INFORMATION RELEVANCE OF DEFERRED TAX

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ABSTRACT

The International Accounting Standards Board (IASB) has undertaken research on accounting for income taxes. The IASB research suggests that a fundamental change from International Accounting Standard 12: *Income Taxes* (IAS 12), the balance sheet method, to another method may be considered. Other methods for accounting for deferred tax include the taxes payable method, the comprehensive basis under the income statement method, and the partial basis under the income statement method. This thesis provides evidence on this issue by using non-United States data to examine these deferred tax methods.

This thesis examines the research question "are deferred tax methods, relative to the taxes payable method, information relevant?" Information that is 'information relevant' has two components: predictability and value relevance (Ohlson, 1995). The predictability of deferred tax methods is measured by its ability to predict future tax payments relative to the taxes payable method. The value relevance of deferred tax methods is measured by its association with share price relative to the taxes payable method.

Literature examining deferred taxes predominately uses United States US data and US Generally Accepted Accounting Principles (US GAAP), and only partially examines deferred tax methods. This thesis contributes to the literature by examining all three deferred tax line items: deferred tax liabilities, deferred tax assets and deferred tax expense. The data is collected from the financial information for firms listed on the NZ Stock Exchange. Two samples of firms are examined: from 2000 to 2004 (pre IFRS) and 2008 to 2012 (post IFRS).

The results show that the comprehensive basis under the income statement method is a better predictor of future tax payments and is value relevant relative to the taxes payable method. This indicates that it is information relevant. The partial basis under the income statement method is a better predictor of future tax payments relative to the taxes payable method however it is only value relevant for firms in the highest three deciles of mean increases in tax paid over the period. The balance sheet method is not a better predictor of future tax payments relative to the taxes payable method. The balance sheet method is, however, value relevant. The balance sheet method using disaggregated deferred tax is also value relevant relative to the balance sheet method.

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LIST OF ABBREVIATIONS

APB:	Accounting Principles Board
BLDGS:	Buildings
BSM:	Balance Sheet Method
BV:	Book Value of Equity Excluding Deferred Tax Assets and Liabilities
DDT:	Disaggregated Deferred Tax
DT:	Deferred Tax
DT_CFH:	Deferred Tax on Cash Flow Hedges
DT_DFI:	Deferred Tax on Derivative Financial Instruments
DT_EB:	Deferred Tax on Employee Benefits
DT_IA:	Deferred Tax on Intangible Assets
DT_IN:	Deferred Tax on Inventories
DT_INV:	Deferred Tax on Investment Properties
DT_OT:	Deferred Tax on Other Items
DT_PPE:	Deferred Tax on Property, Plant and Equipment
DT_TL:	Deferred Tax on Tax Losses Carried Forward
DTA:	Deferred Tax Assets
DTE:	Deferred Tax Expense
DTL:	Deferred Tax Liabilities
IAS:	International Accounting Standard
GAAP:	Generally Accepted Accounting Practices
IASB:	International Accounting Standards Board
IFRS:	International Financial Reporting Standards
ISM_CB:	Comprehensive Basis under the Income Statement Method
ISM_PB:	Partial Basis under the Income Statement Method
MVE:	Market Value of Equity
NetDTL:	Net Deferred Tax Liabilities
NI:	Net Income after Income Tax plus Deferred Tax Expense
SFAS:	Statement of Financial Accounting Standard
SSAP:	Statement of Standard Accounting Practices
TP:	Tax Paid
TPM:	Taxes Payable Method
US:	United States

CHAPTER 1: INTRODUCTION

1.1. Study Overview

Accounting for deferred tax continues to be controversial. As a result of the 2011 Agenda Consultation, the International Accounting Standards Board (IASB) has undertaken research on income taxes.

The IASB research identifies three main issues arising from applying International Accounting Standard 12: *Income Taxes* (IAS 12). These are: (1) "the current model in IAS 12 produces information that some people consider is not particularly relevant and causes an accounting mismatch" (IASB Agenda Reference 19A, p.3); (2) "the current version of IAS 12 may not fit well with more recent IFRS [international financial reporting standards] ... or more recent tax laws across the globe" (IASB Agenda Reference 19A, p.4); and (3) "income taxes are very complex and existing disclosure may be insufficient to explain what drives the amount of income taxes reported" (IASB Agenda Reference 19A, p.4). The IASB research suggests that the first option to resolve these issues is to fundamentally change the main principle in IAS 12, that is, change from the balance sheet liability method to another method of calculating deferred tax. As at the current date, there has been no further work by the IASB on this research project.

Four of the deferred tax methods suggested by the IASB research (IASB Agenda Reference 19B, p.1) are: (1) the taxes payable method in which the income tax expense for the current period is equal to the tax payable in accordance with tax accounting rules; (2) the income statement method in which deferred tax is calculated on almost all timing differences from the Statement of Profit or Loss (comprehensive basis); (3) the income statement method where only the timing differences that will crystallise into cash flows in the foreseeable future (partial basis); and (4) the balance sheet method in which deferred tax is calculated on temporary differences from the Statement of Financial Position.

In New Zealand, pre IFRS, the Statement of Standard Accounting Practice 12: *Accounting for Income Tax* (SSAP-12) allows both the comprehensive basis and the partial basis under the income statement method. Post IFRS, the New Zealand International

Accounting Standard 12: *Income Taxes* (NZ IAS 12) requires the balance sheet method. Neither accounting standard allows the taxes payable method.

This thesis examines the research question "are deferred tax methods, relative to the taxes payable method, information relevant?" Ohlson (1995) suggests if a variable is able to ***predict*** future cash flows and is ***value relevant*** then it is information relevant, for example, where dividends are able to predict future dividends and are value relevant, they are information relevant. The first null hypothesis of this thesis is: there is no difference in the predictive ability of the deferred tax and taxes payable methods. The second hypothesis is: there is no difference in the value relevance of the deferred tax and taxes payable methods. If the deferred tax method is a better predictor of future tax payments and is value relevant relative to the taxes payable method, then it is information relevant.

This chapter is set out as follows. Section 1.2 explains the research methods, section 1.3 the motivation and contribution of this thesis, and section 1.4 reports the main findings. Section 1.5 provides a diagram of the framework for the thesis.

1.2. Research Methods

The research methods are designed to examine the two components of information relevance: predictability and value relevance.

Prediction models are used to examine the ability of a deferred tax method to predict future tax payments relative to the taxes payable method. To assess the ability of deferred tax methods to predict future tax payments, one step ahead prediction of future tax payments models are developed based on Cheung, Krishnan and Min (1997).

Valuation models are used to measure the value relevance of a deferred tax method. This thesis uses a version of the Ohlson (1995) valuation framework. It assesses the association of deferred tax methods relative to the taxes payable method using the share price as at three months' post balance date (Wong, Wong and Naiker, 2011). The Vuong (1989) test for non-nested models (Zhou, 2016) and the Clarke's sign test (Clarke, 2003) are used to assess which is the preferred model.

Two samples from firms listed on the NZ Stock Exchange are employed. The first sample, 2000 to 2004, is pre IFRS. This sample is governed by SSAP-12 and the Income Tax Act 1994. The second sample, 2008 to 2012, is post IFRS. This sample is governed by NZ IAS 12 and the Income Tax Act 2007. Using two samples enables the comprehensive basis and the partial basis under the income statement method and the balance sheet method to be examined. The period 2005 to 2007 is excluded as the transition to NZ IAS 12 affects early adopters more than late adopters (Mear, 2011) and the results may be affected by a self-selection bias.

1.3. Motivation and Contribution of this Thesis

This thesis is motivated by the IASB research on income taxes which suggests fundamentally changing the calculation of deferred tax. Four income tax approaches are examined: the taxes payable method, the comprehensive basis under the income statement method, the partial basis under the income statement method, and the balance sheet method.

The thesis contributes to prior research in two aspects. First, prior research predominately uses US (United States) data and US Generally Accepted Accounting Practices (GAAP). For example, Legoria and Sellers (2005) test the ability of deferred tax assets and liabilities to predict future cash flows using US GAAP. Chludek (2011) examines the value relevance of deferred tax assets and liabilities using US GAAP. However, US GAAP using the income statement method does not require the separate recognition of deferred tax assets and liabilities (Ayers, 1998). US GAAP using the balance sheet method requires separate recognition of deferred tax assets, liabilities and a valuation allowance (reduction of deferred tax assets where the full amount is not expected to be realised) (Ayers, 1998). Under both pre IFRS and post IFRS there is a requirement to separately recognise deferred tax assets and liabilities where they cannot be offset, and there is no valuation allowance. To provide evidence for IASB's research project, non-US data is used.

Second, prior literature only partially examines deferred tax methods. For example, Cheung *et al.* (1997) examine the ability of deferred tax liabilities and deferred tax expense to predict future tax payments. Deferred tax assets are not considered. Wong *et al.* (2011) assess the value relevance of deferred tax liabilities, but not deferred tax assets

or expense. The deferred tax method impacts on the tax expense in the Statement of Profit or Loss, and assets and liabilities recognised in the Statement of Financial Position. In this thesis, a comprehensive approach is taken by employing all three deferred tax line items.

1.4. Main Findings

The first hypothesis is: there is no difference in the predictive ability of the deferred tax and taxes payable methods. The results provide evidence that both the comprehensive basis and the partial basis under the income statement method are better predictors of future tax payments relative to the taxes payable method. Neither the comprehensive basis nor the partial basis under the income statement method is significantly better than the other for predicting future tax payments. The balance sheet method is not a better predictor of future tax payments relative to the taxes payable method.

The second hypothesis is: there is no difference in the value relevance of the deferred tax and taxes payable methods. The results provide evidence that the comprehensive basis under the income statement method and the balance sheet method are value relevant relative to the taxes payable method. The partial basis under the income statement method is only value relevant relative to the taxes payable method where firms are in the three highest deciles of mean increases in tax paid over the period.

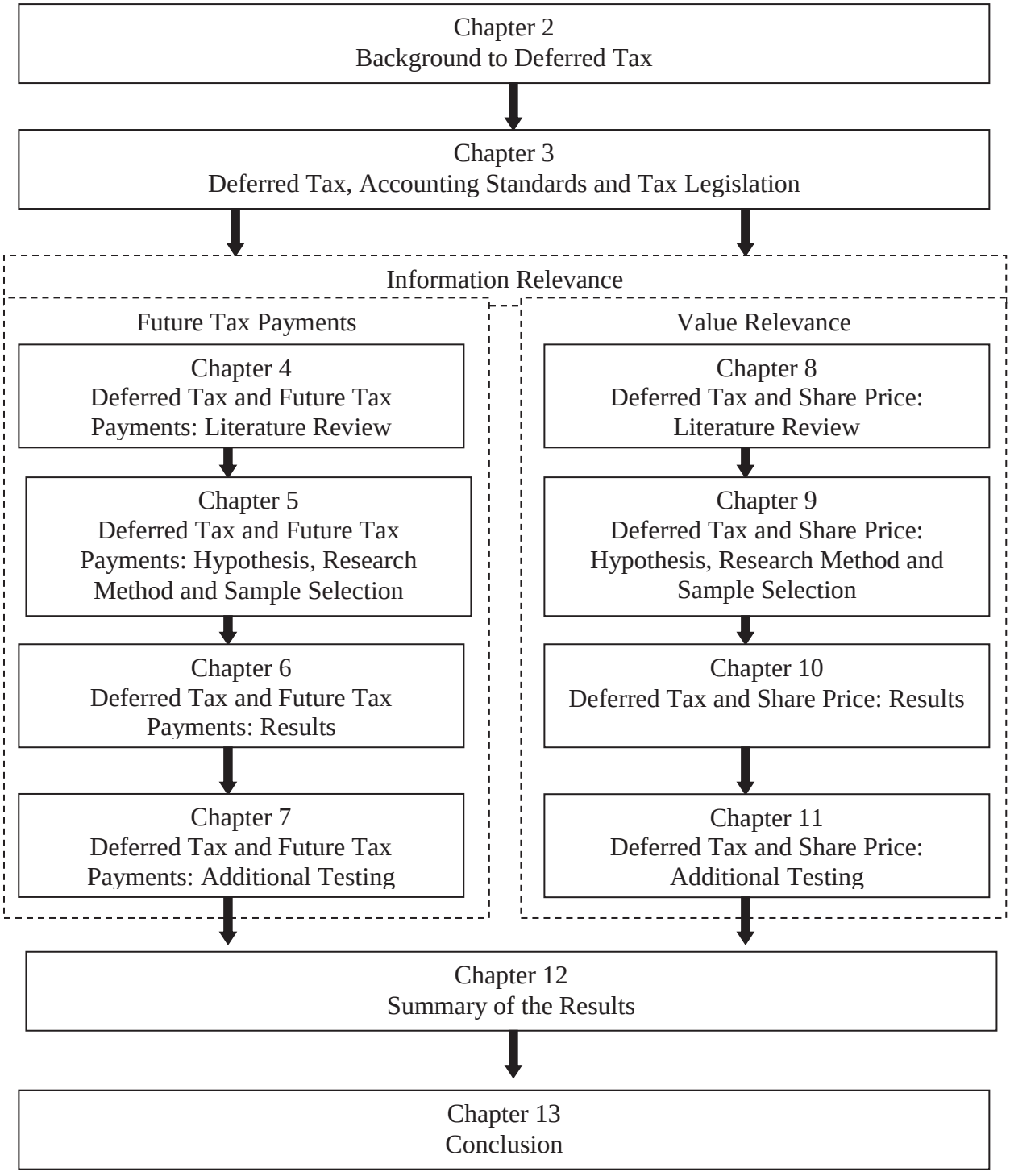
As the comprehensive basis under the income statement method is the only method that is a better predictor of future tax payments and is value relevant, it is the only method that is information relevant.

The results provide important information to the IASB. The recent IASB research project indicates that there is some demand for a fundamental change to IAS 12. This may include a change from the balance sheet method to another method. This thesis shows that the comprehensive basis under the income statement method is the only method that is information relevant.

1.5. Framework of Thesis

The remainder of the thesis is structured as follows.

Figure 1.1: Flow Chart of Thesis Structure



CHAPTER 2: BACKGROUND TO DEFERRED TAX

2.1. Introduction

The recent IASB research project for income taxes indicates that there is some demand for a fundamental change to NZ IAS 12, which calculates deferred tax using the balance sheet method. Four of the income tax approaches suggested by the IASB are the taxes payable method, the comprehensive basis and partial basis under the income statement method, and the balance sheet method.

There are a number of unresolved issues surrounding the methods of deferred taxation. This chapter discusses three key issues in section 2.2 while section 2.3 summarises the chapter.

2.2. Deferred Tax Issues

Three of the unresolved issues surrounding deferred tax are: (1) deferred tax meeting the definition of a liability; (2) deferred tax not crystallising into future cash flows; and chang

Prior research argues that deferred tax is not a liability as it does not meet the common definition of a creditor (Hill, 1957) and as at balance date deferred tax is not currently owing to any creditor (Chambers, 1968). Colley, Rue, Valencia and Volkan (2012) contend that deferred tax liabilities do not meet the definition of a liability as set out in the Statement of Concepts by analysing each of the three parts of the definition of liabilities. They argue that: (1) the liability depends on future events; (2) there is no present obligation as the deferred tax liability is not due and payable at balance date; and (3) the creation of deferred tax is not based on a past transaction but rather legislation allowing different methods of calculating tax income and book income (such as accelerated depreciation). The underlying issue is whether tax should be accounted for on the taxes payable method or the deferred tax method. The taxes payable method is where the income tax expense for the current period is equal to the tax payable in accordance with tax accounting rules. The deferred tax method is the method set out in current accounting standards.

The second issue relates to the crystallising of deferred tax into future cash flows. Prior

research uses the argument that deferred tax does not crystallise into cash flows, making it meaningless (Hill, 1957). Davidson (1958) provides evidence that growth of depreciable assets affects the timing of the deferred tax crystallisation, using two examples. The first example is a static firm and the second is a firm growing at a rate of 5%. The conclusion is that while deferred taxes should only be recognised in rare cases (where there is declining investment and the firm is profitable), any difference between depreciation claimed for accounting purposes and that claimed for tax purposes should be disclosed. Barton (1970) provides similar examples of deferred taxes being avoided due to growth of depreciable assets. However, Jaedicke and Nelson (1960) contest this argument, by using accounts payable as a substitute for deferred tax to demonstrate that accounts payable would also be deferred indefinitely in a growing firm. The underlying issue is whether deferred tax should be calculated using the partial or comprehensive basis. The partial basis includes only the timing differences that will crystallise into cash flows in the foreseeable future (SSAP-12, 4), whereas the comprehensive basis calculates deferred tax on almost all timing differences.

The third issue is calculating deferred tax using the balance sheet method. The balance sheet method increases deferred tax as it captures a wider range of items (Wong, 2006). This increase in deferred tax is evidenced by Stent, Bradbury and Hooks (2010) and Mear (2011). Stent *et al.* (2010) examine the financial statement impacts of New Zealand companies adopting IFRS during 2005 to 2008. The results indicate that deferred tax liabilities increase 24% on the change from the income statement method to the balance sheet method whereas deferred tax assets increase 16%. Mear (2011) examines the impact of adopting IFRS on tax balances and reports larger decreases (increases) in net tax assets (liabilities) when changing from the income statement method under SSAP-12 to the balance sheet method under NZ IAS 12 for those reporting an asset revaluation reserve. Sidhu (1996) argues that deferred tax liabilities calculated under the balance sheet method are not likely to be more 'real' than under the income statement method. Sansing (1998) finds that deferred tax calculated under the balance sheet method is valued at a fraction of that recognised. Similarly, Amir, Kirschenheiter and Willard (2001) find that deferred tax liabilities are overstated and should be recognised at their net present value. An example of the issues with the balance sheet method is highlighted with the introduction of The Income Tax (GST and Remedial) Act (2010) in New Zealand. The Act implements a new rate of 0% depreciation for all buildings with a useful life of 50

years or more, effective from the 2012 tax year. The resulting increase (decrease) in deferred tax liabilities (assets) created controversy. Mear and Bradbury (2013) and Wong, Wong and Yangliu Li (2015) examine the effect of the Income Tax (GST and Remedial) Act (2010) on deferred tax. Mear and Bradbury (2013) use a case study approach to provide evidence that deferred tax liabilities increase for those holding buildings for companies with a financial year end of June 2010 onwards. Wong *et al.* (2015) explain that as a result of lobbying, in December 2010, NZ IAS 12 was amended to allow the rebuttable presumption that the buildings are held for the purpose of sale, reducing the effect of this legislation. This presumption benefits primarily property investment trusts. The underlying issue is whether the balance sheet method is an appropriate method of calculating deferred tax.

2.3. Chapter Summary

This chapter discusses the three underlying issues of deferred tax: (1) deferred tax meeting the definition of a liability; (2) deferred tax not crystallising into future cash flows; and (3) calculating deferred tax using the balance sheet method.

This thesis addresses these issues.

The following chapter reviews the accounting standards that govern deferred tax, and reviews tax legislation.

CHAPTER 3: DEFERRED TAX, ACCOUNTING STANDARDS AND TAX LEGISLATION

3.1. Introduction

This chapter provides a discussion on the accounting standards and tax legislation that were in place during the sample periods 2000 to 2004 and 2008 to 2012. In 2007, New Zealand adopted IFRS, although early adoption was allowed from 2005, resulting in a transition period of 2005 to 2007.[1] This thesis excludes this transition period as NZ IAS 12. Stent *et al*. (2010) suggest that early adopters have self-selected, although the causes and consequences are not examined. Mear (2011) shows that early adopters have a higher percentage change in net tax affects than late adopters. Without knowing the motivation and consequences of early adoption the transition period is excluded. Tax legislation is reviewed as this affects deferred tax accounting (Mear, 2011).

Section 3.2 discusses the accounting standards and section 3.3 discusses the income tax legislation.

3.2. Accounting Standards

The period 2000 to 2004 is governed by Standard Statement of Accounting Policies 12: *Accounting for Income Tax* (SSAP-12), whereas the period 2008 to 2012 is governed by New Zealand International Accounting Standard 12: *Income Taxes* (NZ IAS 12).

SSAP-12: *Accounting for Inter-period Allocation of Income Taxes* was introduced in 1980. This was replaced with SSAP-12: *Accounting for Income Tax* (1991) which allows the comprehensive basis and the partial basis for calculating deferred tax (SSAP-12, 4.18) under the income statement method. It prohibits the taxes payable method, where the income tax expense for the current period is equal to the tax payable in accordance with tax accounting rules.

The comprehensive basis calculates deferred tax on almost all timing differences. Timing differences are "differences between accounting results and assessable income ... and

[1] For a commentary on the adoption of IFRS in New Zealand see Bradbury and van Zijl (2006). The tax effects of IFRS adoption are discussed by Wong (2006) and Mear and Bradbury (2016). For the financial statement impact of IFRS adoption on New Zealand firms, see Stent *et al.* (2010).

reverse in one or more subsequent periods" (SSAP-12, 3). Examples include employee benefits, warranty expense and accelerated depreciation. Deferred tax on timing differences is calculated using the tax rate announced at the date of authorising the financial statements (SSAP-12, 4.36). The comprehensive basis does not require recognition of deferred tax calculated on asset revaluations that are not expected to crystallise into cash flows in the foreseeable future but are required to be disclosed in the Notes to the Financial Statements.

The partial basis includes only the timing differences that will reverse in the foreseeable future (SSAP-12, 4). When using the partial basis, any deferred tax that is not recognised in the financial statements is disclosed in the Notes to the Financial Statements (SSAP-12, 4.19).

Under the comprehensive basis and the partial basis, deferred tax assets and future tax benefits are not recognised unless there is virtual certainty that they will be realised (SSAP-12, 5.5). Tax benefit on losses also requires virtual certainty that they will be realised, with three conditions; (1) the losses are from identifiable and non-recurring causes; (2) the firm has a long period of reporting assessable income; and (3) any future assessable income will be sufficient to absorb the losses beyond any reasonable doubt (SSAP-12, 4.22).

SSAP-12, 4.37 allows offsetting of deferred tax assets and liabilities where operations are carried out in one income tax jurisdiction.

A full example of calculating deferred tax under SSAP-12 is shown in Appendix 3.1.

NZ IAS 12 governs the 2008 to 2012 sample period. Under NZ IAS 12 temporary differences are defined as "differences between the carrying amount of an asset or liability in the Statement of Financial Position and its tax base" (NZ IAS 12.5). Taxable temporary differences are those "that will result in taxable amounts in determining taxable profit (tax loss) of future periods when the carrying amount of the asset or liability is recovered or settled (NZ IAS 12.5). Tax base is defined as "the amount attributed to that asset or liability for tax purposes" (NZ IAS 12.5). NZ IAS 12 requires deferred tax to be recognised for all taxable (deductible) temporary differences using the balance sheet

method. NZ IAS 12 requires deferred tax liabilities to be calculated on all taxable temporary differences with two exceptions, being the initial recognition of goodwill and the initial recognition of an asset or liability that does not affect either accounting profit or taxable profit and is not a business combination (NZ IAS 12.15).

Deferred tax assets are recognised for all deductible temporary differences "to the extent that it is probable that taxable profit will be available against which the deductible temporary difference can be utilised" (NZ IAS 12.24). Deductible temporary differences "are differences that will result in amounts that are deductible in determining taxable profit (tax loss) of future periods when the carrying amount of the asset or liability is recovered" (NZ IAS 12.5). This is a dilution of the recognition criteria from SSAP-12, which states 'virtual certainty' is required when reporting deferred tax assets, instead of a 'probability' test. Deferred tax assets arising from unused tax losses also require the same recognition criteria as deferred tax assets and are recognised where it is probable future taxable profit will be available (NZ IAS 12.34).

NZ IAS 12 applies a more stringent criterion for offsetting deferred tax assets and liabilities than SSAP-12. If the firm can legally offset current assets and liabilities and if deferred tax assets and liabilities will be settled or realised simultaneously, deferred tax assets and liabilities can be offset (NZ IAS 12.74).

One additional disclosure is required by NZ IAS 12, when compared to SSAP-12. An entity must disclose the amount of deferred tax assets and liabilities for each type of temporary difference (NZ IAS 12.81).

A full example of calculating deferred tax under NZ IAS 12 is shown in Appendix 3.2.

3.3. Income Tax Legislation

Tax legislation is important when examining changes in financial statement amounts (Mear, 2011). The period 2000 to 2004 is legislated by the Income Tax Act 1994, whereas the period 2008 to 2012 is legislated predominately by the Income Tax Act 2007.

Table 3.1 provides the accounting standards and income tax legislation over the period 2000 to 2012.

Table 3.1: Accounting Standards and Income Tax Legislation

	2000-2004	2005-2007	2008-2012
Accounting Standard	SSAP-12: *Accounting for Income Tax*	Voluntary adoption of IFRS	NZ IAS 12*: Income Taxes*
Income Tax Legislation	Income Tax Act 1994 Tax Administration Act 1994	Income Tax Act 1994 Tax Administration Act 1994	Income Tax Act 2004 (to 2008 tax year) Income Tax Act 2007 (from 2009 tax year) Tax Administration Act 1994 Income Tax (GST and Remedial) Act 2010 setting the tax depreciation rate on buildings with a useful life of 50 years or more to 0%
Company Tax Rate	33%	33%	2008 tax year - 33% 2009, 2010 and 2011 tax years – 30% 2012 tax year – 28%
Tax Rate for Deferred Tax	33%	33%	30% and 28% respectively from announcement of tax rate change

Significantly, during 2008 to 2012, further legislation is enacted. The Income Tax (GST and Remedial) Act (2010) sets the depreciation rate on buildings with a useful life of 50 years or more to zero from the 2012 tax year.[2] An example of the effect of this legislation is shown in Appendix 3.3.

[2] For an analysis of the effect of the change in legislation on deferred tax, refer to Mear and Bradbury (2013) and Wong *et al.* (2015).

3.4. Chapter Summary

This chapter provides the background to the accounting standards and tax legislation during the period being examined.

The chapter begins with a summary of the two accounting standards used to calculate deferred tax. SSAP-12 uses the income statement method to calculate deferred tax and allows both the comprehensive basis and partial basis. The comprehensive basis requires almost all timing differences to be recognised while the partial basis only requires those that will reverse in the foreseeable future. Any unrecognised deferred tax using the comprehensive or partial basis is required to be disclosed in the Notes to the Financial Statements. NZ IAS 12 uses the balance sheet method to calculate deferred tax. Deferred tax on temporary differences is required to be recognised.

Three key changes moving to NZ IAS 12 are: (1) the recognition criterion of deferred tax assets reduces; (2) offsetting of deferred tax assets and liabilities is more stringent; and (3) disclosure of disaggregated deferred tax is required in the Notes to the Financial Statements.

The second part of this chapter considers the income tax legislation during the two periods being examined. There are no anomalies in the first period. In the second period there are two key changes: (1) legislation is introduced to set the tax depreciation rate on buildings with a useful life of 50 years or more to 0%; and (2) the tax rates reduce over the period.

The following chapter examines the literature on the ability of deferred tax methods to predict future tax payments.

Appendix 3.1. SSAP-12 Example

Example 1, Table 3.2, shows a firm with an asset that is held for use and calculates deferred tax using the comprehensive method under the income statement method. The depreciation rate for tax purposes is 2% ($200) and for accounting purposes is 1% ($100). A timing difference arises ($100) on which deferred tax is calculated at the current tax rate of 33% ($33).

Example 2, Table 3.2, shows the same firm, one year on. In this year the asset is revalued to $12,000, and forms the new base for accounting depreciation. The timing difference is now $80, of which $100 relates to accounting and tax differences on the original cost and $20 relates to the depreciation on the increase in value. The deferred tax expense is calculated on the timing difference based on the original cost ($33), and the deferred tax calculated on the timing difference relating to the increase in value ($7) is disclosed in the Notes to the Financial Statements as it is not expected to reverse on sale.

Examples 3 and 4 calculate deferred tax using the partial basis under the income statement method. Deferred tax not crystallising into cash flows in the foreseeable future is disclosed in the Notes to the Financial Statements.

Table 3.2 shows that the accounting net surplus after tax is lower in 2003 and 2004 for those using the comprehensive basis ($3,417; $3397) than the partial basis ($3,450; $3430) due to the deferred tax expense. The deferred tax liabilities recognised in the Statement of Financial Position in 2003 and 2004 are higher for those using the comprehensive basis ($33; $33) than the partial basis ($0; $0).

Table 3.2: Examples Showing the Comprehensive and Partial Basis

Example:	1	2	3	4
Year end (30 June)	2003	2004	2003	2004
Comprehensive/partial	Comp	Comp	Part	Part
Statement of Financial Position				
Tax				
Asset	10000	10000	10000	10000
Accumulated depreciation				
Opening	200	400	200	400
Current year depreciation (2%)	200	200	200	200
Closing	400	600	400	600
Net tax carrying amount	9600	9400	9600	9400
Accounting				
Asset cost	10000	10000	10000	10000
Revaluation		2000		2000
Asset	10000	12000	10000	12000
Accumulated depreciation				
Opening	100	200	100	200
Current year depreciation (1%)	100	120	100	120
Closing	200	320	200	320
Net carrying amount	9800	11680	9800	11680
Profit and Loss Statement				
Taxation				
Net Surplus Before Tax and Depreciation	5200	5200	5200	5200
Less Depreciation	200	200	200	200
Net Surplus Before Tax	5000	5000	5000	5000
Taxation at 33%	1650	1650	1650	1650
Net Surplus After Tax	3350	3350	3350	3350
Accounting				
Net Surplus Before Tax and Depreciation	5200	5200	5200	5000
Less Depreciation	100	120	100	120
Net Surplus Before Tax	5100	5080	5100	5080
Tax Expense:				
Income Tax Expense	1650	1650	1650	1650
Deferred Tax Expense	33	33	0	0
Total Tax Expense	1683	1683	1650	1650
Net Surplus After Tax	3417	3397	3450	3430
Timing Difference	100	80	100	80

Example:	1	2	3	4
Year end (30 June)	2003	2004	2003	2004
Comprehensive/partial	Comp	Comp	Part	Part
To Journal:				
Deferred tax expense	33	33	0	0
Revaluation reserve	0	0	0	0
Deferred tax liability	33	33	0	0
Notes to Financial Statements:				
Deferred Tax Not Recognised	0	7	33	26

Appendix 3.2. NZ IAS 12 Example

Example 1, Table 3.3, shows a firm with an asset that is held for use and calculates deferred tax under the balance sheet method. Depreciation is calculated at a rate of 2% for tax purposes ($200) and 1% for accounting purposes ($100). A temporary difference arises ($200), of which $100 relates to the prior year and $100 relates to the current year. Deferred tax is calculated at the current tax rate of 28% ($56).

Example 2, Table 3.3, shows the same firm, one year on. In this year the asset is revalued to $12,000, and forms the new base for accounting depreciation. The temporary difference is now $2,280. Deferred tax of $638 is calculated of which $56 relates to the prior year.

Examples 3 and 4 report the same calculations as examples 1 and 2, except the asset is held for the purposes of sale. The temporary difference where assets are held for sale is the tax base being the depreciation claimed for tax purposes that will be recovered.

Table 3.3 shows that the accounting net surplus after tax in 2009 and 2010 is less where an asset is held for the purpose of use ($3672; $3098) than where an asset is held for the purpose of sale ($4944; $3624) due to the deferred tax expense. Deferred tax liabilities recognised in the Statement of Financial Position are higher for firms that revalue assets and hold the assets for the purpose of use ($638) than for those that hold the assets for the purpose of sale ($168).

Table 3.3: Examples Showing the Balance Sheet Method

Example:	1	2	3	4
Year end (30 June)	2009	2010	2009	2010
Use/Sale	Use	Use	Sale	Sale
Statement of Financial Position				
Tax				
Asset	10000	10000	10000	10000
Accumulated depreciation				
Opening	200	400	200	400
Current year depreciation (2%)	200	200	200	200
Closing	400	600	400	600
Tax base	9600	9400		
Accounting				
Asset cost	10000	10000	10000	10000
Revaluation		2000		2000
Asset	10000	12000	10000	12000
Accumulated depreciation				
Opening	100	200	100	200
Current year depreciation (1%)	100	120	100	120
Closing	200	320	200	320
Net carrying amount	9800	11680	9800	11680
Profit and Loss Statement				
Taxation				
Net Surplus Before Tax and Depreciation	5200	5200	5200	5200
Less Depreciation	200	200	200	200
Net Surplus Before Tax	5000	5000	5000	5000
Taxation at 28%	1400	1400	1400	1400
Net Surplus After Tax	3600	3600	3600	3600
Accounting				
Net Surplus Before Tax and Depreciation	5200	5200	5200	5200
Less Depreciation	100	120	100	120
Net Surplus Before Tax	5100	5080	5100	5080
Tax Expense:				
Income Tax Expense	1400	1400	1400	1400
Deferred Tax Expense	28	582	56	56
Total Tax Expense	1428	1982	1456	1456
Net Surplus After Tax	3672	3098	4944	3624
Temporary Difference	200	2280	400	600

Example:	1	2	3	4
Year end (30 June)	2009	2010	2009	2010
Use/Sale	Use	Use	Sale	Sale
To Journal:				
Deferred tax liability	28	56	56	112
Deferred tax expense	28	56	56	112
(Being reversal of prior year deferred tax)				
Deferred tax expense	56	638	112	168
Revaluation reserve	0	0	0	0
Deferred tax liability	56	638	112	168
(Being current year deferred tax)				
Notes to Financial Statements:				
Deferred Tax Not Recognised	0	0	0	0

Appendix 3.3. Change to Depreciation on Buildings

The Income Tax (GST and Remedial Act) 2010 implements the new rate of 0% depreciation for tax purposes which applies to all buildings with a useful life of fifty years or more and is effective from the 2012 tax year. The accumulated depreciation on the buildings remains and is recoverable on the future sale, but no further depreciation is accrued (Keatings, 2010). This change in legislation has an ensuing effect on deferred tax as governed by NZ IAS 12 following the announcement (for companies with a financial year end June 2010 onwards).

One response to this change in legislation was published in the National Business Review (2010) stating "Taxation changes skew results to the tune of $1 billion dollars" (National Business Review, 23 August 2010). The article discusses complaints by directors as to the effect of removing depreciation on buildings for deferred tax. This article reiterates the view that deferred tax liabilities "were pointless in the sense that they measured something that had no practical application or purpose" (National Business Review, 23 August 2010), and that "many professional directors did not regard this accounting entry as a real liability in the economic sense" (National Business Review, 23 August 2010).

As a result of the change in legislation the IASB amended NZ IAS 12. However, this amendment is for periods beginning on or after 01 January 2012, leaving firms with a year end from June 2010 to 30 December 2012 affected.

Table 3.4 shows seven examples of the effect of this change.

Example 1 shows a firm with an asset that is held for use and calculates depreciation at a rate of 2% for tax purposes ($200) and 1% for accounting purposes ($100). A temporary difference arises ($200), of which $100 relates to the prior year and $100 relates to the current year. Deferred tax is calculated at the current tax rate of 28% ($56).

Example 2 shows the same firm, one year on. In this year the asset is revalued to $12,000, and forms the new base for accounting depreciation. The temporary difference is now $2,280. Deferred tax of $638 is calculated of which $56 relates to the prior year.

Examples 3 and 4 are post legislation changes, where the asset is held for use.

The deferred tax calculation differs for those assets that are held for the purpose of resale. Section 51 of NZ IAS 12 states "deferred tax liabilities and deferred tax assets shall reflect the tax consequences that will follow" (NZ IAS 12). Therefore, if the carrying amount of the building is expected to be recovered through sale, and there is no tax on the gain on sale (sale price less cost) in NZ tax jurisdiction, then the deferred tax liability will reflect this. Therefore, classifying buildings as being held for resale reduces deferred tax liabilities.

Examples 5 to 7 report the same firm where the buildings are held for sale.

Table 3.4 shows that in the 2010 year, which was affected by the change in legislation related to buildings, deferred tax expense is $3,102 if the assets are held for use. Deferred tax expense is $56 where the assets are held for sale. The deferred tax liabilities recognised in the Statement of Financial Position are $3,158 where assets are held for use and $168 where assets are held for sale.

The amendment to NZ IAS 12 allows for a presumption that any buildings revalued in accordance with NZ IAS 40: *Investment Properties* is held for the purpose of sale, rather than use. Any firms with a reporting period starting on or after 01 January 2012 with properties revalued will reverse the deferred tax adjustment due to the change in legislation.

Table 3.4: Examples Showing the Impact of Zero Tax Depreciation

Example:	1	2	3	4	5	6	7
Year end (30 June)	2009	2010	2010	2011	2009	2010	2011
Budget impact	Pre-budget	Pre-budget	Budget	Budget	Pre-budget	Budget	Budget
Use/sale assumption	Use	Use	Use	Use	Sale	Sale	Sale
Tax							
Asset	10000	10000			10000	10000	10000
Accumulated depreciation							
Opening	200	400			200	400	600
Current year's depreciation (2%)	200	200			200	200	200
Closing	400	600			400	600	800
Tax base	9600	9400	200				
Accounting							
Asset cost	10000	10000	10000	10000	10000	10000	10000
Revaluation		2000	2000	2000		2000	2000
Asset	10000	12000	12000	12000	10000	12000	12000
Accumulated depreciation							
Opening	100	200	200	320	100	200	200
Current year's depreciation (1%)	100	120	120	120	100	120	120
Closing	200	320	320	440	200	320	320
Net carrying amount	9800	11680	11680	11560	9800	11680	11680
Profit and Loss Statement							
Taxation							
Net Surplus Before Tax and Depreciation	5200	5200	5200	5200	5200	5200	5200
Less Depreciation	200	200	200	200	200	200	200
Net Surplus Before Tax	5000	5000	5000	5000	5000	5000	5000
Taxation at 28%	1400	1400	1400	1400	1400	1400	1400
Net Surplus After Tax	3600	3600	3600	3600	3600	3600	3600
Accounting							
Net Surplus Before Tax and Depreciation	5200	5200	5200	5200	5200	5200	5200
Less Depreciation	100	120	100	120	100	120	100
Net Surplus Before Tax	5100	5080	5100	5080	5100	5080	5100
Tax Expense:							
Income Tax Expense	1400	1400	1400	1400	1400	1400	1400
Deferred Tax Expense	28	582	3102	79	56	56	56
Total Tax Expense	1428	1982	4502	1479	1456	1456	1456
Net Surplus After Tax	3672	3098	598	3601	3644	3624	3644
Temporary Difference	200	2280	11480	11560	400	600	800

Example:	1	2	3	4	5	6	7
Year end (30 June)	2009	2010	2010	2011	2009	2010	2011
Use/Sale	Pre-budget	Pre-budget	Budget	Budget	Pre-budget	Budget	Budget
Comprehensive/partial	Use	Use	Use	Use	Sale	Sale	Sale
To Journal:							
Deferred tax liability	28	56	56	3158	56	112	168
Deferred tax expense	28	56	56	3158	56	112	168
(Being reversal of prior year deferred tax)							
Deferred tax expense	56	638	3158	3237	112	168	224
Revaluation reserve	0	0	0	0	0	0	0
Deferred tax liability	56	638	3158	3237	112	168	224
(Being current year deferred tax)							
Notes to Financial Statements:							
Deferred Tax Not Recognised	0	0	0	0	0	0	0

CHAPTER 4: DEFERRED TAX AND FUTURE TAX PAYMENTS — LITERATURE REVIEW

4.1. Introduction

The thesis examines the information relevance of various deferred tax methods. Information that is 'information relevant' has two components: predictability and value relevance. This chapter and the following three chapters focus on the ability of deferred tax to predict future tax payments. The items of deferred tax are liabilities, assets and expense, recognised using the comprehensive and partial basis under the income statement method, and the balance sheet method.

Section 4.2 examines the literature using the comprehensive basis under the income statement method, section 4.3, the partial basis under the income statement method, and section 4.4, the balance sheet method. The chapter is summarised in section 4.5.

4.2. Comprehensive Basis under the Income Statement Method

Studies have found that deferred tax liabilities assist in predicting future tax payments, (Cheung *et al.*, 1997). Cheung *et al*. (1997) estimate predictive errors to test the association between tax paid, the change in deferred tax liabilities or deferred tax expense, and future tax payments. The association between tax paid and future tax payments represents the taxes payable method where the income tax expense for the current period is equal to the tax payable in accordance with tax accounting rules. The results indicate that deferred tax liabilities and expense assists in predicting future tax payments more than the taxes payable method as they result in the lowest mean ranked predictive errors. Acknowledged in Cheung *et al*.'s (1997) study as a limitation, the period examined covers three different accounting standards: Accounting Principles Board No. 11: *Accounting for Income Taxes* (APB No. 11) (income statement method); Statement of Financial Accounting Standard No. 96: *Accounting for Income Taxes* (SFAS No. 96); and SFAS No. 109: *Accounting for Income Taxes* (SFAS No. 109) (balance sheet method). APB No. 11 does not require the separate recognition of deferred tax assets and liabilities or a valuation allowance, as required by SFAS No.109 (Ayers, 1998). A valuation allowance reduces deferred tax assets when the full amount is not expected to be realised (Ayers, 1998).

4.3. Partial Basis under the Income Statement Method

Laux's (2013) results support the partial basis. Laux (2013) tests the theoretical research of Guenther and Sansing (2000, 2004) and Dotan (2003) which suggests that not all deferred taxes result in tax cash flows. Deferred tax as a result of revenue and expenses accrued in accounting income at a higher amount than taxable income, have a direct impact on future tax when they reverse. The example given in the study is warranty expenses. Accounting standards require warranty expenses to be accrued in accounting income and only recognised in taxable income on a cash basis. In year one, warranty expenses accrued are $500 in accounting income and $200 in taxable income. This creates a temporary/timing difference of $300 on which deferred tax is calculated. In year two, $800 of warranty expenses are realised and included in taxable income. In accounting income, $500 continues to be accrued. Deferred tax is reversed in the same year as the tax payments are reduced by the increased warranty expenses in taxable income, therefore affecting tax cash flows.

4.4. Balance Sheet Method

The NZ IAS 12 objective states the "…principal issue in accounting for income taxes is how to account for the current and future tax consequences of: (a) the future recovery (settlement) of the carrying amount of assets (liabilities) that are recognised in an entities Statement of Financial Position …". It further explains that it is inherent in the recognition of an asset (or liability) that recovery (or settlement) of the carrying amount will make future tax payments smaller (larger) than if there were no tax consequences.

Legoria and Sellers (2005) find that deferred tax using the balance sheet method assists in predicting future operating cash flows. Their study tests the ability of deferred tax assets and liabilities to predict cash flows using the SFAS No. 109 (balance sheet method) compared to APB No. 11 (income statement method). The results indicate that the models using SFAS No. 109 data outperform APB No. 11 data. The results are measured by the significance level of the coefficients and goodness of fit (r^2). However, evidence suggests that the goodness of fit does not necessarily translate into predictive ability (Watts and Leftwich, 1977).[3] The study also assesses the ability of deferred tax assets and liabilities

[3] Watts and Leftwich (1977) find that the Box-Jenkins technique for predicting annual earnings is outperformed by the predictive ability of the random walks model.

to predict future operating cash flows whereas this thesis focuses on predicting future tax payments.

4.5. Chapter Summary

This chapter reviews the literature on the ability of deferred tax to assist in predicting future tax payments or operating cash flows.

In this chapter, the literature reviewed focus on one or two deferred tax variables rather than the deferred tax method. The deferred tax method impacts on deferred tax liabilities, deferred tax assets and deferred tax expense recognised in accordance with the relevant accounting standard (method). There are two main methods: the income statement method and the balance sheet method. The income statement method can be split into the comprehensive and partial basis. This thesis examines which deferred tax ***method*** assists in predicting future tax payments, relative to the taxes payable method. That is, for each method it incorporates the effect of deferred tax on liabilities, assets and expense.

Table 4.1 summarises the literature on the ability of deferred tax to predict future tax payments.

Table 4.1: Summary of Literature

	Ability to Predict Future Tax Payments	Data
Panel A: Comprehensive Basis		
DTL	Cheung *et al.* (1997)	US
DTA		
DTE	Cheung *et al.* (1997)	US
Panel B: Partial Basis		
DTL		
DTA		
DTE		
Panel C: Balance Sheet Method		
DTL	Cheung *et al.* (1997)	US
DTA		
DTE	Cheung *et al.* (1997)	US

DTL = Deferred tax liabilities as recognised in the Statement of Financial Position
DTA = Deferred tax assets as recognised in the Statement of Financial Position
DTE = Deferred tax expense as recognised in the Statement of Profit or Loss

The following chapter develops the hypothesis, discusses the research method and describes the sample used to test the ability of deferred tax to predict future tax payments.

CHAPTER 5: DEFERRED TAX AND FUTURE TAX PAYMENTS — HYPOTHESIS, RESEARCH METHOD AND SAMPLE SELECTION

5.1. Introduction

Section 5.2 of this chapter develops the hypothesis, section 5.3 discusses the research method and section 5.4 describes the sample. Section 5.5 summarises the chapter.

5.2. Hypothesis Development

This thesis examines whether deferred tax liabilities, assets and expense assist in predicting future tax payments. The null hypothesis is:

H1 **There is no difference in the predictive ability of the deferred tax and taxes payable methods.**

The taxes payable method is used as a benchmark. The taxes payable method is where income tax paid for the current period is equal to the tax payable calculated in accordance with tax accounting rules. Cheung *et al*. (1997) provide evidence that deferred tax liabilities and expense assist in predicting future tax payments across three accounting standards beyond the taxes payable method but do not examine the full deferred tax method; that is, the ability of deferred tax liabilities, assets and expense to assist in predicting future tax payments.

5.3. Research Method

To test the hypothesis, two models based on Cheung *et al.* (1997) are used:

$$TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)} \quad (1)$$

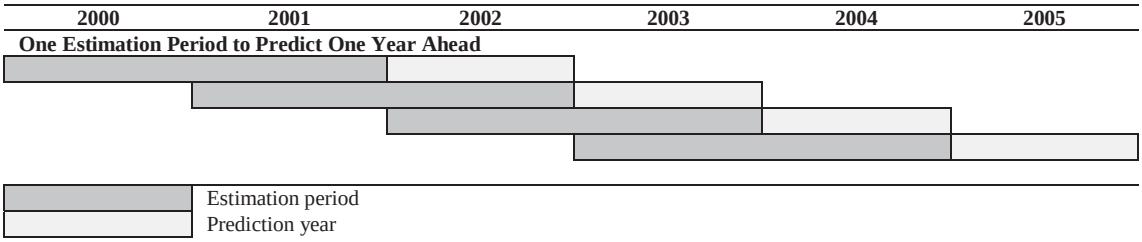
$$TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(t-1)} + \Phi_3 DTAk_{,(t-1)} + \Phi_4 DTEk_{,(t-1)} + \epsilon_{(t)} \quad (2)$$

The dependent variable $TP_{(t)}$ equals tax paid from the current year's Statement of Cash Flows and $TP_{(t-1)}$ equals tax paid from the prior year's Statement of Cash Flows. $DTLk_{,(t-1)}$ are deferred tax liabilities recognised in the prior year's Statement of Financial Position under deferred tax method k. Where k = three methods of deferred tax: the comprehensive basis under income statement method (ISM_CB), the partial basis under

the income statement method (ISM_PB) and the balance sheet method (BSM). $DTAk_{,(t-1)}$ are deferred tax assets recognised in the prior year's Statement of Financial Position under deferred tax method k. $DTEk_{,(t-1)}$ is deferred tax expense recognised in the prior year's Statement of Profit or Loss under deferred tax method k. $\epsilon_{(t)}$ denotes the error term. All variables are deflated by outstanding shares (Barth and Clinch, 2009).

Model one examines the ability of the taxes payable method (TPM) to predict future tax payments on a yearly basis. Model two examines the ability of the deferred tax method to predict future tax payments on a yearly basis. The models are used to predict one year ahead tax payments. Table 5.1 shows the estimation periods and prediction years.

Table 5.1: Estimation Periods and Prediction Years



Tax paid for the current year is regressed against tax paid for the prior year (the estimation period) to predict one year ahead tax paid (prediction year). The absolute prediction errors for each of the models are then calculated as follows:

Absolute prediction error = | Predicted tax payment – Actual tax payment |

The predictive errors are ranked 1 for the lowest error, otherwise 2. The average rank of the predictive errors is then calculated. The model with the lowest mean ranked predictive error indicates it has better predictive ability. The Friedman S-statistic is used to test for statistical difference between the rankings of the models.[4]

[4] Cheung *et al.* (1997) use the mean percentage error with all predictive errors greater than 100% truncated to 100%. However, using the mean absolute percentage error also creates difficulty in ranking where both models report an error of 100%.

5.4. Sample Selection

The variables are hand collected from the NZ Stock Exchange. From 2000 to 2004 and 2008 to 2012, deferred tax expense is collected from the Statement of Profit or Loss, deferred tax assets and liabilities are collected from the Statement of Financial Position, and tax paid from the Statement of Cash Flows. The basis for calculating deferred tax is collected from the Notes to the Financial Statements. The period 2005 to 2007 is excluded as the transition to NZ IAS 12 affects early adopters more than late adopters (Mear, 2011) and the results may be affected by a self-selection bias.

For each year all available observations are included that have three years of tax information and the market value of equity.

The sample by year (2000 to 2004) ranges from 60 to 91 (Table 5.2, Panel A). The following were excluded: overseas and nonstandard issuers, equity and debt firms, observations that had missing years or information, and those not reporting in NZ dollars or NZ IFRS. There are 371 firm years (93 firms) in the sample, of which 298 calculate deferred tax using the comprehensive basis under the income statement method and 73 calculate deferred tax using the partial basis under the income statement method.

Panel B, Table 5.2, shows that from 2008 to 2012, the sample by year ranges from 85 to 90 and there are 440 firm years (99 firms) in the sample.

Table 5.2: Sample by Year

Panel A: 2000-2004	**2000**	**2001**	**2002**	**2003**	**2004**	**Firm Year**	**Firms**
Total Observations	101	116	124	127	126	594	161
Overseas/Nonstandard issuers	13	14	15	18	17	77	20
Equity Trust and Debt	5	6	6	6	6	29	7
Missing Years or Information	18	25	17	24	6	90	35
Not NZ Dollars	2	2	2	3	3	12	3
Not NZ IFRS	3	3	3	3	3	15	3
Sample	60	66	81	73	91	371	93
Comprehensive Basis under the Income Statement Method	46	51	66	60	75	298	75
Partial Basis under the Income Statement Method	14	15	15	13	16	73	18
Sample	60	66	81	73	91	371	93
Panel B: 2008-2012	**2008**	**2009**	**2010**	**2011**	**2012**	**Firm Year**	**Firms**
Total Observations	135	132	133	132	133	665	159
Overseas/Nonstandard issuers	18	17	16	19	19	89	23
Equity Trust and Debt	7	7	8	7	7	36	8
Missing Years or Information	13	10	16	11	8	58	20
Not NZ Dollars	4	4	4	4	4	20	4
Not NZ IFRS	5	4	4	5	5	22	5
Sample	89	90	85	86	90	440	99

5.5. Chapter Summary

This chapter explains the research design used to examine the ability of the taxes payable and deferred tax methods to predict future tax payments. The hypothesis is developed and the research methods are discussed.

The sample used for this research is 371 firm years or 93 firms from 2000 to 2004. From 2008 to 2012 there are 440 firm years or 99 firms.

The research findings are presented in the next chapter.

CHAPTER 6: DEFERRED TAX AND FUTURE TAX PAYMENTS — RESULTS

6.1. Introduction

This chapter presents the research findings for the hypothesis developed in the previous chapter. These findings are presented in five sections (6.2–6.6).

Descriptive statistics are presented in section 6.2. Section 6.3 reports the results of the comprehensive basis under the income statement method (ISM_CB). Section 6.4 reports the results of the partial basis under the income statement method (ISM_PB) and section 6.5 reports the results of the balance sheet method (BSM). Section 6.6 summarises the chapter.

6.2. Descriptive Statistics

Table 6.1 provides the variable descriptive statistics.

Tax paid (TP) is based on the income tax legislation during the sample period. Mean (median) TP for the observations using: (1) the ISM_CB, from 2000 to 2004, is 0.085 (0.024); (2) the ISM_PB, from 2000 to 2004, is 0.018 (0.009); and (3) the BSM, from 2008 to 2012, is 0.041 (0.016). The observations using the partial basis have lower TP than the comprehensive basis. One explanation for this is that the level of tax paid is determined in part by the industry, and particular industries choose one accounting method over another. For example, Wong *et al.* (2011) find that those using the partial basis are predominately in the property industry. The tax rate from 2000 to 2004 is 33% whereas from 2008 to 2012 it reduces to 28%.

The observation using the ISM_CB have a mean (median) deferred tax liabilities (DTL) of 0.030 (0.00). This is higher than the observations using the ISM_PB of 0.003 (0.000) due to accounting standards requiring the ISM_PB to only recognise those deferred tax liabilities expected to crystallise into cash flows in the foreseeable future. The mean (median) DTL for observations using the BSM is 0.086 (0.00). The mean (median) deferred tax liabilities for the ISM_PB recalculated using the comprehensive basis (DTLC) are 0.105 (0.050).

Table 6.1: Descriptive Statistics

	ISM_CB (n=298) 2000-2004			ISM_PB (n=73) 2000-2004			BSM (n=440) 2008-2012		
Variable	**Mean**	**Median**	**Std dev**	**Mean**	**Median**	**Std dev**	**Mean**	**Median**	**Std dev**
Variable Descriptive Statistics (Scaled by Outstanding Shares)									
TP	0.085	0.024	0.174	0.018	0.009	0.032	0.041	0.016	0.056
DTL	0.030	0.000	0.108	0.003	0.000	0.009	0.086	0.000	0.199
DTA	0.020	0.000	0.051	0.004	0.000	0.014	0.021	0.000	0.048
DTE	-0.002	0.000	0.042	0.000	0.000	0.008	0.004	0.000	0.039
DTLC				0.105	0.050	0.194			
PPE							-0.085	-0.003	0.206
INV							-0.004	0.000	0.024
EB							0.004	0.000	0.012
TL							0.007	0.000	0.020
DFI							0.003	0.000	0.010
IN							0.001	0.000	0.005
IA							-0.005	0.000	0.029
CF							-0.001	0.000	0.009
OT							0.010	0.002	0.054

ISM_CB = Comprehensive basis under the income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
TP = Tax paid as reported in the Statement of Cash Flows
DTL = Deferred tax liabilities recognised in the Statement of Financial Position
DTA = Deferred tax assets recognised in the Statement of Financial Position
DTE = Deferred tax expense recognised in the Statement of Profit and Loss
DTLC = Deferred tax liabilities recalculated using the comprehensive basis, by adding deferred tax liabilities recognised in the Statement of Financial Position, and deferred tax liabilities disclosed in the Notes to the Financial Statements
PPE = Deferred tax on property, plant and equipment disclosed in the Notes to the Financial Statements
INV = Deferred tax on investment properties disclosed in the Notes to the Financial Statements
EB = Deferred tax on employee benefits disclosed in the Notes to the Financial Statements
TL = Deferred tax on tax losses disclosed in the Notes to the Financial Statements
DFI = Deferred tax on derivative financial instruments disclosed in the Notes to the Financial Statements
IN = Deferred tax on inventories disclosed in the Notes to the Financial Statements
IA = Deferred tax on intangible assets disclosed in the Notes to the Financial Statements
CF = Deferred tax on cash flow hedges disclosed in the Notes to the Financial Statements
OT = Deferred tax on other items disclosed in the Notes to the Financial Statements

Table 6.1 also shows that mean (median) deferred tax assets (DTA) are higher for those using the ISM_CB, 0.020 (0.00), than the ISM_PB, 0.004 (0.00) for the same period. Mean DTA for observations using the BSM are 0.021 (0.000).

Deferred tax expense (DTE) is a proxy for the change in deferred tax assets and liabilities. Under the ISM_CB, mean DTE is a credit (revenue), indicating that there is either an increase in mean DTA or a decrease in mean DTL. However, mean DTE for those using the ISM_PB and BSM is a debit (expense), indicating an increase in mean DTL or a decrease in mean DTA over the period.

Table 6.1 also provides the descriptive statistics of deferred tax reported in the Notes to the Financial Statements for the observations using the BSM. Mean deferred tax on property, plant and equipment is higher (-0.085) than the median due to some observations having large deferred tax liabilities. This is consistent across the other deferred tax variables. Median property, plant and equipment is a liability (-0.003), whereas median deferred tax on investment property, employee benefits, tax losses, derivative financial instruments, inventory, intangible assets, and cash flow hedges is zero. Mean (median) deferred tax on other liabilities is an asset of 0.010 (0.002).

Table 6.2, Panel A, provides the yearly statistics from 2000 to 2004 for those using the ISM_CB.

Mean (median) TP ranges from 0.075 (0.017) to 0.090 (0.035) over the period. There are no tax rate changes in this period to influence TP. Mean DTL are higher than mean DTA. Median DTL, DTA and DTE are all as zero.

Panel B of Table 6.2 provides the yearly statistics for those using the ISM_PB. As expected the mean (median) tax paid is lower than the ISM_CB and ranges from 0.012 (0.003) to 0.023 (0.011) over the period. Mean (median) DTL for the ISM_PB are lower than DTL for the ISM_CB in each year as expected. Median DTA and DTE are zero.

Table 6.2: Yearly Descriptive Statistics

	2000	2001	2002	2003	2004
Panel A: ISM_CB					
No. of Observations	46	51	66	60	75
TP	0.090 (0.035)	0.087 (0.017)	0.081 (0.022)	0.075 (0.033)	0.090 (0.020)
DTL	0.064 (0.000)	0.032 (0.000)	0.020 (0.000)	0.018 (0.000)	0.027 (0.000)
DTA	0.010 (0.000)	0.023 (0.000)	0.025 (0.000)	0.018 (0.000)	0.019 (0.000)
DTE	0.002 (0.000)	-0.015 (0.000)	-0.001 (0.000)	0.001 (0.000)	0.000 (0.000)
Panel B: ISM_PB					
No. of Observations	14	15	15	13	16
TP	0.012 (0.004)	0.021 (0.007)	0.012 (0.003)	0.023 (0.011)	0.023 (0.010)
DTL	0.001 (0.000)	0.000 (0.000)	0.002 (0.000)	0.005 (0.000)	0.005 (0.000)
DTA	0.013 (0.000)	0.007 (0.000)	0.001 (0.000)	0.000 (0.000)	0.001 (0.000)
DTE	-0.001 (0.000)	0.002 (0.000)	0.001 (0.000)	-0.001 (0.000)	0.001 (0.000)
DTLC	0.097 (0.030)	0.083 (0.049)	0.091 (0.057)	0.117 (0.064)	0.134 (0.063)
	2008	**2009**	**2010**	**2011**	**2012**
Panel C: BSM					
No. of Observations	89	90	85	86	90
TP	0.053 (0.026)	0.035 (0.017)	0.035 (0.010)	0.041 (0.012)	0.041 (0.012)
DTL	0.083 (0.000)	0.079 (0.000)	0.090 (0.000)	0.087 (0.000)	0.090 (0.000)
DTA	0.026 (0.000)	0.034 (0.000)	0.015 (0.000)	0.014 (0.000)	0.015 (0.000)
DTE	0.001 (0.000)	-0.007 (0.000)	0.019 (0.001)	0.008 (0.000)	0.000 (0.000)
Net DTL	-0.058 (0.000)	-0.045 (0.000)	-0.075 (0.000)	-0.072 (0.000)	-0.075 90.000)

Variables as per Table 6.1

Table 6.2, Panel C, provides the yearly mean (median) variables using the BSM. Mean (median) TP reduces in 2009, possibly reflecting the decrease in corporate tax rates to 30%. It then increases in 2011 and 2012. This increase could be a result of economic conditions offsetting in part the reduction in tax rates in 2011. Mean DTL decrease in 2009 and increase sharply in 2010. This suggests the change in legislation due to depreciation on buildings and subsequent change to accounting standards affects DTL. Median DTL are zero in each year. Mean DTA increases in 2009 (0.034), decreases in 2010 (0.015) and remains constant over 2011 to 2012 (0.014, 0.015). The reduction in 2010 is possibly related to the aforementioned change in legislation. Mean DTE ranges from -0.007 to 0.019 over the period.

6.3. Comprehensive Basis under the Income Statement Method

Table 6.3, Panel A, provides the mean ranked predictive errors of the TPM and the ISM_CB.

In each year and in the pooled results the ISM_CB has a lower mean ranked predictive error than TPM, indicating that the ISM_CB is better at predicting future tax payments. Panel B provides the number of first rankings for each model. Again ISM_CB has the higher number of first rankings (143) relative to TPM (80). Panel C of the same table, provides the pair wise testing of the mean ranked predictive errors of each model using the Friedman S-statistic. In three out of the four years and in the pooled results, the ISM_CB has a significantly lower mean ranked predictive error than the TPM. This indicates that ISM_CB is a better predictor of future tax payments relative to the TPM and is consistent with Cheung *et al.* (1997).[5]

As the ISM_CB consistently has a significantly lower mean ranked predictive error relative to the TPM, the hypothesis 'H1 There is no difference in the predictive ability of the deferred tax and taxes payable methods' can be rejected for the ISM_CB.

[5] The purpose of the regression is to calculate predictive errors, therefore the coefficients are not reported.

Table: 6.3: Results of Mean Ranked Predictive Errors

	Prediction Year					
	2002	**2003**	**2004**	**2005**	**Pooled**	**Ranking**
Panel A: Mean Ranked Predictive Errors TPM vs. ISM_CB						
TPM	1.674	1.588	1.636	1.666	1.641	2
ISM_CB	1.326	1.411	1.363	1.333	1.358	1
Panel B: Number of 1st Rankings TPM vs. ISM_CB						
TPM	15	21	24	20	80	2
ISM_CB	31	30	42	40	143	1
Panel C: Pair Wise Tests TPM vs. ISM_CB						
Friedman S-statistic	5.565**	1.588	4.909**	6.667**	17.379***	
	(0.018)	(>0.10)	(0.027)	(0.010)	(<0.001)	
No. of Observations	46	51	66	60	223	
Panel D: Mean Ranked Predictive Errors TPM vs. ISM_PB						
TPM	1.929	1.600	1.800	1.462	1.702	2
ISM_PB	1.071	1.400	1.200	1.538	1.298	1
Panel E: Number of 1st Rankings TPM vs. ISM_PB						
TPM	1	6	3	7	17	2
ISM_PB	13	9	15	6	40	1
Panel F: Pair Wise Tests TPM vs. ISM_PB						
Friedman S-statistic	10.286***	0.600	5.400**	0.071	9.281***	
	(0.001)	(>0.10)	(0.020)	(>0.10)	(0.002)	
No. of Observations	14	15	15	13	57	
Panel G: Mean Ranked Predictive Errors ISM_PB vs. ISM_CB						
ISM_PB					1.421	1
ISM_CB					1.579	2
Panel H: Number of 1st Rankings ISM_PB vs. ISM_CB						
ISM_PB					33	1
ISM_CB					24	2
Panel I: Pair Wise Tests ISM_PB vs. ISM_CB						
Friedman S-statistic					1.421	
					(>0.10)	
No. of Observations					57	
	2010	**2011**	**2012**	**2013**	**Pooled**	**Ranking**
Panel J: Mean Ranked Predictive Errors TPM vs. BSM						
TPM	1.629	1.411	1.541	1.383	1.491	1
BSM	1.370	1.588	1.458	1.616	1.508	2
Panel K: Number of 1st Rankings TPM vs. BSM						
TPM	33	53	39	53	178	1
BSM	56	37	46	33	172	2
Panel L: Pair Wise Tests TPM vs. BSM						
Friedman S-statistic	5.944**	2.844*	0.576	4.651**	0.103	
	(0.015)	(0.092)	(>0.10)	(0.031)	(>0.10)	
No. of Observations	89	90	85	86	350	

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
ISM_CB = Comprehensive basis under the income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

6.4. Partial Basis under the Income Statement Method

Table 6.3 Panel D, provides the mean ranked predictive errors for observations using the TPM and the ISM_PB. The ISM_PB has the lowest mean ranked predictive errors and the results are significant for two out of the four years and the pooled results (Panel F). The number of first rankings are reported in Panel E and show similar results. This indicates that ISM_PB is the better method for predicting future tax payments relative to the TPM.

As the results are significant, the hypothesis 'H1 There is no difference in the predictive ability of the deferred tax and taxes payable methods' can be rejected for the ISM_PB.

Panel G provides the ISM_PB compared to the ISM_CB for the pooled sample. The ISM_PB has a lower mean ranked predictive error than the ISM_CB; however, the results are not significant (Panel I). Based on the argument that the ISM_PB reflects the crystallisation of deferred tax into cash flows, it is expected that the ISM_PB will have a significantly lower mean ranked error than the ISM_CB. A possible reason for this is that the sample is not segregated by growth of depreciable assets.

6.5. Balance Sheet Method

Panel J, Table 6.3, shows that the TPM has the lowest mean ranked predictive error relative to the BSM in two out of four years. These results are supported by the number of first rankings (Panel K). This suggests that the BSM is not a better predictor of future tax payments relative to the TPM. Table 6.3, Panel L, provides the pair wise testing of the TPM and the BSM. The results are mixed. The only year where the BSM has a significantly lower mean ranked predictive error than the TPM is 2010. The TPM has a significantly lower mean ranked predictive error than the BSM for the years 2011 and 2013. The results may have been affected by the change in legislation of depreciation on buildings or the change in tax rates.

As the results are not conclusive, the hypothesis 'H1 There is no difference in the predictive ability of the deferred tax and taxes payable methods' cannot be rejected for the BSM.

6.6. Chapter Summary

This chapter summarises the research findings for the hypothesis developed in the previous chapter.

The ISM_CB and the ISM_PB are better predictors of future tax payments relative to the TPM. The BSM is not a better predictor of future tax payments relative to the TPM. This indicates deferred tax calculated using the BSM does not meet the objective under NZ IAS 12.

The ISM_PB has a lower mean ranked predictive error than the ISM_CB (recalculated using the ISM_PB observations). However, the results are not significant.

Additional testing is reported in the following chapter. Chapter 7 examines: (1) alternative estimation periods and prediction years; (2) the sample partitioned by tax paid; (3) the sample partitioned by growth; (4) the sample partitioned by buildings; (5) net deferred tax liabilities; (6) disaggregated deferred tax liabilities; and (4) the change in tax rates.

CHAPTER 7: DEFERRED TAX AND FUTURE TAX PAYMENTS — ADDITIONAL TESTING

7.1. Introduction

This chapter examines additional testing of the ability of deferred tax to assist in predicting future tax payments. Section 7.2 examines alternative estimation periods and prediction years. Section 7.3 partitions the sample by tax paid. Section 7.4 partitions the sample by growth and section 7.5 partitions the sample by buildings. Section 7.6 examines net deferred tax liabilities and section 7.7 examines disaggregated deferred tax. Section 7.8 examines the change in tax rates. Section 7.9 summarises the chapter.

7.2. Alternative Estimation Periods and Prediction Years

Prior studies use alternative estimation periods to predict future tax payments. Laux (2013) uses one estimation period, 1994 to predict 1995, 1996, 1997, 1998 and 1999. Cheung *et al*. (1997) use a seven year estimation period to predict ten rolling years.

Model 1 and 2 are re-estimated using alternative estimation periods and prediction years, as depicted in Figure 7.1. Panel A depicts one estimation period to predict two years ahead (t+2), Panel B, one estimation period to predict three years ahead (t+3), and Panel C, all available estimation periods to predict one year ahead (t+1). A dummy variable controlling for the year is included in the regression depicted in Panel C.

Table 7.1: Estimation Periods and Prediction Years

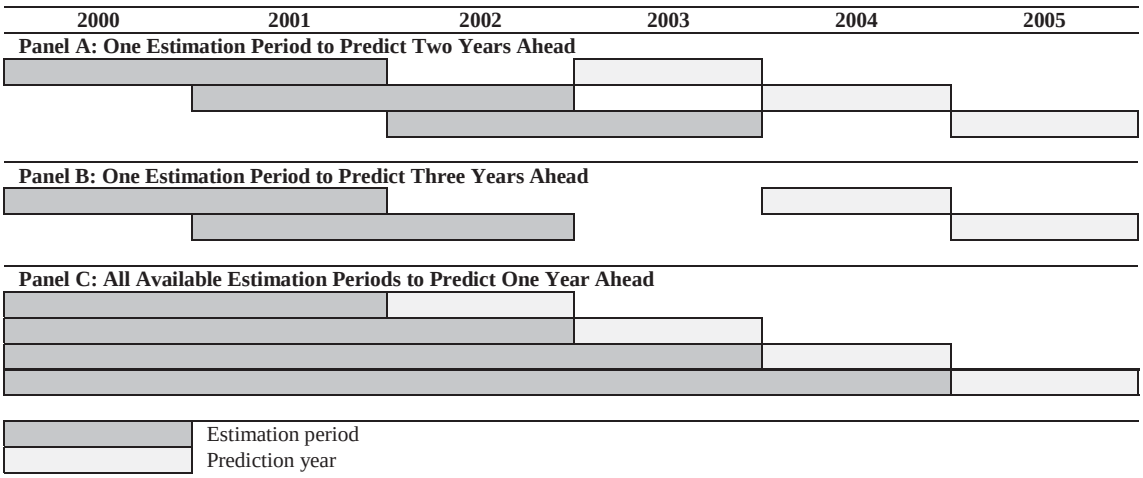


Table 7.2 provides the results for the comprehensive basis under the income statement method (ISM_CB), the partial basis under the income statement method (ISM_PB), and the balance sheet method (BSM).

Table 7.2: Results of Alternative Estimation Periods and Prediction Years

	Results from Chapter 6 (t+1)	One estimation period (t+2)	One estimation period (t+3)	Available estimate periods (t+1)
Panel A: Mean Ranked Predictive Errors TPM vs. ISM_CB				
TPM	1.641	1.624	1.671	1.667
ISM_CB	1.358	1.376	1.329	1.333
Panel B: Number of 1st Rankings TPM vs. ISM_CB				
TPM	80	53	25	20
ISM_CB	143	88	51	40
Panel C: Pair Wise Tests TPM vs. ISM_CB				
Friedman S-statistic	17.379*** (<0.001)	8.688*** (0.003)	8.895*** (0.003)	6.667 (0.010)
No. of Observations	223	141	76	60
Panel D: Mean Ranked Predictive Errors TPM vs. ISM_PB				
TPM	1.702	1.611	1.750	1.769
ISM_PB	1.298	1.388	1.250	1.231
Panel E: Number of 1st Rankings TPM vs. ISM_PB				
TPM	17	14	6	2
ISM_PB	14	22	18	10
Panel F: Pair Wise Tests TPM vs. ISM_PB				
Friedman S-statistic	9.281*** (0.002)	1.778 (>0.10)	2.261** (0.022)	3.769 (0.05)
No. of Observations	57	36	24	12
Panel I: Mean Ranked Predictive Errors TPM vs. BSM				
TPM	1.491	1.520	1.503	1.616
BSM	1.508	1.480	1.497	1.384
Panel J: Number of 1st Rankings TPM vs. BSM				
TPM	178	120	82	30
BSM	172	130	83	50
Panel K: Pair Wise Tests TPM vs. BSM				
Friedman S-statistic	0.103 (>0.10)	0.400 (>0.10)	0.006 (>0.10)	4.651 (0.03)
No. of Observations	350	250	165	80

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
ISM_CB = Comprehensive basis under the Income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Panel A of Table 7.2 provides the results for the ISM_CB. For the two year and three year ahead predictions, the ISM_CB has a lower mean ranked predictive error than the TPM. Panel C provides the results are significant and indicates that deferred tax using

the ISM_CB assists in predicting two and three year ahead tax payments relative to the TPM. Where all available estimation years are included, the ISM_CB is also a better predictor of future tax payments than the TPM.

Table 7.2, Panel D, provides the results for the ISM_PB. For the two year and three year ahead predictions, the ISM_PB has the lowest mean ranked predictive errors relative to the TPM. Panel F provides the three year ahead prediction results as significant; the Friedman S-statistic is 2.261 with a significance level of less than 0.05. This suggests that the ISM_PB assists in predicting tax payments three years ahead relative to the TPM. Where all available estimation periods are included, the ISM_PB continues to have a lower mean ranked predictive error than the TPM, and the results are significant.

The results for the BSM are reported in Panel I, Table 7.2. For the two year and three year ahead predictions, the BSM has a lower mean ranked predictive error than the TPM; however, these results are not significant (Panel K). Where all available estimation periods are included, the BSM continues to have a lower mean ranked predictive error than the TPM. The results are significant at less than 0.05. It is possible that the results for all available estimation periods are affected by other economic, accounting or tax changes.

7.3. Sample Partitioned by Tax Paid

The sample is partitioned by tax paid. Chang, Herbohn and Tutticci (2009) results indicate that deferred tax liabilities are more likely to reverse where firms report a loss.

An observation with no tax paid is where the tax paid in the Statement of Cash Flows is zero or a refund in the prior year. All other observations are tax paid. Models 1 and 2 are examined using the partitioned samples.

Table 7.3 provides the results for the ISM_CB and the BSM. There are insufficient observations to partition sample using the ISM_PB.

Table 7.3: Results of Sample Partitioned by Tax Paid

	No Tax	Tax
Panel A: Mean Ranked Predictive Errors TPM vs. ISM_CB		
TPM	1.724	1.470
ISM_CB	1.276	1.530
Panel B: Number of 1st Rankings TPM vs. ISM_CB		
TPM	16	80
ISM_CB	42	61
Panel C: Pair Wise Testing TPM vs. ISM_CB		
Friedman S-statistic	11.655***	0.536
	(0.001)	(>0.10)
No. of Observations	58[6]	141
Panel D: Mean Ranked Predictive Errors TPM vs. BSM		
TPM	1.485	1.506
BSM	1.515	1.494
Panel E: Number of 1st Rankings TPM vs. BSM		
TPM	51	124
BSM	48	127
Panel F: Pair Wise Testing TPM vs. BSM		
Friedman S-statistic	0.091	0.036
	(>0.10)	(>0.10)
No. of Observations	99	251

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
ISM_CB = Comprehensive basis under the income statement method
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

[6] 2001 year is excluded as tax paid is a constant of zero

Panel A, Table 7.3, shows that the ISM_CB has a lower mean ranked predictive error than the TPM for those observations with no tax paid. These results are significant (Panel C). The results are not significant for observations with tax paid.

Panel D of Table 7.3 provides the results of the BSM where observations are partitioned by no tax paid and tax paid. The TPM has the lowest mean ranked predictive error relative to the BSM for those observations with no tax paid, and the BSM has the lowest mean ranked predictive error relative to the TPM for those observations with tax paid. However, Panel F shows the results are not significant. Partitioning the observations by tax paid does not assist the BSM in predicting future tax payments relative to the TPM.

The change in legislation on depreciation of buildings may affect the results for the BSM. The observations with buildings are removed from the sample. Models 1 and 2 are re-examined for those with no tax paid and tax paid. The BSM has a lower mean ranked predictive error than TPM for those with no tax paid.[7] However, the results are not significant. For those observations with no buildings and tax paid, the BSM has a lower mean ranked predictive error than the TPM.[8] The results are significant. This provides evidence that the BSM assists in predicting future tax payments, where observations record no buildings and pay tax. There are two possible explanations for this. First, the change in legislation of depreciation on buildings affects the results. Second, observations that have buildings are also likely to have growth of depreciable assets. By excluding observations that record buildings, the sample is excluding observations that have growth.

7.4. Sample Partitioned by Growth

Laux (2013) partitions the sample by growth and finds it does not affect future tax payments.[9]

[7] TPM 1.563; BSM 1.437; Friedman S-statistic 1.141 (>0.10)
[8] TPM 1.604; BSM 1.396; Friedman S-statistic 4.167** (0.041)
[9] Laux (2013) uses increase of deferred tax variables over three years as a proxy for growth. However, the present study uses increase in book value of depreciable assets, consistent with Wong *et al.*'s (2011) value relevance testing.

The sample is partitioned by no growth and growth of depreciable assets. Observations with no growth are where there is a zero or decrease in book value of depreciable assets from the two years prior to the observed year. All other observations have growth.

Table 7.4 provides the results.

Table 7.4: Results of Sample Partitioned by Growth

	No Growth	Growth
Panel A: Mean Ranked Predictive Errors TPM vs. ISM_CB		
TPM	1.688	1.564
ISM_CB	1.311	1.435
Panel B: Number of 1st Rankings TPM vs. ISM_CB		
TPM	33	51
ISM_CB	73	66
Panel C: Pair Wise Testing TPM vs. ISM_CB		
Friedman S-statistic	15.094***	1.923
	(0.000)	(>0.10)
No. of Observations	106	117
Panel D: Mean Ranked Predictive Errors TPM vs. BSM		
TPM	1.450	1.504
BSM	1.550	1.496
Panel E: Number of 1st Rankings TPM vs. BSM		
TPM	116	69
BSM	95	70
Panel F: Pair Wise Testing TPM vs. BSM		
Friedman S-statistic	2.090	0.070
	(>0.10)	(>0.10)
No. of Observations	211	139

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
ISM_CB = Comprehensive basis under the income statement method
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Table 7.4, Panel A, shows the ISM_CB has a lower mean ranked predictive error than the TPM where observations have no growth. The results are significant (Panel C). The results for the observations with growth are not significant. The results are consistent with the results from observations with no tax paid.

Panel D, Table 7.4, provides the results for the BSM. As the results in Chapter 6 indicate that the BSM is not a better predictor of future tax payments relative to the TPM, it is expected that the results will be similar where observations are partitioned by growth.

The TPM (BSM) has the lowest mean ranked predictive error relative to the BSM (TPM) for observations with no growth (growth). However, the results are not significant (Panel F).

Again, it may be possible that the change in legislation on depreciation on buildings is affecting the results. The observations with buildings are removed from the sample. Models 1 and 2 are re-examined for those with no growth and growth. The results (not tabulated) are not significant. Therefore, the results indicate that the BSM is not a better predictor of future tax payments relative to the TPM where the sample is partitioned by growth. This is consistent with Laux (2013).

7.5. Sample Partitioned by Buildings

For 2008 to 2012 the sample is partitioned by buildings (Mear, 2011) to examine the effect of the Income Tax (GST and Remedial) Act (2010).

Panel A, Table 7.5, provides the results for observations with buildings or no buildings. Buildings include depreciable buildings and investment properties.

For those with no buildings, the BSM has a lower mean ranked predictive error than the TPM. For those with buildings, the TPM has a lower mean ranked predictive error than the BSM. However, the results are not significant. This indicates that the change in legislation may not affect the results.

Table 7.5: Results of Sample Partitioned by Buildings

	No Buildings	Buildings
Panel A: Mean Ranked Predictive Errors TPM vs. BSM		
TPM	1.551	1.454
BSM	1.449	1.549
Panel B: Number of 1st Rankings TPM vs. BSM		
TPM	75	100
BSM	92	83
Panel C: Pair Wise Testing TPM vs. BSM		
Friedman S-statistic	1.731 (>0.10)	1.579 (>0.10)
No. of Observations	167	183

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

7.6. Net Deferred Tax Liabilities

A few prior studies examine the ability of deferred tax to predict future tax payments where deferred tax assets and liabilities are offset. Net deferred tax liabilities (*NetDTL*) offsets deferred tax assets and deferred tax liabilities in totality. The ISM_CB and the ISM_PB governed by SSAP-12, and the BSM governed by NZ IAS 12 use different offsetting regulations. SSAP-12 allows offsetting where deferred tax assets and liabilities are carried out in the same tax jurisdiction, whereas NZ IAS 12 allows offsetting if the firm can legally offset current assets and liabilities and deferred tax assets and liabilities will be settled or realised simultaneously.

To examine the ability of offsetting deferred tax variables to predict future tax payments, the following models are used, based on Cheung *et al.* (1997):

$$TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 NetDTLk_{,(t-1)} + \Phi_3 DTEk_{,(t-1)} + \epsilon_{(t)} \quad (3)$$

The dependent variable $TP_{(t)}$ equals tax paid from the current year's Statement of Cash Flows and $TP_{(t-1)}$ equals tax paid from the prior year's Statement of Cash Flows. $NetDTL_{k,(t-1)}$ are deferred tax assets less deferred tax liabilities as recognised in the prior year's Statement of Financial Position under deferred tax method k, where k = three methods of deferred tax (the ISM_CB, the ISM_PB and the BSM). $DTE_{k,(t-1)}$ is deferred

tax expense recognised in the prior year's Statement of Profit or Loss under deferred tax method k.

Model 3 examines the ability of net deferred tax and deferred tax expense under the three deferred tax methods to predict future tax payments on a yearly basis. The predictive errors of each of the models are calculated and compared to model 2 (ISM_CB, ISM_PB and the BSM). The average rank of the predictive errors is then calculated, with the model yielding the lowest error ranked 1, otherwise 2. The model with the lowest mean ranked predictive error indicates it has better predictive ability. The Friedman S-statistic is used to ensure there is a statistical difference between the rankings of the models.

Table 7.6 provides the results.

Table 7.6, Panel A, provides the results for the ISM_CB. The ISM_CB has a lower mean ranked predictive error than the ISM_CB using *NetDTL*. However, the results are not significant (Panel C).

Panel D provides the results for the ISM_PB. The ISM_PB has a lower mean ranked predictive error than the ISM_PB *NetDTL,* suggesting that offsetting in accordance with the standard for these observations provides more information on future tax payments relative to offsetting deferred tax assets and liabilities in totality. Panel F shows the results are significant at less than 0.10.

Table: 7.6: Results of Net Deferred Tax Liabilities

	Pooled	Ranking
Panel A: Mean Ranked Predictive Errors ISM_CB vs. ISM_CB *NetDTL*		
ISM_CB	1.497	1
ISM_CB *NetDTL*	1.502	2
Panel B: Number of 1st Rankings ISM_CB vs. ISM_CB *NetDTL*		
ISM_CB	112	2
ISM_CB *NetDTL*	111	1
Panel C: Pair Wise Testing ISM_CB vs. ISM_CB *NetDTL*		
Friedman S-statistic	0.004 (>0.10)	
No. of Observations	223	
Panel D: Mean Ranked Predictive Errors ISM_PB vs. ISM_PB *NetDTL*		
ISM_PB	1.385	1
ISM_PB *NetDTL*	1.614	2
Panel E: Number of 1st Rankings ISM_PB vs. ISM_PB *NetDTL*		
ISM_PB	35	1
ISM_PB *NetDTL*	22	2
Panel F: Pair Wise Testing ISM_PB vs. ISM_PB *NetDTL*		
Friedman S-statistic	2.965* (0.085)	
No. of Observations	57	
Panel G: Mean Ranked Predictive Errors BSM vs. BSM *NetDTL*		
BSM	1.488	1
BSM *NetDTL*	1.511	2
Panel H: Number of 1st Rankings BSM vs. BSM *NetDTL*		
BSM	179	1
BSM *NetDTL*	171	2
Panel I: Pair Wise Testing BSM vs. BSM *NetDTL*		
Friedman S-statistic	0.183 (>0.10)	
No. of Observations	350	

ISM_CB = Comprehensive basis under the income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 NetDTLk_{,(-1)} + \Phi_3 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Table 7.6, Panel G, shows that the BSM has a lower mean ranked predictive error than the BSM *NetDTL*. Consistent with these results, Panel H shows that the BSM has a higher number of 1st rankings. However, the results are not significant (Panel I).

Therefore, there is only evidence that the ISM_PB is significantly better at predicting future tax payments than ISM_PB *NetDTL*.

7.7. Disaggregated Deferred Tax

Limited studies examine the ability of deferred tax to predict future tax payments where deferred tax assets and liabilities are disaggregated into deferred tax components. Disaggregated deferred tax (*DDT*) separates deferred tax assets and liabilities into the components of deferred tax disclosed in the Notes to the Financial Statements as required by NZ IAS 12.

To examine the ability of disaggregating deferred tax variables to predict future tax payments, the following model is used, based on Cheung *et al.* (1997):

$$TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DDT_{(t-1)} + \Phi_3 DTE_{(t-1)} + \epsilon_{(t)} \quad (4)$$

The dependent variable $TP_{(t)}$ equals tax paid from the current year's Statement of Cash Flows and $TP_{(t-1)}$ equals tax paid from the prior year's Statement of Cash Flows. $DDT_{(t-1)}$ are disaggregated deferred taxes as disclosed in the Notes to the Financial Statements under the BSM. These are deferred tax on: (1) property, plant and equipment (DT_PPE); (2) investment properties (DT_INV); (3) employee benefits (DT_EB); (4) tax losses carried forward (DT_TL); (5) derivative financial instruments (DT_DFI); (6) inventories (DT_IN); (7) intangible assets (DT_IA); (8) cash flow hedges (DT_CFH); and (9) other (DT_OT). $DTE_{(t-1)}$ is deferred tax expense recognised in the prior year's Statement of Profit or Loss using the BSM. $\epsilon_{(t)}$ denotes the error term. All variables are deflated by outstanding shares (Barth and Clinch, 2009).

Model 4 examines the ability of the disaggregated deferred tax and deferred tax expense under the BSM to predict future tax payments on a yearly basis. Disaggregated deferred tax is not available using the ISM_CB or the ISM_PB under SSAP-12. The predictive errors of each of the models are calculated and compared to model 2. The average rank of the predictive errors is then calculated, with the model yielding the lowest mean ranked predictive error ranked 1, otherwise 2. The model with the lowest mean ranked predictive error indicates it has better predictive ability. The Friedman S-statistic is used to ensure there is a statistical difference between the rankings of the models.

Table 7.7 provides the results.

Table: 7.7: Results of Disaggregated Deferred Tax

Prediction Year	Pooled	Ranking
Panel A: Mean Ranked Predictive Errors BSM vs. BSM *DDT*		
BSM	1.454	1
BSM *DDT*	1.545	2
Panel B: Number of 1st Rankings BSM vs. BSM *DDT*		
BSM	191	1
BSM *DDT*	159	2
Panel C: Pair Wise Testing BSM vs. BSM *DDT*		
Friedman S-statistic	2.926*	
	(0.087)	
No. of Observations	350	

BSM = Balance sheet method

Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$

Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DDT_{,(-1)} + \Phi_3 DTE_{,(t-1)} + \epsilon_{(t)}$

*** = Significant at less than 0.01

** = Significant at less than 0.05

* = Significant at less than 0.10

Panel A shows that the BSM has a lower mean ranked predictive error than the BSM *DDT*. Panel C shows these results are significant at less than 0.10. These results suggest that *DDT* does not provide any additional information when using the BSM to predict future tax payments.

7.8. Change in Tax Rates

During the 2008 to 2012 period, corporate tax rates were reduced from 33% to 28%. For the 2008 tax year the corporate tax rate is 33%, for the 2009 to 2011 tax years the corporate tax rate is 30% and for the 2012 tax year the corporate tax rate is 28%. While the tax rates affect tax paid in models 1 and 2 in the year it is legislated, the deferred tax in model 2 is recalculated when the legislation is enacted or substantially enacted. For example, the reduction to the 28% tax rate was legislated for the 2012 tax year but was substantially enacted in May 2010. Therefore changes in tax rates affect the deferred tax calculation, and model two earlier. It is possible that the change in tax rates has an effect on the ability of deferred tax to predict future tax payments.

The sample is segregated into tax years, rather than accounting years. For example, year ended 02/10/08 to 01/10/09 is the 2010 tax year whereas year ended 01/01/09 to 31/12/09 is the 2009 accounting year. In order to predict future tax payments without the effect of changes in tax rates, three years of tax information is required using the same tax rate for income tax and deferred tax. Table 7.8, columns A and B, report the tax and deferred tax rates for each tax year.

Table 7.8: Tax Rates

Tax Year	(A) Tax Rate	(B) Deferred Tax Calculated on	(C) Adjusted Tax Rates	(D) Deferred Tax Calculated on
2008	33%	30%	30%	30%
2009	30%	30%	30%	30%
2010	30%	To May 2010 30%; From June 2010 28%	30%	
2011	30%	28%	28%	
2012	28%	28%	28%	
2013	28%	28%	28%	

If tax paid for the 2008 tax year is estimated using 30% (TP/33x30), a prediction model using the same tax rates can be used for the estimation periods of 2008 to 2009 to predict 2010, and 2009 to 2010 to predict 2011 tax payments. Post 2010 estimation periods are excluded as this may be affected by the change in legislation. Eleven observations are excluded when compared to the 2008 to 2011 accounting years due to the change to tax years.

The results are reported in Table 7.9.

Columns A to C report the results from Chapter 6. Columns D to F report the results for the predictions with a tax rate of 30%. In the 2010 year, the BSM continues to have a significantly lower mean ranked predictive error than the TPM as reported in column D, consistent to the main test results in Chapter 6 as reported in column A. In 2011, the main test results reported in column B show that the TPM has a significantly lower mean ranked predictive error than the BSM. With the tax rates at 30%, column E shows that the results are no longer significant (Panel C). The pooled results are not significant. As there has been little change in the overall results, this suggests that the change in tax rates does not affect the ability of deferred tax to predict future tax payments.

Table 7.9: Results of Changes in Tax Rates

	Prediction Years					
	Accounting years from main tests in Chapter 6			Tax years at 30% tax rate		
	(A) 2010	(B) 2011	(C) Pooled	(D) 2010	(E) 2011	(F) Pooled
Panel A: Mean Ranked Predictive Errors TPM vs. BSM						
TPM	1.629	1.411	1.520	1.610	1.429	1.512
BSM	1.370	1.588	1.480	1.390	1.571	1.488
Panel B: Number of 1st Rankings TPM vs. BSM						
TPM	33	53	86	30	52	82
BSM	56	37	93	47	39	86
Panel C: Pair Wise Testing TPM vs. BSM						
Friedman S-statistic	5.944**	2.844*	0.274	3.753*	1.857	0.095
	(0.015)	(0.092)	(>0.10)	(0.053)	(>0.10)	(>0.10)
No. of Observations	89	90	179	77	91	168

TPM = Taxes payable method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \epsilon_{(t)}$
BSM = Balance sheet method
Model = $TP_{(t)} = \Phi_0 + \Phi_1 TP_{(t-1)} + \Phi_2 DTLk_{,(-1)} + \Phi_2 DTAk_{,(t-1)} + \Phi_2 DTEk_{,(t-1)} + \epsilon_{(t)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

7.9. Chapter Summary

This chapter examines additional testing using; (1) alternative estimation periods and prediction years; (2) the sample partitioned by tax paid; (3) the sample partitioned by growth; (4) the sample partitioned by buildings; (5) net deferred tax liabilities; (6) disaggregated deferred tax; and (4) the change in tax rates.

Research uses alternative estimation periods and prediction years (Cheung *et al*., 1997; Laux, 2013). Therefore additional testing is undertaken for one estimation period predicting two and three years ahead and all available estimation periods predicting one year ahead. The alternative estimation periods and prediction years' results are predominately consistent with the main results in Chapter 6. The ISM_CB has a significantly lower mean ranked predictive error than the TPM for predictions two and three years ahead, and where all available estimation periods are included. The ISM_PB has a significantly lower mean ranked predictive error than the TPM for predicting three years, consistent with the results in Chapter 6. The BSM has a significantly lower mean ranked predictive error than the TPM for all available estimation periods predicting one year ahead. This indicates that the BSM is a better predictor of future tax payments relative to the TPM where all available estimation periods are included. This is

inconsistent with the results in Chapter 6. Again, a possible explanation for this is that economic, accounting or tax changes affect the results over the longer term.

The sample is partitioned by tax paid. The ISM_CB has a significantly lower mean ranked predictive error than the TPM for observations with no tax paid.

There are insufficient observations to report on ISM_PB.

The BSM results are not significant for observations with no tax or tax paid. However, after removing the observations with buildings, the BSM assists in predicting future tax payments for observations with tax paid relative to the TPM. Two possible explanations are provided. First, the results are affected by the change in legislation. Second, observations that have buildings also have growth of depreciable assets. By excluding observations with buildings, the sample may exclude firms with growth of depreciable assets.

Laux (2013) partitions the sample by growth to find it does not affect the ability of deferred tax to predict future tax payments. The sample in this thesis is partitioned by growth of depreciable assets. The ISM_CB has a significantly lower mean ranked predictive error than the TPM for those observations with no growth. These results suggest that for observations with no growth, the ISM_CB assists in predicting future tax payments. The results for observations with growth are not significant.

There are insufficient observations to report on ISM_PB.

For those observations using the BSM, the results are not significant.

The sample is partitioned by observations with buildings. The results are not significant.

Both SSAP-12 and NZ IAS 12 have different regulations for offsetting deferred tax assets and liabilities. Therefore *NetDTL* are examined. Using deferred tax assets and liabilities recognised in accordance with the relevant accounting standards, the ISM_CB, the ISM_PB and the BSM are compared with deferred tax assets and liabilities offset in totality. For each deferred tax method, using *NetDTL* does not provide any more

information on future tax payments relative to deferred tax methods. This suggests that offsetting in accordance with the standard is appropriate.

Disaggregated deferred tax is examined. Under NZ IAS 12 only the BSM requires disclosure of disaggregated deferred tax. The BSM is compared with the BSM using disaggregated deferred tax instead of deferred tax assets and liabilities recognised in accordance with the standard. The results indicate that the BSM *DDT* does not assist in predicting future tax payments relative to the BSM.

The change in tax rates is examined. The results indicate that the change in tax rates do not affect the ability of the BSM to predict future tax payments.

The following chapter reviews the literature on the second component of information relevance – value relevance. The focus is on deferred tax and share price.

CHAPTER 8: DEFERRED TAX AND SHARE PRICE — LITERATURE REVIEW

8.1. Introduction

The second component of information relevance is value relevance. This chapter and the following three chapters focus on the value relevance of various deferred tax methods relative to the taxes payable method.

Section 8.2 examines the literature using the comprehensive basis under the income statement method, section 8.3, the partial basis under the income statement method, and section 8.4, the balance sheet method. The chapter is summarised in section 8.5.

8.2. Comprehensive Basis under the Income Statement Method

Research finds that deferred tax liabilities and assets calculated using the comprehensive basis under the income statement method are value relevant (Givoly and Hayn, 1992; Chaney and Jeter, 1994; Chang *et al.*, 2009). Givoly and Hayn (1992) test a sample using APB Opinion 11, where there is a reduction in corporate tax rates from 46% to 34% from the Tax Reform Act of 1986. The study indicates that the change in deferred tax liabilities due to the reduction in tax rates is value relevant. Chaney and Jeter (1994), using US data, examine a sample from 1969 to 1985, to find a negative association between the change in deferred tax liabilities using APB No. 11 and share prices. Chang *et al.* (2009) use Australian data and find that deferred tax liabilities (where observations have a loss) and deferred tax assets calculated under Australian Accounting Standards Board 1020: *Accounting for Income Taxes* (AASB 1020) are negatively and positively associated with share prices, respectively. The study also finds that unrecognised deferred tax assets are negatively associated with share price, indicating the market expects future losses.

8.3. Partial Basis under the Income Statement Method

Some studies find that deferred tax calculated using the comprehensive basis under the income statement method is unlikely to reverse (Rue and Volkan, 1985; Chaney and Jeter, 1994; Colley *et al.*, 2012). Rue and Volkan (1985) find that deferred tax balances are constant or increasing over time. Chaney and Jeter (1994) support the partial basis as timing differences of a recurring nature (such as depreciation) are generally offset by

equal or larger differences, so are unlikely to reverse. The study supports the view that deferred tax bears no relation to taxes that will be paid in the future. Colley *et al*. (2012) provide evidence to support that over the period 2004 to 2010, deferred tax reversals are postponed for most firms, allowing them to defer the tax payments indefinitely. These studies support the partial basis for calculating deferred tax.

Under the income statement method, New Zealand firms choose between the comprehensive basis and the partial basis. The partial basis requires deferred tax to be calculated on the timing differences that will reverse in the foreseeable future (SSAP-12.4). Some studies provide evidence that deferred tax liabilities calculated using the partial basis are value relevant (Citron, 2001; Wong *et al.*, 2011). Citron (2001) tests the association between deferred taxes and share prices for the years 1989 to 1991. The results indicate that deferred tax liabilities using the partial basis are value relevant. Wong *et al.* (2011) examine a time series from 1999 to 2004 using deferred tax liabilities and market value of securities. Two samples of firms listed on the NZ Stock Exchange are examined, one using the comprehensive basis and the other using the partial basis. The results are similar to Citron (2001) with deferred tax liabilities using the partial basis being negatively and significantly associated to share price where firms have growth of depreciable assets (top three deciles of growth). Wong *et al.* (2011) suggest that deferred tax liabilities using the comprehensive basis are viewed by investors as part of equity, with a positive association to share price for firms in the lowest three deciles of growth of depreciable assets. The study does not examine deferred tax assets or deferred tax expense.

8.4. Balance Sheet Method

Some US studies find deferred tax liabilities and assets are not value relevant using the balance sheet method. Chludek (2011) uses the Feltham and Ohlson (1995) model to examine the time period 2005 to 2008. The results indicate that deferred tax liabilities using the balance sheet method are not value relevant. The results also indicate that deferred tax assets are not value relevant. The exception is where the firm has a loss and deferred tax assets are negatively associated with share price. Chludek (2011) examines deferred tax assets less deferred tax liabilities (net deferred tax liabilities) to find that only the highest quintile of deferred tax assets net of deferred tax liabilities are value relevant.

Amir, Kirschenheiter and Willard (1997) examine the association of disaggregated deferred tax with share price, using US data. Deferred tax is disaggregated into depreciation, amortisation, losses and credits carried forward, restructuring charges, environmental charges, employee benefits, valuation allowance and other components. Deferred tax on losses and credits carried forward is negatively associated to share price, suggesting that investors expect future losses. Deferred tax on restructuring charges has a higher coefficient and is negatively associated to share price. Other components of disaggregated deferred tax are not value relevant.

8.5. Chapter Summary

This chapter reviews the literature of the value relevance of deferred tax.

Similar to the predictability studies, prior value relevance studies focus on specific items of deferred tax (e.g., tax assets and liabilities) rather than the complete impact of the deferred tax method. The next three chapters examine which method of deferred tax is associated with share price relative to the taxes payable method.

Table 8.1 summarises the literature on deferred tax and value relevance.

Table 8.1: Summary of Literature

	Association with Share Price	Data
Panel A: Comprehensive Basis		
DTL	Givoly and Hayn (1992)	US
	Chaney and Jeter (1994)	US
	Chang *et al.* (2009)	Australian
DTA	Chang *et al.* (2009)	Australian
DTE		
Panel B: Partial Basis		
DTL	Citron (2001);	UK
	Wong *et al.* (2011)	NZ
DTA		
DTE		
Panel C: Balance Sheet Method		
DTL	Chludek (2011)	US
DTA	Amir and Sougiannis (1999)	US
	Chludek (2011)	US
DTE		

DTL = Deferred tax liabilities as recognised in the Statement of Financial Position
DTA = Deferred tax assets as recognised in the Statement of Financial Position
DTE = Deferred tax expense as recognised in the Statement of Profit or Loss

The following chapter develops the hypothesis, discusses the research method and describes the sample for assessing the value relevance of deferred tax.

CHAPTER 9: DEFERRED TAX AND SHARE PRICE — HYPOTHESIS, RESEARCH METHOD AND SAMPLE SELECTION

9.1. Introduction

Section 9.2 of this chapter develops the hypothesis. Section 9.3 discusses the research methods for examining the association of deferred tax methods with share price relative to the taxes payable method. Section 9.4 describes the data used and section 9.5 summarises the chapter.

9.2. Hypothesis Development

This thesis examines whether deferred tax liabilities, assets and expense are associated with share price. The null hypothesis is:

H2 **There is no difference in the value relevance of the deferred tax and taxes payable methods.**

The three methods of calculating deferred tax are examined: (1) the comprehensive basis under the income statement method (ISM_CB); (2) the partial basis under the income statement method (ISM_PB); and (3) the balance sheet method (BSM).

Studies find that deferred tax liabilities calculated using the ISM_CB are negatively associated to share price (Givoly and Hayn, 1992; Chaney and Jeter, 1994). However, Wong *et al.* (2011) find that deferred tax liabilities are only significant in firms with low growth of depreciable assets (bottom three deciles) for those using ISM_CB. Wong *et al.* (2011) find that deferred tax liabilities are value relevant using the ISM_PB where firms have high growth of depreciable assets (top three deciles). Chludek (2011) finds deferred tax liabilities and assets are not associated to share price using the BSM. The exception is where the firm has a loss; in that case, deferred tax assets are negatively associated to share price.

9.3. Method and Data

To test the hypothesis this thesis uses models based on Wong *et al.* (2011):

$$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BVE_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)} \quad (5)$$

$$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)} \quad (6)$$

$MVE_{(it)}$ equals the market value of shares from the NZ Stock Exchange as at three months post balance date. $BVE_{(it)}$ is the book value of equity as at balance date and $BV_{(it)}$ is the book value of equity excluding deferred tax assets and deferred tax liabilities. $NIAT_{(it)}$ is net income after tax and $NI_{(it)}$ is net income after tax and before deferred tax expense. $YR_{(it)}$ is set as a dummy variable to capture years 2000 to 2004 and 2008 to 2012. $DTLk_{,(t-1)}$ are deferred tax liabilities recognised in the prior year's Statement of Financial Position under deferred tax method k (where k denotes the three methods of deferred tax: the ISM_CB, the ISM_PB and the BSM). $DTAk_{,(t-1)}$ are deferred tax assets recognised in the prior year's Statement of Financial Position under deferred tax method k. $DTEk_{,(t-1)}$ is deferred tax expense recognised in the prior year's Statement of Profit or Loss under deferred tax method k. $\epsilon_{(t)}$ denotes the error term. All variables are deflated by outstanding shares (Barth and Clinch, 2009).

Model 5 represents the TPM, and model 6, the deferred tax method. The models are tested using the Vuong (1989) test for non-nested models (Zhou, 2016), and the Clarke sign test (Clarke, 2003).[10] The tests identify which is the preferred deferred tax method. The method that is more value relevant will have the highest significant Z-statistic.

9.4. Sample Selection

The variables are collected from the NZ Stock Exchange Deep Archive for years 2000 to 2004, and 2008 to 2012. The period 2005 to 2007 is excluded as the transition to NZ IAS 12 affects early adopters more than late adopters (Mear, 2011) and the results may be affected by a self-selection bias.

For each year all available observations are included that have market value of equity, book value of equity, net income and a share price at three months post balance date.

[10] Clarke (2003) recommends the Clarke sign test where the underlying data is highly peaked compared to normal distribution.

The sample is the same as used for testing the ability of deferred tax to predict future tax payments. From 2000 to 2004, there are 371 firm years, of which 298 observations use the ISM_CB and 73 use the ISM_PB. There are 440 firm years and 99 firms from 2008 to 2012.

9.5. Chapter Summary

This chapter explains the research design used to investigate the association between deferred tax and share price. The hypothesis is developed and the research methods are discussed.

The sample used for this research is 371 firm years or 93 firms from 2000 to 2004. From 2008 to 2012 there are 440 firm years or 99 firms.

The research findings are presented in the next chapter.

CHAPTER 10: DEFERRED TAX AND SHARE PRICE — RESULTS

10.1. Introduction

This chapter presents the research findings for the hypothesis developed in the previous chapter on the value relevance of deferred tax methods relative to the taxes payable method.

Section 10.2 discusses the descriptive statistics and section 10.3 reports the results of the comprehensive basis under the income statement method (ISM_CB). Section 10.4 reports the results of the partial basis under the income statement method (ISM_PB) and section 10.5 reports the results of the balance sheet method (BSM). Section 10.6 summarises the chapter.

10.2. Descriptive Statistics

Table 10.1 provides the variable descriptive statistics deflated by the number of outstanding shares as at balance date.

The mean (median) market value of equity of observations using: (1) the ISM_CB, from 2000 to 2004, is 2.663 (1.625); (2) the ISM_PB from 2000 to 2004 is 1.364 (0.990); and (3) the BSM from 2008 to 2012, is 1.917 (1.270).

The mean (median) book value of equity (BV) for observations using: (1) the ISM_CB, is 1.666 (0.809); (2) the ISM_PB, is 1.106 (1.037); and (3) the BSM, is 1.473 (0.988). There are some observations with a high BV affecting the mean, therefore more weighting is placed on the Clarke (2003) sign test results, being non-parametric testing, rather than the Vuong (1989) test results.

Table 10.1: Descriptive Statistics

	ISM_CB (n=298)			ISM_PB (n=73)			BSM (n=440)		
	2000-2004			2000-2004			2008-2012		
Variable	**Mean**	**Median**	**Std dev**	**Mean**	**Median**	**Std dev**	**Mean**	**Median**	**Std dev**
Variable Descriptive Statistics (Scaled by Outstanding Shares)									
MVE	2.663	1.625	3.447	1.364	0.990	1.266	1.917	1.270	2.045
BV	1.666	0.809	3.258	1.106	1.037	0.661	1.473	0.988	1.562
NI	0.138	0.070	0.464	0.084	0.078	0.085	0.082	0.079	0.296
DTL	0.030	0.000	0.108	0.003	0.000	0.009	0.086	0.000	0.199
DTA	0.020	0.000	0.051	0.004	0.000	0.014	0.021	0.000	0.048
DTE	-0.002	0.000	0.042	0.000	0.000	0.008	0.004	0.000	0.039
DTLC				0.105	0.050	0.194			
PPE							-0.085	-0.003	0.206
INV							-0.004	0.000	0.024
EB							0.004	0.000	0.012
TL							0.007	0.000	0.020
DFI							0.003	0.000	0.010
IN							0.001	0.000	0.005
IA							-0.005	0.000	0.029
CF							-0.001	0.000	0.009
OT							0.010	0.002	0.054

ISM_CB = Comprehensive basis under the income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
MVE = Market value of equity at 3 months post balance date
BV = Book value of equity excluding deferred tax liabilities and assets
NI = Net income after taxation before deferred tax expense
DTL = Deferred tax liabilities recognised in the Statement of Financial Position
DTA = Deferred tax assets recognised in the Statement of Financial Position
DTE = Deferred tax expense recognised in the Statement of Profit and Loss
DTLC = Deferred tax liabilities recalculated using the comprehensive basis, by adding deferred tax liabilities recognised in the Statement of Financial Position, and deferred tax liabilities disclosed in the Notes to the Financial Statements
PPE = Deferred tax on property, plant and equipment disclosed in the Notes to the Financial Statements
INV = Deferred tax on investment properties disclosed in the Notes to the Financial Statements
EB = Deferred tax on employee benefits disclosed in the Notes to the Financial Statements
TL = Deferred tax on tax losses disclosed in the Notes to the Financial Statements
DFI = Deferred tax on derivative financial instruments disclosed in the Notes to the Financial Statements
IN = Deferred tax on inventories disclosed in the Notes to the Financial Statements
IA = Deferred tax on intangible assets disclosed in the Notes to the Financial Statements
CF = Deferred tax on cash flow hedges disclosed in the Notes to the Financial Statements
OT = Deferred tax on other items disclosed in the Notes to the Financial Statements

The mean (median) net income (NI) for observations using: (1) the ISM_CB, is 0.138 (0.070); (2) the ISM_PB, is 0.084 (0.078); and (3) the BSM, is 0.082 (0.079).

Deferred tax variables are the same as reported in Table 6.1.

10.3. Comprehensive Basis under the Income Statement Method

Model 6, using ISM_CB, is compared with model 5, the TPM, using the Vuong (1989) test for non-nested models (Zhou, 2016), and the Clarke sign test (Clarke, 2003). The tests will identify if the ISM_CB is value relevant relative to the TPM. The model which is more value relevant will have the highest significant Z-statistic. It is expected that the Clarke sign test results will be stronger than the Vuong test results as it uses non-parametric data.

Table 10.2 provides the results of the Vuong (1989) test and the Clarke (2003) sign test.

Panel A shows that for all years and in the pooled results, the ISM_CB is value relevant relative to the TPM using the Vuong (1989) test. However, the results are not statistically significant except for the year 2003. Panel B shows that, using the Clarke sign test, in the year 2000 the TPM value relevant relative to the ISM_CB with a significance level of less than 0.10. However, in the years 2002, 2003 and 2004 and in the pooled results, the ISM_CB is value relevant relative to the TPM with a significant z-statistic.[11]

As the ISM_CB is consistently value relevant relative to the TPM, the hypothesis 'H2 There is no difference in the value relevance of the deferred tax and taxes payable methods' can be rejected for the ISM_CB. The results are significant for one year using the Vuong (1989) test, and for the pooled observations and three years using the Clarke (2003) sign test. More weighting is placed on the Clarke sign test results, as it is used for non-parametric testing.

[11] The coefficients of the pooled sample using the ISM_CB are: BV 0.160 (<0.01); NI 4.689 (<0.01); DTL 4.768 (<0.01); DTA 9.819 (<0.01); DTE -7.083 (<0.05) (one tailed test)

Table: 10.2: Results of Value Relevance Testing

	2000	2001	2002	2003	2004	Pooled
Panel A: Vuong (1989) Test for the TPM vs. the ISM_CB						
Preferred Model	ISM_CB	ISM_CB	ISM_CB	ISM_CB	ISM_CB	ISM_CB
z-statistic	0.725	0.773	0.755	2.155	0.803	1.447
p-value	(>0.10)	(>0.10)	(>0.10)	(0.031)**	(>0.10)	(>0.10)
Panel B: Clarke (2003) Sign Test for the TPM vs. the ISM_CB						
Preferred Model	TPM	TPM	ISM_CB	ISM_CB	ISM_CB	ISM_CB
z-statistic	-7.0	-0.50	10.0	14.0	9.5	41.0
p-value	(0.054)*	(>0.10)	(0.018)**	(<0.001)***	(0.037)**	(<0.001)***
No. of Observations	46	51	66	60	75	298
Panel C: Vuong (1989) Test for the TPM vs. the ISM_PB						
Preferred Model	ISM_PB	ISM_PB	ISM_PB	ISM_PB	ISM_PB	ISM_PB
z-statistic	1.422	0.537	0.826	0.876	0.525	0.907
p-value	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)
Panel D: Clarke (2003) Sign Test for the TPM vs. the ISM_PB						
Preferred Model	ISM_PB	ISM_PB	TPM	TPM	TPM	TPM
z-statistic	3.0	0.50	-0.5	-0.5	0	-5.5
p-value	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)
No. of Observations	14	15	15	13	16	73
Panel E: Vuong (1989) Test for the ISM_PB vs. ISM_CB						
Preferred Model						ISM_PB
z-statistic						1.099
p-value						(>0.10)
Panel F: Clarke (2003) Sign Test for the ISM_PB vs. ISM_CB						
Preferred Model						ISM_CB
z-statistic						-4.5
p-value						(>0.10)
No. of Observations						73

	2008	2009	2010	2011	2012	Pooled
Panel G: Vuong (1989) Test for the TPM vs. the BSM						
Preferred Model	BSM	BSM	BSM	BSM	BSM	BSM
z-statistic	0.975	1.593	1.469	0.840	0.8301	1.241
p-value	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)	(>0.10)
Panel H: Clarke (2003) Test for the TPM vs. the BSM						
Preferred Model	TPM	BSM	BSM	BSM	BSM	BSM
z-statistic	-1.5	16	12.5	9.000	7.000	46
p-value	(>0.10)	(<0.001)***	(0.008)***	(0.066)*	(>0.010)	(<0.001)***
No. of Observations	89	90	85	86	90	440

TPM = Taxes payable method

Model 5 = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

ISM_CB= Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB= Partial Basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model 6 = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

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10.4. Partial Basis under the Income Statement Method

Table 10.2, Panel C, provides the results for the Vuong (1989) test for the ISM_PB relative to the TPM. The results are consistent; the ISM_PB is value relevant relative to the TPM. However, the results are not significant. Panel D provides the results for the Clarke sign test. The results indicate that three out of the five years and in the pooled results the TPM is value relevant relative to the ISM_PB and again, the results are not significant.[12] This is inconsistent with Wong *et al.* (2011). A possible reason for these mixed results is that the sample is not segregated by growth. Alternatively, the ISM_PB provides information about future tax payments through deferred tax liabilities but does not provide information about other facets of the firm, such as profitability.

As the results are mixed, the hypothesis 'H2 There is no difference in the value relevance of the deferred tax and taxes payable methods' cannot be rejected for the ISM_PB relative to the TPM.

The disclosed deferred tax liabilities for the observations using the ISM_PB are included in the model to enable the comparison between ISM_PB and ISM_CB. Panel E provides the results for the Vuong (1989) test using pooled observations. The ISM_PB is value relevant relative to the ISM_CB; however, the results are not significant. Panel F provides the results using the Clarke (2003) sign test. The ISM_CB is now value relevant relative to the ISM_PB and again, the results are not significant.

10.5. Balance Sheet Method

The results for the BSM relative to the TPM are reported in Table 10.2. Panel G provides the results of the Vuong (1989) test. While the BSM is consistently value relevant relative to the TPM, the results are not significant. Panel H provides the results for the Clarke (2003) sign test. The BSM is now value relevant relative to the TPM, except for 2008. The results for this test are significant for the years 2009, 2010 and 2011 and the pooled results.[13]

[12] The coefficients of the pooled sample using the ISM_PB are: BV 0.588 (<0.01); NI 8.351 (<0.01); DTL -19.057 (<0.10); DTA 0.311 (>0.10); DTE 12.349 (>0.10) (one tailed test)
[13] The coefficients of the pooled sample using the BSM are: BV 0.930 (<0.01); NI 1.658 (<0.01); DTL -0.183 (>0.10); DTA 3.737 (<0.01); DTE 1.238 (>0.10) (one tailed test)

As the results are consistent and significant, the hypothesis ‘H2 There is no difference in the value relevance of the deferred tax and taxes payable methods’ can be rejected for the BSM relative to the TPM.

10.6. Chapter Summary

This chapter summarises the research findings for the hypothesis developed in the previous chapter. The Vuong (1989) test and the Clarke (2003) sign test are used to compare two models: one using deferred tax methods and the other using the taxes payable method. The results, where significant, provide evidence of that the deferred tax method is value relevant relative than the TPM, or alternatively, the TPM is value relevant relative to the deferred tax method.

The ISM_CB is value relevant relative to the TPM, using the Vuong (1989) test and the Clarke (2003) sign test. The results for the ISM_PB are not significant. The BSM is value relevant relative to the TPM.

Additional testing is reported in the following chapter. Chapter 11 examines: (1) the sample partitioned by tax paid; (2) the sample partitioned by growth; (3) the sample partitioned by buildings; (4) net deferred tax liabilities; (5) disaggregated deferred tax; and (6) using the share price as at balance date.

CHAPTER 11: DEFERRED TAX AND SHARE PRICE — ADDITIONAL TESTING

11.1. Introduction

This chapter examines additional testing of the association of deferred tax methods with share price relative to the taxes payable method. Section 11.2 examines the sample partitioned by tax paid, section 11.3, the sample partitioned by growth and section 11.4, the sample partitioned by buildings. Section 11.5 examines net deferred tax liabilities, and section 11.6, disaggregated deferred tax. Section 11.7 examines the models using the share price as at balance date. Section 11.8 summarises the chapter.

11.2. Sample Partitioned by Tax Paid

Similar to the predictive testing, the sample is partitioned by tax paid.

Chang *et al*. (2009) provide evidence that deferred tax liabilities are more likely to reverse where firms report a loss. The study tests the value relevance of deferred tax liabilities and concludes that for observations that have a loss, using the comprehensive basis under the income statement method, deferred tax liabilities are associated with share price.

The sample is partitioned by tax paid. An observation with no tax paid is where the tax paid in the Statement of Cash Flows is zero or a refund in the current year. All other observations are included as tax paid.

Table 11.1 provides the results.

Table 11.1: Results of Sample Partitioned by Tax Paid

ISM_CB	No Tax	Tax
Panel A: Vuong (1989) Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	2.454	1.4737
p-value	(0.014)**	(>0.10)
Panel B: Clarke (2003) Sign Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	23.5	3.5
p-value	(<0.001)***	(>0.10)
No. of Observations	97	201
Panel C: Vuong (1989) Test for the TPM vs. the ISM_PB		
Preferred Model	ISM_PB	ISM_PB
z-statistic	2.020	0.822
p-value	(0.043)**	(>0.10)
Panel D: Clarke (2003) Sign Test for the TPM vs. the ISM_PB		
Preferred Model	TPM	ISM_PB
z-statistic	-0.50	0.000
p-value	(>0.10)	(>0.10)
No. of Observations	17	56
Panel E: Vuong (1989) Test for the ISM_CB vs. the ISM_PB		
Preferred Model	ISM_CB	ISM_PB
z-statistic	-1.102	0.359
p-value	(>0.10)	(>0.10)
Panel F: Clarke (2003) Sign Test for the ISM_CB vs. the ISM_PB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	-0.5	-1.0
p-value	(>0.10)	(>0.10)
No. of Observations	17	56
Panel G: Vuong (1989) Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	1.339	1.016
p-value	(>0.10)	(>0.10)
Panel H: Clarke (2003) Sign Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	20.5	21.5
p-value	(<0.001)***	(0.018)**
No. of Observations	121	319

TPM = Taxes payable method

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

ISM_CB = Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB = Partial basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Consistent with Chang *et al.* (2009), Panel A shows the ISM_CB is value relevant relative to the TPM using the Vuong (1989) test for observations with no tax paid. Panel B shows similar results using the Clarke (2003) sign test. The results are significant. The results are not significant for observations with tax paid.

Table 11.1 provides the results for the ISM_PB relative to the TPM for observations partitioned by tax paid. Panel C shows the ISM_PB is value relevant relative to the TPM using the Vuong (1989) test for observations with no tax paid and the results are significant. Panel D shows the TPM is value relevant relative to the ISM_PB; however, the results are not significant using the Clarke (2003) sign test. Panels C and D also show that the ISM_PB is value relevant relative to the TPM for observations with tax paid, however the results are not significant. This is examined further. The sample is partitioned into deciles of the mean changes in tax paid over the period. The three highest deciles are examined. The results (not tabulated) now show that the ISM_PB is value relevant relative to the TPM for firms with high changes in tax paid.[14] The results provide evidence that the ISM_PB is value relevant relative to the TPM for firms with the top three deciles of mean increases in tax paid.

Panels E and F provide the results of the ISM_PB relative to the ISM_CB where the observations are partitioned by tax paid. The results are not significant.

Table 11.1, Panels G and H, provide the results for the BSM relative to the TPM where observations are partitioned by tax paid. The results in Chapter 10 indicate that the BSM is value relevant relative to the TPM. Therefore, it is expected that the BSM will be value relevant relative to the TPM for the partitioned observations. Panel G shows that the results are not significant for the observations with no tax paid, using the Vuong (1989) test. However, Panel H shows the BSM is value relevant relative to the TPM for observations with no tax paid or tax paid, using the Clarke (2003) sign test and the results are significant. More weighting is placed on the Clarke sign test as it uses non-parametric testing. The results are consistent with Chapter 10.

[14] Vuong z-statistic 2.415**; p-value (0.015); Clarke (2003) Sign Test z-statistic 0.2632; p-value (>0.10); no. of obs. = 20

11.3. Sample Partitioned by Growth

Wong *et al.* (2011) examine observations using the ISM_PB. The study provides evidence that deferred tax liabilities are value relevant for firms with mean growth (in the three highest deciles) of depreciable assets over the sample period. The study recalculates deferred tax liabilities for those using the partial basis to include disclosed deferred tax liabilities, to simulate the ISM_CB. The recalculated deferred tax liabilities are value relevant where there is low growth of depreciable assets (bottom three deciles) over the sample period. Chludek (2011) finds that deferred tax liabilities and assets are not value relevant using the balance sheet method. These studies do not examine the deferred tax method.

Observations are partitioned by growth. No growth is where there is a zero or decrease in book value of depreciable assets from the prior year to the current year. Growth is an increase in book value of depreciable assets from the prior year to the current year.

Table 11.2, Panel A, shows that for observations partitioned by no growth the ISM_CB is value relevant relative to the TPM. The results are significant. Panel B shows similar results for the Clarke (2003) sign test. The results are consistent with Wong *et al*. (2011). The results for the observations with growth are not significant.

Panel C shows the results are not significant for the ISM_PB relative to the TPM for observations partitioned by growth. Panel D shows similar results using the Clarke sign test. This is inconsistent with Wong *et al.* (2011). It is expected that the ISM_PB is value relevant relative to the TPM for observations with growth.[15] The sample is partitioned into deciles of mean changes in book value of depreciable assets over the period (Wong *et al*., 2011). The three highest deciles are examined. The results (not tabulated) are not significant for the firms with high changes in depreciable assets, which again is inconsistent with Wong *et al.* (2011).

[15] In the sample partitioned by growth, the co-efficient of deferred tax liabilities for ISM_PB is negatively and significantly associated with share price at less than 0.10 (one tailed test).

Table 11.2: Results of Sample Partitioned by Growth

	No Growth	Growth
Panel A: Vuong (1989) Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	2.249	0.329
p-value	(0.024)**	(>0.10)
Panel B: Clarke (2003) Sign Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	18.5	4.5
p-value	(0.002)***	(>0.10)
No. of Observations	139	159
Panel C: Vuong (1989) Test for the TPM vs. the ISM_PB		
Preferred Model	ISM_PB	ISM_PB
z-statistic	0.940	1.434
p-value	(>0.10)	(>0.010)
Panel D: Clarke (2003) Sign Test for the TPM vs. the ISM_PB		
Preferred Model	TPM	ISM_PB
z-statistic	-3.0	4.5
p-value	(>0.10)	(>0.10)
No. of Observations	46	27

	No Growth	Growth
Panel E: Vuong (1989) Test for the ISM_CB vs. the ISM_PB		
Preferred Model	ISM_PB	ISM_CB
z-statistic	0.784	-0.288
p-value	(>0.10)	(>0.10)
Panel F: Clarke (2003) Sign Test for the ISM_CB vs. the ISM_PB		
Preferred Model	ISM_CB	ISM_PB
z-statistic	-4.0	1.5
p-value	(>0.10)	(>0.10)
No. of Observations	46	27
Panel G: Vuong (1989) Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	1.286	0.480
p-value	(>0.10)	(>0.10)
Panel H: Clarke (2003) Sign Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	23.5	9.5
p-value	(0.004)***	(>0.10)
No. of Observations	263	177

TPM = Taxes payable method

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

ISM_CB = Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB = Partial basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

The ISM_PB is compared with the ISM_CB and the results are reported in Table 11.2. Panel E provides the results of the Vuong (1989) test. The results are not significant for observations partitioned by growth. Panel F provides the results of the Clarke (2003) sign test. Again, the results are not significant. With regard to the value relevance of the ISM_PB relative to ISM_CB, partitioning the sample by growth does not provide any additional information to the results given in Chapter 10.

Table 11.2 provides the results for the BSM relative to the TPM for observations partitioned by growth. While Chludek (2011) finds that deferred tax assets and liabilities are not value relevant using the BSM, the results in Chapter 10 indicate that the BSM is value relevant relative to the TPM. It is therefore expected that the BSM will be value relevant for the partitioned observations. Panel G shows that the results are not significant for the observations partitioned by growth using the Vuong (1989) test. However, Panel H shows the BSM is value relevant relative to the TPM for observations with no growth using the Clarke (2003) sign test. The results are significant. More weighting is placed on the Clarke sign test as it uses non-parametric testing.

11.4. Sample Partitioned by Buildings

For 2008 to 2012, the sample is also partitioned by observations with no buildings and buildings (Mear, 2011), to examine the effect of the Income Tax (GST and Remedial) Act (2010). The Act sets a 0% depreciation rate on buildings with a useful life of 50 years or more.

Table 11.3 provides the results for the BSM relative to the TPM for observations partitioned by buildings.

Table 11.3: Results of Sample Partitioned by Buildings

	No Buildings	Buildings
Panel A: Vuong (1989) Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	0.643	1.633
p-value	(>0.10)	(>0.10)
Panel B: Clarke (2003) Sign Test for the TPM vs. the BSM		
Preferred Model	TPM	BSM
z-statistic	-3.5	4.5
p-value	(>0.10)	(>0.10)
No. of Observations	213	227

TPM = Taxes payable method

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

ISM_CB = Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB = Partial basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Panels A and B show that neither results for observations with no buildings and with buildings are significant. If the results are affected by the change in legislation, it is expected that the BSM would be value relevant relative to the TPM for observations recording no buildings and the BSM would not be value relevant for observations recording buildings. However, this is not the case. This indicates that the results are not affected by the change in legislation.

11.5. Net Deferred Tax Liabilities

SSAP-12 allows deferred tax liabilities to be offset with deferred tax assets where operations are carried out in one tax jurisdiction. NZ IAS 12 applies a more stringent criterion, allowing offsetting if the deferred tax assets and liabilities will be settled or realised simultaneously. There is little research on the value relevance of deferred tax recognised in accordance with the accounting standards or offset in totality. Chludek (2011) finds that net deferred tax liabilities are value relevant where the observations are of the highest quintile of deferred tax assets less liabilities.

Net deferred tax liabilities (*NetDTL*) offsets deferred tax assets and deferred tax liabilities.

To examine the association of net deferred tax liabilities with share price, using offsetting, and deferred tax recognised in accordance with accounting standards, the following model is used:

$$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 NetDTLk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)} \quad (7)$$

$MVE_{(it)}$ equals the market value of shares from the NZ Stock Exchange as at three months post balance date. $BV_{(it)}$ is the book value of equity excluding deferred tax assets and deferred tax liabilities at balance date. $NI_{(it)}$ is net income after tax and before deferred tax expense. $NetDTLk_{,(it)}$ are deferred tax liabilities less deferred tax assets as recognised in the Statement of Financial Position under deferred tax method k. The deferred tax method k is the ISM_CB, the ISM_PB and the BSM. $DTEk_{,(it)}$ is deferred tax expense recognised in the Statement of Profit or Loss under the BSM. $YR_{(it)}$ is a dummy variable to capture years 2000 to 2004 and 2008 to 2012. $\epsilon_{(t)}$ denotes the error term. All variables are deflated by outstanding shares as at balance date (Barth and Clinch, 2009).

The models are compared with model 6 (deferred tax method *k*) using the Vuong (1989) test for non-nested models (Zhou, 2016), and the Clarke (2003) sign test. The tests identify which is the preferred deferred tax method. The preferred model will have the highest significant Z-statistic.

Table 11.4 provides the results.

Table 11.4: Results of Net Deferred Tax Liabilities

	DT vs. DT *NetDTL*
Panel A: Vuong (1989) Test for the ISM_CB vs. the ISM_CB *NetDTL*	
Preferred Model	ISM_CB
z-statistic	-1.25
p-value	(>0.10)
Panel B: Clarke (2003) Sign Test for the ISM_CB vs. the ISM_CB *NetDTL*	
Preferred Model	ISM_CB
z-statistic	-41.0
p-value	(<0.001)***
No. of Observations	298
Panel C: Vuong (1989) Test for the ISM_PB vs. the ISM_PB *NetDTL*	
Preferred Model	ISM_PB
z-statistic	-0.869
p-value	(>0.10)
Panel D: Clarke (2003) Sign Test for the ISM_PB vs. the ISM_PB *NetDTL*	
Preferred Model	ISM_PB *NetDTL*
z-statistic	7.5
p-value	(>0.10)
No. of Observations	73
Panel E: Vuong (1989) Test for the BSM vs. the BSM *NetDTL*	
Preferred Model	BSM
z-statistic	0.991
p-value	(>0.10)
Panel F: Clarke (2003) Sign Test for the BSM vs. the BSM *NetDTL*	
Preferred Model	BSM
z-statistic	10.0
p-value	(>0.10)
No. of Observations	440

TPM = Taxes payable method

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

DT = Deferred Tax Method
ISM_CB = Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB = Partial basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 NetDTLk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DDTk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Panel A shows the ISM_CB is value relevant relative to the ISM_CB *NetDTL*; however, the results are not significant. Panel B provides the results using the Clarke sign test. The ISM_CB is value relevant relative to the ISM_CB *NetDTL* with a significant z-statistic. This provides evidence that the offsetting of deferred taxes in accordance with SSAP-12 for the ISM_CB is value relevant relative to offsetting in totality.

Panel C, Table 11.4, provides the results for the ISM_PB relative to the ISM_PB *NetDTL* using the Vuong (1989) test. The results are not significant. Panel D provides the results using the Clarke (2003) sign test and, again, the results are not significant. It is not, therefore, clear if the ISM_PB *NetDTL* is value relevant relative to the ISM_PB.

Table 11.4, Panel E, provides the results of the BSM relative to the BSM *NetDTL*, using the Vuong (1989) test. The results are not significant. The Clarke (2003) sign test results, reported in Panel F, are also not significant. Again, it is not clear if the BSM *NetDTL* is value relevant relative to the BSM.

11.6. Disaggregated Deferred Tax

NZ IAS 12 requires the disclosure of deferred tax assets and liabilities for each type of temporary difference (NZ IAS 12.81). SSAP-12 does not require this disclosure. Some studies find elements of this disclosure value relevant. For example, Amir *et al.* (1997) find that disaggregated deferred tax on losses and credits carried forward and restructuring charges are value relevant. However, the value relevance of disaggregating deferred tax is not compared to the BSM.

Using the BSM sample, the deferred tax on the types of temporary differences are collated manually. These are deferred tax on: (1) property, plant and equipment (DT_PPE); (2) investment properties (DT_INV); (3) employee benefits (DT_EB); (4) tax losses carried forward (DT_TL); (5) derivative financial instruments (DT_DFI); (6) inventories (DT_IN); (7) intangible assets (DT_IA); (8) cash flow hedges (DT_CFH); and (9) other (DT_OT).

The following model is compared to model 6 using the BSM:

$$MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DDT_{(it)} + \Upsilon_5 DTE_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)} \quad (8)$$

$MVE_{(it)}$ equals the market value of shares from the NZ Stock Exchange as at three months post balance date. $BV_{(it)}$ is the book value of equity excluding deferred tax assets and

deferred tax liabilities at balance date. $NI_{(it)}$ is net income after tax and before deferred tax expense. $DDT_{(it)}$ are disaggregated deferred tax as disclosed in the Notes to the Financial Statements under the BSM. $DTE_{(it)}$ is deferred tax expense recognised in the Statement of Profit or Loss under the BSM. $YR_{(it)}$ is a dummy variable to capture years 2008 to 2012. $\epsilon_{(t)}$ denotes the error term. All variables are deflated by outstanding shares as at balance date (Barth and Clinch, 2009).

The model is compared with model 6 (the BSM), using the Vuong (1989) test for non-nested models (Zhou, 2016), and the Clarke (2003) sign test. The tests identify which is the preferred deferred tax method. The preferred model will have the highest significant Z-statistic.

Table 11.5 provides the results.

Table 11.5: Results of Disaggregated Deferred Tax

	BSM vs. BSM *DDT*
Panel A: Vuong (1989) Test for the BSM vs. The BSM *DDT*	
Preferred Model	BSM *DDT*
z-statistic	3.086
p-value	(0.002)***
Panel B: Clarke (2003) Sign Test for the BSM vs. The BSM *DDT*	
Preferred Model	BSM *DDT*
z-statistic	20.5
p-value	(0.062)*
No. of Observations	440

BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

BSM *DDT* = Balance sheet method deferred tax using disaggregated deferred tax and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DDTk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Panel A shows that, using the Vuong test, the BSM *DDT* is value relevant relative to the BSM. The Clarke sign test results support this finding (Panel B). The results are significant. These results indicate that including disaggregated deferred tax in the Notes to the Accounts is beneficial to users of the financial information.

11.7. Share Price at Balance Date

Wong *et al.* (2011) use the share price as at balance date to test the value relevance of deferred tax. The value relevance of deferred tax methods are re-examined using share price as at balance date.

Table 11.6 provides the Vuong (1989) test and Clarke (2003) sign test results where the dependent variable, share price at three months post balance date, is replaced with share price as at balance date.

Table 11.6: Results of Alternative Share Price

	Main Tests from Chapter 10	Share Price as at Balance Date
Panel A: Vuong (1989) Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	1.447	1.207
p-value	(>0.10)	(>0.10)
Panel B: Clarke (2003) Sign Test for the TPM vs. the ISM_CB		
Preferred Model	ISM_CB	ISM_CB
z-statistic	41.0	44.0
p-value	(<0.001)***	(<0.001)***
No. of Observations	298	298
Panel C: Vuong (1989) Test for the TPM vs. the ISM_PB		
Preferred Model	ISM_PB	ISM_PB
z-statistic	0.907	0.943
p-value	(>0.10)	(>0.10)
Panel D: Clarke (2003) Sign Test for the TPM vs. the ISM_PB		
Preferred Model	TPM	TPM
z-statistic	-5.5	-4.5
p-value	(>0.10)	(>0.10)
No. of Observations	73	73
Panel E: Vuong (1989) Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	1.241	1.893
p-value	(>0.10)	(0.058)*
Panel F: Clarke (2003) Sign Test for the TPM vs. the BSM		
Preferred Model	BSM	BSM
z-statistic	46	59.0
p-value	(<0.001)***	(<0.001)***
No. of Observations	440	440

TPM = Taxes payable method

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NIAT_{(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$

ISM_CB = Comprehensive basis under the income statement method, using DTL, DTA and DTE
ISM_PB = Partial basis under the income statement method, using DTL, DTA and DTE
BSM = Balance sheet method deferred tax using DTL, DTA and DTE

Model = $MVE_{(it)} = \Upsilon_0 + \Upsilon_1 BV_{(it)} + \Upsilon_2 NI_{(it)} + \Upsilon_3 DTLk_{,(it)} + \Upsilon_4 DTAk_{,(it)} + \Upsilon_5 DTEk_{,(it)} + \sum_{Y=0}^{03} \Upsilon_{6+Y} YR_{(it)} + \epsilon_{(it)}$
*** = Significant at less than 0.01
** = Significant at less than 0.05
* = Significant at less than 0.10

Panels A and B show that the ISM_CB is value relevant relative to the TPM. The significance level is less than 0.01, using the Clarke sign test. This is consistent with the results from Chapter 10.

Panel C provides the results for the Vuong test for the ISM_PB relative to the TPM. The results are not significant, similar to Chapter 10. Panel D shows the Clarke sign test and, again, the results are not significant. This is consistent with the results from Chapter 10.

Panel E, Table 11.6, provides the results for the Vuong (1989) test for the BSM relative to the TPM. The BSM is value relevant, with a significance level of less than 0.10. Panel F provides the results for the Clarke (2003) sign test. The BSM continues to be value relevant relative to the TPM with a significance level of less than 0.01. This is consistent with the results from Chapter 10.

11.8. Chapter Summary

This chapter examines additional testing using: (1) the sample partitioned by tax paid; (2) the sample partitioned by growth; (3) the sample partitioned by buildings; (4) net deferred tax liabilities; (5) disaggregated deferred tax; and (6) the share price as at balance date.

The sample is partitioned by tax paid. The results indicate that the ISM_CB is value relevant relative to the TPM where observations have no tax paid.

The results suggest that the ISM_PB is value relevant relative to the TPM for observations with no tax paid. The results for observations with tax paid are not significant. The sample is partitioned into deciles of mean changes in tax paid and examines the highest three deciles. The results find that the ISM_PB is value relevant relative to the TPM for firms that have high changes in tax paid.

As the results in Chapter 10 indicate that the BSM is value relevant, it is expected that where the BSM is partitioned by tax paid, the BSM will continue to be value relevant. The results provide evidence that the BSM is value relevant for observations with no tax paid and tax paid relative to the TPM.

Wong *et al.* (2011) find that deferred tax liabilities for the ISM_PB are value relevant where there is high growth of depreciable assets (top three deciles), and for the ISM_CB where there is low growth of depreciable assets (bottom three deciles). The sample is partitioned by growth. The results indicate that ISM_CB is value relevant relative to the TPM for observations with no growth. The ISM_PB is not value relevant for observations with no growth or growth. The three highest deciles of mean changes in book value of depreciable assets for the ISM_PB are examined and provide no significant results. The BSM is value relevant relative to the TPM for observations with no growth.

The sample is also partitioned by observations with no buildings and buildings (Mear, 2011) to examine the effect of the Income Tax (GST and Remedial) Act (2010). The results for the observations with and without buildings are not significant, suggesting the change in legislation does not affect the results.

One study finds that net deferred tax liabilities are value relevant where the observations are of the highest quintile of deferred tax assets less liabilities (Chludek, 2011). SSAP-12 and NZ IAS 12 have different offsetting regulations. This thesis compares the deferred tax models with deferred tax recognised in accordance with the accounting standards to deferred tax models using deferred tax assets and liabilities offset in totality. The results are not significant.

Amir *et al.* (1997) find that some components of disaggregated deferred tax are value relevant. This thesis compares the BSM with the BSM *DDT*. The results indicate that disaggregating deferred tax under the BSM is value relevant relative to the BSM.

Research uses share price at balance date (Wong *et al*., 2011). This thesis replaces the share price as at three months post balance date with the share price as at balance date. The results are similar to Chapter 10.

The following chapter summarises the results of the predictability and value relevance testing.

CHAPTER 12: SUMMARY OF THE RESULTS

12.1. Introduction

This chapter discusses the research results. Sections 12.2 summarises the results. Sections 12.3 to 12.5 discuss the results in relation to the literature, accounting standards, and tax legislation. Section 12.6 summarises the chapter.

12.2. Summary of the Results

Table 12.1 provides a summary of the results for the thesis.

Table 12.1: Summary of Results

	Full Sample	One estimation period t+2	One estimation period t+3	All available estimation periods t+1	No Tax Paid	Tax Paid	No Growth	BSM *DDT*
Panel A: TPM vs. ISM_CB								
Predictions	**ISM_CB**	**ISM_CB**	**ISM_CB**	**ISM_CB**	**ISM_CB**	-	**ISM_CB**	
Value Relevance	**ISM_CB**				**ISM_CB**	-	**ISM_CB**	
Panel B: TPM vs. ISM_PB								
Predictions	**ISM_PB**	-	**ISM_PB**	**ISM_PB**				
Value Relevance	-				**ISM_PB**	-	-	
Panel C: TPM vs. BSM								
Predictions	-	-	-	**BSM**	-	-	-	-
Value Relevance	**BSM**				**BSM**	**BSM**	**BSM**	**BSM**

Full Sample = One estimation period to predict one year ahead tax payments.
One estimation period t+2 = One estimation period to predict two year ahead tax payments
One estimation period t+3 = One estimation period to predict three year ahead tax payments
All available estimation periods t+1 = All available estimation periods to predict one year ahead tax payments
TPM = Taxes payable method
ISM_CB = Comprehensive basis under the income statement method
ISM_PB = Partial basis under the income statement method
BSM = Balance sheet method
DDT = Disaggregated deferred tax

Panel A compares the ability of the ISM_CB to predict future tax payments relative to the TPM. The results provide evidence that the ISM_CB is a better predictor of the TPM for the full sample, consistent with Cheung *et al.* (1997). The ISM_CB is a better predictor of future tax payments relative to the TPM for two and three years ahead, where all estimation periods are included, and where observations record no tax paid or no growth. Overall, the results suggest that the ISM_CB is a better predictor of future tax payments relative to the TPM.

Table 12.1, Panel A, also shows that the ISM_CB is value relevant relative to the TPM for the full sample. Consistent with Wong *et al.* (2011), the ISM_CB is also value relevant relative to the TPM where observations record no tax paid or no growth. These results are consistent with the ability of ISM_CB to predict future tax payments, therefore suggesting that the ISM_CB is information relevant.

Table 12.1, Panel B, provides the results for the ISM_PB. Across the full sample, the ISM_PB assists in predicting future tax payments relative to the TPM. The results also suggest that the ISM_PB is a better predictor of future tax payments relative to the TPM for three year ahead tax payments and where all estimation periods are included. There are insufficient observations to segregate the ISM_PB sample into tax paid and growth, for measuring the mean ranked predictive errors.

The association between the ISM_PB and TPM and share price is examined. Neither method provides significant results. The sample is further segregated into tax paid and growth. The ISM_PB is value relevant relative to the TPM for observations with no tax paid. Further testing shows that the ISM_PB is value relevant relative to the TPM , where observations have the highest three deciles of mean changes in tax paid. While ISM_PB assists in predicting future tax payments relative to the TPM, the ISM_PB is only value relevant relative to the TPM for firms in the top three deciles of mean increases in tax paid. The results therefore suggest that the ISM_PB is not consistently information relevant.

Table 12.1, Panel C, provides the results for the BSM. The BSM is not a better predictor of future tax payments relative to the TPM. The exception is where all available estimation periods are included to predict one year ahead. However, the results are likely to be affected by other economic, accounting or tax changes over the sample period. The objective of NZ IAS 12 is to recognise deferred tax if it is probable deferred tax will affect future tax payments. Based on these results, NZ IAS 12 does not meet its objective for one, two and three year ahead predictions.

Panel C also provides the results for the value relevance of BSM relative to the TPM. The BSM is value relevant relative to the TPM for the full sample. It is also value relevant where observations record no tax paid, tax paid and no growth. This is inconsistent with

the prediction results. However, the value relevance results may be affected by the NZ IAS 12 requirement to disclose components of deferred tax in the Notes to the Financial Statements. With the additional information in the disaggregated deferred tax, investors may be able to discount deferred tax liabilities, assets and/or expense using the BSM. There is further evidence of this, as the BSM using disaggregated deferred tax is value relevant relative to the BSM. However, as the BSM is not a better predictor of future tax payments relative to the TPM, the results suggest it is not information relevant.

12.3. Literature

Three of the key issues surrounding deferred tax are: (1) deferred tax meeting the definition of a liability; (2) deferred tax not crystallising into future cash flows; and (3) calculating deferred tax using the balance sheet method.

Some researchers argue that deferred tax does not meet the definition of a liability (Hill, 1957; Chamber, 1968; Colley *et al.*, 2012). The argument is based on: (1) the liability being dependent on future events; (2) there being no present obligation as deferred tax is not due and payable as at balance date; and (3) the creation of deferred tax liability not being based on a past transaction. The results of this thesis provide evidence that the ISM_CB and the ISM_PB are better predictors of future tax payments relative to the TPM. The ISM_CB and the BSM are also value relevant. This suggests that deferred tax should be recognised in the financial statements.

Findings from other research suggest that deferred tax does not crystallise into future cash flows and therefore the ISM_PB should be used (Hill, 1957; Davidson, 1958), instead of the ISM_CB. Both the ISM_PB and the ISM_CB are better predictors of future tax payments relative to the TPM. However only the ISM_CB is value relevant relative to the TPM across the full sample. The results for the ability to predict future tax payments and value relevance of the ISM_PB relative to the ISM_CB are not significant. The overall results indicate that the ISM_PB is not information relevant, and the ISM_CB is information relevant.

Recent changes to legislation on depreciation of buildings highlight the issues with the BSM. The BSM captures a wider range of items subject to deferred tax (Wong, 2006). The present study's results provide evidence that the BSM is not a better predictor of

future tax payments relative to the TPM, except where all available estimation periods are used to predict one year ahead. It is, however, value relevant relative to the TPM. Overall, the results suggest that the BSM is not information relevant as it is not consistently a better predictor of future tax payments relative to the TPM.

12.4. Accounting Standards

The present study uses financial information from firms listed on the NZ Stock Exchange. Two samples are employed. The first is from 2000 to 2004 and is regulated by SSAP-12. The second is from 2008 to 2012 and is regulated by NZ IAS 12. The years 2005 to 2007 are excluded as firms have a choice to implement IFRS during the transition period. NZ IAS 12 affects early adopters more than late adopters (Mear, 2011), resulting in a self-selection bias.

SSAP-12 uses the income statement method to calculate deferred tax and allows both the comprehensive basis and partial basis. It prohibits the taxes payable method. The ISM_CB requires the recognition of almost all timing differences. One exception is deferred tax on asset revaluations that are not expected to crystallise into cash flows in the foreseeable future. The ISM_PB requires deferred tax to be calculated on the timing differences that will reverse in the foreseeable future. The income statement method does not require the disaggregation of deferred tax to be included in the Notes to the Financial Statements. For the period 2008 to 2012, NZ IAS 12 regulates the recognition and disclosure of deferred taxes. NZ IAS 12 uses the balance sheet method. It requires the recognition of deferred tax on all temporary differences, regardless of whether they will reverse in the foreseeable future.

The results provide evidence that the ISM_CB is the only method of calculating deferred tax that is information relevant. It assists in the prediction of future tax payments and is value relevant. Neither the ISM_PB nor the BSM are information relevant across the full sample. Of particular importance is that the BSM is not a better predictor of future tax payments than the TPM; therefore, NZ IAS 12 does not meet its objective.

12.5. Tax Legislation

Mear (2011) suggests that tax legislation is important when examining changes in financial statement information. The two time periods, 2000 to 2004 and 2008 to 2012,

are legislated by the Income Tax Act 1994 and the Income Tax Act 2007 respectively. During the second time period, legislation changing tax rates and depreciation on buildings are enacted.

The results indicate that the changes in tax rates do not affect the ability of deferred tax to assist in predicting future tax payments. The results are inconclusive on the effect of the change in depreciation rates on buildings on the ability of deferred tax to predict future tax payments and value relevance.

12.6. Chapter Summary

This chapter summarises the results, and discusses the results in reference to literature, accounting standards and tax legislation.

The conclusion of this thesis is that the ISM_CB is the only deferred tax method which is information relevant. It assists in predicting future tax payments and is value relevant relative to the TPM.

Three of the key deferred tax issues from prior literature are discussed. First, evidence is provided that deferred tax methods are preferred to the TPM. Second, there is no conclusive evidence that the ISM_PB is more information relevant than the ISM_CB, however, the results indicate that the ISM_PB is not information relevant. Third, the BSM is not information relevant.

NZ IAS 12 explains that the recovery of recognised deferred tax assets and liabilities will make future tax payments smaller or larger than if there were no tax consequences. However, the BSM is not a better predictor of future tax payments relative to the TPM. The only exception is where all estimation periods are included to predict one year ahead tax payments. This thesis explains these contrary results as being due to changes in other economic, accounting or tax changes over the estimation period. Overall, the BSM is not a better predictor of future tax payments than the TPM and therefore does not meet the objective of NZ IAS 12.

The results indicate that the change in tax rates does not affect the ability of deferred tax to predict future tax payments. It is not clear whether the change in legislation on the tax rate of depreciation for buildings affects the results.

CHAPTER 13: CONCLUSION

13.1. Introduction

Section 13.2 of this chapter, concludes the thesis and section 13.3 provides suggestions for future research.

13.2. Conclusion

The IASB has undertaken research on income taxes, addressing concerns that IAS 12 may cause accounting mismatches. The IASB research suggests that one option is to fundamentally change the main principle of IAS 12 from the balance sheet method to another method. Four deferred tax methods are suggested: (1) the taxes payable method (TPM); (2) the comprehensive basis under the income statement method (CB_ISM); (3) the partial basis under the income statement method (PB_ISM); or remaining with, (4) the balance sheet method (BSM).

In New Zealand, SSAP-12 governs the comprehensive basis and partial basis under the income statement method pre IFRS. NZ IAS 12 governs the balance sheet method post IFRS. Neither accounting standard allows the taxes payable method.

This thesis examines the research question "are deferred tax methods, relative to the taxes payable method, information relevant?" Ohlson (1995) suggests a variable is information relevant when it assists in predicting future cash flows and it is value relevant. Two hypotheses are tested: (1) there is no difference in the predictive ability of the deferred tax and taxes payable methods; and (2) there is no difference in the value relevance of the deferred tax and taxes payable methods.

Prediction models are used to examine hypothesis one, based on Cheung *et al.* (1997). Valuation models are used to examine hypothesis two, based on the Ohlson (1995) valuation framework. Financial information is manually collected from the NZ Stock Exchange. Two samples of firms are employed. The first sample is 2000 to 2004, where the comprehensive basis and partial basis under the income statement method are allowed. The second sample is 2008 to 2012 where the balance sheet method is required. The thesis excludes the years from 2005 to 2007 where firms choose to implement IFRS. The

transition to NZ IAS 12 affects early adopters more than late adopters (Mear, 2011) resulting in a self-selection bias.

The results provide evidence that the ISM_CB assists in predicting future tax payments and is value relevant relative to the TPM; therefore, it is information relevant. The ISM_PB assists in predicting future tax payments relative to the TPM but is not value relevant except for firms in the top three deciles of mean increases in tax paid. The BSM is not a better predictor of future tax payments but is value relevant relative to the TPM. The BSM using disaggregated deferred tax is value relevant relative to the BSM, suggesting that disaggregating deferred tax in the Notes to the Financial Statements provides useful information to investors.

The prediction results are generalizable to jurisdictionsusing IFRS. While countries are governed by different tax legislation, this will impact both the temporary tax differences giving rise to deferred tax and the future tax that paid. Although Mear and Bradbury (2013) show there can be unanticipated consequences of IFRS adoption in relation to deferred tax, there had been no other major changes to IAS 12. Hence, the external validity of this study to other IFRS jurisdictions is likely to be strong.

These findings are important to accounting standard setters. For accounting standard setters, the ISM_CB is the only information relevant deferred tax method.

This thesis is motivated by the IASB research suggesting fundamental changes to IAS 12. It differs from prior research in several respects. First, the thesis uses non-US data. IFRS and US GAAP have different requirements for recognising deferred tax and, therefore, the results from US studies may not be able to be applied to data governed by IFRS.

The thesis also extends the literature on the ability of deferred tax assets, liabilities and expense (being the deferred tax method) to predict future tax payments relative to the TPM. Cheung *et al.* (1997) examines the ability of deferred tax liabilities and deferred tax expense to predict future tax payments relative to the TPM but does not consider the deferred tax assets. The thesis also extends research on the value relevance of deferred tax methods relative to the TPM. Other studies, such as Wong *et al.* (2011), assess the value relevance of deferred tax liabilities, but not assets or expense and therefore not the

deferred tax method. The deferred tax method impacts on the tax expense in the Statement of Profit or Loss, and assets and liabilities recognised in the Statement of Financial Position. A comprehensive approach is taken by employing all three deferred tax line items in this thesis.

13.3. Limitations

A limitation of this thesis is that firms are able to self-select between the comprehensive basis and the partial basis under the income statement method. While Wong *et al.* (2011) suggest that firms are more likely to choose the partial basis if they are more capital intensive and therefore have larger depreciation timing differences, the motivation for the accounting choice is not always clear. The results may be influenced by a self-selection bias.

A further limitation is the small sample sizes. However nonparametric testing has been used to compensate for this.

13.4. Suggestions for Future Research

The results show that the ISM_CB is value relevant relative to the TPM, however the ISM_PB is not value relevant relative to the TPM. This result is unexpected. One explanation is that the ISM_CB provides additional information on other facets of the firm, such as profitability, in addition to future tax payments. The ISM_PB only provides information on future tax payments. Further research could be undertaken to determine what other information is being reflected in deferred tax calculated using the ISM_CB.

The results provide evidence that disaggregated deferred tax using the BSM is value relevant relative to the BSM. This suggests that the disaggregated deferred tax disclosed in the Notes to the Financial Statements is more useful to investors than the deferred tax assets and liabilities recognised in the Statement of Financial Position. One explanation for this is that investors are able to discount the components of deferred tax which impacts on share price. Further research could be undertaken on an appropriate method of discounting deferred tax. Other studies examine the association of disaggregated deferred tax with share price, such as Amir *et al*. (1997). However, the discounting of components of deferred tax using either estimated length of time to settle components of deferred tax

and discount rates, or judgement, has not been examined. If discounting of deferred tax is useful to investors, then the IASB may consider this in further research on IAS 12.

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