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THE MATERIALITY AND VOLATILITY OF COMPREHENSIVE INCOME

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LAURA BABETT SCHRÖDER

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ABSTRACT

The objective of this research is to investigate the materiality and volatility of comprehensive income for non financial firms in a non US environment. As the FASB and IASB are planning to require the reporting of comprehensive income in a single performance statement, it is important to resolve the issues surrounding the materiality and the volatility of comprehensive income.

This study investigates the materiality of comprehensive income and its components in relation to total comprehensive income and closing equity for 37 non financial companies listed on the NZX from 2003 to 2008. Moreover, the cumulative impact of comprehensive income on equity over time is investigated. Further the volatility of comprehensive income is compared to the volatility of net income. This study also investigates the impact of the change to NZ IFRS on comprehensive income

The results show that other comprehensive income is material in relation to total comprehensive income, but not in relation to closing equity. Moreover, some components of comprehensive income have a cumulative effect over time on closing equity. Comprehensive income is more volatile than net income. However, these findings are due to asset revaluations, which is the most dominant component of other comprehensive income. Though, all components of comprehensive income are significant for some firm year observations. Further, the move to NZ IFRS affects the materiality of some components of other comprehensive income and reduces the volatility of comprehensive income compared to net income.

This study provides evidence that other comprehensive income is material for non financial firms in a non US environment. This suggests that it should be displayed clearly in the financial statement in order to be taken into consideration by financial statement users. Further, this study provides evidence that the difference in volatility between comprehensive income and net income in New Zealand can be avoided by choosing the cost method when measuring assets after recognition.

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CHAPTER 1: INTRODUCTION

1.1 What is Comprehensive Income?

Comprehensive income includes all changes in equity during a period, except those resulting from investments by owners or distributions to owners (Johnson, Reither and Swieringa, 1995). Comprehensive income consists of net income and other comprehensive income. Other comprehensive income includes all items of income that currently bypass the income statement. In New Zealand comprehensive income is called “total revenues and expenses”.

1.2 Objective

The objective of this study is to investigate comprehensive income for non financial firms in a non US environment. This study attempts to find out whether other comprehensive income is material and therefore worthwhile the attention it is receiving from standard setters and the literature. Further, this study tries to establish whether comprehensive income is more volatile than net income as is often assumed.

Most prior research in regards to comprehensive income is from the US and relates to SFAS 130. New Zealand is an interesting environment for investigating comprehensive income as it recently adopted the New Zealand equivalent to International Financial Reporting Standards (NZ IFRS). Further, the New Zealand reporting environment differs to the US, as the revaluation of assets, and the use of financial instruments are more common (Berkman et al., 1997).

Both, the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) are in favour of the all inclusive income concept and the reporting of comprehensive income in a

single statement. However, neither board has achieved this yet. Both boards formed a joint project group on financial statement presentation. One of the aims of this project is the display of comprehensive income in a single statement (IASB, 2008).

An important issue that needs to be resolved in this process is the perceived volatility of comprehensive income. Because increased volatility of earnings could mean increased risk to financial statement users.

However, the efficient market hypothesis suggests that this should not matter, as the information displayed will not change. Only the statement in which it is displayed will change. Currently, the information in regards to comprehensive income is displayed in the statement of changes in equity. Although, this claim has been disputed by research in psychology which indicates that information is only processed if it is readily available and processable (Hirst and Hopkins, 1998)

Further, financial statement preparers have several concerns in regards to the display of comprehensive income in a single performance statement. They are worried that comprehensive income might reduce the importance of other performance measures. Additionally, multiple performance measures might be confusing to financial statement users. This change in accounting regulation could be redundant as this information is already displayed in a different statement. Therefore, the increased volatility might increase the risk perception (Hirst and Hopkins, 1998).

Therefore, this study is attempting to find evidence in regards to the materiality and volatility of comprehensive income. In order to explore the importance and the advantages of the display of comprehensive income, as well as providing evidence on its true volatility.

1.3 Research

The research in this study is threefold. First, the materiality of comprehensive income and its components is investigated in relation to total comprehensive income, and in relation to closing equity. Second, the impact of other comprehensive income on closing equity over time is examined. It is important to know whether the effects of comprehensive income balance or accumulate over time. Third, the volatility of comprehensive income is compared to the volatility of net income. Further, the impact of the change to NZ IFRS on the materiality and volatility of comprehensive income is analysed.

1.4 Findings

The findings of this study indicate that the components of other comprehensive income are material in relation to total comprehensive income, but not in relation to closing equity. The most dominant component of comprehensive income in New Zealand besides net income is asset revaluations.

Further, the cumulative components of other comprehensive income in equity are material, especially the asset revaluation reserve.

Comprehensive income is more volatile than net income. However, this finding is due to the impact of asset revaluations on comprehensive income. Asset revaluations are voluntary in New Zealand. Therefore, this volatility of comprehensive income could be avoided.

Evidence suggests that NZ IFRS might affect the materiality of cash flow hedges and employee benefits, but asset revaluations remain the dominating component of other comprehensive income. Additionally, NZ IFRS seems to reduce the volatility of comprehensive income, due to a correlation between cash flow hedges and employee benefits with foreign currency.

Therefore, the overall findings in regards to the materiality and volatility of comprehensive income are dominated by asset revaluations. However, the other components of comprehensive income can be very significant for some firm year observations.

1.5 Implications

The results of this study have implications for the existing literature, standard setters and financial statement users.

The contribution to the existing literature is the in depth analysis of the materiality and volatility of comprehensive income focusing on non financial firms in a non US environment that allows asset revaluations. This study analyses the components of comprehensive income. As well as the effects of materiality and volatility based on company size and industry sector. Further, this is one of the first studies investigating the impact of NZ IFRS on financial statements by using actual data.

This study demonstrates to standard setters that comprehensive income is material and should be displayed prominently. Since the most dominant component of other comprehensive income is asset revaluations, this study further highlights the many different options available to financial statement preparers in New Zealand in regards to asset revaluations, which could be exploited for income smoothing.

To financial statement users this study reveals the importance of considering comprehensive income in investment decisions. It can be used as an additional risk assessment tool as it provides information in regards to the environment an organisation is operating in, as well as possible additional income streams besides net income.

1.6 Chapter Outline

The remainder of this thesis is structured as follows. Chapter two provides an extensive literature review on comprehensive income. Chapter three explains the methodology and research questions. Chapter four describes and depicts the results. Chapter five discusses the findings of this research, as well as their implications and limitations. Chapter six provides a summary of this thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter is intended to provide a review of the existing literature in regards to comprehensive income. It is divided into five parts. First, a background to comprehensive income and the FASB/IASB convergence project is presented. Then, the two main streams of research in regards to comprehensive income are assessed. These are experimental research and valuation studies. Next, the results and shortcomings of the previous research are discussed. The last section introduces research in regards to materiality and volatility and develops the research design for this study.

2.2 Developing Performance Reporting

2.2.1 Comprehensive Income

This section includes the theoretical literature discussing comprehensive income. It is intended to provide a background to the issues that need to be considered when analysing comprehensive income.

Much of the early research in the 1990s reviewing the reasons for reporting comprehensive income as well as its components is from the US, and focusing on the Financial Accounting Standards Board (FASB). However, the US articles can also be related to other jurisdictions as the general issues are the same: why, where and how should comprehensive income be reported. Especially, during a time of globalisation of the economy, with many multinational companies that are listed on several stock exchanges. The world economy has been constantly growing and moving faster. Further, the increased use of financial instruments is similar for most industrial nations. A major difference in financial reporting between the various jurisdictions is the items that are included in comprehensive income. This is due to the development of each countries own standard setting

system, which over the years, has allowed a varying amount of items to be recognised directly in equity.

The Association for Investment Management and Research (AIMR) published a paper in 1993 pointing out the difficulty of comparing financial statements from different companies. The AIMR calls for all gains and losses, whether realised or not, to be displayed together, separate from operating activities. Further, they would like these gains and losses displayed as what they are, e.g. marketable securities, foreign currency translations, or unusual and non recurring items. The AIMR predicts that this could reduce share market tremors that occur when investors only act on aggregated numbers like net income or earnings per share.

Johnson, Reither and Swieringa (1995) describe the early stages of the Financial Accounting Standards Board (FASB) project to develop SFAS 130, *Reporting Comprehensive Income*. They provide a background to comprehensive income as well as an explanation of why it should be reported. Further, they raise a number of questions that need to be considered during the course of developing this standard. Comprehensive income is the change in net assets during a period excluding all transactions with owners, for example investments by owners and distributions to owners. Comprehensive income therefore includes, but is not limited to, net income. As well as net income, it includes all other non owner changes to equity that are not included on the income statement. The main questions raised by Johnson et al. (1995) are: which items of comprehensive income should be reported, and where in the financial statements should comprehensive income be displayed.

Johnson et al. (1995) do not actually answer these questions, but raise some of the issues to be considered. For example, when discussing what should be included in comprehensive income they compare the current operating performance concept to the all inclusive income concept. The current operating performance concept excludes some items from net income that are part of the all inclusive concept, which disregards whether gains and

losses stem from operating activities of the current period or not. Johnson et al. (1995) point out that in general the FASB supports the all inclusive concept, however, over the years various exceptions were made for a number of items to be recognised directly in equity.

One of the reasons cited by the authors in favour of the all inclusive concept is to make financial statements more transparent and user friendly. Further, Johnson et al. (1995) consider whether preparers of financial statements should display comprehensive income in a single statement of income or whether it should be displayed in a separate statement. Additionally, Johnson et al. (1995) raise the issue of how comprehensive income should be categorised on the financial statements, whether the current categories on the income statement are sufficient. Moreover, it is also pointed out that this project does not consider measurement or recognition issues, but is solely focusing on presentation. The authors of this article are members of the International Accounting Standards Board (IASB) and are involved in this project. This research paper was written before the standard was introduced. However, the future standard is clearly reflected in this paper. Overall, this paper displays the complexity of the FASB reporting framework, as it points out that new requirements or changes to existing requirements could also involve changes to other related previous regulations. This can cause the system to be quite sluggish and difficult, in some cases it might even be easier not to innovate.

Cope, Johnson and Reither (1996) further discuss the project to develop SFAS 130. In particular, they explain why the project was added to the FASB's agenda. According to the authors, a standard on reporting comprehensive income is necessary in order to require preparers of financial statements to report all items of comprehensive income in the period in which they are recognised. Further, it is explained that the comprehensive income project is strongly related to the FASB's financial instruments project. The financial instruments project evaluates whether financial instruments should be recognised at fair value or at historic cost. Most items on the balance sheet are currently recognised at historic cost. Most of the

FASB members appear to agree on this issue, but are concerned that displaying financial instruments more prominently, and at fair value, might lead to more volatile financial statements. This article by Cope et al. (1996) clearly demonstrates why comprehensive income reporting is such a current issue by pointing out the increase in the use of financial instruments, as well as the need to recognise and display them accurately in the financial statements, to ensure that users are aware of its effects. Another issue with displaying financial instruments at fair value is that the economy is moving much faster compared to when many of the current standards using historic cost were developed. This change in pace should be reflected in the reporting standards as well as in the financial statements to ensure that they are relevant.

Beresford, Johnson and Reither (1996) point out that neither the requirements of fair value disclosure in the notes nor the historical cost measures in the financial statements are sufficient. Some financial instruments are acquired without an initial cost and are therefore not displayed on the balance sheet. An example are interest rate swaps, they do not involve a cash transaction when acquired and hence do not appear on the balance sheet. However, Beresford et al. (1996) also highlight that measuring and displaying financial instruments at fair value could result in more volatile financial statements. In general the FASB embraces the all inclusive income concept. However, over the years, they have made some exceptions and have allowed for certain items to be recognised directly in equity. Nevertheless, they also find it worrying that equity might become a dumping ground for a growing amount of important information, if no other means of reporting comprehensive income is provided. Therefore, they suggest an expanded or an additional income statement to require the display of comprehensive income.

Smith and Reither (1996) indicate that market efficiency is based on the theory of competition where decisions reflect the available economic information and prices are competitively set. Further, one type of information used to promote market efficiency is financial statement

information. Therefore, the reporting of comprehensive income could enhance the consistency of information among companies and result in more efficient use of financial statement information. However, without the introduction of a standard requiring the display of comprehensive income, it is difficult for financial statement users to extract information regarding comprehensive income from the financial statements, due to the variety of practices that currently exist. This makes it difficult for financial statement users to analyse the effects that comprehensive income could have on an organisation (Smith and Reither, 1996). Further, the authors perform a small experiment wherein they compile the net income and the comprehensive income information of 70 Fortune 1000 companies from 7 different sectors. This experiment found that unrealised gains and losses mainly occur in the insurance industry or in organisations that have financial subsidiaries.

Schipper and Vincent (2003) investigate which earnings concept best represents Hicksian income. Hicks (1939) developed an economic based definition of earnings. According to Hicks (1939), income is the amount that can be consumed during a period that leaves an organisation equally well off at the end as at the beginning of that period. Therefore, this income measure is consistent with the change in net assets that does not relate to transactions with owners. In their quest, Schipper and Vincent (2003) focus on the quality of earnings as well as on decision usefulness. They point out that earnings measures are often used for contracting arrangements. Overstated earnings could therefore lead to larger than intended wealth transfers, or hide declining solvency. Further, it is highlighted that the larger the amount of judgement, estimation and forecasting required during the preparation of the financial statements, the lower the quality of the reported earnings. The authors find that neither earnings nor comprehensive income are perfect measures of Hicksian income, but that comprehensive income better corresponds to it than earnings. The difference between Hicksian income and comprehensive income is due to the fact that some assets or liabilities are not required to be initially recognised and measured. Because historic cost accounting does not require changes in value to be recognised, until they have been realised. The difference between comprehensive

income and earnings is also due to accounting standards, as some items of comprehensive income are excluded from earnings and others are included with delay. Schipper and Vincent (2003) conclude that the closer the earnings figure represents Hicksian earnings, the higher the quality of these earnings, as this is the change in total wealth during a period.

2.2.2 Beyond Comprehensive Income

More and more countries are adopting International Financial Reporting Standards. The European Union required all publicly listed companies to adopt International Accounting Standards from the 1st of January 2005 (Lin, Ramond, Casta, 2007). According to Deloitte Touche Tohmatsu (2009), 89 jurisdictions require their financial statements to be prepared according to International Accounting Standards. Only two jurisdictions are requiring FASB standards (McLaughlin, 2009). Therefore, it is becoming more important for the FASB to converge their standards with the IASB standards.

Newberry (2003) highlights some of the points that need to be taken into consideration when setting international accounting standards, by using performance reporting as an example. Two problems are (1) the internal incoherence of the conceptual frameworks and (2) the risk that the standard setting process could be used to meet political ends. According to the FASB and IASB conceptual frameworks, an important attribute of the information contained in financial statements should be decision usefulness. Therefore, the financial statements should display the information that the users find useful and not what the standard setters think should be useful to users. The author outlines that the FASB and IASB conceptual frameworks are not coherent, which makes it difficult to derive standards from them and to make them compatible. One of the difficulties of the convergence project is the integration of 43 different technical codes.

The IASB and FASB established a Joint International Working Group on Performance Reporting in 2004. The aim of this group is to develop a statement of comprehensive income that would replace the current income

statement. In their article, van Cauwenberge and Beelde (2007), focus on the perspective of the IASB rather than the FASB. They point out that the IASB's accounting model incorporates two income concepts, historical cost accounting and fair value accounting. Therefore, the authors raise the question whether this should be reflected in the reporting of comprehensive income. In their discussion Van Cauwenberge and Beelde (2007) determine that both income concepts should be reflected in the new statement of comprehensive income.

Another aim of the Joint International Working Group of Performance Reporting is to categorise all items of income on the statement of comprehensive income in a way that is useful to investors. Financial institutions are not yet considered in the development of this new performance statement, as their reporting requirements are different. Van Cauwenberge and Beelde (2007) further highlight that in general the IASB supports clean surplus accounting, but that some standards have made exceptions to this concept. This typically arises from fair value remeasurements, which often bypass the income statement and are displayed in the statement of changes in equity. A single comprehensive income statement is already allowed by IAS 1, *Presentation of Financial Statements*, but it is not yet required. One of the categorisations that are currently being discussed for the future statement of comprehensive income is to categorise income based on historical cost income and fair value remeasurements. In this scenario the aim of net income would be to predict future income, and the aim of comprehensive income would be to alert investors to all other possible sources of income, although they might be unpredictable. This is one of the main trade offs between net income and comprehensive income, predictive ability and telling the facts (Van Cauwenberge and Beelde, 2007). Overall, the authors argue in favour of the display of both income figures.

Barker (2004) joins the debate about comprehensive income display by suggesting a matrix format statement of comprehensive income, disaggregating remeasurements and other items of revenue and expense.

The author discusses three concepts of earnings: operating, recurring and management control. He concludes that there is no earnings concept that satisfactorily describes all earnings to be included on a financial performance statement, as they all depend on the industry and on the environment of an organisation. Therefore, he suggests remeasurements as an alternative concept. In the authors opinion this approach would avoid the requirement of defining earnings. Barker (2004) explains remeasurements as the adjustment to the carrying amount of an asset or of a liability. The matrix format suggested by Barker (2004) consists of three columns, the first column lists all items of income and expense, while the second column lists the remeasurements and the third column lists all other items of income and expense. This would separate the different valuation methods on the performance statement. Further, the author suggests that this display of remeasurements could reduce attempted earnings management and create more transparency.

The CFA (formerly know as the AIMR) published another paper in 2007, suggesting revised financial statements. They point out that the current business reporting model needs to be changed in order to fully convey the operations of modern organisations. It is important for investors to understand the economic activities of an organisation and to understand how the numbers in the financial statements have been determined. The CFA (2007) criticises the different valuation measurements currently used in the balance sheet, e.g. historical cost, amortised cost, fair value, and manager's estimates of values. Further, they criticise that changes in balance sheet amounts are not always recognised on the income statement, but in other comprehensive income. They point out that transparency and accessibility of information is just as important to investors as relevance and reliability of this information. In the CFA's (2007) opinion, transactions in all financial statements should be divided into business (operating and investing) and financing activities. Third party financing would be displayed in the financing section and could therefore be distinguished from financing activities that are part of operations. Instead of a statement of comprehensive income, the CFA (2007) suggests a statement of changes in

net assets available to common shareholders. This statement would display all changes to net assets, irrespective of whether they are considered to be performance indicators. The new revised set of financial statements would not incur any extra costs to financial statement preparers as they only display information already available in a different format. However, they might create savings for investors in terms of time and money spent to find and analyse the necessary information.

McClain and McLelland (2008) provide an outline of some of the progress as well as of the tentative conclusions, reached in the IASB/FASB convergence project. The joint project group was created in April 2004. Its aim is to create universal requirements for financial statement presentation. A revised version of IAS 1, *Presentation of Financial Statements*, was published by the IASB in September 2007. This aligned IAS 1 with SFAS 130, *Reporting Comprehensive Income*. The tentative conclusions issued by the FASB outline the statements to be included in a complete set of financial statements; these are a statement of financial position, a statement of comprehensive income, a statement of changes in equity, and a statement of cash flows. Each of these financial statements should have two years of comparative data and be shown with equal prominence. Overall, these new proposed financial statements appear to change the focus from net income to comprehensive income.

In 2006 the European Accounting Association Financial Reporting Standards Committee (EAA FRSC) published a paper in response to the exposure draft of proposed amendments to IAS 1. Its objective was to bring some relevant research to the standard setter's attention. The main purpose of the amendments to IAS 1 was to bring it in line with SFAS 130, and the introduction of a statement of recognised income and expense to replace the current income statement. In their review they included research from all over the world. They identified two main streams of research in regards to performance reporting: (1) experimental research discussing financial statement presentation and (2) market based research that relates a variety of

income measures to stock prices. These research streams seem to exhibit opposing results.

2.3 Experimental Research

The EAA FRSC (2006) found support for a single statement of total recognised income and expense when reviewing previous literature. However, they also point out some of the reasons against a single statement approach. For example, they find that net income is on average more relevant, which might be in favour of the two statement approach. Further, they suggest that not including comprehensive income in a performance statement might protect the company from distributing unrealised gains and losses to equity holders. Moreover, some IASB board members are concerned that there might be too much focus on the bottom line of a single statement of financial performance.

Smith and Reither (1996) point out that it is sometimes difficult for financial statement users, to extract information regarding comprehensive income from the financial statements. They attribute this to the diversity of practices of displaying comprehensive income, e.g. in the statement of changes in equity or the notes to the financial statements. According to the authors, reporting requirements for comprehensive income could enhance the consistency of information among companies and result in more efficient use of financial statement information. One option of reporting comprehensive income is an expanded income statement, see Beresford, Johnson and Reither (1996). However, the authors also warn that reducing net income to a subtotal could be seen as disadvantageous by some users.

SFAS 130 was issued in 1997. Wilson and Waters (1998) discuss the various options of displaying comprehensive income according to this standard. SFAS 130 requires comprehensive income and its components to be displayed in a statement that has the same prominence as other financial statements. It can either be displayed in the income statement below net

income, in a separate statement of comprehensive income that begins with net income, or in the statement of changes in equity. When the FASB published this standard they made clear that the benefits of the information displayed as a requirement of this standard should outweigh the cost of obtaining the information. Wilson and Waters (1998) criticise the many different options of displaying comprehensive income under this standard, as it only requires it to be displayed in a prominent format. They consider that having presentation options could negatively affect comparability between companies. Further, they highlight that the need to report comprehensive income has increased after the FASB decided that the change in value of financial instruments should be displayed as part of other comprehensive income. Reporting of comprehensive income in the statement of changes in equity requires companies to provide more information than previously. Wilson and Waters (1998) believe that reporting comprehensive income in a separate statement of financial performance would have a higher impact on user's analysis.

Hirst and Hopkins (1998) shared this concern in regards to information usefulness. Therefore, they investigate the issue in an experiment and back it up with previous research in psychology. They point out that according to previous research in psychology, information is not used unless it is processable and available. Hirst and Hopkins (1998) test whether buy side financial analysts detect earnings management in a hypothetical manufacturing firm when comprehensive income is displayed in the income statement, or in the statement of changes in equity. The authors claim if analysts can correctly identify whether a company engages in earnings management, they can then value the stock prices of the company more correctly. Hirst and Hopkins (1998) find evidence for their claim, in that more analysts detected earnings management when comprehensive income was displayed in the income statement compared to the statement of changes in equity. These findings suggest that if comprehensive income is clearly displayed in a statement of financial performance it is more likely to be used.

Maines and McDaniel (2000) partially replicate the study by Hirst and Hopkins (1998). However they use non professional investors, and a hypothetical investment firm rather than a manufacturing firm. In their experiment they attempt to assess how the presentation format of comprehensive income affects non professional investors, especially the processing of information on the volatility of available-for-sale marketable securities. The research design includes the income statement, as per SFAS 130¹, the statement of changes in equity as per SFAS 130², and the statement of changes in equity as per SFAS 115³ (pre SFAS 130). In addition to the types of presentation format, each experimental instrument has either high volatility or low volatility. Ninety five evening MBA students participated in this experiment. The results show the acquisition and evaluation of the unrealised gains information and volatility does not differ across all three presentation formats. However, the volatility of available for sale marketable securities only influences the investor's judgement if it is displayed in the income statement. In this display the investors place a higher weighting on this piece of information. This finding affirms the concern of financial services companies that reporting unrealised gains and losses in the income statement could influence non professional investor's reactions to its volatility. According to Maines and McDaniel (2000), many companies emphasise that reporting unrealised gains and losses is not relevant to evaluating corporate performance. This experiment shows that non professional investors are influenced in their performance judgements when volatile comprehensive income information is displayed in the income statement. Maines and McDaniel (2000) conclude that SFAS 130 will affect the performance judgement of non professional investors only if the information of comprehensive income is displayed in the income statement and not on the statement of changes in equity, both are currently allowed.

¹comprehensive income is displayed in the income statement

²comprehensive income is displayed in the statement of changes in equity

³comprehensive income is not required to be displayed prominently

Jordan and Clark (2002) investigate which reporting format allowed under SFAS 130, companies choose to use. Their sample consists only of financial services firms, as these companies are more likely to have items of comprehensive income, due to their significant use of available for sale securities. Further, the financial information for this study was collected from the 1998 financial statements. These were the first financial statements to which SFAS 130 applied. The authors attempted to investigate whether the size of comprehensive income or the size of the organisation affects where a company displays comprehensive income. They find that companies with a large dollar value for other comprehensive income tended to display it in a performance statement, whereas firms with a low or negative dollar value for changes in equity. Overall, the majority (63%) of sampled companies elected to display comprehensive income in the statement of changes in equity (Jordan and Clark, 2002). Jordan and Clark (2002) provide evidence that companies choose to display favourable information in a performance statement and unfavourable information in the statement of changes in equity. This could be due to the belief that the display of other comprehensive income in the statement of comprehensive income does not relate to firm performance. Company size does not seem to affect where companies choose to display other comprehensive income.

Owusu-Ansah and Yeoh (2006) investigate the relative value relevance of the display of unrealised gains and losses on investment properties in the income statement versus the statement of changes in equity in New Zealand. The authors are worried that a variety of allowed accounting treatments for similar situations might affect the comparability between companies as well as the usefulness of this information. The motivation for this study is the current IASB financial reporting project suggesting a single statement of comprehensive income. They examine whether investors value companies differently based on where they display unrealised gains and losses on investment properties in the financial statements. Overall, the results indicate that the unrealised gains and losses on investment properties in

New Zealand are value relevant, but investor's valuation judgements are not affected based on where it is displayed in the financial statements.

Owusu-Ansah and Yeoh (2006) point out that unrealised gains and losses should not be included in net income as it is uncertain whether they will ever be realised and there can be a certain degree of error involved in the revaluation process of these properties. This could further influence the volatility of earnings, and lead to the mistaken assumption that these earnings are available for distribution to owners. Further, the authors point out that the word realised in accounting terms has different meaning in different jurisdictions. For example, in Europe and Asia it means that it is available for distribution to owners, whereas in NZ it just refers to capital maintenance. The Companies Amendment Act 1993 in New Zealand requires the solvency test to be satisfied at all times, which means that companies can only distribute their earnings to equity holders if the solvency test is satisfied. This implies that there is no difference for New Zealand companies whether unrealised gains or losses are included in net income or in equity. However, this might not be the case for other countries.

Overall, Owusu-Ansah and Yeoh (2006) are in favour of having the same regulations for all companies without the availability of choices. However, they prefer unrealised gains and losses to be recognised in equity rather than in net income. Contrary to the IASB they recommend the display of unrealised gains and losses on property revaluations in the statement of changes in equity.

Hunton, Libby and Mazza (2006) investigate how earnings management relates to the reporting of comprehensive income. The authors suggest that the display of comprehensive income in a statement of comprehensive income is the most prominent and transparent way of displaying comprehensive income. They find that the display of comprehensive income in a statement of comprehensive income reduces income increasing and income decreasing earnings management. Their subjects indicate that it is more obvious to readers and would therefore have a negative effect on stock

prices and management's reputation. The display of comprehensive income in the statement of changes in equity is less obvious. The authors use real life financial managers and CEOs as test subjects in their experiment and provide them with the opportunity to manage earnings via the sale of available for sale securities of a non financial company. Overall, the authors favour a single statement of comprehensive income. Although, it does not eliminate earnings management attempts it decreases the incentive for earnings management as it provides more transparency for financial statement users.

Beale and Davey (2001) surveyed members of the Institute of Chartered Accountants of New Zealand to find out about their views regarding a single statement of financial performance. They conducted a postal survey and achieved a response rate of 17.2%. They find strong support for a single statement of financial performance, to replace the current two statement approach, among the members of the Institute. This survey also finds that the preferred display is net income as currently reported on the income statement followed by other comprehensive income.

Tarca, Hancock, Woodliff, Brown, Bradbury and van Zijl (2008) test the matrix format in an experiment to determine the potential benefits of this income statement format. Their test subjects are a variety of sophisticated and non sophisticated financial statement users from various countries, to ensure generalisability of their findings. The subjects are asked to extract information from either a matrix format income statement, or an income statement as currently required by IAS 1. The authors find increased accuracy for items other than net income, for subjects extracting information from the matrix format income statement. Further Tarca et al. (2008) find that unfamiliarity with the matrix format does not impact on the time taken, confidence in results or degree of difficulty in finding information. Overall, the authors appear to favour the matrix format income statement, as it provides more transparent information, improves the accuracy of the information extracted and does not impact on the time taken or the degree of difficulty of extracting information.

McClain and McLelland (2008) describe a further suggestion for financial statement display that has been developed during the FASB/IASB convergence project. This option requires companies to publish four financial statements, a statement of comprehensive income, a balance sheet, a cash flow statement, as well as a reconciliation statement, reconciling the statement of comprehensive income with the cash flow statement. Further, it is suggested that items on all of these statements are divided into the following three categories: operating, investing and financing, as it is currently the case on the cash flow statement, in order to facilitate understandability and comparability between the statements.

2.4 Valuation Studies

The traditional income statement only displays information on gains and losses that have been realised. Whereas, comprehensive income is based on the concept that all gains and losses are included even if they are unrealised (Cahan, Courtenay and Gronewoller, 2000). O'Hanlon (2000) points out that in order to determine usefulness of comprehensive income many researchers have recently rediscovered and used the regression model developed by Ohlson (1995). This model is used by researchers to relate earnings figures to stock prices/returns in order to determine the usefulness of these earnings to financial statement users. This method is used in the majority of the valuation studies on comprehensive income.

Cheng, Cheung and Gopalakrishnan (1993) investigate which income figure (operating income, net income, or comprehensive income) best predicts future stock returns in the US. The results show that operating income slightly dominates net income in predicting future stock returns. However, both operating income and net income dominate comprehensive income. Therefore, the authors conclude that investors appear to value operating items more than non operating items. However, the data used in this study was collected for the period from 1972 to 1989. Therefore, it could be

argued that operating income and net income are more relevant as it has been consistently reported during this period, whereas, comprehensive income is only a recent requirement.

Dhaliwal, Subramanyam, Trezevant (1999) investigate whether comprehensive income better predicts market value than net income in the US. Further they examine which component of other comprehensive income improves the capacity of income to summarise firm performance. Their results indicate that only for financial firms comprehensive income better predicts firm performance than net income. Moreover, they find that the only component of other comprehensive income that improves the capacity of income to summarise firm performance is the marketable securities adjustment. Therefore, the authors conclude that apart from marketable securities adjustments, the other components of other comprehensive income only add noise.

O'Hanlon and Pope (1999) base their study on the dirty surplus accounting regulations in the UK. In 1992 the United Kingdom Accounting Standards Board introduced with FRS 3, *Reporting Financial Performance*, a 'statement of total recognised gains and losses' as a supplement to the income statement. It has been argued in the UK that dirty surplus accounting might result in value relevant items being reported within 'dirty surplus flows' rather than within earnings. The authors examine UK stock returns and accounting flows from 1972 to 1992. They try to find evidence that value relevant accounting flows were excluded from 'ordinary profit' in the UK during this period. As a measure of value relevance the authors use the statistical association between stock returns and accounting flows as revealed by regression analysis. The authors categorise dirty surplus flows into goodwill write-offs, revaluation adjustments, foreign exchange translation differences and extraordinary items. The results indicate that ordinary profit, as reported under UK GAAP before the introduction of the standard, is value relevant. There is little evidence that items excluded from ordinary profit during this time period explain stock returns. Extraordinary items have some effect only if very long intervals are applied. These

findings lead the authors to the conclusion that accounting flows excluded from ordinary profit are not related to stock returns.

Brimble and Hodgson (2004) test whether comprehensive income is value relevant in Australia or whether it just adds noise to the net income figure. Moreover, the authors test whether the inclusion of extraordinary items or fair value adjustments add to the value relevance of net income. The inclusion of comprehensive income on the performance statement as suggested by the IASB has, according to the authors, a number of implications. They claim that this is a move to focus on the value of assets and liabilities rather than the completion of the earnings process. Further, they point out that the IASB recommends abolishing extraordinary items and including them in net income. However, the findings of this study indicate that net income is more value relevant than comprehensive income. They do not find that extraordinary items or fair value adjustments add to the value relevance of net income. Therefore, the authors conclude that the recommendation by the IASB to include comprehensive income on a performance statement only adds noise instead of value relevant information.

Cahan et al. (2000) investigate whether the items of other comprehensive income are incrementally value relevant, or whether it would be sufficient to display an aggregate figure of comprehensive income. They are using a sample of companies listed on the New Zealand stock exchange for their research. The comprehensive income figure they use consists of net income, fixed asset revaluations and foreign currency translation adjustments. The authors do find evidence that comprehensive income is more value relevant than net income. However, they do not find any support for fixed asset revaluations or foreign currency translation adjustments to be disclosed separately. These items do not add any additional useful information. In summary, they find that investors value the comprehensive income figure above the net income figure, but do not require a breakdown of other comprehensive income. However, the authors did not exclude financial companies from their sample which might have influenced these results.

Cahan et al. (2000) do not discuss the display of comprehensive income in a performance statement, but rather focus on whether a breakdown of comprehensive income should be displayed in the statement of changes in equity.

Wang, Buijink and Eken (2006) provide evidence regarding the value relevance of comprehensive income versus net income for non financial firms in the Netherlands. Their results indicate that both comprehensive income and net income are value relevant in regards to stock returns. However, net income appears to be a more relevant measure of returns than comprehensive income. Additionally, their results imply that asset revaluations and currency translation differences are the only items of other comprehensive income that have some explanatory power in regards to stock returns.

This literature review does not include studies examining the value relevance of individual components of other comprehensive income such as asset revaluations (e.g. Aboody, Barth and Kasznik, 1999) or foreign currency translations (e.g. Pinto, 2005).

2.4.1 Cross Country Analysis

Plenborg (1998) partially replicates Alford, Jones, Leftwich and Zmijewski (1993), who compare the information content of earnings from several countries including the US and Denmark. However, the information from each country used was limited. Alford et al. (1993) concluded that US earnings are more informative than Danish earnings. Plenborg (1998) on the other hand does an in depth study, with a larger sample, comparing the information content of US and Danish earnings figures. The author compares the value relevance of operating income, net income and comprehensive income. The results indicate that in many cases Danish earnings are more informative than US earnings. The author attributes this to Danish accounting regulation, which is more flexible than US accounting regulation and allows more items to bypass the income statement. Further, the results indicate that the items making up the difference between

operating income and net income in the US have a high degree of measurement error compared to the items making up the difference between operating income and net income in Denmark. Some items bypassing the income statement in Denmark but not in the US seem to be items with a high degree of measurement error. The author concludes in favour of a more flexible accounting system like the one found in Denmark, which allows more items to bypass the income statement. However, Plenborg (1998) does not investigate the items that bypass the income statement in Denmark and not in the US.

Isidro, O'Hanlon and Young (2004) investigate the existence of cross country variation in items contained in comprehensive income. In their sample they use companies from France, Germany, the UK and the US. The authors point out that the items contained in comprehensive income and the practices in regards to reporting comprehensive income vary across different jurisdictions. The results indicate that on average total comprehensive income is negative across all four jurisdictions during the sampling period. Further, the authors find that in the UK, France and Germany the most significant contributor to comprehensive income is goodwill. Overall, the results indicate that the significance in the amounts and items of comprehensive income does vary across the jurisdictions tested. However, the authors cannot find any evidence that other comprehensive income is value relevant in relation to stock prices. They could not determine any valuation errors due to the omission of any items of other comprehensive income from income. The authors include financial companies in their sample which might explain why the items of comprehensive income are not centred at zero. Further, they admit that they only investigated a nine year period and if they had chosen a different period the results might have been different.

Lin et al. (2007) investigate the value relevance of operating income, net income, and comprehensive income in five European countries. Specifically, they investigate whether comprehensive income and its components is value relevant, whether aggregate comprehensive income

provides incremental information beyond the other two income figures, and whether comprehensive income is more value relevant when it is clearly disclosed on the financial statements. The sample includes companies from Germany, France, Italy, Spain and the UK. The authors exclude financial companies from their sample due to their different regulatory and reporting structure. Overall, they find that all three income figures, operating income, net income and comprehensive income, are related to stock returns. The results show that the income figure that UK investors value most is operating income, whereas the income figures that continental European investors value most are net income and comprehensive income. Additionally, the results show that aggregate comprehensive income does provide incremental information beyond the other two income figures. The sample period for this study was 1992-2004. From 2005 onwards European companies were required to adopt International Accounting Standards. However, some companies in Germany opted to adopt IAS early. The results for these companies indicate that comprehensive income is more value relevant if it is clearly displayed in the financial statements (Lin et al., 2007). One of the main conclusions of this study is that the evidence from prior studies in the UK and the US, cannot be generalised to continental European countries.

2.4.2. Decision Usefulness

The following studies attempt to discuss the term usefulness from a different perspective. They point out that different earnings figures might be useful for different situations, and that there might be a difference to the understanding of usefulness between financial statement users and standard setters.

Biddle and Choi (2002) investigate whether different definitions of income are decision relevant for different situations. They find that comprehensive income as defined in SFAS 130 dominates net income and total comprehensive income in regards to explaining equity returns. Further, they discover that the components of SFAS 130 comprehensive income are incrementally value relevant and should therefore be disclosed separately

rather than having one aggregate figure for other comprehensive income. However, they also find that net income is best suited to explain executive compensation and that none of the components of other comprehensive income is incrementally value relevant for this purpose. This is one of the only studies from the US finding that comprehensive income is more value relevant for predicting stock prices than net income. However, the reason for this might be that this study distinguishes between total comprehensive income and SFAS 130 comprehensive income. Further, the authors do not seem to take into consideration that executive compensation might be based on net income. Schipper and Vincent (2003) also point out that earnings figures are often used for compensation agreements. Therefore, overstated earnings could lead to overcompensation of managers. This could be an argument in favour of using net income for this purpose as it only includes realised gains and losses.

Schipper and Vincent (2003) explain that the FASB has recently moved from a stewardship function focus to a focus on developing standards that are decision useful to financial statement users. According to the authors, one reason for this shift is the requirement for increased functionality. Additionally, they consider decision usefulness can be empirically observed by determining the value relevance of accounting items. However, Schipper and Vincent (2003) warn that this approach cannot consider relevance and reliability separately and therefore cannot provide information in regards to earnings quality, if there is a trade off between relevance and reliability. This could be quite important as one of the main trade offs in the debate between displaying net income and comprehensive income is supposedly that comprehensive income could make the earnings figure more volatile. However, not displaying comprehensive income might leave out relevant information.

Hüfner and Möller (2002) compare DVFA/SG earnings to reported earnings to find out which measure is more value relevant in regards to stock valuations. DVFA/SG earnings are a figure calculated by German analysts to ensure comparability between companies and over time. Further, analysts

claim that this figure is better suited for valuations. However, when analysts calculate this figure they exclude a number of items, for example non recurring items. German GAAP earnings have a comprehensive approach, as the only items that are allowed to bypass the income statement are foreign currency translations and goodwill from consolidation. However, the results of this study indicate that DVFA/SG earnings are not stronger associated with stock returns.

Hung and Subramanyam (2007) investigate the financial statement effects of adopting IAS in Germany. They used a sample of 80 companies that adopted IAS between 1998 and 2002. All these companies adopted IAS voluntarily, as it only became compulsory for countries in the European Union to adopt IAS in 2005. The authors compared the last set of financial statements prepared under German GAAP (HGB) with the restated data in the first set of financial statements prepared under IAS. Hung and Subramanyam (2007) point out that HGB is stakeholder oriented and tax driven, whereas IAS focuses on shareholders. Income streams under HGB are therefore generally smoother and less volatile, due to more flexibility in regards to measuring assets and recognising liabilities. The results indicate that net income, total assets and equity are larger under IAS than under HGB. Additionally, the results indicate that IAS income is quite transitory while HGB income is more persistent. However, the findings also indicate that IAS captures economic events with more timeliness than HGB. Further, the authors find that companies adopting IAS early, are larger and more likely to be listed on the United States stock exchange. Moreover, these companies have a greater need to raise capital compared to the average German firm. Hung and Subramanyam do not find any evidence that the value relevance of equity changes under IAS.

Dehning and Ratliff (2004) investigate the usefulness of the disclosures required by SFAS 130. The data examined in this study stems from periods directly before and after the introduction of this reporting standard. They find no evidence of a change in the market's valuation of comprehensive income adjustments. This is consistent with the efficient market hypothesis

as no change in valuation occurs due to a change in how the information is displayed. Although, the authors do take into consideration that there might be a learning curve and the market cannot yet take full advantage of the new information that is disclosed. However, they conclude that this is more likely due to the fact that the information has always been available and therefore there will be no change.

2.5 Discussion

In summary, the literature reviewed so far is either experimental or investigating the value relevance of comprehensive income. Experimental research relates to the display of comprehensive income in the financial statements and how users find and interpret the information displayed. One of the main differences between these two streams of research is that value relevant research assumes market efficiency and that users know how to find and interpret the data displayed.

Generally, most of the experimental research reviewed appears to be in favour of the display of comprehensive income in a single statement of comprehensive income. With only a few exceptions that prefer a single statement approach but prefer this statement to be the statement of changes in equity. Overall, the benefits of more transparency and reduced opportunities for earnings management appear to be strong arguments in favour of a single performance statement.

The results of the value relevance research are difficult to interpret, due to the issues relating to generalisability which are inherent in this type of research for comprehensive income. However, the majority of the results indicate that total comprehensive income is not more value relevant than net income. The findings in regards to the components of other comprehensive income vary, but the main reason for this is the different regulations across jurisdictions as well as the inclusion/exclusion of financial companies.

Further, most of these studies only take one use (value relevance) and one user (equity investor) into consideration.

One of the main shortcomings of the previous research reviewed is generalisability. There are a number of reasons for this, e.g. the type of companies included, as well as the time frame and the jurisdiction chosen for the research, the learning curve effect, and decision usefulness.

Much of the previous research does not distinguish between financial and non financial companies, although it is well known that financial companies have different reporting requirements. Further, they are more likely to contain financial instruments in their balance sheet and therefore more items of other comprehensive income.

The items included and practices in regards to comprehensive income vary across jurisdictions depending on the development of the various accounting standards. For example, some jurisdictions require asset revaluations to be included in net income and others allow it to be included in an asset revaluation reserve. Further, some jurisdictions require downward asset revaluations to be included in net income, but allow upward asset revaluations to be included in the asset revaluation reserve.

If the period of time is not sufficiently long, not all economic conditions might be reflected. As pointed out by Aboody et al. (1999), in positive economic climates, assets are more often valued upwards and in negative economic climates assets are more often valued downwards.

Additionally, results may vary due to the period of time in which the sample was collected. If the sample was collected in the 1970s or the 1980s it might not be influenced by the use of financial instruments, as their use has mainly increased during the last two decades.

Further, previous research does not take into consideration that there might be a learning curve effect in regards to comprehensive income. Financial

statement users are used to considering net income rather than comprehensive income. However, this might change once comprehensive income is displayed more prominently.

One of the main criteria of information contained in the financial statements is decision usefulness. However, different definitions of income might be decision relevant for different situations. Moreover, the data users perceive as useful might differ from what standard setters perceive as useful. Additionally, some items of other comprehensive income appear to be decision relevant for some firms but not for others.

2.6 Materiality and Volatility

Some of the items not discussed in the previous literature are going to be discussed in this research. This includes the materiality of other comprehensive income. Further, a dominant worry throughout the previous research is the volatility of comprehensive income. Therefore, this thesis is going to empirically investigate whether comprehensive income is more volatile than net income. The following studies have attempted to solve some of these issues.

2.6.1 Materiality

Kreuze and Newell (1999) investigate the materiality of comprehensive income and its components in relation to net income. Their sample consists of 100 Fortune 500 companies and includes data from the 1995 and 1996 financial statements. The results indicate that most firms report comprehensive income that is different to net income. However, they also find that the difference between these two figures is not material for the majority of firms, although for some firms it can be very significant. For all companies together comprehensive income appears to be only slightly different to net income. The authors also point out the concern that companies that do have a large amount of other comprehensive income items in their financial statements, might want to manage these earnings in

order to reduce volatility of reported comprehensive income. However, Kreuze and Newell (1999) do not distinguish between financial and non financial firms.

Jordan and Clark (2002) also investigate the materiality of other comprehensive income in relation to net income. Their sample consists of 100 financial services firms and investigates the financial statements for 1998. They find that comprehensive income is material for financial firms. Similar to Kreuze and Newell (1999) the authors use net income as a base amount to determine materiality of other comprehensive income. Jordan and Clark (2002) however, support their method with the findings of Holstrum and Messier (1982).

Holstrum and Messier (1982) review and summarise the existing literature on materiality. The authors define the concept of materiality in regards to its use in accounting and auditing. Further, they divide the main parties affected by the concept of materiality into financial statement preparers, auditors, and financial statement users. They attempt to find out which base should be used to determine materiality and what percentage makes an item material. Holstrum and Messier (1982) find that the most important factor in determining materiality is its effect on income. Overall, Holstrum and Messier (1982) find for public industrial companies, whose primary financial statement users are equity investors, that income from continuing operations is the most significant factor in determining materiality. Further, the authors find for this type of entity that items within 5% of income can be considered as immaterial, whereas items larger than 10% of income can be considered as material.

SSAP 6, *Materiality in Financial Statements*, recommends for profit and loss items to use total profit or loss as a measurement base for materiality, and for balance sheet items to use the appropriate balance sheet class total as a measurement base for materiality. Further, SSAP 6 points out that generally items greater than 10% of the base amount can be considered as

material and items smaller than 5% of the base amount can be considered as immaterial.

When planning the research design the variables to be analysed need to be taken into consideration when choosing a base variable to measure variability. Jordan and Clark (2002) used the base of net income as they only attempt to find out whether other comprehensive income can be considered material. Kreuze and Newell (1999) are comparing the materiality of the various components of comprehensive income, but do not take into consideration that net income is also a component of comprehensive income. Therefore, the better choice would have been to use comprehensive income as a base amount to relate the components of comprehensive income to. After all, comprehensive income is also an income figure. However, both studies, Kreuze and Newell (1999) and Jordan and Clark (2002), use the percentages suggested by Holstrum and Messier (1982) and SSAP 6 in order to decide whether an item can be considered material or not.

2.6.2 Volatility

One study investigating earnings volatility is by Barth, Landsman and Wahlen (1995). Their study focuses on US banks from 1971-1990. One of its aims is to establish whether fair value earnings are more volatile than historical cost earnings. They find that fair value earnings are significantly more volatile than historical cost earnings. Further, they test whether this increased volatility is reflected in share prices by using regression analysis. However, they do not find that investors prefer the more volatile fair value earnings figure as a risk proxy. The variable used by Barth, Landsman and Wahlen (1995) to determine earnings volatility is the standard deviation. They test whether the standard deviation of historical cost earnings differs to the standard deviation of fair value earnings. Moreover, the authors point out that although the mean value of unrealised gains and losses over the sample period is close to zero, unrealised gains and losses can have a large effect on earnings in any given year.

Hodder, Hopkins and Wahlen (2006) compare the volatility of net income, comprehensive income and full fair value income. Their sample consists of 202 US commercial banks from 1996 to 2004. In their research, the authors use the standard deviation of the various income figures as a measure of volatility. They test the equality of the various standard deviations. Hodder et al. (2006) find that full fair value income is significantly more volatile than comprehensive income, and that comprehensive income is significantly more volatile than net income.

2.6.3 Research Design

This study describes and analyses the components of comprehensive income, and tests whether comprehensive income is more volatile than net income.

In order to achieve this, the study by Kreuze and Newell (1999) is partially replicated in regard to investigating materiality. However, this study uses comprehensive income and closing equity as a measurement base to determine materiality.

Both studies, Barth et al. (1995) and Hodder et al. (2006) investigate the volatility of various income figures for commercial banks using the standard deviation as a measure of variability. This study partially replicates their methods applying them to publicly listed non financial companies in New Zealand, using the standard deviation as a measure of volatility. Financial firms are excluded from this study as they have been previously investigated.

Further, it might be interesting to investigate the volatility of comprehensive income for non financial companies because of the different uses of performance indicators. Volatility could be important for non valuation purposes, e.g. debt contracting, compensations agreements, or standard setting. However, mainly valuation purposes have been discussed in the previous literature.

2.7 Summary

This chapter discussed the previous literature regarding comprehensive income. A background to comprehensive income was provided and the two main streams of research, experimental research and valuation studies, were introduced. The shortcomings of the previous literature were examined. Some research regarding materiality and volatility was discussed and the research design for this study has been outlined. The next chapter will explain the methodology used for this research.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter is divided into four sections. First, the four research questions are outlined. Then, the sample selection and data collection processes are described. The last section explains the data analysis performed in regards to the descriptive statistics, materiality and volatility.

3.2 Research Questions

The research questions in this thesis relate to the materiality of the components of comprehensive income as well as the volatility of comprehensive income compared to net income. The components of comprehensive income are described and analysed, and the following research questions are investigated.

First, the components of comprehensive income are compared to total comprehensive income and closing equity.

1. Are the components of comprehensive income material in relation to total comprehensive income?
2. Are the components of comprehensive income material in relation to closing equity?

Then, the aggregated components of comprehensive income are compared to closing equity.

3. Are the accumulated components of comprehensive income in equity material in relation to closing equity?

Finally, the volatility of comprehensive income compared to net income is examined.

4. Is comprehensive income more volatile than net income?

3.3 Sample Selection

The sample for this research includes all companies listed on the NZSX and the NZAX with 6 years of data available. The NZSX is the main share market in New Zealand. The NZAX is a listing of fast growing and developing companies. These two markets are chosen as a data source as the study is completed in New Zealand. Moreover, New Zealand has a statement of changes in equity, which requires the reporting of “total revenues and expenses”, or comprehensive income.

Finance and Insurance companies are excluded from the sample, as they differ from other companies. Banks and insurance companies are subject to different legislative regulation, e.g. Life Insurance Act 1908, Bank of NZ Act 1988. Finance companies, banks and insurance companies, and their particular capital requirements are subject to scrutiny by the Reserve Bank of New Zealand. Furthermore, they have their own reporting standards (e.g. *FRS-33 Disclosure of Information by Financial Institutions*; *FRS-34 Life Insurance Business*; *FRS-35 Financial Reporting of Insurance Activities*). Moreover, finance companies have a greater amount of financial instruments displayed at fair value on their balance sheet which could bias the results. Finally, comprehensive income of finance companies has been widely examined in prior research (e.g., Barth et al., 1995; Mozes, 2002; Jordan and Clark, 2002; Hodder et al., 2006)

All companies whose financial statements are not in NZ dollars are deleted from the sample. The reason for this is comparability among the data collected. All companies which chose to adopt International Financial

Reporting Standards (IFRS) before 2008 are excluded from the sample. The reason for this is to achieve a clean comparison between the old GAAP and the NZ IFRS sample. Early adopters might have a self selection bias. That is, they may adopt early because they have higher (or lower) other comprehensive income under IFRS.

After these exclusions, the sample consists of 37 companies in total, 29 of them are listed on the NZSX and 8 are listed on the NZAX.

The data is collected for the years 2003 to 2008. The financial statements for the years 2004, 2006 and 2008 are downloaded from the Internet, as they each display two years of information. There is a trade off between sample size and the number of years of financial information available online. However, there is a sufficient amount of companies listed that have six years of financial information available online, but it would be difficult to find a sample large enough that has more than six years of financial information available online. Less than six years of information, would allow a larger sample, but the time period would not be sufficiently long in order to find any trends in the data or measure volatility.

The change to NZ IFRS was compulsory for all NZ listed companies from the 1st January 2008. Companies computed their financial statements for 2007 twice, a NZ IFRS set and an old GAAP set. Hence, we have data for 2003-2007 prepared under old GAAP and 2007-2008 prepared under NZ IFRS.

3.4 Data Collection

The data is collected from the financial statements of each company, in particular from the statement of changes in equity, the balance sheet and the notes to the financial statements.

Net income, minority interest, and the items of other comprehensive income are added up to “total revenues and expenses” in the statement of changes in equity (see FRS-2, *Presentation of Financial Reporting*). “Total revenues and expenses” is the term used in New Zealand financial statements instead of comprehensive income. FRS-7, *Extraordinary Items and Fundamental Errors*, paragraph 5.1 requires all revenues and expenses to be recognised in net income “unless required by any financial reporting standard to be incorporated in the statement of movement in equity”. The following standards allow items to be taken directly to equity:

- Revaluation increments or decrements (FRS-3, *Accounting for Property, Plant and Equipment*, paragraph 7.14).
- Foreign currency differences on the translation of the financial statements of an independent foreign operation (FRS-21, *Accounting for the Effects of Changes in Foreign Currency Exchange Rates*, paragraph 6.5).
- Actuarial gains and losses on defined benefit plans (NZ IAS 19, *Employee Benefits*, paragraph 93A).
- Gains and losses on remeasuring available for sale financial assets (IAS 39, *Financial Instruments: Recognition and Measurement*, paragraph 55(b)).
- Gains and losses on cash flow hedges (IAS 39, *Financial Instruments: Recognition and Measurement* paragraph 95 (a))

Therefore, the items of other comprehensive income include: asset revaluations, foreign currency, cash flow hedges, and employee benefits. Cash flow hedges include available for sale securities. Employee Benefits include share based payments. However, these amounts are very small and it is therefore not worthwhile listing them separately.

The data collected from the balance sheet includes closing equity as well as the closing value of the equity accounts, if this information is disclosed in the balance sheet. Some companies only display total equity in the balance sheet and the breakdown of what is included can be found in the notes to the

financial statement. Data is collected for the following equity accounts: contributed equity, minority interest, retained earnings as well as the reserve accounts. The reserves in this sample include: asset revaluations, foreign currency, cash flow hedges, and employee benefits.

3.5 Data Analysis

3.5.1 Descriptive Analysis

In order to describe and analyse the components of comprehensive income the mean, median, minimum, maximum, quartiles and standard deviations are determined.

To avoid the problem of negative denominators (i.e. total comprehensive income, closing equity) the components of comprehensive income are scaled by absolute value of total comprehensive income and absolute value of closing equity respectively. Furthermore, positive and negative comprehensive income is reported separately. The means and medians of most components of comprehensive income indicate that the data are not normally distributed. Therefore, non parametric statistical tests are used. The Mann-Whitney U test is used to determine whether there is a statistical difference between NZAX and NZSX companies, between large and small firms, and between old GAAP versus NZ IFRS.

3.5.2 Materiality

For each of the tables in the descriptive analysis, a materiality analysis is performed. This analysis reports the number of observations in which the component is within a percentage range of comprehensive income and closing equity respectively. Absolute values of comprehensive income and closing equity are used. Holstrum and Messier (1982) and SSAP 6 recommend using total earnings as the base amount to calculate materiality of income figures. SSAP 6 suggests using equity in order to determine materiality for relevant balance sheet amounts. Further, both Holstrum and Messier (1982) and SSAP 6, agree on the percentages used to determine

whether an item is material in regards to its base amount. These percentages are applied in this study. The percentage range brackets are divided as follows -20%+, -11% to -20%, -6% to -10%, -1% to -5%, 0, 1% to 5%, 6% to 10%, 11% to 20%, 20%+.

3.5.3 Volatility

In order to determine whether comprehensive income is more volatile than net income the standard deviation ratio will be used. This is the ratio between the standard deviation of comprehensive income and the standard deviation of net income. A standard deviation ratio greater than 1 indicates that comprehensive income is more volatile than net income. This analysis is completed for total comprehensive income, for comprehensive income less asset revaluations as well as for comprehensive income less asset revaluations and less cash flow hedges. The latter two comparisons are applied as a sensitivity analysis to determine whether any one component of comprehensive income is especially dominant.

For the sensitivity analysis asset revaluations that are disclosed in equity are deducted from comprehensive income. This is a very simple approach, as this does not take into consideration adjusted depreciation or deferred tax effects. Therefore, this approach could overstate the volatility of the adjusted comprehensive income figure, as both net income and comprehensive income are higher due to lower depreciation. This approach could prevent finding a statistical difference. However, it requires fewer estimates.

Further, the volatility analysis is performed for each of the 37 firms in the sample, whereas the materiality analysis is based on the 222 firm year observations.

For the volatility analysis, minority interest is included in net income. The reason for this is that this study intends to compare total income in the income statement to total comprehensive income. In New Zealand total income as stated in the income statement is made up of income attributable

to minority interest and total income attributable to shareholders of the company.

The Wilcoxon-signed rank test is applied to investigate the statistical difference between the groups. This test analyses the equality of matched pairs, in this case whether the standard deviation of net income is different to the standard deviation of comprehensive income. This test is applied to all 37 companies as well as to a sample of 19 small companies and 18 large companies, to see whether company size determines the volatility of comprehensive income compared to net income. Additionally, the companies are divided by sector: primary, energy, goods, property and services, based on the sectors they are allocated to on the NZX website.

3.6 Summary

In this chapter the research questions were outlined, and the processes of sample selection and data collection were explained. Further, the analysis of the descriptive statistics as well as materiality and volatility were described. The next chapter will illustrate the results of this analysis.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter illustrates the results of the analysis of the components of comprehensive income and the accumulated components of comprehensive income. Further, the results of the analysis of the difference in volatility between comprehensive income and net income are described.

4.2 Analysis of Components of Comprehensive Income

4.2.1 Are the Components of Comprehensive Income Material in Relation to Total Comprehensive Income?

This analysis is divided into four sections. First the components of comprehensive income will be analysed based on positive and negative total comprehensive income. Second, the components of comprehensive income will be analysed based on the market they are listed on and the size of the company. Third, the components of comprehensive income will be analysed based on the accounting regulation applied to them (e.g. old GAAP versus NZ IFRS). Finally, the components of comprehensive income will be analysed based on the sector they are listed under on the NZX. These sectors are: primary, energy, goods, property and services.

All tables in this section include the descriptive statistics for each component of comprehensive income. Further, all Tables use the absolute value of comprehensive income.

Tables 1 and 2 indicate that in most cases comprehensive income equals net income, as the components of other comprehensive income equal 0 for most firm year observations. Table 2 also indicates that when comprehensive income is negative, net income is negative as well.

Table 1

Relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2003 to 2008 when comprehensive income is positive

	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Descriptive Statistics¹							
Mean	0.889	0.006	0.111	0.121	-0.002	-0.013	-0.001
Minimum	0.086	-0.017	-0.987	-0.154	-0.225	-0.987	-0.163
25%	0.797	0.000	0.000	0.000	0.000	0.000	0.000
50%	1.000	0.000	0.000	0.000	0.000	0.000	0.000
75%	1.000	0.000	0.203	0.130	0.000	0.000	0.000
Maximum	1.987	0.404	0.914	0.899	0.404	0.212	0.026
Std Dev	0.270	0.039	0.270	0.236	0.061	0.107	0.013
N	171	171	171	171	171	171	171
Panel B: Materiality²							
-20%+	0	0	6	0	1	4	0
-11% to -20%	0	0	6	1	6	4	1
-6% to -10%	0	0	6	0	7	1	0
-1% to -5%	0	3	17	2	10	6	2
0%	0	152	57	114	131	145	164
1% to 5%	0	14	20	7	8	4	4
6% to 10%	1	0	3	2	2	1	0
11% to 20%	3	0	13	8	4	5	0
20%+	167	2	43	37	2	1	0

¹The descriptive statistic is the component scaled by absolute value of comprehensive income.

²Materiality reports the number of observations where the component is within a percentage range of comprehensive income.

Table 2
Relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2003 to 2008 when comprehensive income is negative

	Net profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Descriptive Statistics¹							
Mean	-0.894	-0.008	-0.106	-0.032	-0.063	-0.003	0.000
Minimum	-1.156	-0.144	-3.898	-1.337	-2.439	-0.298	0.000
25%	-1.000	0.000	-0.002	0.000	0.000	0.000	0.000
50%	-1.000	0.000	0.000	0.000	0.000	0.000	0.000
75%	-0.998	0.000	0.000	0.000	0.000	0.000	0.000
Maximum	2.898	0.088	0.156	0.156	0.141	0.124	0.000
Std Dev	0.562	0.034	0.562	0.194	0.354	0.046	0.000
N	51	51	51	51	51	51	51
Panel B: Materiality²							
-20%+	50	0	5	3	3	1	0
-11% to -20%	0	2	1	0	0	0	0
-6% to -10%	0	2	1	0	0	0	0
-1% to -5%	0	4	4	0	1	0	0
0%	0	42	33	46	44	49	51
1% to 5%	0	0	2	1	1	0	0
6% to 10%	0	1	2	0	1	0	0
11% to 20%	0	0	3	1	1	1	0
20%+	1	0	0	0	0	0	0

¹The descriptive statistic is the component scaled by absolute value of comprehensive income.

²Materiality reports the number of observations where the component is within a percentage range of comprehensive income.

Both Tables clearly indicate that net income is in general the largest component of comprehensive income. Table 1 shows only four firm year observations in which net income makes up less than 20% of comprehensive income. Further, Table 2 shows only one firm year observation where net income makes up less than 20% of comprehensive income.

In Table 1 the components of other comprehensive income mainly take on positive values. With the exception of foreign currency and cash flow hedges, these components take on more negative than positive values. Table 1 shows that the interquartile range for foreign currency, cash flow hedges and employee benefits is 0. This means that for most firm year observations these components of other comprehensive income are zero.

Table 2, the components of other comprehensive income have almost equal amounts of positive and negative values. With the exception of minority interest, this takes on mainly negative values. However, this is due to its relationship with net income. When net income is negative, minority interest is expected to be negative too and vice versa. There are no items of employee benefits for firm year observations with negative comprehensive income.

Further, the minimum and maximum values for other comprehensive income are quite large. The main reason for the large variations in other comprehensive income is asset revaluations. However, most values for asset revaluations are positive.

Panel B for Table 1 and Table 2 show a large amount of observations for each individual item of other comprehensive income that take on a zero value. Also, the small values for some observations of other comprehensive income are due to a similar amount of positive and negative items that are offset. Therefore, in the majority of cases the components of other comprehensive income are not material. However, for some firm year observations they are very material.

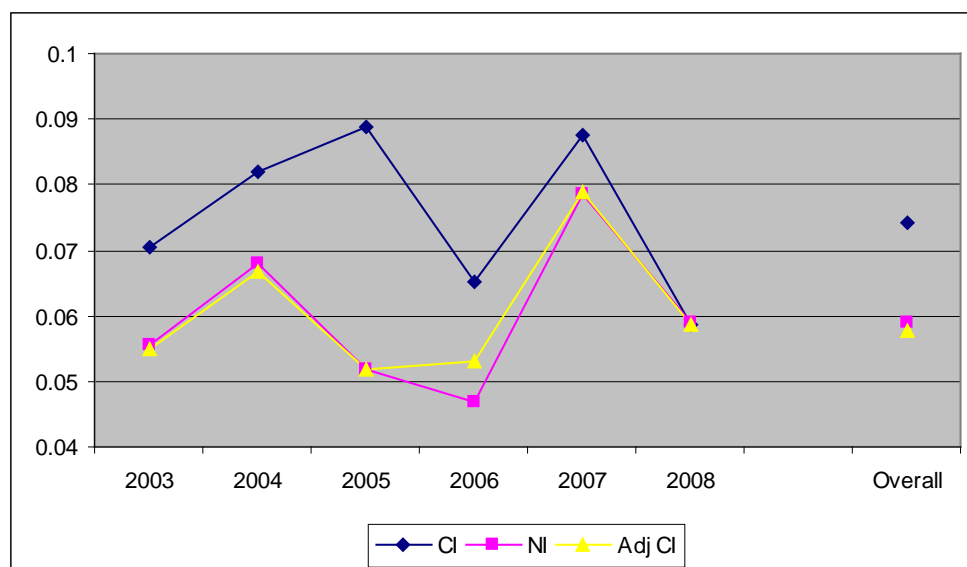
In Table 1, only a third (57/171) of other comprehensive income observations are zero, which indicates that most firm year observations include some items of other comprehensive income. Whereas 68/171 (40%) of firm year observations are greater than 10% and therefore presumed to be material, and 9/171 (5%) of firm year observations are in the 5%-10% bracket and therefore possibly material. There are 77/171 (45%) observations in total that are larger than 5% of comprehensive income, which indicates that in aggregate other comprehensive income is material.

Table 2 Panel B indicates that 33/51 (65%) of other comprehensive income observations are zero. This percentage is a lot larger than in Table 1. Further, only 12 observations are larger than 5% of comprehensive income, five observations are positive and seven observations are negative. Nine of these observations are material at the 10% level. Whereas, in Table 1 out of the 77 observation that are larger than 5% of comprehensive income only 18 observations are negative and 59 observations are positive. This shows that negative comprehensive income firms have less observations of other comprehensive income than positive comprehensive income firms across all categories.

Figure 1 depicts the median values for net income, comprehensive income and adjusted comprehensive income (less asset revaluations) by year. The results clearly show the effect of asset revaluations on comprehensive income. However, due to the use of median values, this figure does not depict the impact of individual other comprehensive income observations on some firms. All performance measures in Figure 1 are scaled by total assets to avoid the problem of negative denominators.

Table 3 compares the descriptive and materiality statistics for companies listed on the NZAX to companies listed on the NZSX. Table 3 Panel E indicates that there is no statistical difference between any of the components of comprehensive income for companies listed on the NZSX and companies listed on the NZAX.

Figure 1
Median alternative performance measures by year 2003-2008



CI: comprehensive income
 NI: net income
 Adj CI: comprehensive income less asset revaluations

Most companies listed on the NZAX appear to operate with negative net profit as well as negative total comprehensive income. There are no observations for cash flow hedges or employee benefits for companies listed on the NZAX. Based on the total asset values, companies listed on the NZAX are on average much smaller than companies listed on the NZSX. The only items of other comprehensive income that appear to be material for companies listed on the NZAX are asset revaluations and minority interest. Although, there are some negative net profit values for companies listed on the NZSX, on average net profit appears to be positive. Further, all items of other comprehensive income appear to be material for some firm year observations for companies listed on the NZSX.

Table 4 compares the descriptive and materiality statistics for small and large firm year observations. The firm year observations are classified as small or large, based on the median amount of total assets on the balance sheet. Panel E of Table 4 indicates a statistically significant difference for net income and minority interest between the two groups.

Table 3

Comparison of relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2003 to 2008 by listing

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: NZAX								
Mean	65616	-0.179	-0.004	0.054	0.057	0.001	0.000	0.000
Minimum	235	-1.156	-0.144	-0.330	-0.260	-0.019	0.000	0.000
25%	2502	-1.000	0.000	0.000	0.000	0.000	0.000	0.000
50%	16913	-0.918	0.000	0.000	0.000	0.000	0.000	0.000
75%	99467	0.959	0.000	0.031	0.000	0.000	0.000	0.000
Maximum	308072	1.006	0.088	0.736	0.736	0.030	0.000	0.000
Std Dev	97328	0.932	0.029	0.184	0.176	0.006	0.000	0.000
N	48	48	48	48	48	48	48	48
Panel B: Materiality								
-20%+		27	0	2	2	0	0	0
-11% to -20%		0	1	1	0	0	0	0
-6% to -10%		0	2	0	0	0	0	0
-1% to -5%		0	2	4	0	2	0	0
0%		0	40	26	35	43	48	48
1% to 5%		0	0	0	0	0	0	0
6% to 10%		0	3	9	5	3	0	0
11% to 20%		0	0	0	0	0	0	0
20%+		21	0	6	6	0	0	0

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash flow Hedges	Employee Benefits
Panel C: NZSX								
Mean	521586	0.661	0.004	0.063	0.094	-0.020	-0.014	-0.001
Minimum	1565	-1.138	-0.122	-3.898	-1.337	-2.439	-0.987	-0.163
25%	56938	0.548	0.000	-0.001	0.000	0.000	0.000	0.000
50%	203775	0.992	0.000	0.000	0.000	0.000	0.000	0.000
75%	438617	1.000	0.000	0.138	0.008	0.000	0.000	0.000
Maximum	5979363	2.898	0.404	0.914	0.899	0.404	0.212	0.026
Std Dev	965955	0.704	0.040	0.406	0.250	0.201	0.109	0.013
N	174	174	174	174	174	174	174	174
Panel D: Materiality								
-20%+		23	0	9	1	4	5	0
-11% to -20%		0	1	6	1	6	4	1
-6% to -10%		0	1	8	0	8	1	0
-1% to -5%		0	4	16	2	8	6	2
0%		0	154	64	125	132	146	167
1% to 5%		0	0	0	0	0	0	0
6% to 10%		4	12	34	14	14	11	4
11% to 20%		0	0	0	0	0	0	0
20%+		147	2	37	31	2	1	0
Panel E: Statistical comparisons between groups (Mann-Whitney U tests)								
Z statistic	6.701	0.000	1.374	0.321	0.673	1.543	0.886	0.622
Prob > z =	0.000	0.751	0.170	0.748	0.501	0.123	0.376	0.534

Table 4

Comparison of relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2003 to 2008 by size

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Small								
Mean	41668	0.191	-0.001	0.052	0.070	-0.007	-0.011	0.000
Minimum	235	-1.124	-0.144	-0.987	-0.001	-0.484	-0.987	0.000
25%	7255	-1.000	0.000	0.000	0.000	0.000	0.000	0.000
50%	37398	0.746	0.000	0.000	0.000	0.000	0.000	0.000
75%	74231	1.000	0.000	0.036	0.000	0.000	0.000	0.000
Maximum	115510	1.987	0.088	0.857	0.857	0.404	0.124	0.006
Std Dev	35848	0.947	0.018	0.227	0.177	0.069	0.100	0.001
N	111	111	111	111	111	111	111	111
Panel B: Materiality²								
-20%+		42	0	3	0	2	2	0
-11% to -20%		0	1	4	0	2	1	0
-6% to -10%		0	1	3	0	2	0	0
-1% to -5%		0	4	6	0	2	0	0
0%		0	100	64	88	99	106	110
1% to 5%		0	0	0	0	0	0	0
6% to 10%		1	5	15	8	3	2	1
11% to 20%		0	0	0	0	0	0	0
20%+		68	0	16	15	1	0	0

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel C: Large								
Mean	804327	0.768	0.006	0.070	0.102	-0.025	-0.011	-0.001
Minimum	116104	-1.156	-0.122	-3.898	-1.337	-2.439	-0.690	-0.163
25%	230310	0.611	0.000	-0.010	0.000	0.000	0.000	0.000
50%	309848	0.985	0.000	0.003	0.000	0.000	0.000	0.000
75%	964911	1.003	0.000	0.160	0.070	0.000	0.000	0.000
Maximum	5979363	2.898	0.404	0.914	0.899	0.363	0.212	0.026
Std Dev	1117079	0.571	0.051	0.471	0.283	0.243	0.093	0.016
N	111	111	111	111	111	111	111	111
Panel D: Materiality²								
-20%+		8	0	8	3	2	3	0
-11% to -20%		0	1	3	1	4	3	1
-6% to -10%		0	2	5	0	6	1	0
-1% to -5%		0	2	14	2	8	6	2
0%		0	94	26	72	76	88	105
1% to 5%		0	0	0	0	0	0	0
6% to 10%		3	10	28	11	14	9	3
11% to 20%		0	0	0	0	0	0	0
20%+		100	2	27	22	1	1	0
Panel E: Statistical comparisons between groups (Mann-Whitney U tests)								
Z statistic		12.875	3.661	2.072	1.440	0.942	0.312	1.255
Prob > z =		0.000	0.000	0.038	0.150	0.346	0.755	0.210

It appears that income is larger on average as a component of comprehensive income for larger companies. Further, small companies appear to have more often negative values for net income than large companies. Minority interest also appears to be larger, on average, for larger companies.

For all other components of comprehensive income there does not appear to be a difference between small and large companies. Although, for small companies the components of other comprehensive income as well as total other comprehensive income appear to be more often zero than for large companies. Further, the minimum values for the components of other comprehensive income are much larger for large companies than for small companies. However, there does not appear to be a difference between the maximum values for the two samples.

Table 5 compares the components of comprehensive income reported under old GAAP to the components of comprehensive income reported under NZ IFRS for the year 2007. This analysis compares like amounts with like amounts under a different set of accounting standards.

However, there does not appear to be a statistically significant difference for any of the components of comprehensive income between the two groups. There also does not appear to be a statistically significant difference for the value of assets between the two groups.

Further, it is interesting to see that there is no difference for cash flow hedges, as these were not disclosed under old GAAP. Therefore, there are no observations for the old GAAP sample. However, this could be due to a large amount of zero values in the NZ IFRS sample for cash flow hedges or a lot of credit and debit amounts that balance out to zero.

However, when absolute values for all variables are used, the difference in the cash flow hedges component between the two samples is statistically significant (these results are not tabulated). This indicates that the positive

Table 5

Comparison of relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2007 by GAAP

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: NZ IFRS GAAP								
Mean	547444	0.531	-0.009	-0.126	0.032	-0.109	-0.041	0.001
Minimum	1537	-1.000	-0.144	-3.898	-1.337	-2.439	-0.987	0.000
25%	43762	-0.218	0.000	-0.135	0.000	0.000	0.000	0.000
50%	178854	0.958	0.000	0.000	0.000	0.000	0.000	0.000
75%	397395	1.017	0.000	0.019	0.000	0.000	0.000	0.000
Maximum	5867449	2.898	0.000	0.852	0.898	0.002	0.212	0.024
Std Dev	1055645	0.952	0.031	0.722	0.327	0.411	0.192	0.005
N	37	37	37	37	37	37	37	37
Panel B: Old NZ GAAP								
Mean	504139	0.422	-0.004	0.091	0.160	-0.060	0.000	-0.005
Minimum	1531	-1.129	-0.141	-1.134	-0.013	-1.134	0.000	-0.167
25%	38645	0.134	0.000	-0.013	0.000	0.000	0.000	0.000
50%	185567	0.930	0.000	0.000	0.000	0.000	0.000	0.000
75%	386064	1.000	0.000	0.129	0.129	0.000	0.000	0.000
Maximum	5728860	1.281	0.070	0.970	0.970	0.035	0.000	0.000
Std Dev	1027194	0.802	0.030	0.374	0.294	0.200	0.000	0.027
N	37	37	37	37	37	37	37	37
Panel C: Statistical comparisons between groups (Mann-Whitney U tests)								
Z statistic	0.254	0.634	-0.882	-1.456	-1.811	-0.864	1.000	0.025
Prob > z =	0.800	0.526	0.378	0.146	0.070	0.388	0.500	0.566

and negative values for the various firm year observations in the NZ IFRS sample cancel each other out. Further, this indicates that the cash flow hedges component is significant for individual firms, but not for all firm year observations taken together. This analysis further indicates that there is no difference for asset revaluations, whereas Table 5 shows a slight statistically significant difference at the 10% level for asset revaluations between the two accounting regimes. The data in Table 5 indicates that some companies had to revalue some of their assets downwards when NZ IFRS were introduced.

Table 6 also compares old GAAP to NZ IFRS. However, this Table includes the last two years of financial information as reported under old GAAP, and the first two years of information as reported under NZ IFRS. Therefore, this Table includes the same amount of observations for each accounting regime. Only two years of old GAAP data were used for this comparison to avoid swamping the data with old GAAP observations.

Table 6 shows a statistically significant difference (at the 10% level) for most of the components of comprehensive income between the two samples. There is a difference at the 5% level for minority interest, total other comprehensive income, asset revaluation and employee benefits. Further, there appears to be a slight difference for cash flow hedges at the 10% level. There is no difference for total assets, net income or foreign currency translation.

When comparing all old GAAP data for 2003-2007 to all NZ IFRS data for 2007-2008 the results are similar (these results are not tabulated). There is a statistically significant difference at the 5% level for minority interest, total other comprehensive income, asset revaluation and cash flow hedges. There is a weak statistically significant difference at the 10% level for employee benefits. However, in this comparison there is also a statistically significant difference at the 5% level for total assets. The difference in total assets is due to the different amount of firm year observations included in each

Table 6

Comparison of relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2006 to 2008 by GAAP

	Total Assets	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Old NZ GAAP								
Mean	470370	0.446	-0.001	0.121	0.146	-0.020	0.000	-0.004
Minimum	521	-1.129	-0.141	-1.134	-0.013	-1.134	0.000	-0.167
25%	38256	0.143	0.000	0.000	0.000	0.000	0.000	0.000
50%	166571	0.909	0.000	0.000	0.000	0.000	0.000	0.000
75%	324302	1.000	0.000	0.248	0.129	0.000	0.000	0.000
Maximum	5728860	1.281	0.070	0.970	0.970	0.404	0.000	0.000
Std Dev	998729	0.778	0.022	0.321	0.276	0.157	0.000	0.027
N	74	74	74	74	74	74	74	74
Panel B: IFRS								
Mean	570670	0.423	-0.005	-0.045	0.037	-0.044	-0.033	0.001
Minimum	808	-1.138	-0.144	-3.898	-1.337	-2.439	-0.987	-0.006
25%	40880	-0.685	0.000	-0.044	0.000	0.000	-0.003	0.000
50%	204875	0.876	0.000	0.000	0.000	0.000	0.000	0.000
75%	596207	1.003	0.000	0.107	0.000	0.000	0.000	0.000
Maximum	5979363	2.898	0.088	0.852	0.898	0.363	0.212	0.026
Std Dev	1066422	0.950	0.028	0.535	0.248	0.301	0.165	0.005
N	74	74	74	74	74	74	74	74
Panel C: Statistical comparisons between groups (Mann-Whitney U tests)								
Z statistic	-0.855	-0.391	1.953	2.031	2.285	-0.096	1.753	-1.921
Prob > z =	0.392	0.696	0.051	0.042	0.022	0.924	0.080	0.055

Table 7
Comparison of relative importance of components of comprehensive income (scaled by absolute value of comprehensive income) for firm-year observations 2003 to 2008 by sector

	Primary	Energy	Goods	Property	Services	All
N	30	24	66	24	78	222
Other Comprehensive Income						
Mean	-0.065	0.208	0.044	0.160	0.004	0.061
Minimum	-3.898	-0.689	-0.782	-0.135	-0.144	-3.898
25%	-0.004	0.000	-0.037	-0.001	0.000	0.000
50%	0.000	0.002	0.000	0.013	0.000	0.000
75%	0.044	0.443	0.081	0.323	0.000	0.113
Maximum	0.452	0.914	0.857	0.589	0.404	0.914
Std Dev	0.736	0.382	0.244	0.234	0.052	0.369
Asset Revaluations						
Mean	0.022	0.215	0.065	0.145	0.049	0.086
Minimum	-1.337	-0.154	0.000	-0.035	-0.987	-1.337
25%	0.000	0.000	0.000	0.000	0.000	0.000
50%	0.000	0.000	0.000	0.000	0.000	0.000
75%	0.037	0.443	0.000	0.285	0.051	0.005
Maximum	0.449	0.899	0.857	0.589	0.852	0.899
Std Dev	0.289	0.355	0.188	0.220	0.245	0.236
Foreign Currency						
Mean	-0.085	0.000	-0.017	0.013	0.071	-0.016
Minimum	-2.439	0.000	-0.506	-0.135	-0.260	-2.439
25%	0.000	0.000	-0.014	0.000	0.000	0.000
50%	0.000	0.000	0.000	0.000	0.000	0.000
75%	0.000	0.000	0.000	0.000	0.000	0.000
Maximum	0.011	0.005	0.404	0.363	0.839	0.404
Std Dev	0.445	0.001	0.120	0.084	0.195	0.178
Cash Flow Hedges						
Mean	0.000	-0.019	-0.005	0.001	-0.023	-0.011
Minimum	0.000	-0.690	-0.298	-0.007	-0.987	-0.987
25%	0.000	0.000	0.000	0.000	0.000	0.000
50%	0.000	0.000	0.000	0.000	0.000	0.000
75%	0.000	0.000	0.000	0.000	0.000	0.000
Maximum	0.000	0.212	0.116	0.042	0.124	0.212
Std Dev	0.000	0.154	0.051	0.009	0.137	0.096
Employee Benefits						
Mean	0.000	0.000	0.000	0.001	-0.002	-0.001
Minimum	0.000	0.000	0.000	-0.006	-0.163	-0.163
25%	0.000	0.000	0.000	0.000	0.000	0.000
50%	0.000	0.000	0.000	0.000	0.000	0.000
75%	0.000	0.000	0.000	0.000	0.000	0.000
Maximum	0.004	0.000	0.006	0.024	0.026	0.026
Std Dev	0.001	0.000	0.001	0.005	0.019	0.012

sample. Old GAAP includes five years of information, whereas the NZ IFRS sample only includes two years of information.

Overall, these results indicate that asset revaluations and cash flow hedges are significantly different, and that employee benefits are slightly different. There does not appear to be a difference in foreign currency between old GAAP and NZ IFRS. Further, for this sample of firms, NZ IFRS does not appear to have made a significant difference to net profit or total assets.

Overall, the findings for the sector analysis in Table 7 are similar to the findings in Tables 1 and 2. The interquartile ranges are mainly zero with the exceptions of asset revaluations and total other comprehensive income. The sector analysis in Table 7 indicates that all sectors have significant observations for other comprehensive income.

All sectors have significant, large observations for asset revaluations, these are mainly positive. The only exceptions are the primary sector and the services sector which include some large negative values for asset revaluations.

All sectors also have significant observations for foreign currency, with the exception of the energy sector. These foreign currency observations are both positive and negative, only the primary sector is dominated by a large negative observation.

Further, all sectors have significant observations for cash flow hedges, with the exception of the primary sector. The cash flow hedges observations are both positive and negative.

Only the services sector has some significant observations for employee benefits.

Table 8

Comparison of relative importance of components of comprehensive income (scaled by absolute value of closing equity) for firm-year observations 2003-2008

	Net Profit	Minority Interest	Other Comprehensive Income	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Descriptive statistics							
Mean	-0.238	0.000	0.019	0.021	-0.001	-0.001	0.000
Minimum	-40.259	-0.609	-0.609	-0.060	-0.156	-0.096	-0.015
25%	0.026	0.000	0.000	0.000	0.000	0.000	0.000
50%	0.085	0.000	0.000	0.000	0.000	0.000	0.000
75%	0.150	0.000	0.018	0.001	0.000	0.000	0.000
Maximum	0.491	0.634	0.634	0.487	0.088	0.070	0.008
Std Dev	2.792	0.059	0.090	0.063	0.017	0.013	0.001
N	222	222	222	222	222	222	222
Panel B: Materiality							
-20%+	33	1	2	0	0	0	0
-11% to -20%	3	0	0	0	1	0	0
-6% to -10%	5	0	5	1	3	2	0
-1% to -5%	9	2	23	3	17	9	2
0%	0	211	121	169	189	200	218
1% to 5%	32	7	40	22	9	10	2
6% to 10%	54	0	16	13	3	1	0
11% to 20%	42	0	7	7	0	0	0
20%+	44	1	8	7	0	0	0

4.2.2 Are the components of comprehensive income material in relation to closing equity?

Table 8 analyses the descriptive statistics and the materiality of the components of comprehensive income compared to absolute values of closing equity.

The results in Panel A of Table 8 for net income seem to be dominated by one observation with a large negative net income value and a small positive closing equity value. All items of comprehensive income appear to some extent material with the exception of employee benefits.

Only four observations for employee benefits differ from zero and these are all smaller than 1.5% of closing equity. However, with the exception of asset revaluation, the values seem to be quite small for all items of other comprehensive income in comparison to closing equity.

Only 22 firm year observations for cash flow hedges differ from zero, 11 of them are positive the other 11 are negative, and none of them is larger than 10% of closing equity. There are only three observations that could be slightly material for cash flow hedges.

Foreign currency appears to be slightly material. However this component of other comprehensive income mainly affects closing equity negatively.

Asset revaluations appear to be material. It mainly influences closing equity positively. This item has seven firm year observations that are larger than 20% of closing equity.

Net income is also material. Net income never takes a zero value in relation to closing equity. It mainly affects closing equity positively, however, there are 33 firm year observations where net income is negative and makes up more than 20% of closing equity.

Panel B of Table 8 indicates that in 121/222 (54%) of firm year observations other comprehensive income is zero. Only 38/222 (17%) of total other comprehensive income observations are larger than 5% of closing equity, and only 17/222 (8%) of firm year observations for other comprehensive income are material at the 10% level. The remaining observations are smaller than 5% of closing equity.

4.3 Analysis of the Accumulated Components of Comprehensive Income

The results for research question 1 find that the components of comprehensive income are material in relation to total comprehensive income. However, it is also important to know whether these effects offset or accumulate over time. Therefore this section analyses the cumulative effect of other comprehensive income on equity over time.

4.3.1 Are the Accumulated Components of Comprehensive Income in Equity Material in Relation to Closing Equity?

Table 9 analyses the descriptive and materiality statistics for the individual equity accounts in relation to total closing equity.

In Table 9, contributed equity and retained earnings are the main components of closing equity. The descriptive statistics for retained earnings are dominated by one observation with a large negative retained earnings value and a small amount for total equity. In 15 observations retained earnings is zero. Almost one third (67/222) of firm year observations for retained earnings are negative. None of the other reserve accounts appear to be affected by extreme outliers.

In panel B of Table 9 asset revaluations appear to be the most common (i.e., non zero observations) of all the reserve accounts. For asset revaluations 107/222 (48%) of all observations are positive. The remaining observations are zero.

Table 9

Comparison of relative importance of components of equity (scaled by absolute value of closing equity) for firm-year observations 2003-2008

	Contributed Capital	Minority Interest	Retained Earnings	Total Reserves	Asset Revaluations	Foreign Currency	Cash Flow Hedges	Employee Benefits
Panel A: Descriptive statistics								
Mean	2.226	0.012	-1.392	0.127	0.129	-0.004	-0.001	0.004
Minimum	0.019	-0.012	-74.018	-0.180	0.000	-0.196	-0.168	0.000
25%	0.453	0.000	-0.106	0.000	0.000	0.000	0.000	0.000
50%	0.796	0.000	0.071	0.015	0.000	0.000	0.000	0.000
75%	1.010	0.000	0.371	0.159	0.148	0.000	0.000	0.000
Maximum	73.018	0.598	0.964	1.441	1.441	0.039	0.035	0.346
Std Dev	6.816	0.057	6.906	0.253	0.250	0.020	0.015	0.025
N	222	222	222	222	222	222	222	222
Panel B: Materiality								
-20%+	0	0	51	0	0	1	0	0
-11% to -20%	0	0	5	4	0	2	2	0
-6% to -10%	0	0	6	3	0	3	0	0
-1% to -5%	0	1	5	20	0	30	4	0
0%	0	192	15	74	115	178	205	198
1% to 5%	1	19	26	41	27	8	11	22
6% to 10%	4	2	8	11	13	0	0	1
11% to 20%	19	2	15	25	25	0	0	0
20%+	198	6	91	44	42	0	0	1

Foreign currency on the other hand, takes on either zero values or affects closing equity negatively. This sample includes only eight observations with a positive foreign currency translation reserve, all of which are less than 5% of closing equity. However, three observations of foreign currency translation are material at the 10% level and three are in the 5-10% judgement zone. Therefore, there are very few observations where the foreign currency translation reserve is material.

Cash flow hedges have only 17 observations that are different from zero. Only two of these observations are negative and material at the 10% level of closing equity.

There are no negative observations for employee benefits in relation to closing equity. Only one observation is 35% of closing equity and therefore material.

In summary, out of all the accumulated components of comprehensive income in closing equity, only retained earnings and asset revaluation appear to be material. All other components have some material values, but the majority of observations are zero or smaller than 5% of closing equity.

4.4 Volatility of Comprehensive Income versus Net Income

The next part of this research relates to volatility and is attempting to answer the question whether comprehensive income is more volatile than net income. This will be achieved in three steps. First the entire sample is examined. Second, the sample is analysed by firm size. Third, the sample is analysed by industry sector.

The analysis undertaken earlier in this chapter indicates that asset revaluations have a considerable impact on comprehensive income. Furthermore, NZ IFRS requires a new component of other comprehensive income to be displayed, cash flow hedges. Therefore, in Tables 10 to 12, as

well as reporting the relative volatility of comprehensive income, the relative volatility for “comprehensive income less asset revaluations” and “comprehensive income less asset revaluations and less cash flow hedges” are reported.

Table 10 Panel A displays the descriptive statistics for the standard deviation ratio. The minimum, median and quartile values seem to be similar across all three classifications. However, the maximum value in the comprehensive income column is affected by a large outlier due to asset revaluations.

Table 10
Comparison of standard deviations for time-series year 2003-2008

Panel A: Descriptive statistics of standard deviations			
	Standard Deviation Ratio ¹		
	Comprehensive Income	Comprehensive Income less Revaluations	Comprehensive Income less Revaluations and Cash Flow Hedges
Mean	2.061	1.030	1.018
Minimum	0.859	0.802	0.802
25%	1.000	1.000	1.000
50%	1.018	1.000	1.000
75%	1.241	1.018	1.006
Maximum	20.838	1.619	1.434
Std Dev	3.597	0.131	0.094
N	37	37	37

Panel B: Statistical comparisons between groups			
	Wilcoxon-Signed Rank Test ²		
	Comprehensive Income	Comprehensive Income less Revaluations	Comprehensive Income less Revaluations and Cash Flow Hedges
>1	25	17	15
=1	6	11	17
<1	6	9	5
	37	37	37
Statistic	3.252	1.638	2.236
p value	0.001	0.101	0.025

¹ The standard deviation ratio is $\sigma(\text{net income}) / \sigma(\text{comprehensive income})$.

² The Wilcoxon-signed rank tests the equality of matched pairs. That is, is $\sigma(\text{net income})$ different to $\sigma(\text{comprehensive income})$.

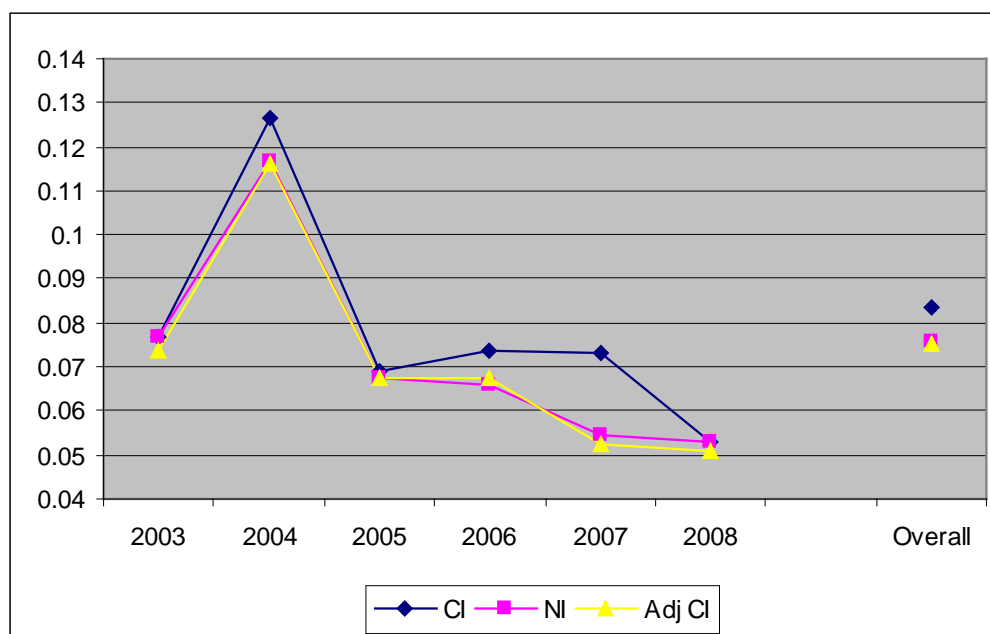
Panel B reports the results of the Wilcoxon-signed rank test, which tests for the equality of differences in standard deviations of matched pairs or observations. That is, each firm is compared to itself. The p values indicate that the standard deviation for comprehensive income, as a measure of variability, is significantly different to the standard deviation of net income at the 10% level. The results are strongest for comprehensive income. However, the difference for comprehensive income less asset revaluations is slightly significant at the 10% level. When cash flow hedges are taken out in addition to asset revaluations, the difference becomes again more significant. One reason for this could be that cash flow hedges offset foreign currency translations.

To find out whether cash flow hedges are offset by another component of other comprehensive income, a Spearman correlation for the components of other comprehensive income (other than asset revaluations) was run for each firm. The results (not tabulated) indicate that the volatility of cash flow hedges and employee benefits offset the volatility of foreign currency.

Panel B further indicates that the standard deviations of comprehensive income and net income equal more often, with each component of comprehensive income deducted from comprehensive income. Further, it can be observed that the standard deviation for comprehensive income is more often larger (25 observations) than the standard deviation of net income (six observations).

Additionally, Figure 2 visually depicts the volatility of comprehensive income, net income and adjusted comprehensive income (comprehensive income less asset revaluations) using the median standard deviations for each year. The standard deviations of net income and adjusted comprehensive income seem to be very similar. However, Figure 2 clearly depicts that the standard deviation for comprehensive income is different to the other two performance measures, due to the inclusion of asset revaluations.

Figure 2
Standard deviations of alternative performance measures by year 2003-2008



CI: comprehensive income
 NI: net income
 Adj CI: comprehensive income less asset revaluations

Table 11 divides the data into small firms and large firms. The standard deviation ratio in panel A indicates that for the majority of firms the standard deviation of comprehensive income is larger than the standard deviation of net income for both groups.

Table 11 reports the results of the Wilcoxon-signed rank test for differences in the standard deviation of comprehensive income and the standard deviation of net income. The results for small firms indicate that only comprehensive income has a significantly different standard deviation (at the 5% level). However, the results for large firms indicate that the standard deviation of comprehensive income is significantly different to the standard deviation of net income for comprehensive income as well as comprehensive income less asset revaluations and less cash flow hedges.

Table 11**Comparison of standard deviation ratio (SDR)¹ for time-series year 2003-2008 analysed by firm size****Panel A: Count data**

	Small Firms			Large Firms		
	Comprehensive Income	Comprehensive Income less Revaluations	Comprehensive Income less Revaluations and Cash Flow Hedges	Comprehensive Income	Comprehensive Income less Revaluations	Comprehensive Income less Revaluations and Cash Flow Hedges
SDR<1	13	8	7	12	9	8
SDR=1	3	5	8	3	6	9
SDR>1	3	6	4	3	3	1
N	19	19	19	18	18	18

Panel B: Statistical tests

Variance ratio test ²						
F statistic	0.817	1.004	1.001	9.726	1.421	1.010
p value	0.664	0.497	0.499	0.000	0.238	0.492
Wilcoxon signed rank test ³						
Z statistic	2.341	0.651	1.029	2.294	1.647	2.201
p value	0.019	0.515	0.303	0.022	0.100	0.028

¹ The standard deviation ratio is $\sigma(\text{net income}) / \sigma(\text{comprehensive income})$.² The variance ratio tests whether the standard deviation ratio is different from 1.³ The Wilcoxon signed rank tests test whether the distributions of matched pairs are the same.

Table 12
Comparison of Standard Deviations¹ for time-series year 2003-2008 by sector

	Comprehensive Income	Comprehensive Income less Revaluations	Comprehensive income less Revaluations and Cash Flow Hedges
Sector: Primary			
SDR>NI	4	3	3
SDR<NI	1	1	1
SDR=NI	1	2	2
Wilcoxon signed rank test²			
Statistic	1.265	0.863	0.863
p value	0.206	0.388	0.388
Sector: Energy			
SDR>NI	3	2	2
SDR<NI	0	0	0
SDR=NI	1	2	2
Wilcoxon signed rank test²			
Statistic	1.671	1.400	1.400
p value	0.095	0.162	0.162
Sector: Goods			
SDR>NI	7	4	4
SDR<NI	2	3	3
SDR=NI	1	3	3
Wilcoxon signed rank test²			
Statistic	1.531	0.779	0.779
p value	0.126	0.436	0.436
Sector: Property			
SDR>NI	3	2	1
SDR<NI	1	2	1
SDR=NI	0	0	2
Wilcoxon signed rank test²			
Statistic	0.365	-0.365	-0.200
p value	0.715	0.715	0.842
Sector: Services			
SDR>NI	8	6	5
SDR<NI	2	3	0
SDR=NI	3	4	8
Wilcoxon signed rank test²			
Statistic	2.009	0.534	2.218
p value	0.045	0.593	0.027

¹ The null comparison is $\sigma(\text{comprehensive income}) = \sigma(\text{net income})$.

² The Wilcoxon-signed rank tests the equality of matched pairs.

Table 12 divides the data into the different sectors they are listed under on the NZX. These sectors are primary, energy, goods, property and services. The standard deviation ratio and the Wilcoxon-signed rank test are applied to each sector.

The results are interesting, as the only statistically significant differences between standard deviations for comprehensive income occur in the services sector (at the 5% level) and the energy sector (at the 10% level). The standard deviations for comprehensive income less asset revaluations are not statistically different for any sector. Moreover, the services sector is the only sector that indicates a statistically significant difference between standard deviations for comprehensive income less asset revaluations and less cash flow hedges.

4.5 Summary

Overall, the results indicate that other comprehensive income is material and accumulates over time. Furthermore, comprehensive income is more volatile than net income. Both results are dominated by asset revaluations. The next chapter will discuss these results in detail.

CHAPTER 5: DISCUSSION

5.1 Introduction

This chapter is divided into six sections. First, the results for the four research questions will be discussed. Second, the requirements for asset measurement after recognition in New Zealand and their impact on this study will be explained. Third, the relationship of this study with previous research will be reviewed. Fourth, the possible implications of this research on the existing literature, for standard setters and for financial statement users will be explored. Fifth, possible limitations of this study will be pointed out. Last, suggestions for possible future research will be provided.

5.2 Discussion of Research Findings

5.2.1 Research Question 1

Are the components of comprehensive income material in relation to total comprehensive income?

Net income is the largest and most material component of comprehensive income. However, the results show that other comprehensive income is also material for many firm year observations. The most prominent component of other comprehensive income is asset revaluations, the majority of asset revaluations in the sample reviewed are positive. Further, the results indicate that profit firms have more items of other comprehensive income than loss firms. Additionally, net income and comprehensive income either seem to be both negative, or both positive for individual firm year observations.

Although no statistically significant difference between companies listed on the NZAX and the NZSX is detected, the results indicate that companies

listed on the NZAX are generally smaller and are more likely to operate on a loss rather than on a profit. Moreover, the only material components of other comprehensive income besides net income are asset revaluations and minority interest for NZAX companies.

A statistical difference is detected between small and large companies for net income and for minority interest. Small companies tend to operate more often on a loss than large companies. Additionally, smaller companies appear to have less items of other comprehensive income, and the items of other comprehensive income are less material.

Large companies have more large negative items of other comprehensive income in their financial statements. This is in line with the finding that other comprehensive income is more material for large companies than for small companies. Further, it is discovered that asset revaluations is the most material component of other comprehensive income. Large companies have more and larger assets and could therefore be more affected by downward asset revaluations. Moreover, large companies are more likely to have operations overseas and are therefore more likely to be affected by foreign currency translations.

The findings for the comparison between old GAAP and NZ IFRS for the year 2007 are surprising, as no significant differences between the two samples are detected. The only weakly significant difference at the 10% level was detected for asset revaluations. Some companies had to revalue their assets downwards when NZ IFRS were introduced. However, the sample size for this comparison might not be large enough, as this sample only includes a comparison of one year of data.

A statistical difference for most components of comprehensive income is detected when the years 2006 and 2008 are included in the comparison between old GAAP and NZ IFRS. The differences for minority interest, other comprehensive income, asset revaluation and employee benefits are all significant at the 5% level. Further, a difference at the 10% level is

detected for cash flow hedges. The findings for cash flow hedges were expected to be much more significant as this item did not exist under old GAAP. However, due to a large amount of zero values for this component and the remaining positive and negative amounts offsetting each other, cash flow hedges are 0 on average. When absolute values are used for all components, cash flow hedges appear very significant, which indicates that cash flow hedges are significant for individual firms, but not for all firm year observations taken together.

Although comprehensive income appears to be affected by the change in accounting standards, there is no difference for net income. However, one reason for this could be that net income is generally larger than other comprehensive income. Therefore, net income is less likely to be materially affected by changes in dollar value that might have a more dramatic impact on comprehensive income.

The sector analysis indicates that other comprehensive income is material for all sectors. The only sectors to include large negative values for asset revaluations are primary and services. Only the services sector shows significant observations for employee benefits. Interesting observations are that the energy sector does not appear to be affected by foreign currency translations, and the primary sector does not appear to have any cash flow hedges.

Overall, these results show that other comprehensive income is material in relation to comprehensive income, especially asset revaluations. Further, the results indicate that small firms are more often loss firms with less items of other comprehensive income. Additionally, the results imply that net income does not differ between old GAAP and NZ IFRS, but that other comprehensive income is affected by this change in accounting standards. This study finds that although some items of other comprehensive income do not appear to be material overall, they are very material for some firm year observations.

5.2.2 *Research Question 2*

Are the components of comprehensive income material in relation to closing equity?

Net income is material in relation to closing equity. Other comprehensive income does not appear to be significantly material in relation to closing equity. Only 8% of other comprehensive income observations are material at the 10% level. Again, these material other comprehensive income observations are mainly driven by asset revaluations.

5.2.3 *Research Question 3*

Are the accumulated components of comprehensive income in equity material in relation to closing equity?

The two main components of closing equity are contributed equity and retained earnings. Asset revaluations appear to be the most common reserve account. Asset revaluations takes on only 0 values and positive values. The reason for this is that according to IAS 16 *Property, Plant and Equipment*, downward asset revaluations can only be recognised in equity, if the company has previously had upward revaluations. The negative values of total reserves are driven by foreign currency. Overall, the reserve accounts appear to be material in relation to closing equity. However, the value of total reserves is mainly driven by asset revaluations and to some extent by foreign currency.

Individually (as investigated in research question 2), other comprehensive income does not appear to be material in relation to closing equity. However, the aggregated reserve accounts in equity appear to be material in relation to closing equity.

5.2.4 Research Question 4

Is comprehensive income more volatile than net income?

The results clearly show that comprehensive income is more volatile than net income. However, this finding changes once asset revaluations are excluded from comprehensive income. A further interesting finding is that when cash flow hedges are eliminated from comprehensive income as well as asset revaluations, comprehensive income appears to be more volatile again. The reason for this is that the volatility of cash flow hedges and employee benefits offsets the volatility of foreign currency.

The results of the volatility analysis by company size indicate that the only difference between these two groups is that small companies do not seem to be affected by cash flow hedges.

The sector analysis indicates that comprehensive income is more volatile than net income only in the services sector and weakly in the energy sector. When asset revaluations are removed from the sample, comprehensive income is not more volatile than net income for any sector. When both asset revaluations and cash flow hedges are excluded from comprehensive income then comprehensive income is more volatile than net income, but only for the services sector.

These results indicate that the volatility of comprehensive income in this sample is driven by asset revaluations, as well as the services and energy industries. Further, it is interesting to find that cash flow hedges reduce volatility of comprehensive income. This is due to their correlation with employee benefits and foreign currency. One of the main arguments for not reporting comprehensive income in a single statement is that it will increase the volatility of earnings. Cash flow hedges are a financial instrument that only has to be reported in the balance sheet since the introduction of NZ IFRS. Therefore, NZ IFRS could possibly reduce the volatility of comprehensive income.

5.3 Asset Measurement after Recognition in New Zealand

NZ IAS 16 *Property, Plant and Equipment*, provides financial statement preparers with two measurement options for assets after the initial recognition: at cost or at fair value. The cost model requires assets to be displayed at cost less depreciation and less impairment losses. The revaluation model requires the asset to be shown at its fair value.

Paragraph 39 requires positive asset revaluations to be recognised in equity unless the asset has previously been revalued downwards. In this case the amount of the previous downward revaluation has to be recognised in profit and loss, and the difference can be recognised in an asset revaluation reserve. Paragraph 40 requires negative asset revaluations to be recognised in profit and loss, unless previous positive asset revaluations of the same or a larger amount were recognised in an asset revaluation reserve account in equity. Therefore, if an asset revaluation reserve is in existence or the first time revaluation of an asset is upwards, financial statement preparers must include the revaluation amount of an asset in the statement of changes in equity, as long as the reserve account remains in a positive balance.

These requirements are quite different to other jurisdictions, which only allow positive asset revaluations to be recognised in equity, and require negative asset revaluations to be recognised in the income statement. Further, NZ IAS 16 allows either historical cost or fair value to be used. However, the standard does not require the same treatment for all assets of one company, but only to use the same treatment consistently for each class of assets.

The requirements of NZ IAS 16 in regards to measuring assets after recognition are similar to the requirements of FRS-3, *Accounting for Property, Plant and Equipment*, under old GAAP.

These differences could affect the results of this study, as asset revaluation is the most dominant component of other comprehensive income. Further, in

this sample asset revaluation appears to be responsible for the volatility of comprehensive income. Financial statement preparers could be tempted to smooth their earnings due to the options available to them regarding asset measurement. If large items of asset revaluation are reported in net income, the net income figure could appear volatile to financial statement users. Therefore, including large items of asset revaluation in equity reduces the volatility of net income and increases the volatility of comprehensive income.

This might differ in other jurisdictions, and it might be interesting to test volatility between net income and comprehensive income in jurisdictions where financial statement preparers do not have the same options for asset measurement available as they have in New Zealand.

5.4 Previous Research

Cahan et al. (2000), is another New Zealand study investigating comprehensive income by using data from the NZX. Some of the descriptive statistics found in their study are similar to the descriptive statistics in this study. Cahan et al. (2000) do not measure the dollar value of comprehensive income, but count the amount of positive and negative observations of the components of other comprehensive income.

Table 13
Comparison of Descriptive Statistics

	<i>Panel A: Results of this study</i> ¹						<i>Panel B: Cahan et al. (2000)</i> ²						
	FC	+	-	AR	+	-	FC	+	-	AR	+	-	
2003	9	2	7	12	11	1	1993	23	6	17	11	5	6
2004	9	1	8	13	13	0	1994	26	16	10	14	13	1
2005	9	4	5	11	10	1	1995	30	12	18	12	12	0
2006	10	7	3	12	11	1	1996	30	24	6	11	6	5
2007	11	1	10	8	5	3	1997	30	22	8	14	13	1
2008	13	11	2	9	7	2							
	61	26	35	65	57	8		139	80	59	62	49	13

¹this study used 37 non financial companies

²Cahan et al. (2000) used 48 financial and non financial companies

The authors find more observations for foreign currency than this study. Further, most of their observations for foreign currency are positive, whereas most of the observations for foreign currency in this study are negative. Further, Cahan et al. (2000) detect fewer observations for asset revaluations compared to this study. However, the percentage of positive and negative asset revaluations in comparison to the entire sample is quite similar to this study.

The difference in the descriptive statistics could be due to the economic climate, as Cahan et al. (2000) collected their data in the 1990s. An indication for this could be the reversed results for foreign currency. The asset revaluation statistics do not provide a good indicator for the economic climate due to the many options available under NZ IAS 16 and FRS-3 for asset measurement after recognition. As only asset revaluations that are recognised in equity are captured separately as a component of comprehensive income. Another difference between the two studies is that Cahan et al. (2000) do not distinguish between financial and non financial companies.

Further, this study excludes companies that opted to adopt NZ IFRS early. This could have further influenced the result of this study, as previous research in Germany has shown that companies choosing to adopt IFRS early differ from companies that do not choose to adopt IFRS early (Hung and Subramanyam, 2007). The authors find that early adopters tend to be larger, have more capital requirements and tend to be cross-listed on overseas stock exchanges. Therefore, the early adopting companies that were excluded could have influenced this sample in terms of materiality and volatility of comprehensive income. However, including these companies would have prevented a comparison between companies in terms of old GAAP versus NZ IFRS. The data for 2007 as reported under old GAAP and NZ IFRS differed for all companies, but one. Therefore, the inclusion of early adopters could have prevented a true comparison between the companies of this sample.

The literature review introduced some previous studies regarding materiality and volatility. One aim of this study was to find out whether the results of these previous studies are also true for non financial companies in a non US environment.

Kreuze and Newell (1999) find that for most firms net income does not differ from comprehensive income, but that other comprehensive income can be material for some firms. This study finds that comprehensive income is generally different to net income although not always in a material manner. Further, this study finds that items of other comprehensive income can be very material for some firm year observations.

Jordan and Clark (2002) find that comprehensive income is material for financial firms. This study finds that comprehensive income is material for non financial firms.

Hodder et al. (2006) investigate US banks and find that comprehensive income is more volatile than net income. This study finds that comprehensive income is also more volatile than net income for non financial firms.

Therefore, this study did find evidence that the results of previous studies in the US investigating financial companies can be applied to non financial companies in a non US environment.

5.5 Implications of this Research

5.5.1 Contribution to the Existing Literature

Most of the previous research regarding comprehensive income has been undertaken in the US. This is especially true for research in regards to materiality (Kreuze and Newell, 1999; Jordan and Clark, 2002) and volatility (Barth et al., 1995; Hodder et al., 2006). Therefore, one

contribution of this study is that it analyses comprehensive income in a non US environment that allows asset revaluations.

The previous studies regarding volatility only investigated financial companies, whereas this study investigates the volatility of comprehensive income for non financial companies. This is similarly true for studies regarding materiality, Kreuze and Newell (1999) did not distinguish between financial and non financial firms, and Jordan and Clark (2002) only investigated financial firms.

Additionally, none of the previous studies analysed the materiality of the components of comprehensive income in as much detail as this study, or distinguished between company size or industry sector.

Further, this study could be seen as one of the first attempts to investigate the impact of NZ IFRS on financial statements by using actual data.

5.5.2 Implications for Standard Setters

This study provides standard setters with some food for thought in regards to the reporting of comprehensive income, in particular asset revaluations. This study shows that other comprehensive income is material and should be displayed in the financial statements where it is easily accessible and processable. Different users might have different uses for the financial statement information, and net income is probably best for contracting decisions and to determine dividend payments. However, comprehensive income is equally important and it can help investors to identify risks the company is exposed to, as well as possible income streams besides net income. Further, comprehensive income can help investors to identify the economic environment a company is operating in.

Standard setters might be interested in the effect that asset revaluations have on other comprehensive income and on the volatility of comprehensive income. The current treatment might be confusing to financial statement users, as asset revaluations in New Zealand can be either included in net

income (e.g., NZ IAS 40 and NZ IAS 39) or in other comprehensive income (e.g., NZ IAS 16 and NZ IAS 39) and therefore equity. Further, assets can be displayed at cost or at fair value. Maybe the requirement of only one treatment that is applied to all assets might be less confusing for financial statement users.

5.5.3 Implications for Financial Statement Users

This study demonstrates to financial statement users the materiality of other comprehensive income, and that it is important to take it into consideration when making investment decisions. Other comprehensive income can be an indicator for the economic environment an organisation is operating in (e.g., foreign currency translation) and other comprehensive income can also be an indicator for possible gains and losses facing the organisation (e.g., asset revaluations and cash flow hedges). Therefore, financial statement users could utilise other comprehensive income as an additional risk assessment tool in their decision making process.

Further, this study points out to financial statement users the different treatments available to financial statement preparers in regards to asset measurement after recognition, which impacts on the volatility of comprehensive income and could be used as a tool for income smoothing, if financial statement users do not look at both net income and comprehensive income.

5.6 Limitations

There are a few possible limitations to this study. One of them is the relatively short period of time reviewed. The reason for the many positive asset revaluations and negative foreign currency translation observations could be due to the economic climate. As the time period reviewed was a relatively positive climate for the New Zealand economy. According to Aboody et al. (1999), in a positive economic climate, assets are more often

valued upwards. Further, a strong New Zealand dollar could lead to losses on foreign currency translations.

Another possible weakness of this study could be the problem of small denominators in the ratio analysis. For example, if comprehensive income or closing equity is small, the resulting ratio might be quite large, although it is not necessarily large in terms of dollar value. This could create extreme outliers. However, non-parametric statistics were used which utilise ranks to limit the effect of outliers.

A further possible limitation could be negative denominators. If both values are negative the ratio turns out positive, which could indicate more positive than negative values in the ratio analysis. However, this study tries to counteract this effect, by first analysing comprehensive income for positive and negative comprehensive income separately, as well as using absolute values for comprehensive income and closing equity.

5.7 Future Research

There are three possible suggestions for future research in regards to this thesis.

In addition to testing the volatility of various income figures for financial firms, Hodder et al. (2006) also investigate whether this volatility is reflected in stock prices or market based risk factors. Future research could investigate whether their findings also apply to non financial firms.

Additionally, the differences between old GAAP and NZ IFRS could be further investigated, when more NZ IFRS data is available. This research could investigate volatility, as the results of this study indicate that NZ IFRS might reduce the volatility of comprehensive income.

Further, future research could investigate the materiality and volatility of comprehensive income and its components in other IAS jurisdictions that have different requirements for asset revaluations.

5.8 Summary

This chapter discussed the findings for the four research questions. It was pointed out that asset revaluations is the most dominant component of other comprehensive income, and its remeasurement requirements in New Zealand were explained. Further, it was determined that the findings from previous US studies on financial companies can be applied to non financial New Zealand firms. Further, the implications of this study for the existing literature, standard setters and financial statement users were discussed. Possible limitations to this research were pointed out and suggestions for possible future research were provided. The next chapter is going to conclude the findings of this research.

CHAPTER 6: CONCLUSION

The objective of this thesis was to investigate the materiality and the volatility of comprehensive income for non financial companies in a non US environment. In order to determine whether other comprehensive income is worthwhile the attention it is receiving. Since, standard setters are planning to require the presentation of comprehensive income in a single performance statement together with net income, its materiality and its volatility are important factors that need to be resolved.

The literature in relation to comprehensive income was extensively reviewed. Providing a background to the discussion in regards to comprehensive income, as well as the two main streams of research: experimental research and valuation studies. Further some previous research on materiality and volatility was introduced and the research design was explained.

This study investigated whether comprehensive income and its components are material in relation to total comprehensive income and to closing equity, using data from 37 companies listed on the NZX for 2003 to 2008. Further, this study tested whether the cumulative components of other comprehensive income in equity are material in relation to closing equity. Additionally, the volatility of comprehensive income was compared to the volatility of net income.

The results indicate that other comprehensive income and some of its components are material in relation to total comprehensive income, but not in relation to closing equity. Further, the findings indicate that some of the cumulative components of comprehensive income in equity are material in relation to closing equity. Additionally, this study finds that comprehensive income is more volatile than net income. Although all components of comprehensive income are very material for some firm year observations,

all findings are driven by asset revaluations as the most dominant component of comprehensive income.

As an additional analysis the listing effect, the firm size effect and the sector effect were tested. Further, the impact of the move to NZ IFRS on comprehensive income was investigated. The results indicate that large firms are more affected by other comprehensive income. A sector effect was not found for materiality, but for volatility. Additionally, NZ IFRS seem to affect the materiality of some components of other comprehensive income, as well as to reduce the volatility of comprehensive income compared to net income.

Due to the prominence of asset revaluations in the findings, the requirements for asset measurement after recognition in New Zealand were discussed. It was found that there are many different options available to financial statement preparers, which could be abused for income smoothing.

Further, the contribution of this study to the existing literature, as well as its implications for standard setters and financial statement users were discussed. The possible limitations of this research were outlined and suggestions for future research were provided.

APPENDIX 1: SAMPLE SELECTION

Total number of listings on the NZSX at 27/03/09	204
Less companies with insufficient information available	-71
Less listings that are not for ordinary shares	-43
Less finance companies	-34
Less early adopters	-17
Less companies with a presentation currency other than NZ\$	-10
<hr/>	
Companies included in NZSX sample	29
Total number of listings on the NZAX at 27/03/09	36
Less companies with insufficient information available	-18
Less finance companies	-7
Less early adopters	-3
<hr/>	
Companies included in NZAX sample	8

APPENDIX 2: LIST OF FIRMS EXAMINED

NZSX

Affco Holdings Limited
Broadway Industries Limited
Cavalier Corporation Limited
Delegat's Group Limited
Fisher & Paykel Appliances Holdings Limited
Fisher & Paykel Healthcare Corporation Limited
Freightways Limited
Hallenstein Glasson Holdings Limited
Heritage Gold NZ Limited
Horizon Energy Distribution Limited
ING Medical Properties Trust
ING Property Trust
Kirkcaldie & Stains Limited
Kiwi Income Property Trust
Metlifecare Limited
New Zealand Oil & Gas Limited
Port of Tauranga Limited
Postie Plus Group Limited
Provencocadmus Limited
Pumpkin Patch Limited
Ryman Healthcare Limited
Scott Technology Limited
Sealegs Corporation Limited
Seeka Kiwifruit Industries Limited
Skellerup Holdings Limited
The National Property Trust
The Warehouse Group Limited
Trustpower Limited
Vector Limited

NZAX

A2 Corporation Limited

Botry-Zen Limited

Connexions Limited

Livestock Improvement Corporation Limited

The New Zealand Wine Company Limited

Oyster Bay Marlborough Vineyards Limited

Speirs Group Limited

Windflow Technology Limited

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