar but slightly different formula:

$$(3.6)\ PV_A/PV_L = RL/TL * (PVAF_{r\%,\ TL}/\ PVAF_{r\%,\ RL})$$

where $PVAF_{r\%}$ is the present value annuity factor. This study uses the formula (3.6) suggested by Beattie et al. (1998).

More importantly, RL/TL is a necessary piece of information required to perform the *Constructive Capitalization* of operating leases. Another assumption about the proportion of remaining lease life to total lease life had to be made. For example, Imhoff et al. (1991) assume that the break-even point *(50%)* occurs where the periodic capital leases expenses equal the periodic operating lease expenses. A number of studies have used the 50% of RL/TL assumption (Bennett & Bradbury, 2003; Fulbier et al. 2008; Fito et al. 2013.). However, this study adopts the approach of Durocher (2008) and Xu et al. (2017) who suggest another solution for determining **RL/TL** with the following formula:

$$(3.7)\ RL/TL = Accumulated\ Depreciation\ \%/Gross\ amount\ of\ PPE$$

Where the remaining life of leases equals 1 minus the obtained RL/TL ratio. This study uses the Durocher's (2008) and Xu et al.'s (2017) formula because it avoids assuming a sample-wide or uniform ratio of RL/TL (the remaining life of operating leases) used in previous studies.

When companies voluntarily reported information about the remaining/total lease life, such information was used in the priority order. In addition, following the method of Xu et al. (2017) allows one to obtain individual RL/TL ratios for every company in the sample. This seems to be a better approach for a rigorous study than an assumption of a single RL/TL proportion for the whole sample. Finally, for robustness, this study uses a sensitivity analysis for the calculated individual values of remaining life of off-balance sheet operating leases. This is discussed in Section 4.4.

3.6. Methodology

This study largely uses descriptive statistics, such as mean, median, standard deviation, minimum and maximum values. These statistics provide evidence on the following aspects:

a) The significance of the impact of NZ IFRS 16 on key elements of financial statements and the values of financial metrics/ratios.

b) The variability of the impact of NZ IFRS 16 on the ratios/metrics of financial position and financial performance of the firms within the overall study sample.

First, the findings of this study were tabulated and explained with the descriptive statistics. Secondly, based on the literature review of the effects of capitalizing operating leases, the following statistical analyses were used. The statistical significance of the results was established with a combination of instruments:

i. A parametric correlation test to test the strength of the relationships between pre- and post-capitalization metrics.

ii. Non-parametric correlation tests to ensure and verify the strength of the relationships between the matched pairs of pre- and post-capitalization metrics and ratios.

iii. A parametric test to check the change in the **mean values** of financial metrics and ratios before and after capitalization.

iv. A test for the normality and the characteristics of the shape of the data to assist in the choice of the non-parametric test.

v. A non-parametric test to establish the changes in the **median values** of the variables as a result of capitalization.

Such a combination of statistical methods provides a high level of robustness for this study's results. The tests for correlation between pre- and post-capitalization values are the same as those used by Bennett & Bradbury (2003), Goodacre (2003) and Durocher (2008). In addition, the following studies

used the parametric *t*-test in combination with a non-parametric test: Beattie et al. (1998); Goodacre (2003); Durocher (2008); Fulbier (2008); Xu et al. (2017) and Morales-Diaz & Zamora-Ramirez (2018). This is done to deal with the known difference of distribution of financial ratios from the normal distribution with the last three studies identifying such a problem directly. This is further discussed in Subsection 4.3.1.

3.6.1. Correlation, normality and symmetry testing

To test the strength of the relationships between before and after capitalization values, this study uses two correlation tests: a parametric Pearson correlation test and the non-parametric Spearman Rho test. Such a combination seems to be sufficient to ensure the robustness level of the results. As discussed in Section 3.6, correlation tests have been used in previous studies related to the capitalization of operating leases (Bennett & Bradbury, 2003; Goodacre, 2003; Durocher, 2008). Abdel-khalik & Ajinkya (1979) note a justifiable use of matching data (pre- and post-capitalization values in this study) requires correlation test(s) to be passed.

In addition, given the study focuses on the impact of capitalization under the requirements of NZ IFRS 16, the Anderson-Darling test is used for the **Difference** resulting from subtracting the values before capitalization from the values after operating leases have been capitalized. That decision was made because the study uses a paired sample *t*-test, which is equivalent to a one sample *t*-test for the difference in the means of the matched pairs of values. The null hypothesis of this *t*-test is that the difference between the test *mean* (0.0) and the actual *mean* of the **Difference** is zero.

Finally, a test for symmetry is performed for the following reasons:
- a better understanding of the shape of the data; and
- the decision for the choice of a non-parametric test.

3.6.2. Parametric testing

Following the literature review, this study uses the paired sample *t-test* as a parametric test. This was chosen because the study uses a single sample of financial statements. The sample was subject to both accounting treatments: *Treatment 1*, in compliance with the requirements of NZ IAS 17 and *Treatment 2*, in compliance with the requirements of NZ IFRS 16. Therefore, the *t*-test falls under the description of a *t*-test for two related samples (Roscoe, 1975).

Roscoe (1975) also explains that in a *repeated measurements design* an experimenter may use an experimental group as a control group. In such a study, the criterion measured (the elements of financial statements and metrics/ratios) would be administered to the sample of the NZX listed companies before and after the experimental treatment, which is the capitalization of operating

leases in the context of this study. Figure 3-1 illustrates the format of the study, which is an experimental study via repeated measurement.
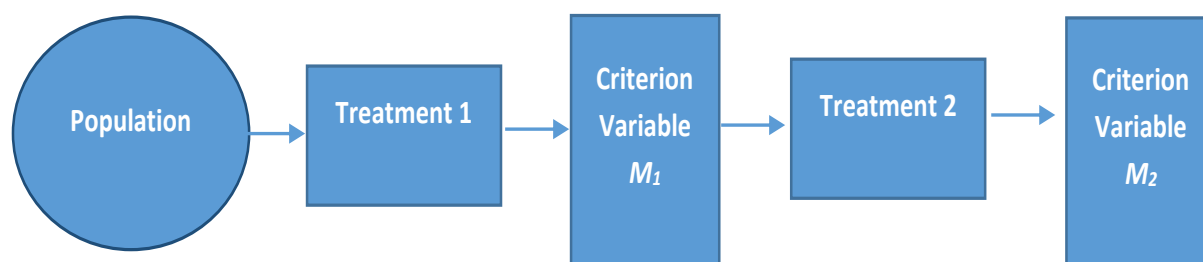
Figure 3-1 A repeated measurement design for experimental research (adapted from Roscoe, 1975, p. 225).

Where:

Population is the sample of the NZX listed companies;

Treatment 1 meets the requirements of NZ IAS 17 by the firms;

Criterion variable M_1 comprises the elements of the financial statements, metrics, and ratios before capitalization;

Treatment 2 meets the requirements of NZ IFRS 16 applied by the study; and

Criterion variable M_2 comprises the elements of the financial statements, metrics, and ratios after capitalization.

3.6.3. Non-parametric testing

Although Anderson, Sweeney & Williams (2012) claim that there is evidence that the *t* distribution can be effectively applied when data do not follow a normal distribution, it seemed important to follow the approach taken by previous studies and run an additional non-parametric test. Given the Wilcoxon signed rank test relies on symmetry of the data, this test was considered unsuitable for the purposes of this study. Therefore, following Anderson et al. (2012), the Sign test was chosen because that statistical test does not rely on any assumption about the distribution of the population. Consequently, the difference in the median values of *before* and *after capitalization* was obtained and tested against a *test median* of 0.0.

Chapter 4: Results and Discussion

4.1. Materiality of the effect of NZ IFRS 16

To summarise the results of this study, it is important to provide an answer to the question whether the impact of implementing NZ IFRS 16 would be **material** to the financial position and financial performance of the sampled companies. Borrowing from the concept of materiality, XRB explains 'material' means it could **"influence the economic decisions that users make on the basis of the financial statements"** (XRB For-profit Standards Glossary 2019, p. 21)[23]. In addition, XRB clarifies that materiality depends on the size and nature of the items or a combination of both (XRB *For-profit Standards Glossary*, 2019). However, the XRB does not specify quantitative thresholds for the level of materiality. Looking further at the use of materiality, it is explained that this concept is used "in planning and preparation for an audit of financial statements" and is determined by applying a percentage to a benchmark, where the size of the percentage requires professional judgement (International Standard on Auditing (New Zealand) 320, par. 1, p. 5; par. A4 and par. A8).[24]

More importantly, this is clarified as "although financial reporting frameworks may discuss materiality in different terms, they generally explain that misstatements, including omissions, are **considered to be material if** they, individually or in the aggregate, **could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements**" (International Standard on Auditing (New Zealand) 320, par. 2, part 1). Therefore, we can infer that both general reporting and auditing profession are concerned about influence of material items of information on decisions of the users of financial statements.

Elements of the materiality concept have been used already in prior research devoted to the accounting treatment of off-balance sheet operating leases, i.e., Imhoff et al. (1991; 1997), Goodacre (2003), Durocher (2008), Wong & Joshi (2015) and the IASB (2016)[25]. However, none of these studies offers a list of quantitative materiality benchmarks and corresponding percentage thresholds; this study refers to the study by Eilifsen & Messier (2015), which is reviewed in Section 4. Finally, the review of the 2017 financial statements of the sampled listed companies shows that some companies already use materiality in assessing the impact of NZ IFRS 16 on their financial

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[23] The author is aware that, in December 2018, XRB amended the definition of materiality, however this change will be effective from 2020. Hence, this study uses the current definition of materiality.
[24] Only the general context of auditing materiality is meant and referenced here without taking into account the specifics of the use of this concept by auditing practitioners.
[25] For example, the IASB links the effect of the IFRS 16 on balance sheets of the firms with the presence of material off-balance sheet leases.

statements. For example, Synlait Milk Limited expects that the NZ IFRS 16 standard would unlikely have a material impact on the group's financial statements; Chorus Limited reports that the effect of NZ IFRS 16 was expected to be material (greater than $20 million) given the intensive nature of the company's assets; Michael Hill International reports that the group has not assessed the potential financial impact of the changes in accounting for leases, but expected it to have a material impact on the group's financial statements; and Telstra Corporation discloses that the company expected AASB 16 (Australian version of IFRS 16) to have a material impact because it has a significant number of long-term non-cancellable property leases used for office buildings and network sites.

Eilifsen & Messier (2015) review the use of materiality by the eight largest accounting firms in the United States. Their study identifies the following quantitative benchmarks and percentages used by most firms and are applicable to this study (see Table 4-1).

Table 4-1 The quantitative benchmarks and percentages used by the largest US public accounting firms (not all-inclusive) (modified from Elifsen & Messier, 2015, p. 11, p. 13)

Quantitative benchmark	Range of percentages used
Profit/loss before tax	3%-10%
Total assets	0.25%-2%
Net assets	0.5%-10%
Equity	1%-10%

*Note: for the purposes of this study Net assets = Equity, since it is not clear from Elifsen & Messier (2015) what the difference is in calculating these two benchmarks.

From this perspective, the results summarised in Table 4-2 show that capitalization of operating leases under the requirements of NZ IFRS 16 would produce a material impact on the *Profit before tax* and *Total assets* of the sampled listed companies. The effect on *Equity* can be seen as non-material, since it barely exceeded the lower range of the percentages used for this metric. Table 4-2 lists the quantitative information for these observations.

Table 4-2 The impact of NZ IFRS 16 on the quantitative benchmarks of materiality (based on Elifsen & Messier) of the sampled companies

Item	Median change
Profit before tax	11.35%
Total assets	4.23%
Equity	-1.02%

Discussion of the impact of implementing NZ IFRS 16 is further organised by dividing the analysis into two parts:

- descriptive statistics; and
- statistical analysis.

In addition, when possible, an attempt is made to compare the findings with the analysis by the IASB and with the results in studies published after January 2016.

4.2. Descriptive statistics and discussion

The descriptive statistics use mean, median, standard deviation, maximum and minimum. These statistics were used to describe the effects of capitalizing operating leases on the financial position and financial performance of the sampled firms. Following the approach by the IASB in its *Effects Analysis* of IFRS 16, this study disaggregates the impact of implementation of the new accounting standard into three broad categories:

- *liquidity* (balance sheet effect);
- *long-term solvency* (balance sheet effect and income statement effect); and
- *profitability* (income statement effect).

4.2.1. Elements of the balance sheet (financial position)

Table 4-3 reports the impact of *Constructive Capitalization* on the elements of financial statements.

Table 4-3 The percentage change in the elements of financial statements of the sampled listed companies because of the capitalization of operating leases

Element of financial statement	Mean	Median	Standard deviation	Max.	Min.
Total assets (TA)	8.75%	4.23%	11.08%	44.56%	0.06%
Total liabilities (TL)	24.82%	12.19%	34.60%	175.42%	0.09%
Current liabilities (CL)	3.21%	1.24%	5.88%	39.02%	0.01%

From Table 4-3, it is clear that capitalization of operating leases results in a positive change in the assets and liabilities of the sampled listed companies. The positive change is explained by the nature of capitalization, which is the process of off-balance sheet operating leases being recorded on the balance sheets of companies. This results in growth of lease-related assets and liabilities. The difference between the *mean* and *median* metrics indicates the dissimilarity in the strength of the impact of capitalizing operating leases on firms' balance sheets. This can also be seen from the standard deviation and from the distance between the maximum and the minimum percentage changes. The *standard deviation* values in Table 4-3 show that the impact of capitalization on the elements of financial statements varies within the sampled companies.

To illustrate the changes in *Total assets* and *Total liabilities,* among the most affected are:

- **The Warehouse Group Limited** (WHS) with a 44.56% increase in *Total assets* and 94.02% increase in *Total liabilities*;

- **Evolve Education Group Limited** (EVO) with a 38.22% increase in *Total assets* and 175.42% increase in *Total liabilities*;

- **Kathmandu Holdings Limited** (KMD) with a 37.96% increase in *Total assets* and 159.82% increase in *Total liabilities*;

- **Restaurant Brands New Zealand Limited** (RBD) with a 27.73% increase in *Total assets* and 89.71% increase in *Total liabilities*; and

- **Scales Corporation Limited** (SCL) with a 30.45% increase in *Total assets* and 90.93% increase in *Total liabilities*.

The smallest changes in *Total assets* and *Total liabilities* are:

- **Ryman Healthcare Limited** (RYM) with a 0.06% increase in *Total assets* and 0.09% increase in *Total liabilities;*

- **Metlifecare Limited** (MET) with a 0.07% increase in *Total assets* and 0.15% increase in *Total liabilities;*

- **Tilt Renewables Limited** (TLT) with a 0.10% increase in *Total assets* and 0.16% increase in *Total liabilities;*

- **Synlait Milk Limited** (SML) with a 0.27% increase in *Total assets* and 0.56% increase in *Total liabilities;*

- **Contact Energy Limited** (CEN) with a 0.28% increase in *Total assets* and 0.60% increase in *Total liabilities;* and

- **Vector Limited** (VCT) with a 0.31% increase in *Total assets* and 0.60% increase in *Total liabilities.*

Attempts to explain such differences in response to the impact of capitalization have been made in prior empirical studies. Imhoff et al. (1991) differentiate 'high' and 'low' lessees, which were firms of a similar size, in terms of total assets, but different in the use of operating leases. The difference in the volume/size of off-balance sheet operating leases leads to differences in the impact of capitalization of these operating leases. Morales-Diaz & Zamora-Ramirez (2018) use a *'Lease intensity'* approach to examine the ratio of *Lease expense* and *Total liabilities* of the sampled firms.

Table 4-4 demonstrates an attempt to use both above approaches to see the differences in the use of operating leases as a financing option. *Lease use* and/or *Lease intensity* could be (a) prime factor(s) that led to variability in the strength of the effect of NZ IFRS 16. In Table 4-4:
- *Lease use* was obtained by dividing the total future operating lease payments (FLP) reported by the sampled firms by the amount of their total assets (TA).

- *Lease intensity* was obtained by dividing lease expenses (LE) of the sampled companies by the amount of their total liabilities (TL).

As can be seen from the table, there were noticeable differences in the ratios of *Lease use* and *Lease intensity* between the listed companies that were the most and least affected by capitalization of operating leases. It is important to note that there was a challenge in the adoption of the *Lease intensity* metric for this study. Analysis of the financial statements of the sampled listed companies revealed that some firms had been disclosing alternative elements of reporting to *lease expense* or reported *lease expense* combined with other elements. To illustrate, *lease expense* was reported as:

Table 4-4 The differences in *Lease use* and *Lease intensity* between the most and the least affected sampled listed firms

Firm	Total assets (TA)	Total liabilities (TL)	Total operating lease commitments (FLP)	Lease expense (LE)	**Lease use (FLP/TA)**	**Lease intensity (LE/TL)**
WHS	$1,113,852	$627,463	$739,327	$124,150	**66.4%**	**0.1979**
EVO	$224,722	$56,051	$133,683	$18,600	**59.5%**	**0.3318**
KMD	$439,067	$111,967	$224,196	$62,205	**51.1%**	**0.5556**
RBD	$302,387	$110,328	$124,818	$27,054	**41.3%**	**0.2452**
SCL	$342,506	$120,589	$128,450	$18,415	**37.5%**	**0.1527**
RYM	$4,944,819	$3,292,728	$3,374	$1,196	**0.07%**	**0.0004**
MET	$2,960,592	$1,590,404	$2,823	$551	**0.10%**	**0.0003**
TLT	$1,293,086	$773,658	$1,508	$61	**0.12%**	**0.0001**
SML	$753,625	$360,541	$2,166	$541	**0.29%**	**0.0015**
CEN	$5,429,000	$2,654,000	$20,000	$5,000	**0.37%**	**0.0019**
VCT	$5,574,596	$3,126,258	$24,368	$5,018	**0.44%**	**0.0016**

a. '*Rental and lease expense'* by Fisher & Paykel Healthcare Corporation Limited (FPH) and RYM.
b. Included in '*Other expenses'* by Meridian Energy Limited (MEL) and Mercury NZ Limited (MCY).
c. Included in '*Accommodation costs'* by Spark New Zealand Limited (SPK).
d. Could not be located directly in the annual report of Fletcher Building Limited (FBU).

Therefore, whenever a firm did not report its *lease expense* as a separate element, this study uses operating lease payments for the period *'not later than one year'* reported in the notes to financial statements for year 2016, under the requirements of NZ IAS 17 *Leases*.

In Table 4-4, the contrast in the strength of the effect of capitalization on *Total assets* and *Total liabilities* could be explained simply by the reliance of some companies on operating leases as a way to finance their operations. Thus, comparing the size of these elements with the size of *Total operating lease commitments* (FLP), WHS, in the notes to its financial statements, reports operating lease commitments of $739,327 in '000s', which is larger than the Total on-balance sheet liabilities of $627,463 in '000s'. Other examples include EVO and KMD with their off-balance sheet operating lease commitments equal to 239% and 200% of their on-balance sheet total liabilities. Whereas, in the sample there were companies that had low reliance on operating leases as a way to finance their operations, e.g., RYM reported operating lease commitments equal to 0.1% of its *Total liabilities*; and SML reported operating lease commitments of less than 1% of its *Total liabilities*.

As the literature review demonstrated, the *Effects analysis* for IFRS 16, released by the IASB, shows that the standard-setter expected implementation of IFRS 16 to result in the following effects on firms' balance sheets:

- *Lease assets* increasing;
- *Financial liabilities* increasing; and
- *Equity* decreasing.

In addition, the *ex-ante* analysis of the IFRS 16 standard by the IASB explained and quantified such impacts. Table 4-5 summarises the numbers in millions of US$.

Table 4-5 The proportion of total assets to future payments for off-balance sheet leases (modified from IASB, 2016, p. 16)

Number of companies	Total assets (TA)	Future payments for off balance sheet leases (FLP)	Lease use (FLP/TA)
1,022	30,943,502	2,195,510	7.1%

A comparison of the *Lease use* ratio values of the sampled listed companies with the ratio reported by the IASB shows that there are NZX listed companies with substantially different levels of reliance on off-balance sheet operating leases. Therefore, though the direction of the change to *Total assets* and *Total liabilities* is the same, the size of the effect varies depending on the *Lease use* and *Lease intensity* metrics of individual businesses*.*

Xu et al. (2017) report that the capitalization of operating leases of a sample of Australian listed firms increased the amount of *Total assets* by 4.2% and *Total liabilities* by 8.82%. Pardo & Giner (2018), using a sample of companies from the Spanish Exchange Index 35 (IBEX 35), find capitalization of the operating leases results in a mean increase of 3.5% in *Total assets* and a mean increase of 7% in *Total liabilities* (the median values were smaller; 1.3% growth and 2.2% growth,

respectively). Morales-Diaz & Zamora-Ramirez (2018) published a study based on a sample of 646 European listed companies. The capitalization method, developed by the authors, results in a mean increase of 9.96% in *Total assets* and a mean increase of 21.4% in *Total liabilities*. Thus, the results of this study are consistent with the trends highlighted in recent publications.

4.2.2. Liquidity and long-term solvency ratios.

Table 4-6 shows the effect of capitalizing operating leases in accordance with the requirements of NZ IFRS 16 on the financial position of the firms. The financial position of the sampled listed entities is measured by the *Current ratio* that depicts liquidity and by the *Leverage (gearing)* and *Interest cover* ratios that depict long-term solvency*.*

Table 4-6 Changes in the ratios of liquidity and long-term solvency after capitalization of operating leases for a sample of New Zealand listed companies

Financial metric of a balance sheet	Mean	Median	Standard deviation	Max.	Min.
Current ratio	-2.86%	-1.22%	4.59%	-0.01%	-28.07%
Leverage (gearing)	29.82%	15.79%	41.06%	197.33%	0.09%
Interest cover	24.49%	7.87%%	83.22%	712.04%	-2.28%

Note: Positive changes have no sign in front of them, negative changes have '-'in front of the values.

Given the IASB and our study measure *Liquidity* with the *Current ratio*, which is calculated as *Current assets/Current liabilities*, in the New Zealand context, the *Liquidity* of a business can be linked to part (a) of the solvency test: **the company is able to pay its debts as they become due in the normal course of business** (Companies Act 1993, s4, par.1). The law says that the companies must satisfy the solvency test in the following cases:

1. redemption of shares;
2. assistance in the purchase of its own shares; and
3. authorising a distribution of dividend (Companies Act 1993, par. 70, 77 and 108).

The results of capitalization of operating leases performed for the sampled companies reveal that the overall effect on *Current ratio* is negative. Table 4-6 shows that the standard deviation, maximum and minimum values indicate a variance in the results for the changes in *Current ratio* of the sampled listed firms, however this ratio is relatively less affected by capitalization than the numeric effects depicted for *Leverage and Interest cover* benchmarks. This could be explained by differences in length of the operating lease commitments of the companies. Table 4-7 illustrates the reasons for such a proposition; it shows the data for the companies that experienced different changes in their current ratios.

As it can be seen from the table, multiple variables could be affecting the direction and the strength of the impact on *Current ratio*. Among these variables are:

- the profile of future lease-related outflows from the business;
- the length of remaining lease term;
- the ratio of remaining lease life to total lease life (RL/TL);
- the reported volume of *Current assets* and *Current liabilities*; and
- values of *Current ratio* before capitalization of operating leases.

Table 4-7 An illustration of the contrast in the impact of capitalization on the current ratios of the sampled companies

Code	Name	Current ratio	FLP	FLP1	FLP1/ FLP	RL	Current assets (CA)	Current liab. (CL)	FLP1/CL	FLP1/CA
KMD	Kathmandu Holdings	**-28.07%**	$224,196	$55,089	25%	0.5	$99,027	$67,244	**82%**	**56%**
DGL	Delegat Group	**-19.87%**	$87,019	$13,689	16%	0.22	$175,933	$34,327	**40%**	**8%**
WHS	The Warehouse	**-14.02%**	$739,327	$120,363	16%	0.36	$692,499	$446,125	**27%**	**17%**
MPG	Metro Perf. Glass	**-13.25%**	$54,392	$8,930	16%	0.23	$69,590	$35,917	**25%**	**13%**
MHJ	Michael Hill Intern.	**-10.18%**	$158,767	$42,784	27%	0.53	$238,581	$79,653	**54%**	**18%**
CVT	Comvita Limited	**-8.99%**	$7,994	$4,640	58%	0.5	$155,878	$25,961	**18%**	**3%**
PCT	Precinct Properties	**-0.01%**	$40,800	$1,200	3%	0.98	$15,100	$72,500	**2%**	**8%**
MET	Metlifecare Limited	**-0.01%**	$2,823	$477	17%	0.64	$118,041	$154,608	**0.3%**	**0.4%**
TLT	Tilt Renewables	**-0.02%**	$1,508	$331	22%	0.99	$46,838	$59,432	**1%**	**1%**
SUM	Summerset Group	**-0.03%**	$12,802	$1,290	10%	0.94	$34,175	$117,018	**1%**	**4%**
TPW	Trustpower Limited	**-0.04%**	$37,780	$2,944	8%	0.95	$161,114	$246,176	**1%**	**2%**
RYM	Ryman Healthcare	**-0.05%**	$3,374	$1,041	31%	0.95	$261,498	$439,780	**0.2%**	**0.4%**

Where:

FLP is the total operating lease commitments;
FLP1 is the future operating lease payment within one year; and
RL is the remaining operating lease life.

In Table 4-7, the companies that had the most negative impact of capitalization on their ratio recorded significant FLP1 relative to their *Current assets* and *Current liabilities* depicted in the last two columns. This means these companies will face substantial outflows in the form of lease payments within the first year, which has obvious adverse impact on the *Current* ratios of the affected firms. In addition, the companies that experienced the stronger effect of NZ IFRS 16 reported RL at a noticeably lower level than the companies that had their *Current* ratio affected less. Therefore, implementation of NZ IFRS 16 could result in a further decrease in this liquidity benchmark for a number of firms. This could increase the risk of failing part of the solvency test, i.e.,

the ability of firms to pay their debts as they become due in the normal course of operations. The study results are consistent with the effect on *Current ratio* predicted by the IASB, which forecast a decrease in this metric with the following explanation: *"Decrease because current lease liabilities increase while current assets do not"* (IASB, 2016, p. 53).

According to the IASB, the *Leverage (gearing)* and *Interest cover* metrics aim to measure long-term solvency (IASB, 2016). Given the standard setter calculates *Leverage (gearing)* as *Total liabilities/Equity,* in the New Zealand context, long-term solvency can be linked to part (b) of the solvency test: **the value of the company's assets is greater than the value of its liabilities, including contingent liabilities** (Companies Act 1993, s4, par. 1). As discussed earlier in this section, this test can be seen as crucial for local businesses. For example, the Institute of Directors and FMA explain the solvency test needs to be satisfied by the companies before certain transactions and distributions to the shareholders (New Zealand Institute of Directors & FMA, 2018).

The results in Table 4-3 show capitalizing operating leases can have a direct impact on the solvency test because this process causes greater increases in *Total liabilities* than the corresponding growth in *Total assets.* In addition, as illustrated in Table 4-6, if NZ IFRS 16 had been implemented for financial year 2017, it would have had a significant impact on *Leverage (gearing)* with a median increase of 15.79% and on *Interest cover* with a median increase of 6.32%. The former can be explained by the relatively large size of off-balance sheet operating leases, which would affect the numerator of the *Leverage/gearing* ratio. The latter could be the result of the post-capitalization decrease in the *Interest expense*, which is the denominator of the *Interest cover* ratio.

Table 4-8 shows businesses that had their gearing the most and the least affected by capitalization. The last column (*FLP/TL*) shows the ratio of the total operating lease commitments reported by the sampled companies over their *Total liabilities*. Like *Liquidity*, it can be argued that companies that had large off-balance sheet commitments would experience a major increase in their *Leverage*. This is because companies with a relatively large proportion of operating lease commitments to total liabilities (*FLP/TL* column) would feel a larger impact from capitalization of operating leases. This happens because off-balance sheet operating leases are transforming into on-balance sheet liabilities and assets, where *Total liabilities* will be the numerator of the *Leverage/gearing* ratio. The denominator of the leverage ratio is *Equity*, which, as illustrated by Table 4-2, would be

Table 4-8 An illustration of companies in the sample whose leverage/gearing was most and least affected by capitalization of operating leases

Code	Name	Leverage/gearing change	Total liabilities (TL)	Equity	Total operating lease commitments (FLP)	FLP/TL
EVO	Evolve Education Group	197.33%	$56,051	$168,671	$133,683	**239%**
KMD	Kathmandu Holdings	169.96%	$111,967	$327,100	$224,196	**200%**
WHS	The Warehouse Group	140.25%	$627,463	$486,389	$739,327	**118%**
GXH	Green Cross Health Limited	114.68%	$132,981	$112,230	$115,020	**86%**
RBD	Restaurant Brands	105.94%	$110,328	$160,000	$124,818	**113%**
SEA	SeaDragon Limited	95.87%	$2,773	$16,742	$3,738	**135%**
SCL	Scales Corporation Limited	95.66%	$120,589	$221,917	$128,450	**107%**
MHJ	Michael Hill International	94.47%	$186,939	$202,183	$158,767	**85%**
RYM	Ryman Healthcare Limited	0.09%	$3,292,728	$1,652,091	$3,374	**0.10%**
TLT	Tilt Renewables Limited	0.16%	$773,658	$519,428	$1,508	**0.19%**
MET	Metlifecare Limited	0.16%	$1,590,404	$1,370,188	$2,823	**0.18%**
ARV	Arvida Group Limited	0.55%	$423,350	$371,552	$2,740	**1%**
SML	Synlait Milk Limited (NS)	0.56%	$360,541	$393,084	$2,166	**0.60%**
NZR	The New Zealand Refining	0.61%	$539,950	$792,775	$3,625	**1%**
CEN	Contact Energy Limited	0.63%	$2,654,000	$2,775,000	$20,000	**0.75%**
VCT	Vector Limited	0.65%	$3,126,258	$2,448,338	$24,368	**0.78%**

significantly less affected by capitalization of operating leases (with a median decrease in this element of about 1%). Therefore, the ratio of *long-term solvency* changes positively because of the larger increase in the numerator and the smaller decrease in the denominator.

For the *Leverage (gearing)* effect, the study's findings are consistent with the analysis by the IASB. For the *Interest cover*, the standard-setter does not specify the expected impact and considers it to depend on the characteristics of the lease portfolio of the business (IASB, 2016). For Australia and New Zealand, PWC (2016) reports implementation of IFRS 16 resulting in a median increase of 16.3% in *Leverage* and median decrease in *Solvency* of 7.5%. Xu et al. (2017) find adoption of the new accounting standard results in a 22.66% increase in *Gearing*, a 178.89% decrease in the *Interest cover* and 9.76% decrease in the *Asset turnover* metric. Finally, Pardo & Giner (2018) report adoption of IFRS 16 results in a median increase of 2.31% in *Gearing/Leverage*, a median decrease of 0.65% in *Solvency (current ratio)* and a median decrease of 6.56% in *Non-current asset turnover*. Morales-Diaz & Zamora-Ramirez (2018) argue that capitalization of operating leases, based on their method, leads to a 17.3% increase in *Leverage.* Therefore, it can be concluded that the study's findings are consistent with the most recent publications devoted to the impact of the new accounting standard.

4.2.3. Profitability metrics (financial performance)

Tables 4-9 and 4-10 show the effect of capitalizing operating leases on the financial performance of the sampled listed companies.

Table 4-9 The descriptive statistics for changes in the financial performance ratios/metrics of the sampled New Zealand listed companies after capitalization of operating leases

Financial metric of profitability	Mean	Median	Standard deviation	Max.	Min.
Asset turnover	-7.23%	-4.05%	8.15%	-0.06%	-30.82%
EBIT (Operating profit)	23.80%	9.87%	45.47%	367.90%	-1.10%
EBITDA	26.27%	8.88%	84.91%	725.76%	-0.63%
Profit before taxation	31.69%	11.35%	81.79%	694.98%	-1.57%

Table 4-9 shows the *Asset turnover* benchmark demonstrates the post-capitalization effect in a direction different from the rest of the metrics of profitability. Such behaviour of this metric is consistent with the analysis by the IASB, which expects *Asset turnover* to decrease.

Although the IASB sets *EBIT* to be equal to the operating profit using this ratio (as *'EBIT (Operating profit)'*), it acknowledges there are different methods of calculating *EBIT* (IASB, 2016). Therefore, the manual data collection for this study brought a challenge to obtain the ratio from the statements of the sampled companies. Some firms had different ways of calculating this metric and some reported the *EBIT* value differently/separately from the *Operating profit*. In addition, a number of businesses did not use *EBIT* (it is not compulsory), but used alternative elements. Therefore, whenever companies did not report *EBIT*, this study used *EBIT* as defined by the Financial Markets Authority New Zealand (FMA) in its guidance note "Disclosing non-GAAP financial information" (FMA, 2017, p. 14), which considers *EBIT* as – *Net profit after tax plus interest and tax.*

The standard deviation values in Table 4-9 show significant variability in the effect of NZ IFRS 16 on the profitability ratios. In this light, one can agree with the IASB, which links the strength of the effect of capitalization on *EBIT* to the following factors:

1) the significance of leasing to the firm;
2) the length of the leases; and
3) the discount rates applied to capitalization of off-balance sheet leases (IASB, 2016).

Taking into account differences in the calculation of EBIT by the sampled listed businesses, *Profit before taxation* (PBT) could be seen as a better indicator of the changes to the income statements.

For the *EBITDA*-related results, it is important to note it is not compulsory for this metric to be disclosed in firms' financial statements. A number of the sampled firms chose to disclose *EBITDAF* (earnings before interest, taxation, depreciation, amortisation and change in fair value of financial instruments) instead of *EBITDA*, having included other elements besides depreciation and amortization, e.g., for *Impairment of assets, Loss on sale of assets* and *Net change in fair value of*

treasury instruments reported by Meridian Energy Limited or *Change in the fair value of financial instruments, Impairments, Earnings of associates and joint ventures* reported by Mercury NZ Limited. In such cases, this study recalculates *EBITDA.* To explain further, some companies disclose significant impairments, depletion and revaluation elements; such entries had to be excluded to isolate the effect of capitalization.

The IASB (2016) expects the capitalization of operating leases to result in an increase in the *EBIT* because of the new calculated depreciation charge being lower than the eliminated *'single operating lease expense'* and because expenses related to off-balance sheet leases are being excluded. The standard-setter's expectation is consistent with this study's findings. The study's results indicate substantial mean and median increases in *PBT* for the sampled companies.

In comparing these findings with the analysis by the IASB, it seems important to note the standard-setter provides two different versions that are linked to the distribution of the terms of the leases within the lease portfolio. The IASB expects the effect of capitalization to be neutral for income statements of companies if they have a lease portfolio distributed evenly. The *Effects Analysis* clarifies that, in such cases, the standard-setter forecasts no difference between the sum of depreciation and interest for leases. However, if the lease portfolio of a firm does not have the leases distributed evenly, then the IASB admits IFRS 16 might have an effect on profit/loss of a company (IASB, 2016). This study does not assume an even composition of operating leases within firms' portfolios. As discussed in Section 3.5.2, this study expects different lifetimes of off-balance sheet operating leases within the lease portfolios of the sampled listed firms. Such an approach accounts for situations where operating leases expire unevenly and seems to be more realistic and closer to business reality.

Table 4-10 shows the impact of capitalization of operating leases on the benchmarks of profitability.

Table 4-10 The descriptive statistics for changes in the financial performance ratios/metrics of the sampled New Zealand companies after capitalization of operating leases

Financial metric of profitability	Mean	Median	Standard deviation	Max.	Min.
EPS (cents)	31.69%	11.35%	81.79%	694.98%	-1.57%
ROCE	5.86%	3.61%	38.86%	72.07%	-292.61%
ROE	36.72%	13.43%	86.39%	719.93%	-0.92%
ROA	21.90%	8.43%	58.41%	487.75%	-3.96%

Table 4-10 shows the capitalization of operating leases results in noticeable increases in the profitability ratios. *EPS* demonstrates the same result as *PBT* because the way to calculate this ratio

is with *PBT* as the numerator. For the four metrics of profitability, the *Effects Analysis* of IFRS 16 by the IASB did not contain a record of the expected effect of implementing the new leases standard by companies. Thus, for *Profit/loss, EPS, ROCE* and *ROE*, the board predicts the capitalization impact depends largely on the characteristics of the lease portfolio and on the impact of the tax rate on the *Profit/loss* (IASB, 2016). In addition, the *Effects Analysis* did not use ROA. However, this ratio seems important because it is a relatively simple metric for understanding by and communicating with the various stakeholders of the business.

PWC (2016) reports a median increase of 10% in *EBITDA* for the Australia and New Zealand region, which is consistent with the findings of this study. Xu et al. (2017) find *ROE* increases by 1.59%, *ROA* increases by 14.04% and *Return on capital* (ROC) increases by 9.74%. Morales-Diaz & Zamora-Ramirez (2018) report a 1% decrease in *ROA*, which is different from the effect recorded in this study. Pardo & Giner (2018) show capitalization of operating leases results in a 2.15% decrease in *ROA* and a 1.33% increase in *ROE*. Therefore, this study's findings were consistent with Xu et al.'s (2017) results from Australia, but different from the results reported for Spain.

However, it is important to note that only a crude comparison of the published findings with this study is possible for a number of reasons:
- the different set of ratios employed for the analysis;
- differences in the calculation methodology of financial ratios used by different articles; and
- isolation of the tax effect employed in this study (*PBT* was used over *Net income*).

The difference in the sets of ratios chosen by different researchers was described in Chapter 2*.*

The lack of uniform methodology in calculating financial metrics can be illustrated with the IASB assuming Gearing as *Liabilities/Equity*, whereas Xu et al. (2017) calculate it as *Total debt/Total equity*. Another example is *Interest cover*, which was calculated by the IASB as EBITDA/Interest expense, whereas Xu et al. (2017) use EBIT/Interest expense. Durocher (2008, p. 236) defines *ROA* as the "*Operating income* before *Interest expense*, but after taxes/Total assets", whereas Pardo & Giner (2018) view *ROA* as *EBIT*/Total assets and Beattie et al. (1998) view *ROA* as *Profit after interest & tax*/Total assets[26]. The decision to isolate the tax effect and use *Profit before tax* instead of *Net income* was discussed in Section 3.4. (See Appendixes 4 and 5 for the numeric effect of capitalization on the whole sample measured by the set of financial metrics and ratios.).

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[26] For the differences in calculating financial metrics, see Beattie et al. (1998), Durocher (2008), Xu et al. (2017) and Pardo & Giner (2018).

4.2.4. Industry analysis and discussion

To provide industry-specific or cross-industry observations, an empirical study requires a credible division of local economy sectors. Several classifications could serve such purpose. First, the Global Industry Classification Standard (GICS) is used worldwide and in the literature, e.g., Xu et al. (2017) and Morales-Diaz & Zamora-Ramirez (2018). Second, is the division used by the IASB in its Effects Analysis of IFRS 16 paper. Third, the Australian and New Zealand Industrial Classification (ANZSIC, 2006) could have been used since the classification is used by Statistics New Zealand.

However, the sample of 76 companies is too small for a disaggregation using the whole range of industrial sectors. For example, ANZSIC (2006) divides the New Zealand economy into 20 industries, which makes it difficult for adoption by this study. Therefore, an aggregation of industries into the broad categories used by Statistics New Zealand in calculating the national Gross Domestic Product (GDP) is used. Table 4-11 shows that classification as used for the *Gross Domestic Product: June 2017 quarter.*

Table 4-11 The industry classification system used in the study (adapted from Stats NZ, 2018)

Industry	Category
Agriculture, forestry, and fishing	**Primary industries**
Mining	
Manufacturing	**Goods-producing industries**
Electricity, gas, water, and waste services	
Construction	
Wholesale trade	**Service industries**
Retail trade and accommodation	
Transport, postal, and warehousing	
Information media and telecommunications	
Financial and insurance services	
Rental, hiring, and real estate services	
Prof, scientific, technical, admin, and support	
Public administration and safety	
Education and training	
Health care and social assistance	
Arts, recreation, and other services	

An additional challenge to the classification is that businesses had diversified operations during financial year 2017. In such cases, the largest, based on the sales amount, and the type of business

was used for the analysis. Figure 4-1 shows the proportions after the sampled listed companies were put into the classification. The figure shows the split is uneven with over half of the sample being in the *Service industries*. Given such an uneven distribution and relatively small size of the sample, this study did not focus on an industry-specific analysis, which would require running additional statistical tests and multivariate regression models to properly assess industry-specific effects of NZ IFRS 16. Instead, observations and descriptive statistics were used to comment on the differences in the impact of capitalization.
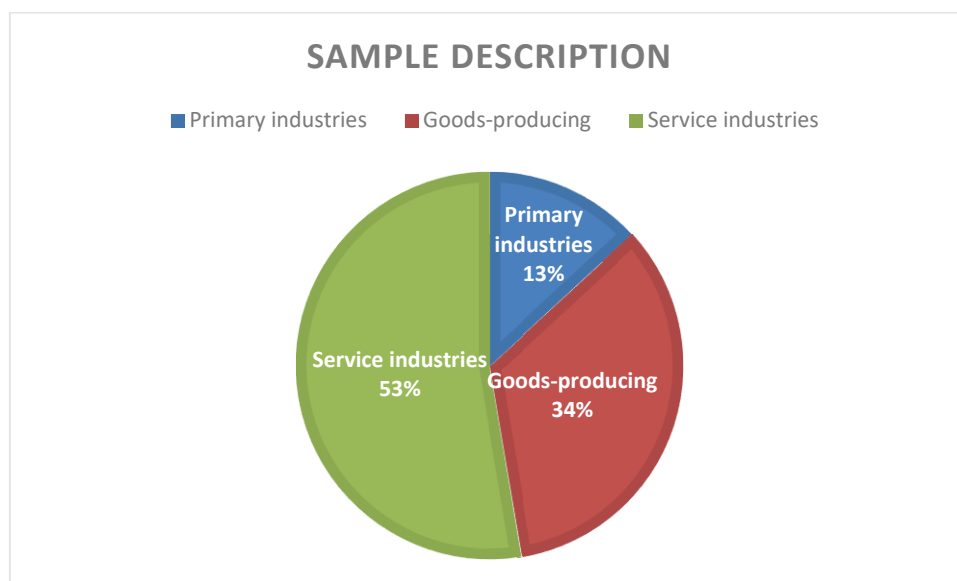
Figure 4-1 The category classification of the sampled listed companies.

Using the median values of capitalization, the variability within the sample is shown in Table 4-12. The table shows the effect of NZ IFRS 16 on elements of the balance sheet, liquidity and long-term solvency of the sampled listed companies.

Table 4-12 The variability of the impact of NZ IFRS 16 on the median values of elements of the balance sheet, liquidity and long-term solvency of the sampled listed companies

	Total assets	Total liabilities	Current liabilities	Leverage (gearing)	Current ratio	Interest cover
Primary industries	5.88%	16.56%	2.73%	17.48%	-2.66%	17.93%
Goods-producing	3.38%	9.45%	0.93%	10.64%	-0.93%	5.69%
Service	5.13%	12.99%	1.51%	17.30%	-1.49%	10.24%

Table 4-12 shows a clear pattern in the effect of capitalizing operating leases under the requirements of NZ IFRS 16. In median changes to the financial values, *Primary industries* firms were

most affected and *Goods-producing* companies were the least affected. The effect on long-term solvency can be illustrated by the post-capitalization changes for the *Leverage and Interest cover* ratios. The former indicates that *Goods-producing* firms had the lowest reliance on off-balance sheet operating leases as the way of financing their operations. It can also be seen from the difference in the effect of capitalization on *Total liabilities*, that *Goods-producing* firms were the least affected companies. The results for *Interest cover* show a similar trend with the strongest impact of NZ IFRS 16 for *Primary-industries* businesses.

It is important to note that the median changes in the benchmarks of *Profitability* do not demonstrate the results pattern discussed above. For some ratios of profitability, namely for *EBIT*, *EBITDA* and *ROCE*, the Service category was the least affected sector of economy, but firms in the *Primary industries* category continued to be the most affected by capitalization for all metrics except *ROCE*.

Table 4-13 The variability of the impact of NZ IFRS 16 on the median values of the profitability of the sampled New Zealand listed companies

	Asset turnover	EBIT	EBITDA	PBT	EPS	ROCE	ROE	ROA
Primary industries	-5.53%	33.15%	34.48%	28.96%	28.96%	4.21%	30.79%	13.29%
Goods-producing	-3.27%	12.43%	10.50%	8.20%	8.20%	1.71%	8.08%	3.47%
Service	-4.88%	6.47%	4.44%	11.35%	11.35%	4.84%	17.19%	9.00%

The post-capitalization results (Table 4-13) for *Goods-producing* firms can be explained by the relatively low volume of operating leasing commitments for this category, shown by the change in *Total liabilities* (see Table 4-12). This lower dependence on operating leases would result in a less strong effect from the elimination of the single operating lease expense under the requirements of NZ IFRS 16 (see Table 1-3 for this transformation as seen by the IASB)*. However, the changes to *EBIT* and *EBITDA* metrics of the *Goods-producing* firms show that impact of NZ IFRS 16 on the financial statements of these firms cannot be ignored.

4.3. Statistical analysis and discussion.

This section establishes the degree of correlation of the financial metrics before and after capitalization. In addition, the statistical significance of the impact of capitalizing operating leases on the financial position and financial performance of the sampled listed firms is established.

4.3.1. Correlation and normality testing: Analysis of symmetry

To ensure a robust relationship between before and after capitalization values, this study uses two correlation tests: the parametric Pearson correlation and non-parametric Spearman Rho. That combination has been used by previous studies, e.g., Goodacre (2003) and Durocher (2008), and seems to be sufficient to ensure a high level of robustness.

In addition, given the study effectively focused on the impact of capitalization under the requirements of NZ IFRS 16, the Anderson-Darling test is used for the **Difference** resulting from subtracting the values before capitalization from the values obtained after the operating leases had been capitalized. The analysis uses the paired sample *t*-test, which is equivalent to a one sample *t*-test to test for the difference in the means of matched pairs of values. The null hypothesis of this *t*-test is that the difference between the *test mean* (0.0) and the *actual mean* of the **Difference** is zero.

Finally, a test for symmetry is performed for the following reasons:

- a better understanding of the nature of the data; and
- decision-making for the choice of a non-parametric test.

Table 4-14 The correlation tests, Anderson-Darling normality test results and the characteristics of the distribution of the sampled New Zealand listed firms' data

	Pearson correlation	Pearson P-Value	Spearman Rho	Spearman P-Value	Anderson-Darling, P-value	A-squared	Kurtosis	Skewness	Alpha
TA	1.000	0.000	0.998	0.000	<0.005	15.10	39.1036	5.7400	
TL	0.999	0.000	0.992	0.000	<0.005	16.33	51.7522	6.7521	
CL	1.000	0.000	0.998	0.000	<0.005	18.59	45.8152	6.3442	
Leverage (gearing)	0.907	0.000	0.930	0.000	<0.005	7.09	8.0247	2.6401	
Current ratio	0.998	0.000	0.995	0.000	<0.005	14.51	19.0136	-4.0130	
Asset turnover	0.981	0.000	0.993	0.000	<0.005	9.47	9.1765	-2.7558	
Interest cover	0.998	0.000	0.991	0.000	<0.005	23.51	71.9313	8.3928	
EBIT (Operating profit)	0.999	0.000	0.993	0.000	<0.005	17.66	49.0917	6.6153	0.05
EBITDA	1.000	0.000	0.994	0.000	<0.005	17.59	49.6127	6.6502	
Profit before taxation (PBT)	0.999	0.000	0.991	0.000	<0.005	17.67	48.9131	6.6029	
EPS (cents)	0.972	0.000	0.970	0.000	<0.005	8.19	11.4324	3.0196	
ROCE	0.983	0.000	0.966	0.000	<0.005	10.07	15.2512	1.6480	
ROE	0.980	0.000	0.913	0.000	<0.005	6.20	3.3320	1.8895	
ROA	0.990	0.000	0.961	0.000	<0.005	7.56	11.6279	3.0683	

Table 4-14 shows that both the parametric and non-parametric correlation tests indicate a strong relationship between the pre- and post-capitalization values for the whole set of metrics. Further, the p-values for both the Pearson and Spearman correlations are below 0.000, which is lower than the significance level of 0.05. This serves as additional evidence that the relationship between the paired samples is strong. However, the Anderson-Darling normality test shows a p-value lower than 0.005 for the whole set of the metrics and ratios, which is well below the alpha of 0.05. Therefore, the null hypothesis that the data sets come from normal distributions had to be rejected. In addition, such p-values are complemented by relatively large A-squared values. This allows one to conclude that the sample data do not follow a normal distribution. This is consistent with the general trend highlighted by previous research. For example, Deakin (1976) provides empirical evidence that 10 of 11 financial ratios studied in his work had distributions that were substantially different from a normal distribution. Among them is the *Current ratio*, which is used in this study to assess the effects of NZ IFRS 16 on the liquidity of the sampled listed companies. According to Barnes (1987), the importance of knowing the distribution of financial ratios is to use the ratios themselves and to understand the impact on the "location measures" of the data. Fito et al. (2013) confirm that, for their sample, the set of ratios did not follow a normal distribution. Xu et al. (2017) use an additional non-parametric test to deal with the assumption of normality for the set of ratios used in their study.

The literature review showed that the use of a combination of a parametric *t*-test and the non-parametric Wilcoxon signed rank test has been widely adopted in studies devoted to the effects of capitalizing operating leases. For example, the combination was used by Beattie et al. (1998), Goodacre (2003), Durocher (2008), Fulbier et al. (2008), Fito et al. (2013) and Xu et al. (2017).

Xu et al. (2017) explain that they used the Wilcoxon sign rank test to relax the assumption of normality in their study and to provide an additional layer of robustness to the results generated. However, the Wilcoxon signed rank test requires the assumption that the differences in the data have a symmetric distribution. As explained by Anderson et al. (2012), such symmetry occurs whenever the shapes of the two populations are the same and the study focus is to determine if there is a difference between the medians of the two populations. Therefore, the *Graphical Summary* function of Minitab has been used to assess the characteristics of the nature of the data displaying the differences in values of financial benchmarks after capitalization. The *Kurtosis* and *Skewness* parameters of the distribution show how far these characteristics vary from zero (see Table 4-14). In summary, despite a strong correlation, the distribution of the data is neither normal nor symmetrical.

4.3.2. Paired sample t-test.

Minitab software was used to perform paired *t*-tests for the set of metrics and ratios with a 95% confidence interval. This test was used to measure the statistical significance of the change in the mean values of financial benchmarks before and after capitalizing operating leases. Table 4-15 shows the results for the elements of the balance sheet.

Table 4-15 The results of paired t-tests on the elements of the firms' balance sheets

	Observations	Df	T-Value	P-Value	Alpha
TA			-3.32	0.001	
TL	76	75	-2.90	0.005	0.05
CL			-2.61	0.011	

Where: *TA* is Total assets; *TL* is Total liabilities; *CL* is Current liabilities; *Observations* is the number of the sampled companies; *Df* is the degrees of freedom; *T-Value* is the t-statistic (sample mean – test mean)/standard error of the mean; *P-Value* is the probability value and *Alpha* is the significance level.

The table shows the elements of the balance sheet **p-value** is lower than the **Alpha**, which means the null hypothesis of the *t*-tests (that the means of the matched pair of financial values are equal) is rejected. Therefore, the test shows that there is a statistically significant change in the mean values before and after capitalization of the data (see Table 4-16).

Table 4-16 The results of paired *t*-test on the sampled listed firms' ratios of liquidity and long-term solvency

Ratio	Observations	Df	T-Value	P-Value	Alpha
Leverage (gearing)			-6.19	0.000	
Current ratio	76	75	3.91	0.000	0.05
Interest cover			-1.54	0.127	

Table 4-16 shows the statistical significance for capitalization-related change established for the top three balance sheet ratios. For *Interest cover,* the metric it is insignificant. The **p-value** of 0.127 is higher than the **Alpha** of 0.05, hence the null hypothesis of the test could not be rejected. The lack of statistical significance for *Interest cover* can be explained by looking closely at the components of this ratio. Given **Interest cover = EBITDA/Interest expense***,* it is unlikely that the numerator was responsible for the non-significant effect of the capitalization of this ratio.

Table 4-17 presents the findings for the ratios of financial performance. It shows that the *t*-test for *EBITDA*, at the 95% confidence level, the impact of capitalizing operating leases is statistically significant. Therefore, considering the denominator of *Interest cover,* it is possible to suggest *Interest expense* was responsible for the lack of statistical significance of post-capitalization impact on *Interest cover*. The minor effect of capitalization on *Interest expense* can also be explained by the

study's time horizon. This study examines the effect of capitalization on off-balance sheet operating leases over one year. Hence, it can be seen how the effect of NZ IFRS 16 on *Interest expense* could be insignificant, since only a short-term (12 months) of operating lease-related interest is included. The paired *t*-test shows statistically significant differences in the post-capitalization changes in the means of all profit-related metrics.

Table 4-17 The results of paired *t*-tests on the sampled listed firms' profit-related metrics

	Observations	Df	T-Value	P-Value	Alpha
Asset turnover			5.34	0.000	
EBIT (Operating profit)			-2.75	0.007	
EBITDA	76	75	-2.75	0.007	0.05
Profit before taxation (PBT)			-2.76	0.007	

Table 4-18 The results of paired *t*-tests on the sampled listed firms' ratios of return

	Observations	Df	T-Value	P-Value	Alpha
EPS (cents)			-5.48	0.000	
ROCE			-3.34	0.001	
ROE	76	75	-6.50	0.000	0.05
ROA			-5.59	0.000	

Table 4-18 shows there are statistically significant differences in all four ratios of return: *EPS*, *ROCE*, *ROE* and *ROA*. Therefore, in summary, it can be concluded that the paired *t*-tests indicate statistical significance of the impact of NZ IFRS 16 on the means of financial ratios and metrics except *Interest cover*.

4.3.3. Signed test

Table 4-19 shows the results of Sign test. The Sign test P-Values are less than 0.000, which is below the Alpha of 0.05. Hence, the null hypothesis that there is no difference in pre- and post-capitalization values (in other words, median of the difference equals zero) is rejected. This implies there is a statistical difference in the median values of financial metrics/ratios from capitalizing operating leases under the requirements of NZ IFRS 16.

4.4. Robustness tests

This section describes the steps taken to ensure robustness for the findings of this study. The following steps were employed to:

Table 4-19 The sign test results for the sampled listed firms' set of ratios and metrics

Parameter	Difference in median values	Test median	P-Value	N	Alpha
TA	25944.7		0.000		
TL	26350.6		0.000		
CL	1009.3		0.000		
Leverage (gearing)	0.143		0.000		
Current ratio	-0.0187285		0.000		
Asset turnover	-0.266		0.000		
Interest cover	0.610		0.000		
EBIT (Operating profit)	4185.3	0.0	0.000	76	0.05
EBITDA	4338.4		0.000		
Profit before taxation (PBT)	4148.8		0.000		
EPS (cents)	2.12		0.000		
ROCE	0.004		0.000		
ROE	0.024		0.000		
ROA	0.007		0.000		

- try to achieve a normal distribution for the data by log transformation;

- perform a sensitivity analysis for the discount rate assumption; and

- perform a sensitivity analysis for the ratio of remaining lease life (RL).

The robustness testing adopted is from previous studies. Sensitivity analysis for the results of various studies was used for the discounting rate and/or remaining lease life values by the following authors: Beattie et al. (1998); Bennett & Bradbury (2003); Fulbier et al. (2008); Fito et al. (2013); Tai (2013) and Pardo & Giner (2018).

4.4.1. Log transformation of the data

Table 4-14 shows that the *Skewness* and *Kurtosis* characteristics of the matched pairs of the data are non-zero, which implies an absence of normality in the data. It was decided to try a log transformation, which is an approach used in research to normalise data's distribution. Table 4-20 shows the capitalized values converted to logarithms to the base 10 (logten function for Minitab).

Table 4-20 shows that log transformation did not result in normalisation of the data because the p-values generated by the Anderson-Darling test are below the Alpha of 0.05. This means that the null hypothesis that the distribution for the **Difference** between pre- and post-capitalization values was normal is rejected. With a confidence level of 95%, the Anderson-Darling test showed that log

Table 4-20 The results of log transformation of the capitalized values of the sampled listed firms

	Log transformed					
	Anderson-Darling, P-value	A-squared	Kurtosis	Skewness	Alpha	N
TA	<0.005	6.72	1.5725	1.6050		76
TL	<0.005	5.99	2.8111	1.7529		76
CL	<0.005	10.19	16.7317	3.7128		76
Leverage (gearing)	<0.005	5.97	1.8525	1.5934		76
Current ratio	<0.005	10.19	16.7317	-3.7128		76
Asset turnover	<0.005	6.72	1.5725	1.6050		76
Interest cover	<0.005	3.89	0.0880	1.0457		66
EBIT (Operating profit)	<0.005	4.11	-0.3157	1.0108	0.05	64
EBITDA	<0.005	3.78	0.4317	1.1747		66
Profit before taxation (PBT)	<0.005	5.09	19.5233	3.6664		65
EPS (cents)	<0.005	5.09	19.5233	3.6664		65
ROCE	<0.005	5.91	18.3968	-2.5211		64
ROE	<0.005	4.74	13.2093	2.9420		65
ROA	<0.005	7.41	24.1113	4.2991		65

transformation did not normalise the data. The A-squared numbers generated by the Anderson-Darling test provide additional evidence that the null hypothesis be rejected.

Table 4-20 illustrates that the *Kurtosis* and *Skewness* characteristics for the **Difference** before and after capitalization values changed compared with the results in Table 4-14; these changes were far from the desired indicators of symmetry, which is *Skewness* and *Kurtosis* equal to zero. In addition, log transformation for a number of metrics and ratios results in a substantial decrease in the number of observations (**N**). This is because of the inability to log transform values equal to or below zero, which can be seen as a flaw of the procedure. To illustrate, a number of the sampled listed firms report negative values for their *PBT* and/or *EBITDA*, e.g.,:

- EROAD Limited (ERD);
- AFT Pharmaceuticals Limited (AFT);
- Cavalier Corporation Limited (CAV);
- Orion Health Group Limited (OHE); and
- Smith's City Group Limited (SCY).

Thus, data transformation leaves such firms out of the analysis, which seems to lead to a loss of robustness. In summary, this study could not rely on log transformation to run additional paired *t*-tests or for the Wilcoxon's signed rank test as a non-parametric tool. Therefore, to achieve a robust

level of statistical analysis, this study uses a combination of two correlations tests: the parametric paired t-test and the non-parametric Sign test.

4.4.2. Discounting rates – sensitivity analysis

The study calculates a discounting rate for the reported lease payments. This is in accordance with the requirements of NZ IFRS 16 and mainly serves to calculate lease-related liabilities (see Appendix 2 for the decision-making process used in determining each firm's individual discount rate). Table 4-21 shows the range of individual discount rates obtained from the financial statements or calculated for the purposes of this study.

Table 4-21 The range and characteristics of the individual firm discount rates used in this study

Interest/discount rates, %				
Mean	Median	Standard deviation	Max.	Min.
4.90%	4.46%	2.28%	15.75%	1.05%

To illustrate further, firms that had their operating lease payments discounted at the highest rates were:

- **Wellington Drive Technologies Limited (WDT)** reported a 15.75% per annum rate payable quarterly since October 2017 for their newest loan facility;
- **AFT Pharmaceuticals Limited (AFT)** disclosed a single loan facility with the interest fixed at 13.5% per annum;
- **Plexure Group Limited (PLX)** financed its operations issuing convertible notes with an effective interest rate of 9.04%; and
- **Mercury NZ Limited (MCY)** had its discount rate calculated at 8.76%, which corresponds to a reported average interest rate of 8.7% on *Net debt*.

Comparing the above entities with firms that had their discount rate in the minimal range:

- **New Zealand Oil & Gas Limited (NZO)** had a rate of 1.05% calculated by dividing the reported *Interest expense* over *Borrowings*, which was the only form of debt used by the company;
- **Orion Health Group Limited (OHE)** had a rate of 1.86% calculated by dividing the reported *Interest expense* over *Interest bearing debt* consisting of: bank overdraft, current, and non-current secured borrowings;
- **Mainfreight Limited (MFT)** reported a 2.11% of average interest payable per annum for its debt; and

- **Kathmandu Holdings Limited (KMD)** disclosed that interest rates on term loans ranged from 2.24% to 2.52% with the latter used in this study.

Reviewing the financial statements of the sampled listed companies did not allow us to understand the reason for the differences in the individual interest/discount rates. Possible explanations could relate to the differing nature of operations, financial position, financial performance, source of finance and capital structure (see Appendix 7 for the full list of individual discount rates used in this study). The study's findings were tested with the individual discount rates increased and decreased by 200 basis points (bps) for each sampled listed company (as summarised in Table 4-21), roughly a 44.8% change from the original median discount rate for the whole sample.

Table 4-22 The descriptive statistics for the changes in the sampled firms' financial ratios and metrics resulting from capitalizing operating leases with the discount rate reduced by 200 bps

Metric/ratio	Mean	Median	Std dev	Max.	Min.
Total assets	10.13%	4.97%	12.86%	55.19%	0.06%
Total liabilities	27.09%	13.20%	37.67%	191.67%	0.10%
Current liabilities	3.25%	1.17%	6.00%	39.80%	0.01%
Leverage/gearing	30.37%	16.00%	41.49%	210.56%	0.10%
Current ratio	-2.88%	-1.16%	4.67%	-0.01%	-28.47%
Asset turnover	-8.16%	-4.73%	9.07%	-0.06%	-35.56%
Interest cover	14.93%	3.78%	86.90%	716.59%	-53.36%
EBIT (operating profit)	23.70%	9.79%	45.34%	366.94%	-1.14%
EBITDA	15.91%	4.90%	87.86%	724.53%	-53.36%
PBT	31.71%	11.35%	81.78%	694.86%	-1.56%
EPS	31.71%	11.35%	81.78%	694.86%	-1.56%
ROCE	4.84%	2.21%	38.08%	72.18%	-286.78%
ROE	35.25%	13.21%	84.72%	710.74%	-0.91%
ROA	20.64%	7.93%	56.73%	472.47%	-4.24%

Table 4-22 presents the descriptive statistics with capitalization performed at the discount rate decreased by 2%. For a better illustration and a visual comparison, Table 4-23 shows the change in the same set of financial indicators resulting from capitalization with the original discount rate increased by 200 bps. The adjustment in the discount rate was expected to produce a direct impact on the volume of the capitalized total and current liabilities and on the ratios using these elements as a component. However, the analysis showed that the changes in the discounting rate did not produce a noticeable difference in the descriptive statistics of the post-capitalization values.

Table 4-24 summarises the sensitivity testing showing the effect on median values. The table indicates minimal sensitivity of the study's findings to changes in the discount rate. However, the table shows two particular benchmarks that were affected more than the other financial metrics: *Interest cover* and *EBITDA*. For *Interest cover*, the decrease in the discount rate of 200 bps resulted in

Table 4-23 The descriptive statistics for the changes in the sampled listed firms' financial ratios and metrics resulting from capitalizing operating leases with the discount rate increased by 200bps

Metric/ratio	Mean	Median	Std dev	Max.	Min.
Total assets	7.71%	3.67%	9.66%	36.73%	0.06%
Total liabilities	22.90%	11.28%	31.78%	160.89%	0.08%
Current liabilities	3.13%	1.13%	5.78%	38.28%	0.01%
Leverage/gearing	28.89%	15.04%	40.01%	184.12%	0.08%
Current ratio	-2.79%	-1.11%	4.53%	-0.01%	-27.68%
Asset turnover	-6.51%	-3.54%	7.36%	-0.06%	-26.86%
Interest cover	13.91%	3.36%	86.03%	707.75%	-53.36%
EBIT (operating profit)	23.89%	9.97%	45.60%	368.83%	-1.06%
EBITDA	16.05%	4.93%	88.14%	726.95%	-53.36%
PBT	31.70%	11.35%	81.80%	695.08%	-1.58%
EPS	31.70%	11.35%	81.80%	695.08%	-1.58%
ROCE	6.66%	5.30%	39.61%	72.00%	-298.06%
ROE	37.62%	13.60%	87.64%	726.82%	-0.93%
ROA	22.91%	9.31%	59.98%	501.86%	-3.73%

a negative change in this ratio of over 51%, whereas the increase in the discount rate of 200 bps produced a negative median change of 57% for this metric. For *EBITDA*, adjustment of the discount rate resulted in a decrease in this metric of approximately 45% for both scenarios. The results are discussed further below.

Table 4-24 The changes in median values of the sampled listed firms from capitalizing operating leases by the sensitivity test for the discount rate

Change in median values			
Metric/ratio	Minus 200 bps	Original	Plus 200 bps
Total assets	4.97%	4.23%	3.67%
Total liabilities	13.20%	12.19%	11.28%
Current liabilities	1.17%	1.15%	1.13%
Leverage/gearing	16.00%	15.79%	15.04%
Current ratio	-1.16%	-1.22%	-1.11%
Asset turnover	-4.73%	-4.05%	-3.54%
Interest cover	3.78%	7.87%	3.36%
EBIT (operating profit)	9.79%	9.87%	9.97%
EBITDA	4.90%	8.88%	4.93%
PBT	11.35%	11.35%	11.35%
EPS	11.35%	11.35%	11.35%
ROCE	2.21%	3.61%	5.30%
ROE	13.21%	13.43%	13.60%
ROA	7.93%	8.43%	9.31%

Table 4-25 The results of the correlation tests on the sampled listed firms with capitalization performed with the discount rates decreased by 200 bps

	Pearson correlation	Pearson P-Value	Spearman Rho	Spearman P-Value	N	Alpha
TA	1.000	0.000	0.998	0.000		
TL	0.999	0.000	0.992	0.000		
CL	1.000	0.000	0.998	0.000		
Leverage (gearing)	0.918	0.000	0.929	0.000		
Current ratio	0.998	0.000	0.994	0.000		
Asset turnover	0.975	0.000	0.992	0.000		
Interest cover	0.999	0.000	0.975	0.000		
EBIT (Operating profit)	0.999	0.000	0.993	0.000	76	0.05
EBITDA	0.998	0.000	0.984	0.000		
Profit before taxation (PBT)	0.999	0.000	0.991	0.000		
EPS (cents)	0.972	0.000	0.971	0.000		
ROCE	0.982	0.000	0.966	0.000		
ROE	0.981	0.000	0.918	0.000		
ROA	0.990	0.000	0.963	0.000		

Additional statistical tests were performed to assess the sensitivity of the statistical analyses performed in this study to changes in the interest rate used to discount future operating lease payments. Starting by assessing the impact of the changes in the interest/discounting rate on the correlation between before and after capitalization values, Tables 4-25 and 4-26 show the impact of the sensitivity analyses on the results from the Pearson and Spearman correlation tests. Table 4-25 displays the effect of the correlation tests on the matched pair of values obtained by capitalizing operating leases with the individual discounting rates decreased by 200 bps.

As illustrated by Tables 4-25 and 4-26, the 2% change in individual discount rates did not result in a major shift in the strength of the relationships between pre- and post-capitalization metrics/ratios. The results show the Pearson and Spearman p-values stayed well below the Alpha of 0.05, which means the null hypothesis (that there is no linear relationship between before and after capitalization values) is rejected. With a confidence level of 95%, it can be argued that the correlation is different from zero. In addition, it was clear from the both correlations that the strength of the relationship was at the level of over 0.910 for the whole set of metrics.

Table 4-26 The results of the correlation tests on the sampled listed firms with capitalization performed with the discount rates increased by 200 bps

	Pearson correlation	Pearson P-Value	Spearman Rho	Spearman P-Value	N	Alpha
TA	1.000	0.000	0.998	0.000		
TL	0.999	0.000	0.992	0.000		
CL	1.000	0.000	0.998	0.000		
Leverage (gearing)	0.902	0.000	0.932	0.000		
Current ratio	0.998	0.000	0.995	0.000		
Asset turnover	0.985	0.000	0.995	0.000		
Interest cover	0.990	0.000	0.975	0.000		
EBIT (Operating profit)	0.999	0.000	0.993	0.000	76	0.05
EBITDA	0.998	0.000	0.985	0.000		
Profit before taxation (PBT)	0.999	0.000	0.991	0.000		
EPS (cents)	0.972	0.000	0.971	0.000		
ROCE	0.983	0.000	0.965	0.000		
ROE	0.980	0.000	0.912	0.000		
ROA	0.990	0.000	0.957	0.000		

Therefore, we can conclude:

1. That the sample of the matched pairs of financial values before and after capitalization ratios/metrics exhibit high correlation. This shows the relevance of the capitalization of operating leases carried out.

2. That the 200 bps changes in the individual discounting rates did not result in a loss in the strength of the relationship between the pre- and post-capitalization sets of values.

To gain a further insight into the impact of the changes in the discounting rate on the effects of capitalizing operating leases, additional *t*-tests and Sign tests were performed.

Table 4-27 presents the results when the discount rates used were decreased by 200 bps. Given two of the 76 sampled listed companies had their original discount rate below 2%, for these companies the rate was set as 0.01% to avoid using a negative interest rate. In contrast, Table 4-28 displays the impact of performing the statistical analyses with the capitalization of operating leases performed with the discount rate increased by 200 bps.

As can be seen from Tables 4-27 and 4-28, adjustment of the individual discount rates did not result in an overall loss of statistical significance in the post-capitalization changes in the observed set of financial metrics. However, like the observations on the impact of changes in the discount rate,

Table 4-27 The statistical tests on the sampled firms with the discount rate decreased by 200 bps

	t-test		Sign test				
	T-Value	P-Value	Difference in median values	Test median	P-Value	N	Alpha
TA	-3.23	0.002	28352.3		0.000		
TL	-2.91	0.005	28649.9		0.000		
CL	-2.59	0.011	973.306		0.000		
Leverage (gearing)	-6.67	0.000	0.150294		0.000		
Current ratio	3.89	0.000	-0.0168911		0.000		
Asset turnover	5.35	0.000	-0.0296047		0.000		
Interest cover	-2.07	0.042	0.480026		0.008		
EBIT (Operating profit)	-2.75	0.007	4174.32	0.0	0.000	76	0.05
EBITDA	0.12	0.903	963.754		0.008		
Profit before taxation (PBT)	-2.76	0.007	4151.62		0.000		
EPS (cents)	-5.48	0.000	2.11741		0.000		
ROCE	-2.98	0.004	0.0033105		0.000		
ROE	-6.38	0.000	0.0233765		0.000		
ROA	-5.17	0.000	0.0058855		0.000		

based on the descriptive statistics (see Tables 4-22 and 4-23), the performed paired *t*-tests highlight that the *Interest cover* and *EBITDA* values lose their statistical significance. Such sensitivity can be seen as a limitation of this study.

In summary, the 2% change in the interest rate used to discount future lease payments did not result in the loss of statistical significance of the impact of capitalization on the set of financial ratios/metrics. The analysis allows the claim of a level of robustness of the results of this study in relation to the assumption about the individual discount rates, which were calculated for each listed company in the sample.

4.4.3. Ratios of the remaining lease life to total lease life – sensitivity analysis

One challenge in this study was the calculation of the exact remaining lease life of operating leases since NZ IAS 17 requires firms to report operating lease commitments in the following format:

i.   not later than one year;

ii.   later than one year and not later than five years; and

iii.   later than five years (NZ IAS 17, par. 35a).

Table 4-28 The statistical tests on the sampled listed firms with the discount rate increased by 200 bps

	t-test		Sign test				
	T-Value	P-Value	Difference in median values	Test median	P-Value	N	Alpha
TA	-3.40	0.001	23797.2		0.000		
TL	-2.90	0.005	24279.0		0.000		
CL	-2.59	0.011	936.271		0.000		
Leverage (gearing)	-5.84	0.000	0.137271		0.000		
Current ratio	3.88	0.000	-0.0162623		0.000		
Asset turnover	5.38	0.000	-0.0243194		0.000		
Interest cover	-1.09	0.278	0.295362		0.029		
EBIT (Operating profit)	-2.75	0.007	4195.77	0.0	0.000	76	0.05
EBITDA	0.11	0.913	966.068		0.008		
Profit before taxation (PBT)	-2.76	0.007	4146.08		0.000		
EPS (cents)	-5.48	0.000	2.11927		0.000		
ROCE	-3.63	0.001	0.0064835		0.000		
ROE	-6.48	0.000	0.0241481		0.000		
ROA	-5.92	0.000	0.0074345		0.000		

The missing information led to another fundamental assumption in capitalizing operating leases. This relates to the ratio of remaining lease life to total lease life (RL/TL). This ratio serves as the part of the formula (3.6), as follows **$PV_A/PV_L=RL/TL * (PVAF_{r\%, TL}/ PVAF_{r\%, RL})$**, where:

PV_A is the present value of the unrecorded asset;

PV_L is the present value of unrecorded liability;

RL is the remaining lease life;

TL is the total lease life; and

$PVAF_{r\%}$ is the present value annuity factor.

This formula is used to determine the lease related total and current assets. Therefore, changes in the RL/TL ratio would largely affect the named elements of financial statements and the corresponding ratios that use them as required components. As discussed in Section 3.5.3, when it was not possible to establish RL/TL from the financial statements of the sampled listed companies, the ratio was obtained with the help of the formula (3.7). This procedure was used for every business in the sample. Finally, the required ratio of the remaining lease life (RL) was calculated by **1 - RL/TL**. (See Appendix 8 for the full list of individual ratios or RLs used in this study.)

To test the robustness of the study's results, sensitivity analysis of the calculated individual ratios of RL was checked by changing the ratio by +-25% for each sampled company. The percentage was obtained by trial and error, as the highest applicable change to the ratios of remaining lease life of operating leases of the sampled listed companies (see Appendix 8). Table 4-29 shows the effect of decreasing the proportion of RL by 25%.

Table 4-29 The descriptive statistics for the capitalization of operating leases of the sampled firms with the ratios of the remaining lease life reduced by 25%

Metric/ratio	Mean	Median	Std dev	Max.	Min.
Total assets	8.08%	4.02%	10.31%	41.01%	0.06%
Total liabilities	25.04%	11.58%	34.77%	175.44%	0.09%
Current liabilities	3.22%	1.07%	5.92%	39.02%	0.01%
Leverage/gearing	33.08%	17.13%	45.74%	216.05%	0.09%
Current ratio	-2.83%	-1.13%	4.60%	-0.01%	-28.07%
Asset turnover	-6.75%	-3.87%	7.73%	-0.06%	-29.08%
Interest cover	14.36%	3.59%	86.37%	712.04%	-53.36%
EBIT (operating profit)	23.81%	9.88%	45.49%	368.03%	-1.10%
EBITDA	15.98%	4.91%	88.00%	725.76%	-53.36%
PBT	32.03%	11.44%	82.32%	695.23%	-1.57%
EPS	32.03%	11.44%	82.32%	695.23%	-1.57%
ROCE	6.47%	5.32%	39.53%	71.90%	-295.24%
ROE	39.86%	14.48%	92.05%	758.08%	-0.91%
ROA	22.86%	8.92%	59.65%	495.50%	-3.80%

Table 4-30 shows the effect of increasing the individual ratios of RL by 25%. Because a number of the sampled listed companies had a relatively high value for their original remaining lease life, 15 of the 76 sampled listed businesses had the RL recorded as 0.9999 to avoid a value over 1.

To summarise the comparison, Table 4-31 shows the impact of adjusting the ratio of the remaining lease life by 25% in both negative and positive directions. The effect is displayed using the median changes in the financial metrics.

Table 4-30 The descriptive statistics for the capitalization of operating leases of the sampled listed firms with the ratios of remaining lease life increased by 25%

Metric/ratio	Mean	Median	Std dev	Max.	Min.
Total assets	9.29%	4.50%	11.65%	46.93%	0.06%
Total liabilities	24.88%	12.19%	34.57%	175.44%	0.09%
Current liabilities	3.19%	1.15%	5.89%	39.02%	0.01%
Leverage/gearing	27.99%	14.64%	38.40%	185.63%	0.09%
Current ratio	-2.83%	-1.13%	4.60%	-0.01%	-28.07%
Asset turnover	-7.62%	-4.30%	8.47%	-0.06%	-31.94%
Interest cover	14.36%	3.59%	86.37%	712.04%	-53.36%
EBIT (operating profit)	23.79%	9.87%	45.46%	367.82%	-1.10%
EBITDA	15.98%	4.91%	88.00%	725.76%	-53.36%
PBT	31.70%	11.34%	81.77%	694.82%	-1.57%
EPS	31.70%	11.34%	81.77%	694.82%	-1.57%
ROCE	5.45%	3.15%	38.60%	72.18%	-290.96%
ROE	34.97%	12.47%	83.40%	697.29%	-0.92%
ROA	21.39%	8.24%	57.85%	482.91%	-4.38%

Table 4-31 The changes in the median values from capitalizing the sampled listed firms' operating leases because of the sensitivity test for the ratio of remaining lease life (RL)

Change in median values			
Metric/ratio	RL minus 25%	Original	RL plus 25%
Total assets	4.02%	4.23%	4.50%
Total liabilities	11.58%	12.19%	12.19%
Current liabilities	1.07%	1.15%	1.15%
Leverage/gearing	17.13%	15.79%	14.64%
Current ratio	-1.13%	-1.22%	-1.13%
Asset turnover	-3.87%	-4.05%	-4.30%
Interest cover	3.59%	7.87%	3.59%
EBIT (operating profit)	9.88%	9.87%	9.87%
EBITDA	4.91%	8.88%	4.91%
PBT	11.44%	11.35%	11.34%
EPS	11.44%	11.35%	11.34%
ROCE	5.32%	3.61%	3.15%
ROE	14.48%	13.43%	12.47%
ROA	8.92%	8.43%	8.24%

According to the data in Table 4-31, it can be argued that the set of metrics and ratios is insensitive to changes in RL. However, like the sensitivity results for the discounting rates discussed previously, two particular benchmarks, *Interest cover* and *EBITDA*, were sensitive to changes in the values of RL. For *Interest cover*, the decrease in the ratios of the RL results in a 54.4% negative change in the median value of this ratio. An increase in the proportion of RL results in an identical negative change

of 54.4%. Similarly, for the *EBITDA* metric, adjustment of the ratio of the remaining lease life to the total lease life results in a decrease in the median values of approximately 44.7% for the changes in both directions.

As discussed earlier in this section, the results for *EBITDA* and *Interest cover* can be explained by the study's time horizon. This study focuses on the impact of *Constructive Capitalization* on the financial position and financial performance of the sampled listed firms in one year; the data are from the firms' annual statements for financial year 2017. Therefore, it can be seen that, in the short-term (12 months), post-capitalization changes in the components of *EBITDA* and *Interest cover,* such as *Depreciation*, *Amortization* and *Interest expense,* were insignificant.

To test the sensitivity of the correlation between before and after capitalization values to changes in the RL values, additional Pearson and Spearman correlation tests were performed to assess the strength of relationships between the pre- and post-capitalization financial ratios/metrics. This was done with the capitalization of operating leases performed with the individual ratios of RL changed by +-25% (see Appendix 8 for the full list of the values used in this sensitivity analysis). Table 4-32 shows the results for the capitalization with firms' ratios of remaining lease life decreased by 25%. For comparison, Table 4-33 shows the effect on the correlation tests, when capitalization of the operating leases of the sampled listed firms was done with individual RL ratios increased by 25%.

Table 4-32 The correlation of pre- and post-capitalization values of the sampled listed firms, when capitalization of operating leases was performed with the individual values of RL reduced by 25%

	Pearson correlation	Pearson P-Value	Spearman Rho	Spearman P-Value	N	Alpha
TA	1.000	0.000	0.998	0.000		
TL	0.999	0.000	0.992	0.000		
CL	1.000	0.000	0.998	0.000		
Leverage (gearing)	0.884	0.000	0.920	0.000		
Current ratio	0.998	0.000	0.995	0.000		
Asset turnover	0.983	0.000	0.995	0.000		
Interest cover	0.998	0.000	0.975	0.000		
EBIT (Operating profit)	0.999	0.000	0.993	0.000	76	0.05
EBITDA	0.998	0.000	0.985	0.000		
Profit before taxation (PBT)	0.999	0.000	0.991	0.000		
EPS (cents)	0.972	0.000	0.971	0.000		
ROCE	0.983	0.000	0.966	0.000		
ROE	0.977	0.000	0.907	0.000		
ROA	0.990	0.000	0.958	0.000		

Table 4-33 The correlation of pre- and post-capitalization values of the sampled listed firms when capitalization of operating leases was performed with the individual RL values increased by 25%

	Pearson correlation	Pearson P-Value	Spearman Rho	Spearman P-Value	N	Alpha
TA	1.000	0.000	0.998	0.000		
TL	0.999	0.000	0.992	0.000		
CL	1.000	0.000	0.998	0.000		
Leverage (gearing)	0.921	0.000	0.937	0.000		
Current ratio	0.998	0.000	0.995	0.000		
Asset turnover	0.980	0.000	0.993	0.000		
Interest cover	0.998	0.000	0.975	0.000		
EBIT (Operating profit)	0.999	0.000	0.993	0.000	76	0.05
EBITDA	0.998	0.000	0.985	0.000		
Profit before taxation (PBT)	0.999	0.000	0.991	0.000		
EPS (cents)	0.972	0.000	0.971	0.000		
ROCE	0.983	0.000	0.966	0.000		
ROE	0.982	0.000	0.918	0.000		
ROA	0.990	0.000	0.962	0.000		

Tables 4-32 and 4-33 reveal that 25% changes in the calculated proportions of remaining lease life did not cause a noticeable shift in the strength of the relationships between pre- and post-capitalization values. This allows the claim that capitalization was not sensitive to the changes in the calculated/reported ratios of remaining lease life of operating leases.

To illustrate further, the lowest correlation of the two data sets (before and after capitalization values) was observed for the *Leverage* (*gearing*) metric and was obtained with a Pearson correlation test with RL decreased by 25%. This correlation had a strength of 0.884, whereas for the whole set of ratios and benchmarks, adjustment of the RL rates showed correlations with strengths ranging from over 0.900 to 1.000. Therefore, the matched pairs of pre- and post-capitalization values have a strong relationship. This, in turn, provides the required evidence of the relevance of the impact of capitalization, in accordance with the requirements of NZ IFRS 16, on the financial position and financial performance of the sampled listed companies.

To test the sensitivity of the statistical analysis to the calculated proportions of RL, additional *t*-tests and Sign tests were performed. Table 4-34 displays the results of the tests that were estimated with the remaining lease life values reduced by 25%. For comparison, Table 4-35 shows the impact of the RL value increased by 25%.

Table 4-34 The results of statistical tests run on the sampled listed firms when capitalization was performed with the RL decreased by 25%

	t-test		Sign test				
	T-Value	**P-Value**	**Difference in median values**	**Test median**	**P-Value**	**N**	**Alpha**
TA	-3.42	0.001	23482.0		0.000		
TL	-2.91	0.005	26350.6		0.000		
CL	-2.59	0.011	954.430		0.000		
Leverage (gearing)	-5.96	0.000	0.152309		0.000		
Current ratio	3.88	0.000	-0.0165708		0.000		
Asset turnover	5.29	0.000	-0.0242740		0.000		
Interest cover	-1.21	0.229	0.324904		0.029		
EBIT (Operating profit)	-2.75	0.007	4185.73	0.0	0.000	76	0.05
EBITDA	0.12	0.908	964.934		0.008		
Profit before taxation (PBT)	-2.76	0.007	4149.28		0.000		
EPS (cents)	-5.48	0.000	2.12085		0.000		
ROCE	-3.51	0.001	0.0045452		0.000		
ROE	-6.33	0.000	0.0228824		0.000		
ROA	-5.79	0.000	0.0073759		0.000		

Table 4-35 The results of statistical tests run on the sampled listed firms when capitalization was performed with the RL increased by 25%

	T-test		Sign test				
	T-Value	**P-Value**	**Difference in median values**	**Test median**	**P-Value**	**N**	**Alpha**
TA	-3.26	0.002	26349.9		0.000		
TL	-2.91	0.005	26350.6		0.000		
CL	-2.59	0.011	954.430		0.000		
Leverage (gearing)	-6.34	0.000	0.135622		0.000		
Current ratio	3.88	0.000	-0.0162623		0.016		
Asset turnover	5.40	0.000	-0.0298802		0.000		
Interest cover	-1.21	0.229	0.324904		0.029		
EBIT (Operating profit)	-2.76	0.007	4184.97	0.0	0.000	76	0.05
EBITDA	0.12	0.908	964.934		0.008		
Profit before taxation (PBT)	-2.76	0.007	4148.52		0.000		
EPS (cents)	-5.48	0.000	2.11692		0.000		
ROCE	-3.21	0.002	0.0038330		0.000		
ROE	-6.55	0.000	0.0225601		0.000		
ROA	-5.44	0.000	0.0068561		0.000		

The results in Tables 4-34 and 4-35 clearly show that the overall statistical significance of the *t*-tests and Sign tests is not sensitive to the changes in RL values. However, like the analysis for the interest/discount rate sensitivity, the results of the *t*-tests for *Interest cover* and *EBITDA* produce no statistical significance. As discussed previously, a possible explanation for such behaviour of *Interest cover* and *EBITDA* could be the study's time horizon.

In summary, the sensitivity analysis shows the study's findings can be seen as robust in the major part with a minor limitation highlighted in the sensitivity of *Interest cover* and *EBITDA* to changes in the individual discount rates and ratios of RL. More importantly, this sensitivity appears only for the additional *t-tests*, but both the correlation tests and the non-parametric Sign test did not show such weakness.

Chapter 5: Conclusions and Limitations

Chapter 5 provides the conclusions and limitations of this study. It is organised as follows: introduction, summary of the results, limitations of the study, practical implications and future research opportunities.

5.1. Introduction

In January 2016, the International Accounting Standards Board announced the release of a long-anticipated accounting standard IFRS 16 *Leases* (see Figure 2-3). This standard is devoted to the "**recognition, measurement, presentation and disclosure of *leases*"** and represents a major shift in accounting regulation of leases. Some of the problems addressed by IFRS 16 have persisted in financial accounting for 40 years; the current accounting treatment of leases was largely inherited from the provisions of the Statement of Financial Accounting Standards No.13 released by FASB in 1976 (NZ IFRS 16, par. 1, p. 7).

One of the known issues was the division of leases into two types: operating and financing. This division required different treatments for each lease type. Where leasing arrangements fall under the description of an operating lease, it delivered an opportunity for firms to keep lease-related assets and liabilities off their balance sheet. As discussed in Section 1.2.1, a number of academics, e.g., Imhoff et al. (1991), Beattie et al. (1998), Fulbier et al. (2008) and Duke et al. (2009), observe that businesses had an incentive to avoid capitalization of leases and tailored their leasing arrangements to fit the criteria of operating leases. This allowed management to achieve a number of benefits, such as:

- improved performance and leverage indicators (Imhoff et al., 1991); and
- avoidance of on-balance sheet debt (Fulbier et al., 2008).

In addition, the IASB, in its *Effects Analysis* of IFRS 16, quoted the 2005 findings of the US Securities and Exchange Commission (SEC). The report estimated the existence of $1.25 trillion worth of cash flow associated with off-balance sheet operating leases within the United States (SEC, 2005). The standard-setter indicates the existence of about US$3b in off-balance sheet commitments linked to operating leases of IFRS or GAAP reporting listed companies (IASB, 2016). Thus, the IASB claimed its new leases standard served the purpose of enhancing transparency of information about lease obligations (IASB, 2016).

In February 2016, the External Reporting Board (XRB) introduced the New Zealand version of IFRS 16 named the New Zealand Equivalent to International Financing Reporting Standard 16 *Leases* (NZ IFRS 16). Adoption of this standard is compulsory for Tier 1 and Tier 2 for-profit entities and is effective from the 1 January 2019 (NZ IFRS 16, par. NZ 2.1). Therefore, this study examined the impact of NZ

IFRS 16 on the financial position and financial performance of a sample of New Zealand listed companies.

5.2. Summary of the results

The findings of this study can be summarised with the assistance of two concepts: statistical significance and materiality. The analyses show that, with a 95% confidence level, capitalization of operating leases under the requirements of NZ IFRS 16 produces a statistically significant impact on the ratios and metrics of financial position and financial performance of the sampled firms. However, the effect on the *EBITDA* and *Interest* cover benchmarks appears to lack statistical significance for the parametric *t*-tests and statistical significance for the non-parametric Sign tests. In addition, both the *EBITDA* and *Interest cover* benchmarks were sensitive to changes in the value of the discounting rate and the ratios of remaining lease life used to capitalize off-balance sheet operating leases (only for *t*-testing). These results are explained by the reliance of the *t*-test on the normality of the data and by the study's 12 month time horizon, which was too short to capture the full effect of NZ IFRS 16 on the components of *EBITDA* and *Interest cover.*

This study finds the impact of the implementation of NZ IFRS 16 to be material for the *Profit before tax* and *Total assets* metrics of the sampled listed companies. However, the effect on *Equity* was not material. As discussed in Section 4.1, this study adapts the definition of materiality provided by XRB, which is the ability of lease-related information to **"influence the economic decisions that users make on the basis of the financial statements"** (XRB For-profit Standards Glossary 2019, p. 21)[27]. The main justification for such an approach is that some sampled listed companies, e.g., Synlait Milk Limited, Chorus Limited, Michael Hill International and Telstra Corporation, used the concept of materiality to assess the impact of NZ IFRS 16 on their financial statements. In addition, we list a number of prior studies that use word 'material' in the context of assessing the effect of capitalization of operating leases[28].

An examination of the variability of the impact of capitalization in the sample reveals the overall trend that the firms in *primary industries* would have their financial values most affected by the change in accounting standards. The credibility of the study's findings can be explained using individual discounting rates and values of remaining lease life over sample-wide assumptions widely employed by previous research.

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[27] As mentioned in Section 4.1, to apply the concept of materiality to the findings of the study, we use benchmarks of materiality as identified by Eilifsen & Messier (2015). Therefore, we limit the assessment of materiality of the effect of NZ IFRS 16 on these indicators.
[28] We mean the studies by Imhoff et al. (1991; 1997), Goodacre (2003), Durocher (2008), Wong & Joshi (2015) and the IASB (2016).

Finally, the robustness of the results has been enhanced by the sensitivity analysis of the discount rates and the values of remaining lease life used in applying the provisions of NZ IFRS 16.

5.3. Limitations of the study

This section highlights limitations of this study. These are divided into the five major areas: size of the sample; comparability of the findings with previous research; the study's time horizon; the data collection method; and the benchmarks of materiality used.

This study uses a sample based on the financial statements of NZX listed companies as the data source. However, it can be argued that these New Zealand and overseas companies are not fully representative of the Tier 1 and Tier 2 New Zealand business environment. However, a sample based on a population of listed companies is dictated to by restrictions on access to the financial documents of the commercial entities and is consistent with the approach taken by previous studies, e.g., Beattie et al. (1998), Bennett & Bradbury (2003), Fulbier et al. (2008), Fito et al. (2013), Xu et al. (2017) and Morales-Diaz & Zamora-Ramirez (2018) conducted their studies on samples of listed companies. The sample size of 76 listed companies is influenced by the relatively small scale of the New Zealand economy.

In comparing the findings of this study with the results from previous research, a limitation in comparability has been identified. This resulted from:

- differences in the choice of the metrics/ratios to measure the impact of capitalization; and
- differences in the calculation of the particular metrics used in different studies.

Therefore, users of this study are advised to exercise caution in comparing the findings with those in other academic/business publications. Section 4.2.3 discusses this issue with examples. In addition, Section 3.4 explains the reason behind the decision to isolate the tax effect and use *Profit before tax* values instead of *Net profit.* This allowed the study to have a stronger focus on the impact of capitalization on the financial position and financial performance of the sampled listed firms. In addition, Section 4.1 shows the *Profit before tax* is used to assess the materiality of the accounting information/changes. The study's time horizon is 12 months because we performed a capitalization procedure for the 2017 financial statements of the sampled firms, as if NZ IFRS 16 was effective 1 January 2017. Based on Sections 4.3 and 4.4, such a time horizon can be viewed as a limitation, because it cannot capture the long-term impact of NZ IFRS 16 on the ratios and metrics that depict the financial position and financial performance of the New Zealand listed firms.

This study relied on manual data collection using the information disclosed by companies in their annual statements. This study followed the method used by Fulbier et al. (2008), Fito et al. (2013) and Pardo & Giner (2018) and adopted the assumption that the difference between the outstanding

FMLP in two consecutive years is the FMLP for the earlier year. This means the study could not take into account any additional variables to the leasing contracts that could not be obtained from the companies' financial statements. To deliver the results of our study, we adopted the quantitative benchmarks and corresponding percentage thresholds from Eilifsen & Messier (2015). Therefore, we admit that some users of our study might assess the materiality of the impact of NZ IFRS 16 differently, depending on their benchmarks and thresholds.

5.4. Practical implications

Schipper (1994) distinguishes three types of evidence the standard-setters seek in their *ex-ante* research:

i.   How would the reported results change under the proposed standard?

ii.   How would corporate actions change under the proposed standard?

iii.   What might be the effect on users'/investors' decisions under the proposed standard?

(Schipper, 1994, p. 62-63)

These types of evidence show the three major areas where the study's results could be used. First, following the objective stated by the IASB in its *Effects Analysis* for IFRS 16, which was an enhancement of transparency of information about lease obligations, the results of this study can be used by a large group of stakeholders who might be interested in information about the lease obligations of firms operating within the New Zealand economy. The demand for good quality information might increase with the implementation of NZ IFRS 16 in "annual reporting periods beginning on or after 1 January 2019" (NZ IFRS 16, par. C1, p. 32).

Secondly, the results of this study show the effect of capitalization of operating leases on the financial position and financial performance of the sampled listed companies. The management of the listed companies or ones of a comparable size/volume of operations (NZ IFRS 16 is required for both Tier 1 and Tier 2 for-profit entities) could use the study's results to achieve or control the desired level of the metrics of financial position and financial performance.

Thirdly, the study's results show that the impact of NZ IFRS 16 will be material for the *Profit before tax* and *Total assets* metrics. This means the changes are significant for decision-making. For example, the rationale behind the use of leasing as a source of finance and its value in the capital structure of a business could be reviewed by investors and other interested parties.

5.5. Future research opportunities

The study's findings for future research are displayed in Figure 5-1. Edeigba & Amenkhienan (2017) provide evidence on the influence of IFRS adoption on corporate transparency and accountability. The direction of the study seems worthy of consideration since transparency of financial statements

is the main objective of the IASB in implementing IFRS 16. Edeigba & Amenkhienan (2017) acknowledge that different versions of IFRS exist in different countries. In addition, the authors note the differences in the adopted IFRS are attempts to meet country-specific demands for accounting information. Country-specific demands for New Zealand and the suitability of New Zealand equivalents of International Financial Reporting Standards to these demands could be areas for future research.
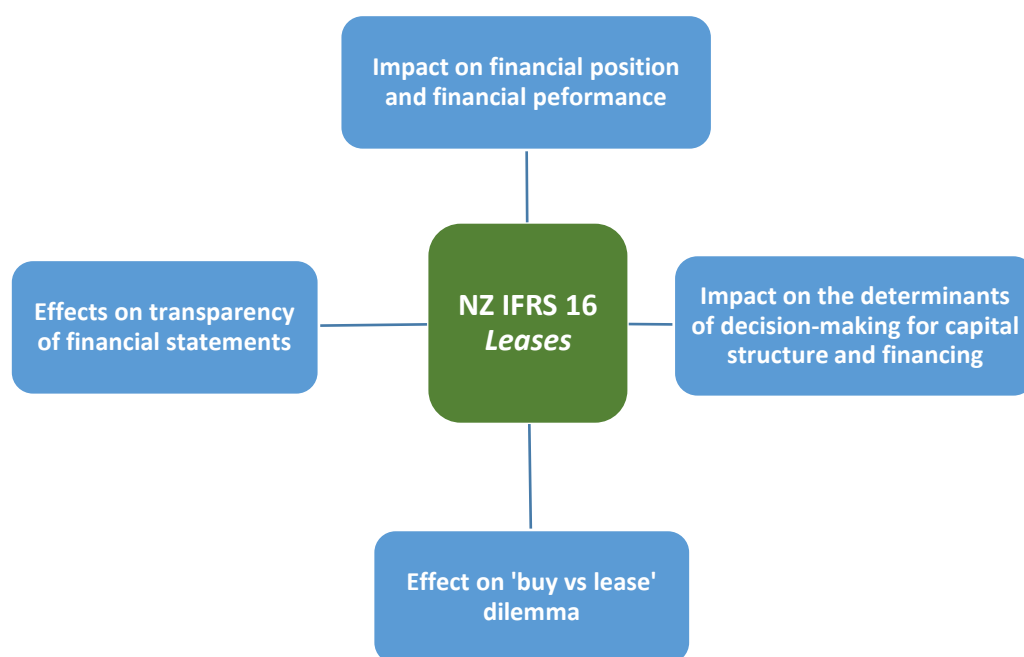
Figure 5-1 Potential future research areas in the field of the present study

Houqe, Monem & van Zijl (2016) use a sample of 29 companies listed on the NZX and conclude that adoption of IFRS results in a reduced cost of equity capital. A study could be conducted to see if such a conclusion is valid regarding the adoption of IFRS 16.

Lin, Wang, Chou & Chueh (2013) provide evidence that businesses were not indifferent in selecting between leases and debt financing; firms with limited access to capital tend to choose leases over debt. Sharpe & Nguyen (1995) find evidence of companies choosing leasing over other means of financing as a way to reduce financial contracting costs. Beattie et al. (2000) argue leases and debt are partial substitutes with £1 of leasing taking over a place of £0.23 of non-lease debt. The authors suggest that management should be aware that leases consume debt capacity. Devos & Rahman (2014) make 154,704 observations of US public firms between 1980 and 2011 that enabled the authors to conclude the average US business has a lease intensity equal to approximately 40% and the future total rent commitments equal to 16.6% of their *Total assets.* The authors add the geographic location of a company, debt capacity and financial constraints to the factors that determine the use of operating leases and overall lease intensity of the business. With the full

implementation of IFRS 16/NZ IFRS 16 those findings require additional testing. Hence, there are multiple opportunities for *ex-post* study of leasing and the effect accounting treatment of leasing produces on various aspects of business life.

Finally, in Section 5.3, we report a limitation of the time horizon of 12 months, which could be seen as too short to capture the full impact of the NZIFRS 16 on the financial statements of New Zealand listed companies. We consider there is a potential for additional studies that would assess the long-term effect of the change in accounting for leases.

Appendix 1 Discount rate used to capitalize operating leases in previous studies

Author(s)	Rate	Methodology
Morales-Diaz & Zamora-Ramirez (2018)	Formula	A model constructed using Bloomberg Euro interest rates per sector, ratings: AAA/AA/A/BBB/BB/CCC and bond's quoted yields' to maturity curves.
Xu, Davidson & Cheong (2017)	Formula	Interest expense in 2012 divided by the interest-bearing debt in 2011, like in Imhoff et al. (1997).
Ozturk & Sercemeli (2016)	10%	Reference to previous studies: Imhoff et al. (1991); Beattie et al. (1998); Duke et al. (2009); Wong & Joshi (2015).
Sari, Altintas & Tas (2016)	9%	The rate of the government bonds issued on Dec 14, 2009.
Wong & Joshi (2015)	10%	Reference to previous studies: Imhoff et al. (1991); Beattie et al. (1998); Duke et al. (2009).
Tai (2013)	6%	Rounded up Hong Kong prime rate of 5.75%, which the author considered to be an incremental borrowing rate.
Fito, Moya & Orgaz (2013)	Formula	• First, estimated a rating and a default spread for each company. (Used online blog http://pages.stern.nyu.edu/~adamodar/. Namely, the spreadsheet devoted to rating companies www.stern.nyu.edu/~adamodar/pc/ratings.xls). • Secondly, added the default spread to the 10-year Spanish bond rate (considering it, as a risk-free rate). • Thirdly, performed additional tests with the obtained interest rate + 1 or +2 points, to provide robustness.
de Villiers & Middelberg (2013)	9%	South African prime interest rate for 2011.
Branswijck, Longueville & Everaert (2011)	10%	Finance lease < 1 year (less current liabilities) divided by the present value of the finance lease, rounded the result of 0.0952 to 0.1 or 10%.
Fulbier, Silva & Pferdehirt (2008)	4.5%-7.7%	Uses company-specific discount and tax rates. Some were disclosed by the companies, the rest were estimated using the median values. In addition, utilised discount rates used for pensions and other provisions.
Durocher (2008)	Formula	The average Bank of Canada rate over a period corresponding to the average expired life of the company's leased assets (computed for each firm) + Risk premium based on company-specific credit issuer rating assigned by Standard & Poor.
Bennett & Bradbury (2003)	9.4%	The average rate of a secured long-term debt for the sample companies.
Beattie, Edwards, Goodacre (1998)	10%	The rounded 10.3%, which was a short-term borrowing rate (the three-month London deposit rate) for the studied period.
Imhoff, Lipe, Wright (1997)	Formula	Suggested two ways: • Using the rate for capital (finance) lease. If it is not disclosed, the author suggests calculating it using, the interest expense and the amount of the current portion of the obligation shown in the footnotes (the ones that are due within 1 year). • Consider recognised debt If not disclosed, interest expense divided by the book value of interest-bearing debt.
Imhoff, Lipe, Wright (1991)	10%	Rounded 9% to avoid understating liability. The rate is the average historical marginal secured borrowing rate for McDonald's (the case study company)

Appendix 2 Decision-making to establish the discount rate

Discount rate

Use the weighted avg. borrowing rate

Yes (Reported)
No

Use the highest borrowing rate

Yes (Reported)
No

Use the highest swap rate

Yes (Reported)
No

Use the formula

Discount future lease payments

End
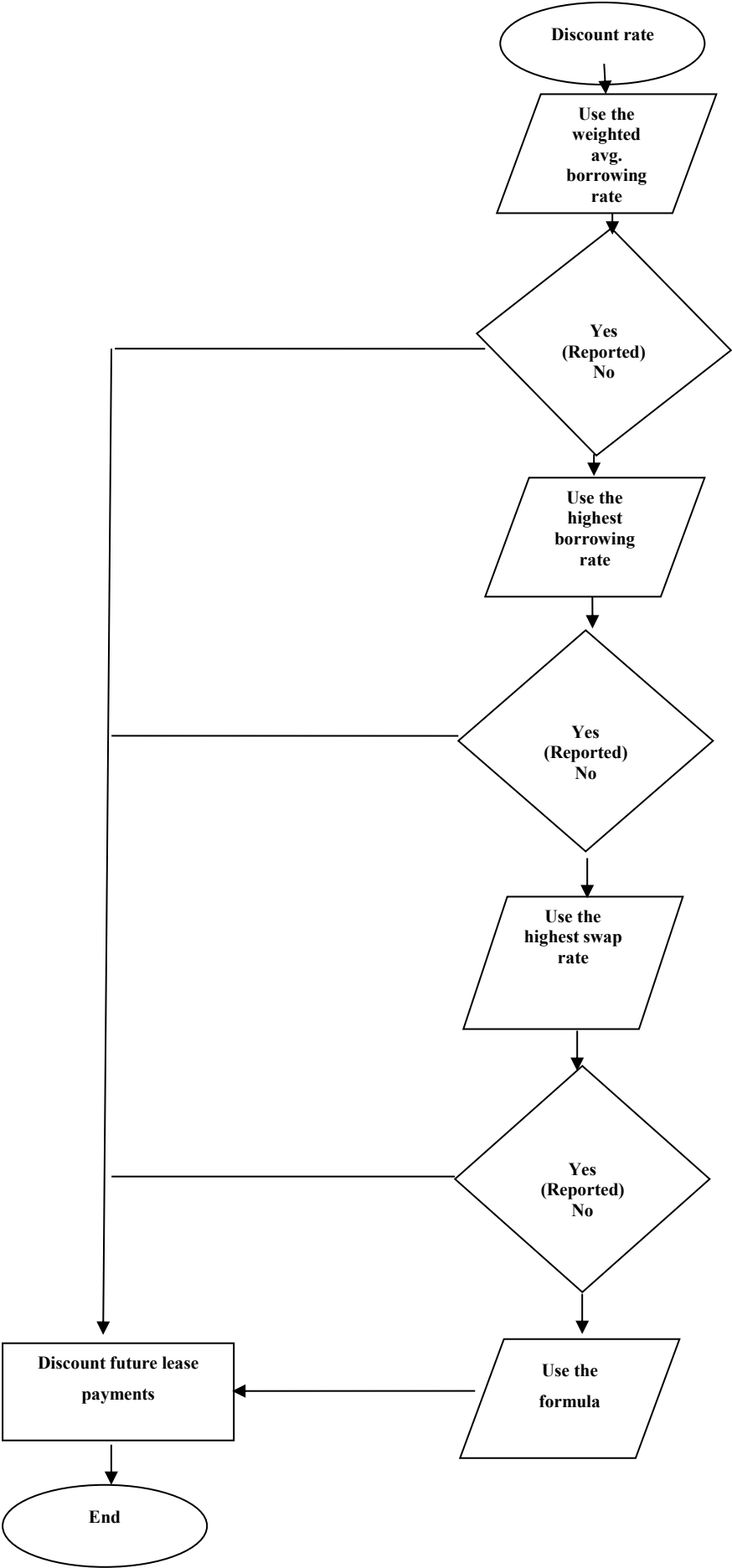
Appendix 3 Illustration of the capitalization method run for Indltex

Illustration of the capitalization method run for Inditex

Inditex

		by trial and error->FLP1/(1+df)^t (Xu et al., 2017)				or by trail and error->FLPt+1=FLPt * df (Fulbier et al., 2008; Fito et al., 2013)		
Operating leases payable in years		FLP1	given			FLP1	given	
Reported	<1	758563	FLP2	540730	df 0.40285	FLP2	540742	df 0.71285
	1-5	1396799	FLP3	385451		FLP3	385468	
	>5	893854	FLP4	274763		FLP4	274781	
	Total	3049216	FLP5	195860		FLP5	195877	
			check: FLP2-5	1396804		check: FLP2-5	1396867	

Remaining life of FLP5+ is equal to (FLP5+/ FLP5).			FLP5	calculated above	Assume: interest rate
FLP5+	given	893854	FLP6	189898	**r%** 0.034
FLP5	calculated	195860	FLP7	184116 df (RL) 0.0314	
Remaining life	4.563729	years	FLP8	178511	$PV_A/PV_L=RL/TL * PV_{TL} / PV_{FLP}$ (Fito et al.,2013)
			FLP9	173077 (Xu et al., (2017) does not specify if they	or
			FLP10	167807 use single df or it is two df.	$PV_A/PV_L=RL/TL * PVAF_{r\%, TL} / PVAF_{r\%, RL}$ (Beattie et al., 1998)
			check: FLP>5	893409 One for FLP2to5 and another for FLP>5)	
					$PVAF = [1-(1+r\%)^{-t}/r\%]$

Year	1	2	3	4	5	6	7	8	9	10	Total	
Reported	758563	1396799				893854						
FLP	758563	540730	385451	274763	195860	195860	195860	195860	195860	110407	3049215	(Fulbier et al., 2008; Fito et al., 2013) RL 4.5637 years — payments are equal
Alternative	*758563*	*540730*	*385451*	*274763*	*195860*	*189898*	*184116*	*178511*	*173077*	*167807*	*3048776*	*(Xu at el., 2017)* RL 5 years rounded — payments degressed

Xu et al.,2017 offers different solution see the doc.file

RL/TL is 50% assumed — using — $PV_A/PV_L=RL/TL * PVAF_{r\%, TL} / PVAF_{r\%, RL}$

	Y1	Y2	Y3	Y4	RL years	TL years	Liability ($)	PVAFr%, TL	PVAFr%, RL	Ratio A/L	Asset ($)
basket 1	217833	difference Year 1-Year 2			1	2	210670	1.90243519	0.96711799	0.983559	207207
basket 2	155279	155279	difference Year 2-Year 3		2	4	290470	3.68181556	1.90243519	0.967659	281076
basket 3	110688	110688	110688	difference Year 3-Year 4	3	6	300373	5.34610062	2.80699728	0.952281	286040
basket 4	78902	78902	78902	78902	4	8	276101	6.90273507	3.68181556	0.937409	258820
basket 5	195860	195860	195860	195860	9.5637	19.1274	1584784	13.8957233	8.0493173	0.863162	1367924
Total	758563	540730	385451	274763			2662398				2401066

(basket 4 difference Year 4-Year 5; basket 5 values continue: 195860 across years 5-9 and 110407 in year 10; Total row: 758563 540730 385451 274763 195860 195860 195860 195860 195860 110407 3049215)

		Equity adjustment
Asset	2401066	-3464
Liability	2662398	-9394
Equity	-261332	-14333
		-17281
		-216859
		-261332

Appendix 4 Effect of capitalization of operating leases on the elements of balance sheets of the sampled companies

Code	Name	TA	TL	CL
TLS	Telstra Corporation Limited	4.96%	11.58%	2.08%
FPH	Fisher & Paykel Healthcare Corporation Limited	1.66%	7.42%	2.42%
MEL	Meridian Energy Limited	0.60%	1.47%	0.11%
SPK	Spark New Zealand Limited	5.78%	19.92%	0.73%
RYM	Ryman Healthcare Limited	0.06%	0.09%	0.05%
MCY	Mercury NZ Limited (NS)	1.16%	2.63%	0.16%
FBU	Fletcher Building Limited	7.54%	15.84%	1.86%
AIR	Air New Zealand Limited (NS)	11.41%	16.67%	1.27%
CEN	Contact Energy Limited	0.28%	0.60%	0.20%
VCT	Vector Limited	0.31%	0.60%	0.16%
ZEL	Z Energy Limited	6.53%	9.44%	0.55%
EBO	Ebos Group Limited	3.92%	6.49%	0.35%
SKC	SKYCITY Entertainment Group Limited (NS)	7.28%	20.74%	0.23%
MFT	Mainfreight Limited	29.39%	61.66%	4.23%
GNE	Genesis Energy Limited (NS)	1.12%	2.14%	0.11%
TPW	Trustpower Limited	1.07%	2.53%	0.04%
TME	Trade Me Group Limited	1.06%	7.03%	0.42%
CNU	Chorus Limited (NS)	0.80%	1.38%	0.15%
SML	Synlait Milk Limited (NS)	0.27%	0.56%	0.56%
SUM	Summerset Group Holdings Limited	0.48%	0.74%	0.03%
PCT	Precinct Properties New Zealand Limited	1.63%	5.96%	0.01%
MET	Metlifecare Limited	0.07%	0.15%	0.01%
FRE	Freightways Limited	14.40%	29.70%	4.62%
SKT	Sky Network Television Limited	4.05%	20.25%	0.55%
RBD	Restaurant Brands New Zealand Limited	27.73%	89.71%	5.08%
DGL	Delegat Group Limited	9.22%	18.24%	24.80%
FCG	Fonterra Co-operative Group Limited	2.13%	4.03%	0.64%
NZR	The New Zealand Refining Company Limited	0.15%	0.51%	0.06%
THL	Tourism Holdings Limited	9.49%	16.95%	2.20%
SAN	Sanford Limited (NS)	4.22%	16.13%	0.59%
WHS	The Warehouse Group Limited	44.56%	94.02%	16.31%
SCL	Scales Corporation Limited	30.45%	90.93%	2.54%
OCA	Oceania Healthcare Limited	0.92%	2.36%	0.56%
TLT	Tilt Renewables Limited	0.10%	0.16%	0.02%
KMD	Kathmandu Holdings Limited	37.96%	159.82%	39.02%
GTK	Gentrack Group Limited	6.96%	19.60%	0.38%
ARV	Arvida Group Limited	0.29%	0.55%	0.17%
VGL	Vista Group International Limited	2.55%	9.90%	2.70%
MHJ	Michael Hill International Limited	29.09%	72.67%	11.33%

PGW	PGG Wrightson Limited	12.42%	23.21%	1.88%
TGG	T&G Global Limited	7.54%	16.99%	4.32%
SKL	Skellerup Holdings Limited	3.42%	10.75%	2.63%
CVT	Comvita Limited	2.76%	7.94%	9.87%
NZK	New Zealand King Salmon Investments Limited	0.82%	4.15%	0.98%
MCK	Millennium & Copthorne Hotels New Zealand Limited	3.74%	13.06%	0.24%
NZX	NZX Limited	2.25%	3.91%	1.07%
SCT	Scott Technology Limited	4.23%	20.02%	0.94%
TRA	Turners Automotive Group Limited	4.48%	6.55%	3.48%
CMO	The Colonial Motor Company Limited	1.37%	3.29%	0.34%
ERD	EROAD Limited	3.21%	9.47%	0.96%
GXH	Green Cross Health Limited	25.85%	66.58%	4.36%
AFT	AFT Pharmaceuticals Limited	2.20%	7.20%	0.89%
ABA	Abano Healthcare Group Limited	11.38%	22.52%	9.52%
SKO	Serko Limited	16.90%	48.40%	0.90%
STU	Steel & Tube Holdings Limited	14.86%	33.55%	4.76%
NZM	NZME Limited	11.14%	59.14%	2.77%
SPN	South Port New Zealand Limited (NS)	0.84%	3.00%	2.26%
OHE	Orion Health Group Limited	37.81%	53.61%	2.27%
MPG	Metro Performance Glass Limited	12.95%	29.36%	15.28%
RBC	Rubicon Limited	7.57%	20.80%	3.28%
SEK	Seeka Limited	28.66%	59.98%	2.91%
NZO	New Zealand Oil & Gas Limited	0.45%	3.33%	3.81%
EVO	Evolve Education Group Limited	38.22%	175.42%	5.82%
MVN	Methven Limited	7.12%	19.98%	6.25%
AWF	AWF Madison Group Limited	7.46%	12.93%	1.83%
RAK	Rakon Limited	5.95%	21.45%	1.01%
CAV	Cavalier Corporation Limited	6.12%	15.56%	2.48%
WDT	Wellington Drive Technologies Limited	0.90%	2.60%	0.93%
NWF	NZ Windfarms Limited	4.04%	76.82%	0.83%
SPY	Smartpay Holdings Limited	3.34%	5.16%	1.62%
SCY	Smiths City Group Limited	35.26%	60.92%	9.27%
TTK	TeamTalk Limited	2.49%	4.84%	1.75%
SEA	SeaDragon Limited	12.52%	93.96%	2.06%
PLX	Plexure Group Limited	2.44%	5.36%	0.96%
MGL	Mercer Group Limited	5.30%	10.22%	1.23%
DOW	Downer EDI Limited	5.58%	12.79%	1.24%

Appendix 5 Effect of capitalization of operating leases on balance sheet ratios

Code	Name	Leverage (gearing)	Current ratio	Asset turnover	Interest cover
TLS	Telstra Corporation Limited	20.75%	-2.03%	-4.72%	4.65%
FPH	Fisher & Paykel Healthcare Corporation Limited	7.66%	-2.37%	-1.63%	3.51%
MEL	Meridian Energy Limited	1.48%	-0.11%	-0.60%	0.94%
SPK	Spark New Zealand Limited	31.22%	-0.72%	-5.46%	3.97%
RYM	Ryman Healthcare Limited	0.09%	-0.05%	-0.06%	0.25%
MCY	Mercury NZ Limited (NS)	2.68%	-0.16%	-1.14%	1.03%
FBU	Fletcher Building Limited	18.15%	-1.82%	-7.01%	28.71%
AIR	Air New Zealand Limited (NS)	19.44%	-1.25%	-10.24%	19.04%
CEN	Contact Energy Limited	0.63%	-0.20%	-0.28%	0.76%
VCT	Vector Limited	0.65%	-0.16%	-0.31%	0.75%
ZEL	Z Energy Limited	10.31%	-0.54%	-6.13%	4.34%
EBO	Ebos Group Limited	7.18%	-0.35%	-3.77%	12.57%
SKC	SKYCITY Entertainment Group Limited (NS)	31.07%	-0.22%	-6.79%	1.92%
MFT	Mainfreight Limited	65.91%	-4.06%	-22.71%	28.11%
GNE	Genesis Energy Limited (NS)	2.17%	-0.11%	-1.10%	1.95%
TPW	Trustpower Limited	2.57%	-0.04%	-1.06%	1.61%
TME	Trade Me Group Limited	7.44%	-0.42%	-1.05%	1.50%
CNU	Chorus Limited (NS)	2.77%	-0.15%	-0.79%	2.52%
SML	Synlait Milk Limited (NS)	0.56%	-0.56%	-0.27%	-0.84%
SUM	Summerset Group Holdings Limited	0.76%	-0.03%	-0.48%	0.41%
PCT	Precinct Properties New Zealand Limited	5.99%	-0.01%	-1.60%	0.82%
MET	Metlifecare Limited	0.16%	-0.01%	-0.07%	0.18%
FRE	Freightways Limited	36.84%	-4.42%	-12.58%	17.01%
SKT	Sky Network Television Limited	23.68%	-0.54%	-3.89%	12.37%
RBD	Restaurant Brands New Zealand Limited	105.94%	-4.83%	-21.71%	31.92%
DGL	Delegat Group Limited	19.56%	-19.87%	-8.44%	6.58%
FCG	Fonterra Co-operative Group Limited	4.70%	-0.63%	-2.09%	4.92%
NZR	The New Zealand Refining Company Limited	0.61%	-0.06%	-0.15%	0.43%
THL	Tourism Holdings Limited	18.28%	-2.16%	-8.67%	9.43%
SAN	Sanford Limited (NS)	17.10%	-0.59%	-4.05%	5.85%
WHS	The Warehouse Group Limited	140.25%	-14.02%	-30.82%	32.02%
SCL	Scales Corporation Limited	95.66%	-2.48%	-23.34%	27.37%
OCA	Oceania Healthcare Limited	2.84%	-0.55%	-0.91%	1.35%
TLT	Tilt Renewables Limited	0.16%	-0.02%	-0.10%	0.04%
KMD	Kathmandu Holdings Limited	169.96%	-28.07%	-27.51%	30.72%
GTK	Gentrack Group Limited	21.88%	-0.37%	-6.51%	8.64%
ARV	Arvida Group Limited	0.55%	-0.17%	-0.29%	0.56%
VGL	Vista Group International Limited	10.16%	-2.63%	-2.49%	1.23%

MHJ	Michael Hill International Limited	94.47%	-10.18%	-22.53%	40.15%
PGW	PGG Wrightson Limited	26.95%	-1.85%	-11.04%	35.16%
TGG	T&G Global Limited	17.86%	-4.14%	-7.01%	15.26%
SKL	Skellerup Holdings Limited	10.97%	-2.56%	-3.30%	8.66%
CVT	Comvita Limited	8.13%	-8.99%	-2.69%	7.32%
NZK	New Zealand King Salmon Investments Limited	4.30%	-0.97%	-0.81%	1.82%
MCK	Millennium & Copthorne Hotels New Zealand Limited	13.59%	-0.24%	-3.60%	2.91%
NZX	NZX Limited	4.38%	-1.05%	-2.20%	1.61%
SCT	Scott Technology Limited	20.62%	-0.93%	-4.06%	-2.28%
TRA	Turners Automotive Group Limited	6.72%	-3.36%	-4.29%	15.49%
CMO	The Colonial Motor Company Limited	3.33%	-0.34%	-1.36%	6.81%
ERD	EROAD Limited	10.10%	-0.95%	-3.11%	8.42%
GXH	Green Cross Health Limited	114.68%	-4.18%	-20.54%	29.57%
AFT	AFT Pharmaceuticals Limited	16.24%	-0.88%	-2.15%	6.07%
ABA	Abano Healthcare Group Limited	26.58%	-8.69%	-10.22%	30.39%
SKO	Serko Limited	52.80%	-0.89%	-14.46%	28.57%
STU	Steel & Tube Holdings Limited	37.41%	-4.54%	-12.94%	31.39%
NZM	NZME Limited	95.51%	-2.70%	-10.02%	33.63%
SPN	South Port New Zealand Limited (NS)	3.04%	-2.21%	-0.83%	1.47%
OHE	Orion Health Group Limited	66.60%	-2.22%	-27.44%	43.42%
MPG	Metro Performance Glass Limited	31.26%	-13.25%	-11.47%	5.71%
RBC	Rubicon Limited	22.47%	-3.18%	-7.04%	53.90%
SEK	Seeka Limited	78.80%	-2.83%	-22.27%	20.59%
NZO	New Zealand Oil & Gas Limited	3.33%	-3.67%	-0.45%	24.10%
EVO	Evolve Education Group Limited	197.33%	-5.50%	-27.65%	53.58%
MVN	Methven Limited	27.72%	-5.88%	-6.65%	10.28%
AWF	AWF Madison Group Limited	16.31%	-1.80%	-6.94%	14.29%
RAK	Rakon Limited	21.70%	-1.00%	-5.62%	45.41%
CAV	Cavalier Corporation Limited	20.04%	-2.42%	-5.77%	173.40%
WDT	Wellington Drive Technologies Limited	5.93%	-0.92%	-0.89%	29.10%
NWF	NZ Windfarms Limited	91.14%	-0.82%	-3.88%	23.18%
SPY	Smartpay Holdings Limited	6.02%	-1.60%	-3.23%	5.67%
SCY	Smiths City Group Limited	65.97%	-8.48%	-26.07%	712.04%
TTK	TeamTalk Limited	5.97%	-1.72%	-2.43%	-1.04%
SEA	SeaDragon Limited	95.87%	-2.02%	-11.12%	11.31%
PLX	Plexure Group Limited	6.38%	-0.95%	-2.38%	11.45%
MGL	Mercer Group Limited	12.66%	-1.21%	-5.03%	11.05%
DOW	Downer EDI Limited	15.33%	-1.23%	-5.28%	2.05%

Appendix 6 Impact of capitalization of operating leases on the ratios of profitability

Code	Name	EBIT(Operating profit)	EBITDA	PBT	EPS (cents per share)	ROCE	ROE	ROA
TLS	Telstra Corporation Limited	9.14%	5.51%	9.97%	9.97%	3.12%	19.00%	4.78%
FPH	Fisher & Paykel Healthcare Corporation Limited	4.06%	3.51%	3.11%	3.11%	0.90%	3.34%	1.43%
MEL	Meridian Energy Limited	1.84%	0.98%	1.98%	1.98%	1.07%	1.98%	1.36%
SPK	Spark New Zealand Limited	7.50%	4.41%	7.81%	7.81%	1.10%	17.97%	1.92%
RYM	Ryman Healthcare Limited	0.28%	0.27%	0.28%	0.28%	0.21%	0.28%	0.22%
MCY	Mercury NZ Limited (NS)	1.66%	1.07%	2.14%	2.14%	0.21%	2.18%	0.97%
FBU	Fletcher Building Limited	52.26%	30.23%	87.27%	87.27%	40.67%	90.99%	74.14%
AIR	Air New Zealand Limited (NS)	37.94%	20.08%	39.09%	39.09%	21.84%	42.40%	24.85%
CEN	Contact Energy Limited	1.38%	0.82%	1.89%	1.89%	1.02%	1.92%	1.61%
VCT	Vector Limited	1.23%	0.78%	2.03%	2.03%	0.86%	2.09%	1.72%
ZEL	Z Energy Limited	5.43%	4.47%	6.31%	6.31%	-1.94%	7.15%	-0.21%
EBO	Ebos Group Limited	14.69%	13.30%	16.10%	16.10%	10.03%	16.85%	11.71%
SKC	SKYCITY Entertainment Group Limited (NS)	3.68%	2.01%	4.29%	4.29%	-6.16%	13.22%	-2.79%
MFT	Mainfreight Limited	39.60%	31.28%	41.55%	41.55%	5.47%	106.66%	55.63%
GNE	Genesis Energy Limited (NS)	3.34%	1.97%	4.54%	4.54%	1.95%	4.57%	3.38%
TPW	Trustpower Limited	2.07%	1.62%	2.71%	2.71%	0.84%	2.75%	1.62%
TME	Trade Me Group Limited	1.81%	1.57%	1.86%	1.86%	0.70%	2.26%	0.79%
CNU	Chorus Limited (NS)	5.28%	2.54%	10.38%	10.38%	4.21%	11.89%	9.50%
SML	Synlait Milk Limited (NS)	-0.68%	-0.46%	-0.92%	-0.92%	-1.15%	-0.92%	-1.18%
SUM	Summerset Group Holdings Limited	0.43%	0.42%	0.45%	0.45%	-0.06%	0.46%	-0.03%
PCT	Precinct Properties New Zealand Limited	0.88%	0.83%	1.03%	1.03%	-0.76%	1.05%	-0.59%
MET	Metlifecare Limited	0.21%	0.20%	0.21%	0.21%	0.13%	0.22%	0.13%
FRE	Freightways Limited	21.65%	19.19%	23.96%	23.96%	3.94%	30.79%	8.36%
SKT	Sky Network Television Limited	19.76%	12.68%	22.05%	22.05%	14.85%	25.53%	17.30%
RBD	Restaurant Brands New Zealand Limited	62.08%	38.63%	65.60%	65.60%	23.84%	79.76%	29.65%
DGL	Delegat Group Limited	10.23%	8.77%	12.10%	12.10%	-0.85%	13.36%	2.64%
FCG	Fonterra Co-operative Group Limited	7.64%	5.15%	11.06%	11.06%	5.15%	11.77%	8.74%
NZR	The New Zealand Refining Company Limited	0.82%	0.47%	0.92%	0.92%	0.62%	1.02%	0.77%
THL	Tourism Holdings Limited	18.45%	10.25%	20.01%	20.01%	7.22%	21.39%	9.61%
SAN	Sanford Limited (NS)	7.90%	6.03%	9.04%	9.04%	3.28%	9.94%	4.62%
WHS	The Warehouse Group Limited	58.81%	43.10%	65.10%	65.10%	1.48%	104.44%	14.21%
SCL	Scales Corporation Limited	37.34%	28.69%	39.70%	39.70%	1.09%	43.16%	7.09%
OCA	Oceania Healthcare Limited	1.58%	1.42%	2.22%	2.22%	0.57%	2.70%	1.29%
TLT	Tilt Renewables Limited	0.09%	0.04%	0.19%	0.19%	-0.03%	0.19%	0.09%
KMD	Kathmandu Holdings Limited	70.10%	60.96%	71.82%	71.82%	13.87%	78.52%	24.54%
GTK	Gentrack Group Limited	10.74%	9.00%	11.44%	11.44%	2.90%	13.56%	4.19%
ARV	Arvida Group Limited	0.78%	0.74%	0.80%	0.80%	0.47%	0.80%	0.51%
VGL	Vista Group International Limited	9.52%	8.61%	11.26%	11.26%	6.05%	11.52%	8.49%

MHJ	Michael Hill International Limited	69.63%	51.44%	73.99%	73.99%	27.48%	95.96%	34.79%
PGW	PGG Wrightson Limited	39.18%	38.90%	43.13%	43.13%	21.94%	47.47%	27.32%
TGG	T&G Global Limited	28.72%	17.38%	42.39%	42.39%	18.01%	43.45%	32.40%
SKL	Skellerup Holdings Limited	12.75%	10.43%	13.27%	13.27%	8.38%	13.50%	9.53%
CVT	Comvita Limited	12.10%	9.04%	18.21%	18.21%	7.95%	18.42%	15.04%
NZK	New Zealand King Salmon Investments Limited	2.62%	2.39%	2.74%	2.74%	1.59%	2.89%	1.90%
MCK	Millennium & Copthorne Hotels New Zealand Limited	4.29%	2.99%	4.86%	4.86%	0.29%	5.35%	1.08%
NZX	NZX Limited	2.99%	3.04%	2.95%	2.95%	0.06%	3.41%	0.69%
SCT	Scott Technology Limited	7.93%	6.74%	7.93%	7.93%	2.91%	8.46%	3.55%
TRA	Turners Automotive Group Limited	16.73%	16.64%	23.98%	23.98%	10.26%	24.17%	18.65%
CMO	The Colonial Motor Company Limited	7.82%	7.11%	8.72%	8.72%	6.14%	8.76%	7.25%
ERD	EROAD Limited	16.10%	12.13%	15.24%	15.24%	19.35%	14.76%	17.88%
GXH	Green Cross Health Limited	46.88%	39.90%	49.03%	49.03%	13.04%	92.07%	18.42%
AFT	AFT Pharmaceuticals Limited	5.36%	5.68%	4.25%	4.25%	7.85%	3.82%	6.31%
ABA	Abano Healthcare Group Limited	47.26%	33.76%	61.37%	61.37%	30.29%	66.71%	44.88%
SKO	Serko Limited	19.42%	26.18%	19.90%	19.90%	32.10%	17.52%	31.48%
STU	Steel & Tube Holdings Limited	41.63%	33.87%	45.93%	45.93%	22.01%	50.16%	27.05%
NZM	NZME Limited	60.43%	35.20%	69.52%	69.52%	43.34%	108.26%	52.53%
SPN	South Port New Zealand Limited (NS)	2.39%	1.92%	2.46%	2.46%	1.27%	2.51%	1.60%
OHE	Orion Health Group Limited	26.08%	35.18%	26.05%	26.05%	50.35%	19.80%	46.34%
MPG	Metro Performance Glass Limited	11.54%	10.11%	12.54%	12.54%	-3.80%	14.19%	-0.37%
RBC	Rubicon Limited	77.04%	57.52%	119.72%	119.72%	62.88%	122.74%	104.25%
SEK	Seeka Limited	34.61%	21.34%	47.57%	47.57%	1.79%	64.94%	14.70%
NZO	New Zealand Oil & Gas Limited	1.43%	2.12%	11.48%	11.48%	2.13%	11.47%	11.87%
EVO	Evolve Education Group Limited	70.52%	65.01%	74.05%	74.05%	20.50%	87.89%	25.92%
MVN	Methven Limited	16.29%	13.18%	18.44%	18.44%	7.13%	26.09%	10.57%
AWF	AWF Madison Group Limited	19.62%	16.29%	22.12%	22.12%	9.78%	25.78%	13.64%
RAK	Rakon Limited	19.33%	44.89%	14.24%	14.24%	24.51%	14.06%	19.05%
CAV	Cavalier Corporation Limited	70.06%	174.26%	85.92%	85.92%	72.07%	85.37%	86.73%
WDT	Wellington Drive Technologies Limited	15.05%	31.76%	7.21%	7.21%	16.35%	4.20%	8.04%
NWF	NZ Windfarms Limited	57.35%	23.27%	98.12%	98.12%	51.21%	114.17%	90.43%
SPY	Smartpay Holdings Limited	15.33%	5.86%	26.45%	26.45%	-59.69%	27.49%	22.37%
SCY	Smiths City Group Limited	367.90%	725.76%	694.98%	694.98%	-292.61%	719.93%	487.75%
TTK	TeamTalk Limited	-1.10%	-0.63%	-1.57%	-1.57%	-4.01%	-0.51%	-3.96%
SEA	SeaDragon Limited	9.25%	10.77%	8.60%	8.60%	19.54%	7.70%	18.77%
PLX	Plexure Group Limited	5.34%	7.92%	5.32%	5.32%	8.14%	4.41%	7.57%
MGL	Mercer Group Limited	9.21%	10.56%	7.70%	7.70%	14.34%	5.65%	12.34%
DOW	Downer EDI Limited	8.18%	5.61%	8.48%	8.48%	1.47%	10.92%	2.75%

Appendix 7 A list of individual discount rates used for capitalization of operating lease of the sampled companies

Code	Name	Discount, %	Sensitivity analysis	
			minus 200bps	plus 200bps
TLS	Telstra Corporation Limited	**5.10%**	3.10%	7.10%
FPH	Fisher & Paykel Healthcare Corporation Limited	**2.80%**	0.80%	4.80%
MEL	Meridian Energy Limited	**6.38%**	4.38%	8.38%
SPK	Spark New Zealand Limited	**4.86%**	2.86%	6.86%
RYM	Ryman Healthcare Limited	**3.40%**	1.40%	5.40%
MCY	Mercury NZ Limited (NS)	**8.76%**	6.76%	10.76%
FBU	Fletcher Building Limited	**4.80%**	2.80%	6.80%
AIR	Air New Zealand Limited (NS)	**3.46%**	1.46%	5.46%
CEN	Contact Energy Limited	**5.83%**	3.83%	7.83%
VCT	Vector Limited	**6.50%**	4.50%	8.50%
ZEL	Z Energy Limited	**3.80%**	1.80%	5.80%
EBO	Ebos Group Limited	**3.54%**	1.54%	5.54%
SKC	SKYCITY Entertainment Group Limited (NS)	**6.70%**	4.70%	8.70%
MFT	Mainfreight Limited	**2.11%**	0.11%	4.11%
GNE	Genesis Energy Limited (NS)	**4.97%**	2.97%	6.97%
TPW	Trustpower Limited	**6.66%**	4.66%	8.66%
TME	Trade Me Group Limited	**3.85%**	1.85%	5.85%
CNU	Chorus Limited (NS)	**6.06%**	4.06%	8.06%
SML	Synlait Milk Limited (NS)	**4.75%**	2.75%	6.75%
SUM	Summerset Group Holdings Limited	**3.57%**	1.57%	5.57%
PCT	Precinct Properties New Zealand Limited	**3.58%**	1.58%	5.58%
MET	Metlifecare Limited	**3.98%**	1.98%	5.98%
FRE	Freightways Limited	**6.15%**	4.15%	8.15%
SKT	Sky Network Television Limited	**6.50%**	4.50%	8.50%
RBD	Restaurant Brands New Zealand Limited	**5.50%**	3.50%	7.50%
DGL	Delegat Group Limited	**4.44%**	2.44%	6.44%
FCG	Fonterra Co-operative Group Limited	**4.36%**	2.36%	6.36%
NZR	The New Zealand Refining Company Limited	**6.40%**	4.40%	8.40%
THL	Tourism Holdings Limited	**4.30%**	2.30%	6.30%
SAN	Sanford Limited (NS)	**2.87%**	0.87%	4.87%
WHS	The Warehouse Group Limited	**2.68%**	0.68%	4.68%
SCL	Scales Corporation Limited	**3.34%**	1.34%	5.34%
OCA	Oceania Healthcare Limited	**5.97%**	3.97%	7.97%
TLT	Tilt Renewables Limited	**3.80%**	1.80%	5.80%
KMD	Kathmandu Holdings Limited	**2.52%**	0.52%	4.52%
GTK	Gentrack Group Limited	**3.19%**	1.19%	5.19%
ARV	Arvida Group Limited	**3.60%**	1.60%	5.60%

VGL	Vista Group International Limited	**6.18%**	4.18%	8.18%
MHJ	Michael Hill International Limited	**3.85%**	1.85%	5.85%
PGW	PGG Wrightson Limited	**4.52%**	2.52%	6.52%
TGG	T&G Global Limited	**3.10%**	1.10%	5.10%
SKL	Skellerup Holdings Limited	**3.45%**	1.45%	5.45%
CVT	Comvita Limited	**3.55%**	1.55%	5.55%
NZK	New Zealand King Salmon Investments Limited	**4.75%**	2.75%	6.75%
MCK	Millennium & Copthorne Hotels New Zealand Limited	**2.59%**	0.59%	4.59%
NZX	NZX Limited	**2.74%**	0.74%	4.74%
SCT	Scott Technology Limited	**3.47%**	1.47%	5.47%
TRA	Turners Automotive Group Limited	**3.91%**	1.91%	5.91%
CMO	The Colonial Motor Company Limited	**3.45%**	1.45%	5.45%
ERD	EROAD Limited	**5.30%**	3.30%	7.30%
GXH	Green Cross Health Limited	**6.15%**	4.15%	8.15%
AFT	AFT Pharmaceuticals Limited	**13.50%**	11.50%	15.50%
ABA	Abano Healthcare Group Limited	**4.56%**	2.56%	6.56%
SKO	Serko Limited	**5.51%**	3.51%	7.51%
STU	Steel & Tube Holdings Limited	**2.86%**	0.86%	4.86%
NZM	NZME Limited	**4.00%**	2.00%	6.00%
SPN	South Port New Zealand Limited (NS)	**3.16%**	1.16%	5.16%
OHE	Orion Health Group Limited *	**1.86%**	0.01%	3.86%
MPG	Metro Performance Glass Limited	**4.30%**	2.30%	6.30%
RBC	Rubicon Limited	**6.99%**	4.99%	8.99%
SEK	Seeka Limited	**3.45%**	1.45%	5.45%
NZO	New Zealand Oil & Gas Limited*	**1.05%**	0.01%	3.05%
EVO	Evolve Education Group Limited	**6.76%**	4.76%	8.76%
MVN	Methven Limited	**4.30%**	2.30%	6.30%
AWF	AWF Madison Group Limited	**4.74%**	2.74%	6.74%
RAK	Rakon Limited	**6.91%**	4.91%	8.91%
CAV	Cavalier Corporation Limited	**6.00%**	4.00%	8.00%
WDT	Wellington Drive Technologies Limited	**15.75%**	13.75%	17.75%
NWF	NZ Windfarms Limited	**8.00%**	6.00%	10.00%
SPY	Smartpay Holdings Limited	**3.55%**	1.55%	5.55%
SCY	Smiths City Group Limited	**4.58%**	2.58%	6.58%
TTK	TeamTalk Limited	**4.90%**	2.90%	6.90%
SEA	SeaDragon Limited	**7.95%**	5.95%	9.95%
PLX	Plexure Group Limited	**9.04%**	7.04%	11.04%
MGL	Mercer Group Limited	**5.60%**	3.60%	7.60%
DOW	Downer EDI Limited	**5.20%**	3.20%	7.20%

Appendix 8 A list of individual ratios of the remaining operating lease life (RL) calculated for the sampled companies

Code	Name	RL	Sensitivity analysis	
			RL-25%	RL+25%
TLS	Telstra Corporation Limited	0.3320	0.2490	0.4150
FPH	Fisher & Paykel Healthcare Corporation Limited	0.6353	0.4765	0.7941
MEL	Meridian Energy Limited	0.9889	0.7417	0.9999
SPK	Spark New Zealand Limited	0.2194	0.1646	0.2743
RYM	Ryman Healthcare Limited	0.9535	0.7152	0.9999
MCY	Mercury NZ Limited (NS)	0.9625	0.7219	0.9999
FBU	Fletcher Building Limited	0.5484	0.4113	0.6855
AIR	Air New Zealand Limited (NS)	0.6642	0.4982	0.8303
CEN	Contact Energy Limited	0.7373	0.5530	0.9216
VCT	Vector Limited	0.7202	0.5401	0.9002
ZEL	Z Energy Limited	0.8893	0.6670	0.9999
EBO	Ebos Group Limited	0.7257	0.5443	0.9071
SKC	SKYCITY Entertainment Group Limited (NS)	0.6582	0.4936	0.8227
MFT	Mainfreight Limited	0.6918	0.5189	0.8648
GNE	Genesis Energy Limited (NS)	0.9681	0.7261	0.9999
TPW	Trustpower Limited	0.9515	0.7136	0.9999
TME	Trade Me Group Limited	0.3037	0.2278	0.3797
CNU	Chorus Limited (NS)	0.4469	0.3351	0.5586
SML	Synlait Milk Limited (NS)	0.9117	0.6838	0.9999
SUM	Summerset Group Holdings Limited	0.9449	0.7087	0.9999
PCT	Precinct Properties New Zealand Limited	0.9834	0.7375	0.9999
MET	Metlifecare Limited	0.6416	0.4812	0.8020
FRE	Freightways Limited	0.5388	0.4041	0.6735
SKT	Sky Network Television Limited	0.2506	0.1879	0.3132
RBD	Restaurant Brands New Zealand Limited	0.4996	0.3747	0.6245
DGL	Delegat Group Limited	0.7813	0.5860	0.9766
FCG	Fonterra Co-operative Group Limited	0.5672	0.4254	0.7090
NZR	The New Zealand Refining Company Limited	0.3134	0.2351	0.3918
THL	Tourism Holdings Limited	0.7864	0.5898	0.9831
SAN	Sanford Limited (NS)	0.4400	0.3300	0.5500
WHS	The Warehouse Group Limited	0.3558	0.2668	0.4447
SCL	Scales Corporation Limited	0.7227	0.5420	0.9033
OCA	Oceania Healthcare Limited	0.6000	0.4500	0.7500
TLT	Tilt Renewables Limited	0.9986	0.7490	0.9999

KMD	Kathmandu Holdings Limited	0.4995	0.3746	0.6244
GTK	Gentrack Group Limited	0.4866	0.3650	0.6083
ARV	Arvida Group Limited	0.9754	0.7315	0.9999
VGL	Vista Group International Limited	0.5721	0.4291	0.7151
MHJ	Michael Hill International Limited	0.4691	0.3518	0.5864
PGW	PGG Wrightson Limited	0.6000	0.4500	0.7500
TGG	T&G Global Limited	0.7134	0.5350	0.8917
SKL	Skellerup Holdings Limited	0.6332	0.4749	0.7915
CVT	Comvita Limited	0.5000	0.3750	0.6250
NZK	New Zealand King Salmon Investments Limited	0.5397	0.4047	0.6746
MCK	Millennium & Copthorne Hotels New Zealand Limited	0.7701	0.5776	0.9627
NZX	NZX Limited	0.3761	0.2821	0.4702
SCT	Scott Technology Limited	0.4564	0.3423	0.5705
TRA	Turners Automotive Group Limited	0.9000	0.6750	0.9999
CMO	The Colonial Motor Company Limited	0.8476	0.6357	0.9999
ERD	EROAD Limited	0.5129	0.3847	0.6412
GXH	Green Cross Health Limited	0.3255	0.2441	0.4068
AFT	AFT Pharmaceuticals Limited	0.2699	0.2024	0.3374
ABA	Abano Healthcare Group Limited	0.4436	0.3327	0.5545
SKO	Serko Limited	0.5833	0.4375	0.7291
STU	Steel & Tube Holdings Limited	0.5551	0.4163	0.6939
NZM	NZME Limited	0.1825	0.1369	0.2281
SPN	South Port New Zealand Limited (NS)	0.5202	0.3901	0.6502
OHE	Orion Health Group Limited *	0.5330	0.3998	0.6663
MPG	Metro Performance Glass Limited	0.7709	0.5782	0.9636
RBC	Rubicon Limited	0.7500	0.5625	0.9375
SEK	Seeka Limited	0.7449	0.5587	0.9312
NZO	New Zealand Oil & Gas Limited*	0.5000	0.3750	0.6250
EVO	Evolve Education Group Limited	0.6306	0.4730	0.7883
MVN	Methven Limited	0.3590	0.2693	0.4488
AWF	AWF Madison Group Limited	0.4975	0.3731	0.6218
RAK	Rakon Limited	0.8890	0.6668	0.9999
CAV	Cavalier Corporation Limited	0.3331	0.2499	0.4164
WDT	Wellington Drive Technologies Limited	0.1506	0.1129	0.1882
NWF	NZ Windfarms Limited	0.2400	0.1800	0.3000
SPY	Smartpay Holdings Limited	0.4849	0.3637	0.6061
SCY	Smiths City Group Limited	0.7780	0.5835	0.9725
TTK	TeamTalk Limited	0.2917	0.2188	0.3647
SEA	SeaDragon Limited	0.8212	0.6159	0.9999

PLX	Plexure Group Limited	0.4231	0.3173	0.5288
MGL	Mercer Group Limited	0.4637	0.3478	0.5796
DOW	Downer EDI Limited	0.4500	0.3375	0.5625

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