



The Usefulness of Comprehensive Income and Other Comprehensive Income

A European Study

Abstract

This master's thesis examines the usefulness of comprehensive income and other comprehensive income compared to net income, for investors, among European firms. The usefulness of these performance measures is measured by assessing the value relevance and incremental value relevance, which are the associations with share prices and share returns. The evidence indicates that overall net income is more useful to investors, however, comprehensive income is also useful to investors of European firms. Furthermore, other comprehensive income is incrementally value relevant, once added to net income. Additional analyses show that net income is more persistent and a better predictor of future cash flows, than comprehensive income. The sample consists of European listed firms, available in Datastream and Worldscope in the period 2005-2016. The results provide strong evidence that comprehensive income and other comprehensive income are useful to investors. Finally, the results also indicate that comprehensive income is more useful to investors of financial firms.

Keywords: Comprehensive income; Net income; Other comprehensive income; Usefulness; Value relevance

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Preface and acknowledgements

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1. Introduction

Questions regarding how net income is calculated and summarised, and how it impacts external users such as investors, debtors, and financial analysts, have long been empirical research subjects. The purpose of this thesis is to examine the usefulness of comprehensive income and other comprehensive income to investors, compared to the more traditional net income. The goal is to provide evidence on whether distinctive characteristics exist between these three performance measures. The presentation requirements of net income, other comprehensive income components and comprehensive income have been amended on several occasions by both the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). The goal of these amendments, by the Conceptual Framework of the IASB, has been to present comprehensive income and its components in the best way possible, to provide prospective and current capital providers with informative figures, which are useful in making economic decisions (IASB, 2010). This thesis therefore examines one of these providers of capital, more specifically investors, their usefulness of comprehensive income and other comprehensive income. This leads to the following research question:

Are comprehensive income and other comprehensive income useful to investors across European firms?

Accounting research on net income and (other) comprehensive income reported under the Statement of Financial Accounting Standard (SFAS) 130 created two opposing views. The first view entails the “all-inclusive” statement of performance. Supporters of this view argue that comprehensive income, instead of only reporting net income, reveals an entity’s true and full value creation. The first view is based on the perception that, a clean surplus relation between the statement of equity changes and the income statement is only possible when all changes in value flow through the income statement – comprehensive income. The second view is related to the arguments of Ohlson (1999), an opponent of comprehensive income reporting. Based on the arguments of Ohlson (1999), only “core earnings” from operations are considered to have information which is relevant, and thus, useful to investors. “Transitory earnings,” which do not add relevant information must be included in a separate statement – other comprehensive income – and therefore be reported separately from the core earnings – net income.

My motivation to perform this research is based on the fact that most studies researching the usefulness of comprehensive income and other comprehensive income, compared to net income, are based on SFAS 130 issued by FASB under US GAAP (United States Generally

Accepted Accounting Principles). The results of these studies might not be possible to extend to Europe for several reasons. Firstly, the previous research papers are mostly based on three components of other comprehensive income (i.e. unrealized gains and losses on marketable securities, change in foreign currency translation, and certain components of pensions and post-employment benefits) based on SFAS 130. In addition to these components, IASB standards require changes in revaluation allowance for property, plant and equipment and intangible assets and gains and losses on the effective portion of cash flow hedging instruments to be recorded as other comprehensive income. Secondly, previous studies based on SFAS 130, did not consider the location of other comprehensive income reporting, as indicated by Chambers et al. (2007). SFAS 130 allowed other comprehensive income to be reported in the statement of changes in equity or in the statement of financial performance. This effect is mitigated under International Financial Reporting Standards (IFRS), because IFRS only allows other comprehensive income to be reported in the statement of financial performance. The only two research papers that study this under IFRS in Europe, are by Goncharov and Hodgson (2011) and Mechelli and Cimini (2014). The first study uses a sample before the implementation of IFRS in Europe (sample from 1991-2005), while Mechelli and Cimini (2014) only include three years before and after the revised version of International Accounting Standard (IAS) 1. My research extends this previous research by including more components of other comprehensive income, which have been added since the time of research done by Goncharov and Hodgson (2011) and not just including the years before and after the revised version of IAS 1, but a sample that includes the first publication of IAS 1, until the most recently available data.

The usefulness of the performance measures for investors is tested by assessing the value relevance, persistence and forecasting ability. Value relevance is defined in the existing accounting literature as an accounting number that has a predicted association with equity market values or share prices (Barth et al., 2001). Thus, to assess the usefulness of these performance measures I look at their association with share prices and share returns. To examine this association, the valuation model of Ohlson (1995) is the assumption made to assess the usefulness of accounting information. Ohlson (1995) presents the following view: equity valuation can be performed accurately if book value of equity can be measured accurately and earnings can be predicted based on “clean surplus” accounting.

The findings of this thesis indicate that investors value the traditional net income measure as more value relevant, for the sample of European firms from the period 2005 until 2016. Net income is more useful compared to comprehensive income, which includes other

comprehensive income. The results indicate that other comprehensive income is not persistent, thus, once this is added to net income, investors value this less. However, comprehensive income is also useful to investors, but significantly less than net income. Other comprehensive income has incremental value relevance. Once other comprehensive income is added to net income, the regression has a higher R^2 , compared to the regression including only net income. However, the regression coefficient of other comprehensive income is significantly lower, indicating that other comprehensive income is less useful to investors. The findings of the predictability analysis indicate that net income is a better predictor of future cash flow from operations, compared to comprehensive income. This result supports the evidence of the persistence test, which indicates that other comprehensive income is the least persistent measure, thus once added to net income, its forecasting ability decreases.

This master's thesis has several contributions. Firstly, the results of this thesis should be relevant to investors and to the standard setters (IASB and FASB). The results of this thesis indicate whether the current financial reporting standards of comprehensive income and other comprehensive income enhance investors' usefulness, compared to the traditional net income, which is one of the goals of the combined project of the IASB and the FASB, to develop an international standard for presenting financial statement information, which increases the usefulness in assessing the financial performance of entities.

Secondly, the findings of this thesis are relevant for external auditors. External auditors provide assurance that the financial statements give a true and fair view. As McVay (2006) explained, while classification shifting of expenses does not change bottom-line income, here comprehensive income, it does occur within the income statement, thus, classification shifting might occur between profit or loss and other comprehensive income. If other comprehensive income is useful to investors, accountants should express care in detecting materially misstated amounts, which might include shifting of expenses to other comprehensive income.

Thirdly, this thesis adds to the existing literature of which performance measure reporting is most useful. Thus, the research of this thesis will add value to the research on the usefulness of (other) comprehensive income regarding investors' perception, because prior empirical research examining the usefulness of comprehensive income and other comprehensive income show mixed evidence or are only based on SFAS 130 or are only considering a single country (i.e. United States) or were done when there were less components required to be included in other comprehensive income.

Finally, pioneering studies like Dhaliwal et al. (1999), provide evidence that net income has more explanatory power for share prices compared to comprehensive income and a more recent study by Landsman et al. (2011) indicates that comprehensive income and other comprehensive income are price-irrelevant. However, these studies did not consider the effects of presentation choice, which are mitigated in this thesis, because other comprehensive income cannot be presented in the statement of changes in equity. This makes the results of my thesis more applicable to European firms, current IFRS standards and current FASB standards, which recently adjusted the presentation of comprehensive income (for financial statements beginning after December 15, 2011) to performance reporting.

The remainder of this master's thesis consists of the following chapters; chapter 2 presents the theoretical background, which includes the relevant concepts and institutional setting. Chapter 3, presents the literature review, followed by chapter 4, the hypothesis development. The research design is included in chapter 5, which consists of the methodology and sample and data collection. The empirical results are presented in chapter 6. Finally, chapter 7, summarizes this thesis and answers the research question and provides suggestions for future research.

2. Theoretical background

This chapter discusses the main concepts of importance to this thesis. It starts with the different performance measures (i.e. net income, comprehensive income and other comprehensive income) and explains the main idea behind the usefulness of accounting information, and continues with value relevance. Value relevance is then explained by providing definitions to its underlying components (price relevance and return relevance). This is done by using the Ohlson (1999) model, which developed a concept of transitory earnings compared to core earnings. And finally, the institutional setting is presented.

2.1. IFRS performance measures

2.1.1. Net income, other comprehensive income and comprehensive income

The question to what should make up a performance statement is one that has existed since the 20th century and continues till date to be a question of many answers and different views by both academics and accounting standard setters (i.e. FASB and IASB). As Reed and Shane (2012) explain, according to Paton and Littleton (1940), all determinants of income in its broadest sense – whether it is unusual, special or irregular – ought to be reported in the statement

of income and reported in the equity statement as net income, which is considered to be the “all-inclusive income statement.” This view was adopted by the Accounting Principles Board (APB) in 1969, in its Opinion 9, “*Reporting the Results of Operations*” (APB, 1960). While the APB required some accounting changes to be reported as prior period changes, the FASB did not allow this¹. This led users to believe that some items could thus be arbitrary excluded from the statement of performance. These views led to the FASB issuing Statement no.130, “*Reporting Comprehensive Income*,” in 1997. This statement was, and in its adjusted version, is used by many researchers to answer the question of, which performance statement and which performance measure is better. The history of developments of performance disclosure under IFRS is somewhat more recent, as IFRS was implemented in 2005 in Europe and has been adjusted since then. The standards of IFRS differ from the FASB’, but are also closely aligned.

The different performance measures are defined in International Accounting Standard 1 *Presentation of Financial Statements* (IAS 1). Net income (referred to in IAS 1 as “*profit or loss*”) is defined as “*the total of income less expenses, excluding the components of other comprehensive income.*”

Other comprehensive income is defined as containing “*items of income and expense (including reclassification adjustments) that are not recognised in profit or loss as required or permitted by other IFRSs.*”

And finally, IAS 1 defines total comprehensive income as “*the change in equity during a period resulting from transactions and other events, other than those changes resulting from transactions with owners in their capacity as owners.*” In a formula, this can be stated as follows:

$$\text{Comprehensive income for the period} = \text{Net income} + \text{Other comprehensive income}$$

Thus, net income is all income minus expenses for the period, except for the income and expenses which must be recorded as other comprehensive income. Table 1 describes the components of net income (*profit or loss*) which must be included in other comprehensive income, according to IAS 1.

¹ The FASB eliminated most prior period adjustments in FASB Statement No. 16 *Prior Period Adjustments*, but then allowed these in other statements (i.e. “Foreign Currency Translation”, “Employers’ Accounting for Pensions” and “Accounting for Certain Investments in Debt and Equity Securities”).

Table 1: Components of other comprehensive income

<i>Other comprehensive income components</i>	<i>Standard(s)</i>
1. Changes in revaluation surplus for property, plant and equipment and intangible assets.	IAS 16 & IAS 38
2. Re-measurements of a net defined benefit liability or asset.	IAS 19
3. Exchange rate differences resulting from translating functional currencies into presentation currency.	IAS 21
4. Gains and losses on re-measuring available-for-sale financial assets.	IAS 39
5. Gains and losses on the effective portion of cash flow hedging instruments.	IFRS 9
6. Gains and losses on re-measuring equity instruments investments, if the entity has chosen to present it in other comprehensive income.	IFRS 9
7. Changes in the credit risk of financial liabilities measured at fair value through net income.	IFRS 9
8. Correction of errors and changes in accounting policies which are required to be recognised outside of net income.	IAS 8

2.1.2. Presentation requirements IFRS

IAS 1 also describes the choices entities have of presenting income. The first option of presenting income is a “*single statement of comprehensive income.*” The second option is presenting “*two separate statements,*” with the first statement being the statement of income (profit or loss) and the second, a statement of comprehensive income. The two different choices of presentation are illustrated in figure 1 and 2. An important section in the other comprehensive section is the line item that is classified by nature and then grouped between items that will be reclassified to income in subsequent periods and items which will never be reclassified to income². Presentation of performance measures has an influence on the value relevance of said measures, as examined by previous research (discussed in the section literature review). Thus, it is deemed necessary to understand the presentation options provided by IFRS (i.e. IAS 1).

² This thesis follows the traditional efficient market view, which states that rational investors process information completely, regardless of the location of presentation (i.e. whether this is presented as groups that will or will not be recycled to net income). Furthermore, the model employed in this thesis that is based on Ohlson (1995,1999), assumes perfect capital markets, but also permits imperfect markets for a finite number of periods.

<p>Statement of <u>comprehensive income</u></p> <p>Revenues</p> <p>-/- Cost of Good Sold</p>
<p>Gross Margin</p> <p>-/- Selling, General and Administrative expenses</p>
<p>Operating Profit</p> <p>-/+ tax, interest and other income/expenses</p>
<p>Net Income</p> <p>-/+ <i>Other comprehensive income</i></p> <p>Total comprehensive income for the year</p>

<p>Statement of profit or loss and other <u>comprehensive income</u></p> <p>Revenues</p> <p>-/- Cost of Good Sold</p>
<p>Gross Margin</p> <p>-/- Selling, General and Administrative expenses</p>
<p>Operating Profit</p> <p>-/+ tax, interest and other income/expenses</p>
<p>Net Income</p>
<p>Net Income</p> <p>-/+ <i>Other comprehensive income</i></p> <p>Total comprehensive income for the year</p>

Figure 1: Single statement approach

Figure 2: Two statement approach

2.2. Useful accounting information

The concept of useful accounting information and its definitions differ across literature and academic research. As stated by the International Accounting Standards Board (IASB, 2015), the definition of useful accounting information is as follows: *“If financial information is to be useful, it must be relevant and faithfully represent what it purports to represent. The usefulness of financial information is enhanced if it is comparable, verifiable, timely and understandable.”*

To understand the concept of useful accounting information the Conceptual Framework of the IASB is discussed in this section, in which the usefulness of accounting information is presented. In recent years the IASB and the FASB have been working on the joint development of a conceptual framework, with the goal of developing more common accounting standards. Two of the most important developments of this joint operation related to this thesis are, firstly, the amendment of IAS 1 – amended in September 2007 – which states that it is mandatory for entities to present a comprehensive income statement for financial statements beginning on or after January 1, 2009. The second important development is the update of the FASB standards,

which amended the presentation of comprehensive income – Topic 220 – for financial statements beginning after December 15, 2011 to performance reporting instead of reporting other comprehensive income in the statement of changes in equity.

The definition of useful accounting information suggests that there are two sets of qualitative characteristics, fundamental qualitative and enhancing qualitative characteristics (IASB, 2015). The fundamental characteristics are relevance and faithful representation, while timeliness, comparability, understandability, and verifiability are the enhancing qualitative characteristics. The first two qualitative characteristics, concern the decision usefulness of accounting information. Thus, to be decision useful, accounting information should be capable of affecting the decisions made by the users of this accounting information – relevance – and it should be presented faithfully. Furthermore, the Conceptual Framework (IASB, 2010) states that accounting information is decision useful if it has predictive value.

In this thesis, the usefulness of accounting information for investors is assessed by using the definition provided by Black (2016), based on the models of Ohlson (1995). Black (2016), defines usefulness of comprehensive income and other comprehensive income to investors as: *“the value relevance of comprehensive income and other comprehensive income”*. The reason to use the definition provided by Black (2016) in this thesis, is by means of researching several concepts of accounting information, that are related to the Conceptual Framework of the IASB. These concepts include, relevance, persistence and forecasting ability, which are discussed in the next section.

2.3. Value relevance

Value relevance is defined in the existing accounting literature as an accounting number that has a predictable association with share prices or equity market values (Barth et al., 2001). The literature examining this association dates back to the study of Miller and Modigliani (1966), and the first study to use the term of value relevance is Amir et al. (1993). As Barth et al. (2001) state, the purpose of value relevance studies is to provide evidence regarding the relevance and reliability of accounting numbers, which are reflected in equity market values or share prices. Thus, in the academic literature, value relevance is defined as the empirical operationalization of relevance and reliability, which are to be compared with the two fundamental characteristics of the IASB, relevance and faithful representation.

An accounting number will be value relevant when this number reflects information which is relevant to investors in order to value the entity, thus implying an accounting number is value relevant when it can make a difference in the decisions taken by the user (Barth et al., 2001). The different studies done on value relevance use different models to structure their tests, which most often use equity market value as their benchmark. Equity market value is perceived to reflect information used by investors. For this thesis, I examine the association between net income, comprehensive income and other comprehensive income with both equity market values and returns.

The first step to examine this association in this thesis is selecting a valuation model. The most commonly used model, is the model based on Ohlson (1995) and the adjustments made to the original model (i.e. Feltham and Ohlson, 1995; Ohlson, 1999). Firm value is presented by the Ohlson (1995) model as a linear function of book value of equity and the expected future abnormal earnings. Ohlson (1995) presents the following view: equity valuation can be performed accurately if book value of equity can be measured accurately and abnormal earnings can be predicted based on “clean surplus” accounting.³ The model of Ohlson (1995) assumes that capital markets are perfect, however this model allows for imperfect product markets for a restricted number of periods. The Ohlson (1995) model is not dependent on permanent earnings or assets values or liability values, which makes it possible to implement this model without requiring specifying a link between accounting numbers and economic constructs. This model received criticism from academics, whom argue that it does not include the possibility of economic rents (i.e. returns in excess of the cost of capital for a restricted number of periods). However, this claim is waived by Barth et al. (2001), stating that economic rents are viewed by the Ohlson (1995) model as being reflected in the persistence of abnormal earnings. Research on value relevance of accounting numbers only needs one assumption, share prices reflect investors' consensus beliefs. The literature on investors' consensus beliefs began with Ball and Brown (1968), who found that share prices are affected by the valuation implications of the information which is publicly available. Thus, the model presented by Ohlson (1995), with the assumption that investors' consensus beliefs is reflected in share prices is employed to research the usefulness of net income, comprehensive income and other comprehensive income to investors. Finally, value relevance studies do not need market efficiency (Barth et al., 2001).

³ Clean surplus accounting is defined by Ohlson (1995) as: $\text{Bookvalue}_{t-1} = \text{Bookvalue}_t + \text{Dividends}_t - \text{Earnings}_t$.

As they explain, research on value relevance does not assume true or unbiased measures of equity market values or true economic values of the firms' assets and liabilities or income.

The most common argument against comprehensive income and other comprehensive income is that these performance measures are transitory, thus, not useful to investors to perform accurate equity valuations and base their economic decisions on (Black, 2016). In this thesis, transitory earnings are based on the three attributes of Ohlson (1999). The research by Ohlson (1999) presents three attributes of transitory – non-recurring – performance measures, of which two must meet the requirement to be core earnings, and hence, not transitory. The following are the three attributes of Ohlson (1999): first, the accounting number is value relevant (price and return relevance), second, the accounting number must have the ability to predict itself (persistence) and third, the accounting number is relevant in forecasting cash flows from operations in the following period (forecasting ability). Therefore, if comprehensive income and other comprehensive income are not value relevant, or persistent and do not have forecasting ability, these are considered transitory and therefore not useful to investors to perform accurate equity valuations and base their economic decisions on. The following paragraphs further elaborate on the attributes of the concept, transitory.

2.3.1. Price relevance

Black (2016) defines price relevance as the relation between an accounting number (i.e. net income, comprehensive income and other comprehensive income) and a firms' equity market price. Value relevance studies examine the association between accounting numbers and equity market values, which can be done by examining share prices or changes in share prices. The distinction between using changes in share prices or stated actual prices, is that studies examining share price changes are interested in changes of the firms' value over a specific period of time, while the association with share prices determines what is actually reflected in a firms' value. This distinction is important to make, as changes in share prices is only used for timeliness studies, while the association with share prices is not. Thus, for this thesis the association with share prices will be used, as this association is not merely to measure the timeliness of accounting numbers.

2.3.2. Returns relevance

The definition of return relevance is the relation between a firms' accounting numbers (i.e. net income, comprehensive income and other comprehensive income) and that firms' equity market return (Black, 2016). Return relevance is used to investigate which performance measure of a

firm is reflected in its share returns (Dhaliwal et al., 1999). Research examining value relevance can also make a distinction between the association with returns or the changes in returns. Like the association between share prices or changes in share prices, I use returns instead of changes in returns, as I am not only interested in the timeliness of the different performance measures. However, the return models are also suitable for the timeliness of accounting numbers as examined by Easton (1999).

2.3.3. Persistence

In this thesis, I refer to predictability – the ability of an accounting number to predict itself – as persistence. Different performance measures have different levels of persistence. Persistence captures the different performance measure's sustainability over time (Barton et al., 2010) Performance measures with higher persistence are more likely to be viewed as desirable by investors, as these performance measures are recurring. Consistent with this view, different researches have shown that the information content of earnings components increased, when the persistence increased. Earnings components which tend to be more persistent (e.g. core earnings), than earnings components which are either transitory or have zero persistence (e.g. special items) are more value relevant (Brown and Shivakumar, 2003).

2.3.4. Forecasting ability

Other than having different levels of persistence, performance measures also differ in forecasting ability. Ohlson (1999) shows that current gains from a forward contract might not predict future gains, from this forward contract. However, this same forward contract might still be able to predict future earnings. Thus, the relation with comprehensive income and other comprehensive income is that, gains and losses from these earnings components might be able to predict future cash flows, as these gains and losses accumulate on the balance sheet for several years, prior to being realised (i.e. assets sold, liability settled or a pension plan funded). The Conceptual Framework (IASB, 2010), states that performance measures which predict future cash flows are more useful to investors and investors view these performance measures as more desirable.

2.4. Institutional setting

In this thesis, the International Financial Reporting Standards (IFRS) adopted by the European Union (EU), are the main standards of how the performance measures (i.e. income, comprehensive income and other comprehensive income) are presented. IFRS are issued by the International Accounting Standards Board (IASB) and were adopted by the EU in 2005, whom

required member states to apply these standards, in order to enhance comparability and understandability within financial reporting in its member states. In this section I discuss IFRS, IFRS in Europe and other IFRS requirements related to the different performance measures.

2.4.1. International Financial Reporting Standards

In this thesis IFRS, endorsed by the EU, are the main financial reporting standards. IFRS are issued by the International Accounting Standards Board (IASB), which assumed responsibilities from its predecessor in April 2001, the International Accounting Standards Committee (IASC). The IASC issued International Accounting Standards (IASs). In this thesis, all standards issued by the IASB or IASC are referred to as IFRS. All entities listed on the stock exchanges of European Member States were required to adopt IFRS for financial statements beginning on or after January 1, 2005. Whilst the majority of entities that were required to apply IFRS, did so when it became mandatory, some European countries permitted the adoption of IFRS before 2005 (Armstrong et al., 2010). IFRS developed and advanced compared to its adoption in 2005 in the EU. Nowadays, IFRS is a global financial reporting framework, that provides principle-based standards on how to prepare the firms' financial statements. The principle-based approach of IFRS have been both endorsed and opposed by academics and users of financial statements. On the one hand, those who agree with the principle-based approach argue that these standards grant managers more flexibility and greater discretion in preparing the financial statements, thus, enhancing the accountability, transparency and efficiency of the financial statements and the preparation of these financial statements. Those who oppose the principle-based standards, argue that these standards allow too much discretion to managers, thus, enhancing earnings management and accounting distortions in financial statements. Overall, IFRS as principle-based standards, are said to enhance the comparability and understandability of financial statements, and earnings management and accounting distortions also occur under a rules-based financial reporting standards (e.g. one of the most famous accounting scandal in the history of accounting, Enron, whom prepared its financial statements under US GAAP).

2.4.2. IFRS adoption in the EU

IFRS presented a major shift in financial reporting for many European firms, because these standards differentiate from the domestic standards which were required in member states. To become the main financial reporting standards of member states, IFRS had to be endorsed by the EU. The EU regulation that made IFRS a requirement for its member states, is EU regulation

1606/2002. This regulation requires all listed companies to prepare their (consolidated) financial statements, which will subsequently be published to the public, in accordance with IFRS, as endorsed by the EU, and explicitly state that these financial statements have been prepared in accordance with IFRS standards.

The adoption of IFRS by European entities introduced a substantial shift in financial reporting, especially the use of fair value measurements. The fair value measurements resulted in different accounting numbers, compared to the pre-adoption of IFRS. These differences were also reflected in the performance measurement statements. In this thesis, I discuss IAS 39 "*Financial Instruments*" and IAS 19 "*Employee Benefits*," as the standards which affected financial reporting and subsequently the financial statement performance measures. IAS 39 requires many financial instruments (e.g. derivatives) to be recognized at fair value and changes in fair value should be recorded in net income. The requirements of IAS 39 differed significantly from the previous (domestic) financial reporting standards, which were effective in each member state. This resulted in concerns from European financial institutions. They expressed their concern regarding the fact that the adoption of IFRS 39 would result in the reduction of the usefulness of an entity its financial statements. According to Armstrong et al. (2010), critics of IFRS argued that the adoption of IAS 39 would result in financial instability across Europe, as this would affect many financial institutions. IAS 19 required that all the expenses made for providing employee benefits to be recognised when these benefits were earned. For defined benefit plans IAS 19 offered two methods, first, the actuarial gains and losses had to be recognised immediately in the income statement (i.e. net income or other comprehensive income). Second, the actuarial gains could not be recognised immediately, but amortised (also referred to as the corridor approach). Whilst IAS 19 provided standards for employee benefits, domestic financial reporting standards did not offer specific rules or guidelines to account for employee benefits (Armstrong et al., 2010).

2.4.3. *Summary institutional setting*

IFRS – as a principle-based standard – grants managers great flexibility and discretion to prepare their (consolidated) financial statements, was adopted by (most) EU Member States in 2005 to enhance (consolidated) financial statements their comparability, transparency and capital markets' benefits (ICAEW, 2015). This discretion granted to managers can either be used to reflect the true underlying economic reality of an entity or to distort the financial statements. Overall, IFRS as a principle-based standard, are said to enhance the comparability

and understandability of financial statements. The adoption of IFRS was not only met with praise, but also critical comments from European financial institutions. One comment, which is important to this thesis is that the application of fair value measurement would decrease a financial statement its usefulness. This comment also refers to the presentation of gains and losses in net income or other comprehensive income. Thus, this makes my research interesting by researching the usefulness of the different performance measures – net income, comprehensive income and other comprehensive income.

3. Literature review

This chapter begins with the literature review of prior empirical research related to the usefulness of net income, comprehensive income and the components of other comprehensive income. I review the existing literature on these subjects, and present a summary of these studies and their conclusions (a summary of all main literature is presented in table 11 of appendix 1).

Reporting comprehensive income as a separate item in the financial statements was mandatory in the US for fiscal years beginning after December 15, 1997 (FASB, 1997). While this has been well implemented by the FASB, under the IASB standards this is a more recent phenomenon. The IASB standards required entities to present a comprehensive income statement for annual periods beginning on or after January 1, 2009. Ever since the FASB has required entities to report comprehensive income, this has been a subject of value relevance and other research. Value relevance research of accounting numbers is relevant to assess their usefulness, which highlights whether these accounting numbers reflect the information used by investors to reach their economic conclusions, which are based on said accounting numbers reported in the financial statements. Thus, according to the accounting literature, value relevance is a commonly used method to measure the usefulness and quality of financial statement information to investors (Barth et al., 2001; Brown et al., 1999; Chen et al., 2010).

Most of the academic research on comprehensive income and other comprehensive income related questions can be classified into four categories (Reed and Shane, 2012). The first category, is academic research which examines the relation between standard-setting issues (i.e. FASB and IASB) related to comprehensive income. The second category is related to the presentation of comprehensive income and other comprehensive income. The third category is related to the convergence of IFRS and US GAAP, which focuses on the identification of other

comprehensive components, the recycling of other comprehensive income components and other differences and issues in the convergence of the financial reporting standards. The fourth category, which is related to this thesis, is the usefulness of comprehensive income and other comprehensive income to investors.

3.1.1. Usefulness of income and comprehensive income

One of the first studies that examined the usefulness of (other) comprehensive and its components was by Dhaliwal et al. (1999). The first question Dhaliwal et al. (1999) answered is whether earnings – in this thesis referred to as net income – or comprehensive income has greater explanatory power for annual share returns and share prices. The second question Dhaliwal et al. (1999) answered is, which performance measure (i.e. net income or comprehensive income) has a greater predictive ability for future income and future cash flows. The study by Dhaliwal et al. (1999) was done immediately after the implementation of SFAS 130 in 1997, thus the authors used existing financial data prior to the implementation and constructed “as-if reported” numbers for comprehensive income. The findings indicate that net income is a better measure of firm performance than comprehensive income. Net income has a higher association with share prices and returns and has greater explanatory power of future earnings and cash flows, compared to comprehensive income. The conclusions of Dhaliwal et al. (1999) have been confirmed by more recent studies by Barton et al. (2010) and Pronobis and Zulch (2010). Chambers et al. (2007) examine the value relevance of (other) comprehensive income and its components using actual as-reported numbers and as-if calculated numbers. The main idea behind this reasoning is that the as-if reported numbers might have introduced measurement errors in the regression models used in previous research (i.e. Dhaliwal et al., 1999). The results of Chambers et al. (2007) indicate that other comprehensive income is not value relevant in both the pre-and post-SFAS 130 period when as-if reported numbers are used, while its positively priced when actual reported numbers are used. This result can be attributed to the increased transparency of other comprehensive income disclosures since its implementation in 1997. Thus, proving that the research design of Dhaliwal et al. (1999) and other papers using as-if numbers might have caused different conclusions. Barton et al. (2010) uses data from 46 countries to measure value relevance of eight performance measures (including net income and comprehensive income). Barton et al. (2010) find that performance measures which are in the middle of the financial statements (i.e. operating income, earnings before interest, taxes, depreciation and amortization, EBITDA) have higher value relevance than performance measures lower in the financial statements (i.e. comprehensive income).

Thus, the findings indicate that comprehensive income is one of the least value relevant performance measure. Pronobis and Zulch (2010) examine the predictive ability of comprehensive income compared to net income in a homogeneous institutional setting of German IFRS firms and find that net income has greater predictive power of future firm operating performance compared to comprehensive income. Goncharov and Hodgson (2011) research whether aggregated realised or unrealised income (comprehensive income) influences the decision usefulness by assessing the information, valuation and prediction content of investors. The findings indicate that net income and comprehensive income are positively associated with price changes and that aggregated comprehensive income does not improve the measurement association of net income.

3.1.2. Usefulness of other comprehensive income its components

Most of prior research have studied the individual components of other comprehensive income, under US GAAP, which consisted of the following components: first, “foreign currency translation changes”, second, “gains or losses on derivative instruments that are designated as cash flow hedges,” third, “unrealized holding gains from available-for-sale securities” and fourth, “certain components of pensions and post-employment benefits (i.e., gains or losses not recognized in net income, prior service costs, and transition costs not recognized in earnings).” A study of individual components of other comprehensive income, before the implementation of SFAS 130, was by Soo and Soo (1994). They examined the valuation effect of foreign currency reported in equity (after SFAS 130, this had to be included in other comprehensive income) and found that the market uses foreign currency translation changes in reaching their economic decisions, however, the valuation effect of foreign currency translation changes is much smaller than other components reported in net income. Another study that finds that foreign currency translation changes are value relevant is by Bartov (1997). However, a study by Louis (2003) indicates that a negative change in a firms' value is associated with a positive change in foreign currency translation changes. Louis (2003) uses a sample of manufacturing firms, to illustrate that a negative foreign currency translation change is caused when the local or foreign currency depreciates in value. Thus, this indicates that an entity its operating environment is an important factor for the value relevance of foreign currency translation changes. Furthermore, these results indicate the importance of disaggregation of other comprehensive income.

A study by Barth et al. (1995) examined the value relevance of one of the components of other comprehensive income (i.e. fair value of financial instruments) for a sample of US banks, prior to the implementation of SFAS 130. The findings by Barth et al. (1995) indicate that the bank share prices are associated with the disclosure of fair values of securities, loans and other long-term debt. The findings of this research indicate that “unrealized holding gains from available-for-sale securities” (as referred to in SFAS 130) and fair values of financial instruments are valued, and hence useful to the market. Another study that examined the usefulness of individual comprehensive income components is by Dhaliwal et al. (1999). The findings of Dhaliwal et al. (1999) support those of Barth et al. (1995), gains or losses on marketable securities are useful, however, this component of other comprehensive income is only useful for the financial services industry. The other two components of other comprehensive income, foreign currency translation changes and “adjustments to minimum pension liability in excess of unrecognized prior service costs⁴,” examined by Dhaliwal et al. (1999), were not useful to investors. O’Hanlon and Pope (1999) use a sample of firms in the United Kingdom (UK) reporting under UK GAAP, and examine the value relevance of different earnings components (i.e. extraordinary items, foreign currency translation changes and revaluations). The findings indicate that only extra ordinary items are value relevant, if measured over multiple years, and the other income components are not considered value relevant.

3.1.3. Price relevance

Value relevance studies examine the usefulness of accounting information by assessing the association between accounting numbers and share returns and prices. A higher explanatory power of accounting information for share prices and returns, indicates more usefulness of that accounting information to investors. Almost all papers mentioned in this literature review assessed the price and return relevance of net income and comprehensive income. Dhaliwal et al. (1999) find that net income has a higher association with share prices than does comprehensive income. Cahan et al. (2000) assessed the price relevance of individual other comprehensive components in New Zealand and find that only fixed asset revaluation changes are associated with share returns. Kanagaretnam et al. (2009) assess the association of other comprehensive income components and find that unrealised gains and losses on available-for-sale securities are significantly associated with the entity its share prices. Goncharov and Hodgson (2011) also

⁴ As referred to in the research paper of Dhaliwal et al. (1999), derived from SFAS 130. In IFRS “*adjustments to minimum pension liability in excess of unrecognized prior service costs*” is part of IAS 19 – “*Employee Benefits*.”

assess the association of individual other comprehensive income components and find that both comprehensive income and other comprehensive income are price relevant, however net income is found to be more relevant. The components of other comprehensive income (i.e. revaluation reserve changes, unrealised gains and losses on available-for-sale securities and changes in foreign currency translation) are significantly associated with share prices, however, when the authors controlled for net income, the components were significantly less value relevant. Goncharov and Hodgson (2011) also find that changes in revaluation reserve, foreign currency translation changes are not only relevant to investors, but also to analysts, when assessing their share price targets.

3.1.4. Returns relevance

The same value relevance studies examining the usefulness of accounting information by assessing the association between accounting numbers and share prices also examine the association with share returns. Dhaliwal et al. (1999) find that the association of share returns and comprehensive income is stronger than the association between net income and share returns. One component of other comprehensive income in particular – unrealised gains and losses on available-for-sale securities – explains the stronger association of comprehensive income and share returns. This association is driven by financial institutions, however, the authors conclude that the association between comprehensive income and share returns is also stronger for non-financial firms, and that this could be due to the magnitude of other comprehensive income. Thus, the results of Dhaliwal et al. (1999) indicate that the environment and the business model of the entity should be considered as an important factor, when assessing which performance measure is useful to investors. O'Hanlon and Pope (1999), who assessed the association of other comprehensive income and stock returns for a sample of firms in the UK, find that other comprehensive income components are significantly associated with share returns. Kanagaretnam et al. (2009), find that comprehensive income has a stronger association with share returns compared to the association of net income and share prices. Kanagaretnam et al. (2009) also assess the association of other comprehensive income components, and find that unrealised gains and losses on available-for-sale securities are significantly associated with share returns. Barton et al. (2010) find that comprehensive income has the strongest association with share returns, out of eight different performance measures. Jones and Smith (2011) their findings indicate that special items have a stronger association with share returns compared to comprehensive income components. And finally, Goncharov and Hodgson (2011) also tested

the association of other comprehensive income components and the findings indicate that only unrealised gains and losses on available-for-sale securities are return relevant.

3.1.5. Persistence

Persistence of performance measures – comprehensive income and other comprehensive components – has significant implications for an entity's firm value (Kormendi and Lipe, 1987). The valuation models of Ohlson (1995, 1999) suggest that a financial reporting statement that emphasizes the importance of persistence is useful to investors. Jones and Smith (2011) indicate that special items are not persistent (i.e. zero persistence), while other comprehensive income is negatively persistent. Barton et al. (2010) find that comprehensive income is the least persistent performance measure, and while net income is more persistent, above the line items (e.g. revenues) are most persistent.

3.1.6. Forecasting ability

Dhaliwal et al. (1999) find empirical evidence that net income is a better predictor of next years' cash flow from operations and income, compared to comprehensive income. The first part of this conclusion is supported by the findings in the study of Kanagaretnam et al. (2009), who find that net income is a significantly better predictor of future income, compared to comprehensive income. The second part of the conclusion is not supported by the findings of Kanagaretnam et al. (2009), who find that comprehensive income is a better predictor of future cash flow from operations, contradicting the findings of Dhaliwal et al. (1999). Kanagaretnam et al. (2009) also find that unrealized holding gains from available-for-sale securities is the most significant component of other comprehensive income in forecasting future cash flow from operations. Barton et al. (2010), who empirically tested the forecasting ability of eight performance measures, find that comprehensive income has the least predictive power to forecast future cash flow from operations. The findings of Barton et al. (2010) are consistent with those of Dhaliwal et al. (1999). Jones and Smith (2011) examine the forecasting ability of special items and other comprehensive income and find that special items have a greater forecasting ability than other comprehensive income. Goncharov and Hodgson (2011) test the forecasting ability of comprehensive income and net income, and find that comprehensive income has a lower forecasting ability for cash flow from operations.

3.1.7. Summary literature review

This chapter presents an overview of relevant streams of literature. The most important literature streams for this thesis are Ohlson (1995,1999), which presents the models to research

the valuation of share prices and share returns using the book value and earnings based on clean surplus accounting. Dhaliwal et al. (1999) is one of the first research papers to test the relevance of comprehensive income compared to net income, using price and return models. In addition to the literature review, a summary of relevant papers is presented in table 11 of appendix 1. From the literature review the following conclusion is drawn: the usefulness of comprehensive income and other comprehensive income, assessed through value relevance, indicated that on average net income is more useful to investors, compared to comprehensive income and in some instances comprehensive income is not found to be useful to investors. The findings on individual components of other comprehensive income indicate that unrealised gains and losses on available-for-sale securities and foreign currency translation changes are in most instances value relevant. Thus, the existing literature presents mixed results, which makes the results of this thesis more interesting and relevant.

4. Hypothesis development

Most of previous academic research has examined the relevance of net income, comprehensive income and other comprehensive income in the US (i.e. US GAAP), with different results, which might have been caused by the sample years, econometric models or business sectors used. Thus, it is relevant to distinguish the different studies from each other. The common factor between the research mentioned in the literature review is, the relevance of these performance measures. In all previously mentioned research the term value relevance refers to the association between accounting amounts and economic value of an entity, reflected in its share market prices and returns. Thus, as Black (2016) defines accounting numbers as value relevant – when accounting numbers are associated with stock prices and returns – value relevance studies assess how well these accounting numbers then reflect the information that is useful to investors.

From the literature review it has been concluded that the different studies contradict each other. While Dhaliwal et al. (1999) find that net income is more value relevant, when considering all business sectors, and that comprehensive income has more value relevance for entities in the financial industries, Chambers et al. (2007) indicate that other comprehensive income is not value relevant in both the pre-and post-SFAS 130 period when as-if reported numbers are used, while its positively priced when actual reported numbers are used. Thus, proving that the research design of Dhaliwal et al. (1999) and other papers using as-if numbers might have

caused the different conclusions. Goncharov and Hodgson (2011) find that net income has more explanatory power compared to comprehensive income. Thus, these inconsistent results of prior academic research make it interesting to formulate a hypothesis about the higher value relevance of the performance measures – net income or comprehensive income. Ohlson (1999) shows that core earnings are valued more, whereas transitory earnings only affect a firm's value. Comprehensive income contains more transitory income components, therefore the association between comprehensive income and share prices and returns is reflected in the earnings response coefficient, which should be lower than the association between net income and share prices and returns (Kothari & Zimmerman, 1995). This is also confirmed by Chambers et al. (2007), who state that other comprehensive income and its components are transitory in nature, which are gains and losses that arise from a random walk. Thus, this leads to the first hypothesis:

H1: Net income is more value relevant to investors than comprehensive income.

The first hypothesis is stated in its alternative form. The corresponding null hypothesis is that, net income is not more value relevant to investors than comprehensive income.

While the conclusions of previous researches regarding the value relevance between net income and comprehensive income have been inconsistent, the conclusions regarding other comprehensive income and its association with share returns and prices have been even more contradicting. The first component of other comprehensive income that contributes to these contradicting conclusions, is unrealised gains and losses on available-for-sale securities. The first study that concluded that unrealised gains and losses on available-for-sale securities is (incrementally) value relevant is by Dhaliwal et al. (1999). While subsequent studies by Chambers et al. (2007) and Kanagaretnam et al. (2009) all confirm the conclusions of Dhaliwal et al. (1999), other studies by Mitra and Hossain (2009) provide evidence that unrealised gains and losses on available-for-sale securities are not value relevant. Goncharov and Hodgson (2011) show that this component of other comprehensive income is only value relevant, when using the return model. The second component of other comprehensive income that contributes to contradicting conclusions in the empirical research, is foreign currency translation changes. Dhaliwal et al. (1999), O' Hanlon and Pope (1999), and Goncharov and Hodgson (2011) all conclude that foreign currency translation changes is not value relevant, while Chambers et al. (2007) and Mitra and Hossain (2009) find opposing empirical evidence and conclude that foreign currency translation changes do have (incremental) value. The other components of comprehensive income that yield different conclusions regarding (incremental) value relevance

are, adjustments to additional minimum pension liability in excess of unrecognized prior service cost and fixed asset revaluation changes. While Dhaliwal et al. (1999) concludes that adjustments to additional minimum pension liability in excess of unrecognized prior service cost has no (incremental) value, Mitra and Hossain (2009) find evidence that this component of other comprehensive income does have incremental value. The other component of comprehensive income, fixed asset revaluation changes, is not considered value relevant by any of earlier mentioned papers, while Cahan et al. (2000), who assessed the price relevance of individual other comprehensive income components in New Zealand, finds that only fixed asset revaluation changes are associated with share returns, thus, is considered to be (incrementally) value relevant. The contradictory evidence in the existing literature regarding (incremental) value relevance, indicates that other comprehensive income can be value relevant, but is less value relevant than net income. This leads to the second hypothesis of this thesis:

H2: Other comprehensive income is incrementally value relevant to investors, however, its regression coefficient is less significant than net income.

The second hypothesis is also stated in its alternative form, the corresponding null hypothesis is that, other comprehensive income is not incrementally value relevant to investors and its regression coefficient is not significant.

5. Research design

In this chapter, the methodology of this thesis is presented, including the Libby Boxes which show how the conceptual relation will be operationalized. The first paragraph describes the research design, the independent variables, the dependent variables and the control variables. The second paragraph illustrates the data and sample collection process.

5.1. Methodology

The main objective of this thesis is to examine the usefulness of the different performance measures – net income and (other) comprehensive income – to investors, in reaching their economic decisions. This is mainly done by assessing the value relevance of these performance measures. A performance measure will be value relevant when this number reflects information, which is relevant to investors in order to value the entity, thus, implying this performance

measure is useful to investors when it can make a difference in the decisions taken by that user (Barth et al., 2001).

To examine the decision usefulness of the performance measures, I will assess the value relevance of these performance measures – hypothesis 1 – and the incremental value relevance of other comprehensive income – hypothesis 2. Furthermore, I will perform two additional tests, which are part of the Ohlson (1999) model, persistence and forecasting ability of the performance measures. The control variables for the return and price models include, firm size and growth potential, following Biddle and Choi (2006), who introduced these control variables as a robustness check. The control variables which include firm size, is the natural logarithm of the firms’ previous years’ ending value of market equity and growth potential, which is the previous years’ ending book-to-market ratio⁵. The operationalization of this relation can be illustrated by the following Libby Boxes:

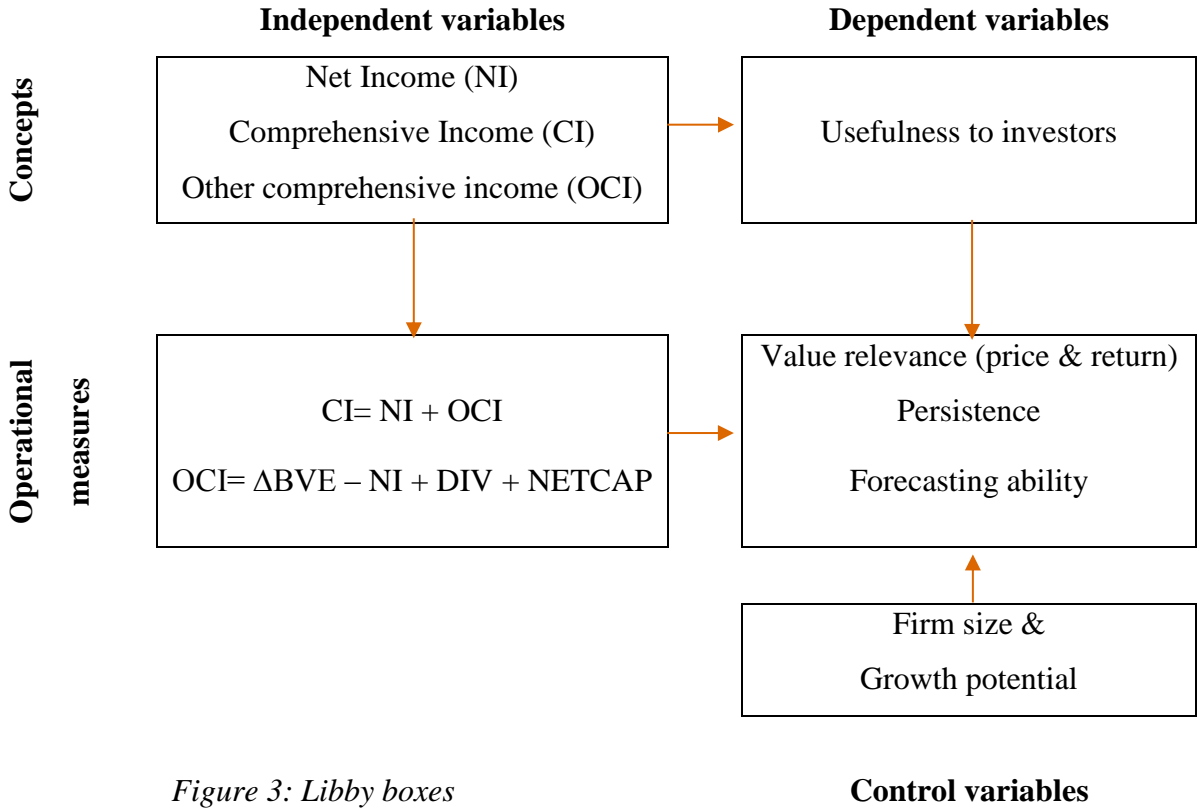


Figure 3: Libby boxes

⁵ While most of previous research papers do not include control variables in the main analysis, but introduce these as robustness checks, these control variables (i.e. firm size and growth potential) have been included in the main analysis of this thesis, to isolate the coefficients of interest – the performance measures –, and to enable a more reliable interpretation of the association with share prices and returns.

Value relevance studies determine the association of share prices and share returns with net income or comprehensive income, to determine which is more useful to investors. These studies measure which performance measure has the highest R^2 , and is assumed to be the most value relevant performance measure. To determine the value relevance, using return models (i.e. models 1 and 3) of the performance measures, the dependent variable is raw returns, which are derived from a market model with the independent variable, raw earnings. The research design for price relevance (i.e. models 2 and 4) follow the well-known theoretical models of Ohlson (1995). These models express the investor's firm value as a function of a firm's book value and abnormal or residual earnings. Following Dhaliwal et al. (1999), Easton et al. (1992) and more recently Goncharov and Hodgson (2011) the following models are constructed to evaluate hypothesis 1:

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{NI_{jt}}{P_{jt-1}} + \alpha_2 Size_{jt-1} + \alpha_3 Btm_{jt-1} + \varepsilon_{jt} \quad (1)$$

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{NI_{jt}}{P_{jt-1}} + \beta_2 \frac{BVE_{jt}}{P_{jt-1}} + \beta_3 Size_{jt-1} + \beta_4 Btm_{jt-1} + \varepsilon_{jt} \quad (2)$$

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{CI_{jt}}{P_{jt-1}} + \alpha_2 Size_{jt-1} + \alpha_3 Btm_{jt-1} + \varepsilon_{jt} \quad (3)$$

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{CI_{jt}}{P_{jt-1}} + \beta_2 \frac{BVE_{jt}}{P_{jt-1}} + \beta_3 Size_{jt-1} + \beta_4 Btm_{jt-1} + \varepsilon_{jt}, \quad (4)$$

where RET_{jt} equals share returns – inclusive of dividends – for the year ended t , at the balance sheet date for firm j . P_{jt} equals price per-share at the end of year t . For the models used to test hypothesis 1, a higher R^2 means that that model has a higher value relevance. Thus, comparing the R^2 of the first two models which include NI_{jt} (net income for year t under IFRS after extraordinary items and discontinued operations) and BVE_{jt} (book value of common equity per share at the end of year t deflated by the number of shares outstanding) with the second two models (i.e. models 3 and 4), which replace NI_{jt} with CI_{jt} (comprehensive income for the period) enables me to conclude whether net income has more explanatory power than comprehensive income. Following previous literature, net income and comprehensive income are measured on a per-share basis and scaled by lagged price per share (P_{jt-1}).

Share returns (RET_{jt}), which equals share returns – inclusive of dividends – for the year ended at the balance sheet date for firm j , will be calculated as follows:

$$RET_{jt} = (P_1 + D - P_0)/P_1,$$

where P_1 is the price per-share at the end of the period, D , is dividends per-share, paid by the entity during the period and P_0 is the price per-share at the beginning of the period.

To test the second hypothesis, I evaluate the incremental value relevance of other comprehensive income. After downloading the data of other comprehensive income and comparing this to actual reported financial statements, I noticed that these amounts were not correct. Therefore, I use the following proxy, created by previous researchers (i.e. Goncharov and Hodgson, 2011) to determine other comprehensive income:

$$OCI_{jt} = BVE_{jt} - BVE_{jt-1} - NI_{jt} + DIV_{jt} + NETCAP_{jt},$$

where OCI_{jt} is equal to other comprehensive income for the period, $BVE_{jt} - BVE_{jt-1}$ equals change in book value of equity, NI_{jt} is equal to net income for the year t under IFRS after extraordinary items and discontinued operations, DIV_{jt} is dividend paid to common shareholders and $NETCAP_{jt}$ equals net capital contributions. To determine whether other comprehensive income has incremental value, I test (1) whether the models that include other comprehensive income have a higher or a lower association with share returns and share prices, by comparing the R^2 of these models with models 1 and 2, the models without other comprehensive income. And (2), by using an F -test to determine if the increase in R^2 is because of the variable other comprehensive income. Using the models of hypothesis 1, variables are added for other comprehensive income. Following Dhaliwal et al. (1999), and more recently Goncharov and Hodgson (2011) the following models are constructed to evaluate hypothesis 2:

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{NI_{jt}}{P_{jt-1}} + \alpha_2 \frac{OCI_{jt}}{P_{jt-1}} + \alpha_3 Size_{jt-1} + \alpha_4 Btm_{jt-1} + \varepsilon_{jt} \quad (5)$$

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{NI_{jt}}{P_{jt-1}} + \beta_2 \frac{OCI_{jt}}{P_{jt-1}} + \beta_3 \frac{BVE_{jt}}{P_{jt-1}} + \beta_4 Size_{jt-1} + \beta_5 Btm_{jt-1} + \varepsilon_{jt} \quad (6)$$

Using both the price and return models to test the incremental value relevance of other comprehensive income – OCI_{jt} – a positive coefficient for OCI in models 5 and 6 indicate that

other comprehensive income has incremental value relevance. As mentioned, other than a positive regression coefficient for OCI, I assess the incremental value relevance of OCI by comparing the R^2 of models 5 and 6, with models 1 and 2, by performing an F -test to verify if the inclusion of OCI is statistically significant. All other variables are as defined earlier in previous models.

5.2. Additional tests

This thesis is based on the three properties of transitory earnings by Ohlson (1999), which include value relevance, persistence and forecasting ability. The main analyses of this thesis are about value relevance (i.e. hypothesis 1 and 2). By performing additional tests, I will also assess the persistence and forecasting ability of comprehensive income and other comprehensive income. As these tests do not rely on market prices, these will therefore also provide a robustness check for the previous value relevance models.

The second property of Ohlson (1999) is persistence. Persistence is a construct which captures in part the performance measure's sustainability over time (Barton et al., 2010). I follow Francis et al. (2004) and more recently Barton et al. (2010) to measure the different performance measure's persistence with the following regression model:

$$\begin{aligned} &(\text{Performance measure } [NI; CI; OCI])_{jt+1} \\ &= \alpha_0 + \alpha_1(\text{Performance measure } [NI; CI; OCI])_{jt} + \varepsilon_{jt} \end{aligned} \quad (7)$$

where performance measure is either next years' net income (NI_{jt+1}), comprehensive income (CI_{jt+1}) or other comprehensive income (OCI_{jt+1}), regressed on net income for the year (NI_{jt}), comprehensive income (CI_{jt}) for the year or other comprehensive income for the year (OCI_{jt}), respectively. Values of α_1 close to 1 indicate a highly persistent financial performance measure, while values close to 0 indicate a highly transitory financial performance measure. As other comprehensive income is considered to be transitory, I expect it to be the least persistent performance measure, followed by comprehensive income, as this includes other comprehensive income. Finally, net income is predicted have the highest α_1 close to 1, as core earnings are expected to be more persistent than non-core earnings (Brown and Sivakumar, 2003).

The third property of Ohlson's (1999) model is forecasting ability. To test the forecasting ability of the performance measures, I follow Dhaliwal et al. (1999) and apply the following regressions to examine the forecasting ability of the different income measures:

$$CASH\ FLOW_{jt} = \alpha_{01} + \alpha_1 NI_{jt-1} + \varepsilon_{jt} \quad (8a)$$

$$CASH\ FLOW_{jt} = \alpha_{02} + \alpha_2 CI_{jt-1} + \varepsilon_{jt} \quad (8b)$$

$$CASH\ FLOW_{jt} = \alpha_{03} + \alpha_3 NI_{jt-1} + \alpha_4 OCI_{jt-1} + \varepsilon_{jt} \quad (8c)$$

where $CASH\ FLOW_{jt}$ equals cash flow from operations as reported in the cash flow statements for the year t . If model 8b has a significantly higher regression R^2 , that means that previous periods' comprehensive income (CI_{jt-1}) is a better predictor of future cash flows from operations, compared to previous periods' net income (NI_{jt-1}). The IASB (2008) states that an entity should disaggregate income and expenses by function in the comprehensive income statement, to increase the usefulness of the information in predicting the entity's future cash flows. Thus, model 8c, which includes previous periods' net income and other comprehensive income OCI_{jt-1} , is expected to have the highest association with future cash flows from operations. All variables have been scaled by average total assets, following Sloan (1996).

The definitions of the variables of models 1 to 8c are summarised and explained in table 2.

Table 2: Description of variables

Variable	Explanation
RET_{jt}	Share returns – inclusive of dividends – for the year ended at the balance sheet date for firm <i>j</i> .
NI_{jt}	Net income for year <i>t</i> under IFRS after extraordinary items and discontinued operations, measured on a per-share basis.
OCI_{jt}	Total other comprehensive income for year <i>t</i> under IFRS, measured on a per-share basis.
CI_{jt}	Total comprehensive income for the year <i>t</i> under IFRS, measured on a per-share basis.
P_{jt}	Price per-share at the end of year <i>t</i> for firm <i>j</i> .
P_{jt-1}	Price per-share at the beginning of the year <i>t</i> for firm <i>j</i> .
BVE_{jt}	Book value of common equity per-share at the end of year <i>t</i> deflated by the number of outstanding shares.
CASH FLOW_{jt}	Cash flow from operations as reported in the cash flow statements for year <i>t</i> , scaled by average total assets.
Performance measure_{jt}	Performance measure is either net income, comprehensive income or other comprehensive income of year <i>t</i> for firm <i>j</i> .
Size_{jt-1}	Natural logarithm of firm <i>j</i> , previous years' <i>t</i> ending value of market equity.
Btm_{jt-1}	Growth potential, which is the previous years' <i>t</i> ending book-to-market ratio.

The data to calculate the above listed variables is obtained from the databases: Datastream and Worldscope. All variables are defined and calculated in a similar manner as those used in Dhaliwal et al. (1999), Biddle and Choi (2006), and Goncharov and Hodgson (2011).

5.3. Sample and data collection

The sample selection process begins by determining European listed companies in Datastream. European companies headquartered in European countries that are part of the EU are required to prepare their (consolidated) financial statements in accordance with IFRS, since 2005. As mentioned, these companies must comply with IFRS starting on or after January 1, 2005,

therefore, the sample period starts from 2005 until 2016 for companies with only complete fiscal year data. Accounting data of these European listed firms is obtained from the Worldscope database. The sample consist of the following 21 European countries⁶: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden and United Kingdom⁷. Countries that are not part of the EU are excluded from the sample as well as countries becoming part of the EU after 2005, as data from these firms might distort the sample⁸.

	Number of observations
Data from selected EU countries	71.281
Firm observations removed with missing data	<u>-3.252</u>
Complete data from EU countries	68.029
Elimination	
Missing data for hypothesis 1	-21.199
1 st and 99 th percentile	<u>-7.053</u>
Final sample	39.777

Data missing for hypothesis 1 includes net income, comprehensive income and ending share price missing or equal to zero and furthermore, market value of equity missing or equal to zero. A total of 21.199 observations are dropped due to missing data for the first hypothesis and finally, duplicates are also dropped. All data is available to test the second hypothesis, as the variable added is other comprehensive income, which is calculated with the data available for hypothesis 1. Observations of the main test variables in the 1st and 99th percentiles are dropped to control for outliers, which amounts to 7.053 observations dropped. Overall, the final sample to test the main regressions consists of 39.777 firm-year observations.

⁶ European Union: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.

⁷ United Kingdom consists of England and Ireland.

⁸ Countries that joined the EU after 2005: Bulgaria, Croatia and Romania.

All firm-year observations per country are summarized in table 3. Malta, Slovakia and Slovenia are not selected as the data in Datastream contains too many errors. The final sample consist of the 21 European countries described in table 3⁹.

Table 3: Number of observations per country

Country	n	Country	n	Country	n
Austria	663	France	5.271	Netherlands	817
Belgium	1.054	Germany	4.986	Norway	1.387
Cyprus	395	Greece	1.427	Poland	3.091
Czech Republic	170	Italy	2.520	Portugal	386
Denmark	1.237	Latvia	94	Spain	1.277
Estonia	131	Lithuania	182	Sweden	3.525
Finland	1.224	Luxembourg	114	United Kingdom	9.826

The number of firm-year observations per country are not equally divided, however with Latvia being the only country, all firm-year observations are above 100 per country. The United Kingdom, which includes Ireland, has the highest number of observations with 9.826 firm-year observations.

Table 4 describes the items in Worldscope and Datastream, which are collected as part of the data collection process. All other variables not mentioned in table 4 as items extracted from Datastream and Worldscope, are calculated in this thesis, based on the data collected.

⁹ All national currencies are translated to Euros based on the period-end exchange rate, which is readily available in Datastream and Worldscope.

Table 4: Datastream and Worldscope items

Item	Description
WC03501	Book value of equity at the end of the year
WC01751	Net income available to common shareholders
WC04551	Dividends paid to common shareholders
WC04751	Common shares repurchased by the entity
WC04251	Sale of common shares
P	Closing price of shares
WC05301	Common shares outstanding
WC04860	Cash flow from operations
WC02999	Total assets

6. Empirical results

In this chapter, the descriptive statistics of the main variables of interest are firstly presented. Hereafter, the mean and median are discussed. Then, the results of the Spearman correlation between the variables are analysed and discussed, which includes analysing and discussing the sign and coefficients of interest. In the second paragraph of this chapter the main regression results are presented and conclusions are drawn with regards to the hypotheses.

6.1. Descriptive statistics

The descriptive statistics are presented in table 5. The overall sample consists of 39.977 (n= 39.977) firm-year observations. The variables included in table 5 are all winsorized at the 1st and 99th percentile to control for outliers. Variables P, NI, CI, OCI and BVE are measured on a per-share basis and scaled by lagged price per share to mitigate the scale effect (Brown et al., 1999).

The mean (median) of this thesis is mainly compared to those of European studies (i.e. Goncharov and Hodgson, 2010 and Mechelli and Cimini, 2014) to make comparability more reliable and representative. The mean (median) of returns (RET) is 0.062 (0.032) which is significantly lower than the mean (median) of 0.1150 (0.0499) of Goncharov and Hodgson (2011), but in range with Mechelli and Cimini (2014) who had a mean of 0.05 for returns. Share price (P) has a mean (median) of 1.037 (1.003), which is in the range of previous studies. Net income (NI) has a mean (median) of 0.016 (0.050), which can be explained by negative earnings in the sample size. The mean of net income of previous European studies is also around 0.02.

The other important variable in this thesis is other comprehensive income (OCI), which is calculated based on reported accounting data. The mean (median) of OCI is around 0.047 (0.002), if this differs significantly from previous (European) studies, it might mean that the proxy used to calculate OCI in this thesis contains some flaws. Goncharov and Hodgson (2011) report a mean (median) of 0.0313 (0), while Mechelli and Cimini (2014) report a mean (median) of 0.08 (0.000). Thus, with a mean (median) of 0.047 (0.002), this thesis is in the same range with previous studies. The final variable of interest is comprehensive income, with a mean (median) of 0.063 (0.058), which is also in line with mentioned previous studies.

Thus, the descriptive statistics are comparable to previous European studies and when these are compared to studies performed in the US (i.e. Dhaliwal et al., 1999) the descriptive statistics are in line with these studies.

Table 6 presents the Spearman correlation of the main variables, in which the significant coefficients are starred. From the correlation matrix can be seen that all the independent variables are significantly correlated with the dependent variables, significant at the one percent level. Net income (NI) is positively correlated with both, returns (RET) and share prices (P). Only net income is negatively correlated with other comprehensive income (OCI). Consistently, comprehensive income, which is the total of OCI and NI, is positively correlated with NI. The correlation between both dependent variables, RET and P and the different performance measures NI, CI and OCI, decreases respectively, which might indicate the relative importance of these performance measures. This is consistent with the predictions made in this thesis, which will be the focus of the following paragraph, empirical results.

Table 5: Descriptive statistics

<u>Variables</u>	<u>n</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>First Quartile</u>	<u>Median</u>	<u>Third Quartile</u>
<i>RET</i>	39.777	0.062	0.424	-0.220	0.032	0.293
<i>P</i>	39.777	1.037	0.419	0.760	1.003	1.264
<i>NI</i>	39.777	0.016	0.170	-0.011	0.050	0.089
<i>CI</i>	39.777	0.063	0.215	-0.006	0.058	0.131
<i>OCI</i>	39.777	0.047	0.167	-0.018	0.002	0.050
<i>BVE</i>	39.777	0.823	0.637	0.367	0.659	1.100
<i>Size</i>	39.777	11.938	2.329	10.177	11.652	13.586
<i>Btm</i>	39.777	0.829	0.656	0.357	0.651	1.108

Table 5 presents the descriptive statistics of the sample, which consists of 21 European countries from 2005 until 2016. The descriptive statistics include: the number of observations, the mean, the standard deviation, the percentiles and the median of the variables included in the main regression models and winsorized at the 1st and 99th percentile.

All variables are measured on a per-share basis and variables P, NI, CI, OCI, BVE are scaled by lagged price per share (P_{jt-1}). The variables are defined as follows:

- RET: share returns – inclusive of dividends – over a one year period at the end of the reporting year
- P: price per share at the end of the reporting year
- NI: net income available to common shareholders
- CI: comprehensive income (measured as $CI = OCI + NI$)
- OCI: other comprehensive income (measured as $OCI_{jt} = BVE_{jt} - BVE_{jt-1} - NI_{jt} + DIV_{jt} + NETCAP_{jt}$)
- BVE: book value of equity
- Size: natural logarithm of previous year ending value of market equity
- Btm: previous year ending book-to-market ratio

Table 6: Spearman correlation

	<u>RET</u>	<u>P</u>	<u>NI</u>	<u>CI</u>	<u>OCI</u>	<u>BVE</u>
<i>RET</i>	1.000					
<i>P</i>	0.994***	1.000				
<i>NI</i>	0.400***	0.381***	1.000			
<i>CI</i>	0.338***	0.331***	0.575***	1.000		
<i>OCI</i>	0.086***	0.093***	-0.155***	0.569***	1.000	
<i>BVE</i>	0.189***	0.186***	0.221***	0.171***	0.040***	1.000

Table 6 presents the Spearman correlation of the variables of interest included in the regression models. All variables are measured on a per-share basis and variables P, NI, CI, OCI, BVE are scaled by lagged price per share (P_{jt-1}). The variables are defined as follows:

RET: share returns – inclusive of dividends – over a one year period at the end of the reporting year

P: price per share at the end of the reporting year

NI: net income available to common shareholders

CI: comprehensive income (measured as $CI = OCI + NI$)

OCI: other comprehensive income (measured as $OCI_{jt} = BVE_{jt} - BVE_{jt-1} - NI_{jt} + DIV_{jt} + NETCAP_{jt}$)

BVE: book value of equity

Size: natural logarithm of previous year ending value of market equity

Btm: previous year ending book-to-market ratio

*** Indicates statistical significance at the 1% level, two-tailed.

6.2. Empirical results

The first hypothesis states that net income is more value relevant to investors than comprehensive income, across Europe. The exact hypothesis is as follows:

H1: Net income is more value relevant to investors than comprehensive income.

To test the first hypothesis the following two return models were developed, which are based on previous literature, such as Dhaliwal et al. (1999) and Goncharov and Hodgson (2011):

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{NI_{jt}}{P_{jt-1}} + \alpha_2 Size_{jt-1} + \alpha_3 Btm_{jt-1} + \varepsilon_{jt} \quad (1)$$

and;

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{CI_{jt}}{P_{jt-1}} + \alpha_2 Size_{jt-1} + \alpha_3 Btm_{jt-1} + \varepsilon_{jt} \quad (3)$$

To test the return models, two sets of regressions are run, in which the first one includes net income (NI) and the second regression replaces net income with comprehensive income (CI) to determine the value relevance of net income and comprehensive income. In the following two models, net income (NI) is once again replaced with comprehensive income (CI) to determine the association of both independent variables, with the dependent variable, here being share price (P). Thus, the main variables of interest are net income and comprehensive income. The coefficients of both net income and comprehensive income are expected to be positive, with net income expected to have a slightly higher coefficient. The coefficient of net income is expected to be higher than comprehensive income, which consist of other comprehensive income and has been expected to be transitory. The second set of regressions include the price models, which were:

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{NI_{jt}}{P_{jt-1}} + \beta_2 \frac{BVE_{jt}}{P_{jt-1}} + \beta_3 Size_{jt-1} + \beta_4 Btm_{jt-1} + \varepsilon_{jt} \quad (2)$$

and;

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{CI_{jt}}{P_{jt-1}} + \beta_2 \frac{BVE_{jt}}{P_{jt-1}} + \beta_3 Size_{jt-1} + \beta_4 Btm_{jt-1} + \varepsilon_{jt} \quad (4)$$

Table 7 presents the results of the regressions from models 1,2,3 and 4. Panel A of table 7 presents the results of the return models and panel B, the results of the price models. Panel A shows that the R² of the return models of NI indicate that, NI has more value relevance than CI (R² of 9.74% for net income compared to an R² of 8.58% for comprehensive income). The regression coefficient of NI (0.7514) is significantly higher than the regression coefficient of comprehensive income (0.5380), with both being significant at the one percent level (*p*-value <

1%). These results confirm the expectations, and confirms that comprehensive income, which includes other comprehensive income (highly transitory), is slightly less value relevant than net income.

Panel B of table 7 presents the regression results of the price models. The R^2 of the model that includes comprehensive income ($R^2 = 10.33\%$) is slightly higher, compared to NI ($R^2 = 10.25\%$). However, the regression coefficient of net income (0.3619) is higher than that of comprehensive income (0.2592), with both being significant at the one percent level (p -value < 1%). To determine whether the association of P with comprehensive income is indeed higher than net income, a sensitivity analysis is performed in section 6.4, which concludes that the R^2 of NI is higher than CI for the price models. Thus, the results from the price models also confirm the first hypothesis, that NI is more value relevant than comprehensive income, but from the higher R^2 of the price model can be noticed that comprehensive income is also value relevant.

Table 7: Regression of value relevance of net income and comprehensive income

<i>Panel A: Return models</i>			
Dependent variable = RET			
<u>Independent variables</u>	<u>Predicted sign</u>	<u>Net income</u>	<u>Comprehensive income</u>
NI	+	0.7514 (42.88) ***	
CI	+		0.5380 (44.58) ***
Size	+/-	0.0015 (1.66)	0.1145 (12.11) ***
Btm	+/-	0.0931 (23.81) ***	0.0917 (22.84) ***
Intercept	+/-	-0.0453 (-3.68)	-0.1852 (-13.99)
Adj. R^2		0.0974	0.0858

(table continues on next page)

Panel B: Price models

Dependent variable = P			
<u>Independent variables</u>	<u>Predicted sign</u>	<u>Net income</u>	<u>Comprehensive income</u>
NI	+	0.3619 (14.37) ***	
CI	+		0.2592 (16.60) ***
BVE	+	0.3714 (17.89) ***	0.4090 (22.88) ***
Size	+/-	0.0012 (1.31)	0.0057 (6.37) ***
Btm	+/-	-0.2685 (-13.23) ***	-0.3040 (-17.26) ***
Intercept	+/-	0.9344 (76.05)	0.8680 (34.79)
Adj. R²		0.1025	0.1033

*, **, *** indicate statistical significance at 10, 5 and 1 percent, respectively. The values in the parentheses indicate the *t*-values, which are based on heteroscedasticity-adjusted standard error. Table 7 presents the results of the value relevance regressions of net income and comprehensive income for the sample of 21 European countries (n=39.777) between 2005 and 2016. In panel A, the dependent variable is share returns (RET) and in panel B the dependent variable is share price (P). All independent variables are as defined in tables 5 and 6.

The other variables (i.e. BVE) and control variable, btm, is significantly associated with the dependent variables, while size is only significant for the models that includes comprehensive income. The predicted signs and magnitude of coefficients are in line with previous (European) studies. The R² of both models are in range with prior research (i.e. Dhaliwal et al., 1999).

The second hypothesis of this thesis looks at the incremental value relevance of other comprehensive income. The exact hypothesis is as follows:

H2: Other comprehensive income is incrementally value relevant to investors, however, its regression coefficient is less significant than net income.

Thus, testing this hypothesis extends the first one, by looking at the component of comprehensive income, other comprehensive income. Other comprehensive income is expected

to be (incrementally) value relevant, but not as such as net income and total comprehensive income, as has come to be clear in this thesis that it is highly transitory and therefore not as useful to investors. To test the first hypothesis the following two models are developed, which are based on previous literature:

$$RET_{jt} = \alpha_0 + \alpha_1 \frac{NI_{jt}}{P_{jt-1}} + \alpha_2 \frac{OCI_{jt}}{P_{jt-1}} + \alpha_3 Size_{jt-1} + \alpha_4 Btm_{jt-1} + \varepsilon_{jt} \quad (5)$$

and;

$$\frac{P_{jt}}{P_{jt-1}} = \beta_0 + \beta_1 \frac{NI_{jt}}{P_{jt-1}} + \beta_2 \frac{OCI_{jt}}{P_{jt-1}} + \beta_3 \frac{BVE_{jt}}{P_{jt-1}} + \beta_4 Size_{jt-1} + \beta_5 Btm_{jt-1} + \varepsilon_{jt} \quad (6)$$

The regression is run to assess the (incremental) value relevance of other comprehensive income (OCI), which is added to net income (NI). The first model is the return model, with dependent variable returns (RET), and the second model is the price model with share price (P) as dependent variable. OCI is expected to be value relevant, but not as net income or comprehensive income. To assess this, the coefficients of OCI are compared to the coefficients of NI. Therefore, the predicted sign for OCI is positive, but its magnitude is expected to be significantly lower than NI. Thus, the coefficient of NI is predicted to be positive.

Table 8 presents the regression results of models 5 and 6. Panel A of table 8 presents the regression results of the return model, which indicates that OCI is value relevant when added to NI, with a regression coefficient of 0.2810 (p -value < 1%). However, the regression coefficient of OCI is significantly lower than NI, with a regression coefficient of 0.7950 (p -value < 1%). The F -statistic of 331.05, significant at the one percent level, indicates that once OCI is added to NI, it has incremental value relevance. Panel B of table 8 presents the regression results of the price model, which indicates that OCI is value relevant, but not as value relevant as NI. The price model indicates that NI is significantly more value relevant than OCI. The regression coefficient of NI is 0.4718 (p -value < 1%), compared to the regression coefficient of OCI, which is 0.2015 (p -value < 1%). The F -test (161.28, significant at the one percent level) also shows that OCI increases the R^2 of the price model. Thus, as predicted OCI has a positive coefficient, which indicates that when OCI is added to NI, it has incremental value relevance, however, it is significantly less relevant than NI. Thus, the results of the price and return models confirm hypothesis 2, that OCI is incrementally value relevant, but that its coefficient is significantly lower than NI. The control variables – size and btm – are statistically significantly associated with both returns and share prices and the predicted signs are in line with the predictions made in this thesis and with prior literature.

Table 8: Regressions of incremental value relevance of other comprehensive income

<i>Panel A: Return model</i>			
Dependent variable = RET			
<u>Independent variables</u>	<u>Predicted sign</u>	<u>Coefficient</u>	<u>t-statistic</u>
NI	+	0.7950	45.16***
OCI	+	0.2810	18.19***
Size	+/-	0.0044	4.82***
Btm	+/-	0.0971	24.49***
Intercept	+/-	-0.0980	-7.68
Adj. R²	0.1025		
F-statistic	331.05***		
No. of observations	39.777		
<i>Panel B: Price model</i>			
Dependent variable = P			
<u>Independent variables</u>	<u>Predicted sign</u>	<u>Coefficient</u>	<u>t-statistic</u>
NI	+	0.4718	18.12***
OCI	+	0.2015	12.70***
BVE	+	0.2886	13.91***
Size	+/-	0.0028	3.02***
Btm	+/-	-0.1867	-9.20***
Intercept	+/-	0.9045	71.80
Adj. R²	0.1079		
F-statistic	161.28***		
No. of observations	39.777		

*, **, *** indicates statistical significance at 10, 5 and 1 percent, respectively. Table 8 presents the regression results of the return (panel A) and price (panel B) models, testing the incremental value relevance of OCI for the period for the sample of 21 European countries between 2005 and 2016. All variables are as described in table 5 and 6. OCI has been calculated as follows: $OCI_{jt} = BVE_{jt} - BVE_{(jt-1)} - NI_{jt} + DIV_{jt} + NETCAP_{jt}$.

6.3. Results additional tests

The main tests of this thesis are about value relevance (i.e. hypothesis 1 and 2). As this thesis is based on the model of the three properties of transitory earnings by Ohlson (1999), which

include value relevance, persistence and forecasting ability I also perform additional tests to assess the persistence and forecasting ability of net income, comprehensive income and other comprehensive income. As these tests do not rely on market prices, they will therefore also provide a robustness check for the previous value relevance models.

To test the persistence of the three performance measures I use the simple regression models of Francis et al. (2004) and more recently Barton et al. (2010):

$$\begin{aligned} (\text{Performance measure } [NI; CI; OCI])_{jt+1} \\ = \alpha_0 + \alpha_1(\text{Performance measure } [NI; CI; OCI])_{jt} + \varepsilon_{jt} \end{aligned} \quad (7)$$

As these are additional tests they are not related to hypothesis, however, from the literature and previous tests done on value relevance of NI, CI and OCI, I expect the highest persistence for NI and the lowest for OCI, which includes transitory items. CI is expected to be less persistent than NI, but more persistent than OCI.

Table 9, panel A, presents the regression results of equation 7, all performance measures are scaled by lagged market value of common equity. NI is the most persistent performance measure, with the highest coefficient of 0.5968 (p -value < 1%). As expected OCI has the lowest persistence with a coefficient of 0.1870 (p -value < 1%) and CI also less persistent than NI, with a significant coefficient of 0.2147. As investors are more likely to view performance measures that are more persistent as useful (Barton et al., 2010), this additional test supports the findings of the main tests, which concluded that NI is the most value relevant performance measure.

The third property of Ohlson's (1999) model is forecasting ability. To test the forecasting ability of the performance measures I follow Dhaliwal et al. (1999) and apply the following regressions to examine the forecasting ability of net income and (other) comprehensive income:

$$CASH\ FLOW_{jt} = \alpha_{01} + \alpha_1 NI_{jt-1} + \varepsilon_{jt} \quad (8a)$$

$$CASH\ FLOW_{jt} = \alpha_{02} + \alpha_2 CI_{jt-1} + \varepsilon_{jt} \quad (8b)$$

$$CASH\ FLOW_{jt} = \alpha_{03} + \alpha_3 NI_{jt-1} + \alpha_4 OCI_{jt-1} + \varepsilon_{jt} \quad (8c)$$

Table 9, panel B, presents the regression results of the predictability of NI, CI and OCI. The results clearly indicate that NI is a better predictor of next years' cash flow from operations, the dependent variable. All variables have been scaled by average total assets, following Sloan (1996). The R^2 of equation 8a ($R^2 = 27.64\%$), with NI as independent variable, is significantly higher than equation 8b, with CI as independent variable ($R^2 = 2.18\%$). The coefficient of NI

(0.4151), compared to the coefficient of CI (-0.0450) also indicate that the magnitude of how these performance measures can predict future cash flows is also different, with NI being the better predictor. These results are in line with previous research, Dhaliwal et al. (1999), Barton et al. (2010) and Goncharov and Hodgson (2011), indicating that once OCI is added to NI, its predictability decreases, as OCI items are transitory (i.e. non-recurring in nature). Thus, the results of this additional test also support the results of the main tests. And finally, model 8c, which includes previous periods' net income and other comprehensive income $OCI_{(jt-1)}$, was expected to have the highest association with future cash flows from operations, as disaggregation of income is more useful to investors (IASB, 2008). The R^2 of model 8c (29.40%) is higher than model 8a, indicating the incremental value relevance of other comprehensive income, which supports the main analysis.

Table 9: Regression results of persistence and forecasting ability

<i>Panel A: Persistence</i>					
<u>Performance measure</u>	<u>Model</u>	<u>Predicted</u>		<u>t-statistic</u>	<u>Adj. R²</u>
		<u>sign</u>	<u>Coefficient</u>		
NI	7	+	0.5968	45.95***	0.1761
CI	7	+	0.2147	20.90***	0.0291
OCI	7	+/-	0.1870	26.20***	0.0346

<i>Panel B: Predictability</i>					
<u>Independent variables</u>	<u>Model</u>	<u>Predicted</u>		<u>t-statistic</u>	<u>Adj. R²</u>
		<u>sign</u>	<u>Coefficient</u>		
NI	8a	+	0.4151	55.29***	0.2764
CI	8b	+/-	-0.0499	-18.16***	0.0217
NI +	8c	+	0.3672	49.33***	0.2940
OCI		-	-0.0450	-22.60***	

Panel A of table 9 presents the results of the persistence regression (model 7). The regression is run for each performance measure (i.e. NI, CI and OCI) of the next period, as dependent variable, against its previous period value (all performance measures are scaled by lagged market value of common equity). Panel B presents the regression results of the forecasting ability regressions, with the dependent variable being this periods' cash flow from operations and the independent variables being last years' NI, CI and OCI. All variables in panel B are scaled by average total assets. The regressions in both panels are run for the sample of 21 European countries during the period 2005-2016. The t -statistics reported in panel A and B are based on heteroskedasticity- adjusted standard errors. *, **, *** indicates statistical significance at 10, 5 and 1 percent, respectively.

6.4. Sensitivity analysis

I perform a sensitivity analysis to test the robustness of the findings, related to one of the analysis of Dhaliwal et al. (1999), who performed a within-industry analysis and found that the sample results differ between major industry groups. Another reason to perform this sensitivity analysis is the argument made by Biddle et al. (1995). Biddle et al. (1995) indicates that information presented in inter-industry differences is useful to investors, because this information can decrease data acquisition and processing costs investors face. If investors know which performance measure – net income, comprehensive income or net income plus other comprehensive income – is a better summary of firm performance of the firms they follow, they can and will use industry-specific data (Biddle et al., 1995).

To test whether the main results of this thesis differ between industry groups, I perform the tests for the first and second hypothesis for the following industry groups¹⁰:

Financial: 6.190 firm-year observations;

Industrial: 30.896 firm-year observations;¹¹

Utility: 1.750 firm-year observations; and

Other: 941 firm-year observations.¹²

The results of the within-industry sensitivity analysis are presented in table 10. Both the price and return models have the highest adjusted R^2 for financial firms. This result is the same as the findings of Dhaliwal et al. (1999), however, the results of Dhaliwal et al. (1999) indicated large differences between the industry types. The results of the sensitivity analysis indicate that investors in all the industry types find NI and CI useful. The F -statistics indicate that except for, Other, OCI is incrementally value relevant for all industry types. Thus, the results of this sensitivity analysis indicate that the results of the main analysis are not affected by one industry type, i.e. financial industry, because the total number of firm-observations for financial firms is not the largest and the results do not differ for the other industries, compared to the main analysis.

¹⁰ Industries are grouped as data available in Datastream and Worldscope.

¹¹ Industrial includes manufacturing and merchandising entities.

¹² Other includes firm-years not included in the other industry categories.

Table 10: Value relevance classified by industry type

<i>Panel A: Return models</i>						
Model			Financial	Industrial	Utility	Other
1	NI	Adj. R ²	0.1655	0.0984	0.0925	0.1456
3	CI	Adj. R ²	0.1727	0.0997	0.0892	0.1332
5	NI+ OCI	Adj. R ²	0.1758	0.1043	0.0995	0.1459
<i>F</i> -statistics			55.72***	133.15***	8.04***	1.20
<i>Panel B: Price models</i>						
Model			Financial	Industrial	Utility	Other
2	NI	Adj. R ²	0.1372	0.0952	0.1030	0.1369
4	CI	Adj. R ²	0.1310	0.0850	0.0910	0.0959
6	NI+ OCI	Adj. R ²	0.1566	0.1070	0.1178	0.1425
<i>F</i> -statistics			89.74***	258.92***	20.48***	4.75***
Observations			n= 6.190	n= 30.896	n= 1.750	n= 941

Table 10 presents the results (adjusted R²) of the tests performed for hypothesis 1 and 2, classified by industry type. Models 1,2,3,4,5 and 6 refer to the models presented in chapter 5. All variables are defined as previously mentioned. Total number of firm observations per industry is equal to the number of observations used in the main tests (n= 39.777). *F*-statistics refer to the incremental value relevance of OCI added to NI. *, **, *** indicates statistical significance at 10, 5 and 1 percent, respectively.

7. Summary and conclusion

This thesis investigates the usefulness of comprehensive income and other comprehensive income to investors, compared to net income, across European firms from the period after the mandatory adoption of IFRS in 2005, until 2016. The usefulness of the performance measures is assessed through value relevance of comprehensive income and net income and through the incremental value relevance of other comprehensive income. Value relevance refers to the association of performance measures with share prices and share returns. This thesis is based on the theory of Ohlson (1995), which states that share prices can be valued using the book value and earnings based on the clean surplus relation. The only question is which performance measure best measures book value of equity and earnings, comprehensive income or net

income, and hence more useful to investors. Prior studies find mixed results as to which performance measure best measures book value of equity and earnings. One of the goals of the IASB has been to present comprehensive income and its components in the best way possible, to provide prospective and current capital providers with informative figures, which are useful in making economic decisions (Conceptual Framework, 2009). This leads to the research question of this thesis:

Are comprehensive income and other comprehensive income useful to investors across European firms?

Prior studies examine this association through share prices and returns (Dhaliwal et al., 1999; Chambers et al., 2007). Most of these prior studies examine this for US samples and not in a European setting. Previous literature find that net income is significantly more value relevant than comprehensive income, hence the first hypothesis:

H1: Net income is more value relevant to investors than comprehensive income.

To examine whether net income is more value relevant than comprehensive income, I use the price and return models, which assess the association of net income and comprehensive income with share returns and share prices. The results confirm the first hypotheses, net income is on average more value relevant, however comprehensive income is also value relevant, with the price model indicating that comprehensive income might be as value relevant as net income. The second hypothesis is related to the incremental value relevance and states:

H2: Other comprehensive income is incrementally value relevant to investors, however, its regression coefficient is less significant than net income.

To test the second hypothesis, the variable OCI, is added to the price and return model of net income. Furthermore, to assess the incremental value relevance of OCI the R^2 of the models are compared to the base models – models without OCI – and an F -test is performed. The R^2 of the models including OCI is higher than the base models and the F -test also indicates that OCI is incrementally value relevant, hence useful to investors. The results confirm the second hypothesis, hence, indicating that other comprehensive income is value relevant, but its coefficient is less significant, which means that it is less useful to investors than net income.

Two additional tests are performed to assess all three properties of the Ohlson (1999) model, the persistence and forecasting ability of net income and comprehensive income and, other

comprehensive income added to net income. The findings indicate that net income is more persistent than comprehensive income and other comprehensive income is the least persistent. The results of the forecasting ability analysis indicate that comprehensive income, which includes other comprehensive income has no forecasting abilities, while net income has a high forecasting ability of future cash flow from operations.

Finally, following Dhaliwal et al. (1999), I perform a sensitivity analysis to assess whether the main results are not influenced by a single industry type. While the results indicate that net income is more value relevant than comprehensive income, comprehensive income is more value relevant for financial industries. The analysis on the incremental value relevance of other comprehensive income indicate, that on average all industries find it incrementally value relevant. Thus, the within-industry sensitivity analysis indicate that the main results are not driven by a single industry.

In conclusion, comprehensive income and other comprehensive income are respectively value relevant and incremental value relevant and comprehensive income has forecasting ability. According to the Conceptual Framework (IASB, 2010), accounting information should be capable of affecting the decisions made by the users of this accounting information – relevance – and it should be presented faithfully, and accounting information is decision useful if it has predictive value. Thus, by performing value relevance, predictive ability and persistence empirical tests, based on the value relevance theory of Black (2016) and the theories of Ohlson (1995,1999) the research question is answered. The findings provide a clear answer to the research question, that both comprehensive income and other comprehensive income are useful to investors when making economic decisions.

The results of this master's thesis contribute to the existing literature on the usefulness of performance measures to investors, by researching European publicly listed firms, which prepare their (consolidated) financial statements in accordance with IFRS, endorsed by the EU. Most of prior literature examined this for firms in the US and the only European research papers examining this, used a sample before IFRS or only performed an event study. Thus, my thesis adds to this existing literature by examining the usefulness, from the implementation of IFRS in the EU until the most recent available (consolidated) financial statements, 2016. The results of this thesis are of importance to standard setters, IASB, whose goal is to establish accounting standards that present earnings which are useful to investors when making economic decisions – comprehensive income and other comprehensive income are indeed useful to investors.

And finally, the results might also be relevant to auditors in public practise. The findings of this thesis indicate that the performance measures are useful to investors, and therefore, auditors should take comprehensive income and other comprehensive income into consideration when planning and performing the financial statements audit, and not consider net income as the only important bottom-line item. Other comprehensive income is useful to investors, thus, accountants should express care in detecting materially misstated amounts, which might include shifting of expenses to other comprehensive income.

Limitations and insights for future research

The major limitation of this thesis relates to the available data on other comprehensive income and its components. After comparing the data available in Worldscope to actual numbers reported in (consolidated) financial statements, I concluded that this data is not reliable. Other databases (i.e. Compustat Global) also does not have the data available on other comprehensive income and its components. Thus, as Chambers et al. (2007) explained, the lack of consistent results in the existing literature might be explained by the fact that these studies use data from periods before the effective date of comprehensive income reporting. Therefore, like this thesis, these studies used “as-if” measures of OCI and its components in their tests of relevance rather than actual “as-reported” numbers from (consolidated) financial statements (Chambers et al., 2007). This problem cannot be avoided in this thesis as the data is not available and therefore the proxy to calculate other comprehensive income has been used. Future research might be able to mitigate this problem by using a smaller sample size and collect the data manually from reported (consolidated) financial statements. Additionally, future researchers can use other countries that report according to IFRS and have this data readily available in databases. When this limitation is mitigated, a conclusion can be drawn on actual reported financial statement data, instead of using a proxy to calculate other comprehensive income.

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9. Appendices

9.1. Appendix 1: Literature review

Table 11: Literature review and comparison with thesis

<u>Author</u>	<u>Title</u>	<u>Research Question</u>	<u>Dependent Variable(s)</u>	<u>Independent Variables</u>	<u>Sample</u>	<u>Time period</u>	<u>Methodology</u>	<u>Outcomes</u>	<u>Thesis results</u>	<u>Results related</u>
Barton, J., T. B. Hansen, and G. Pownall. 2010.	Which performance measures do investors around the world value the most— And why.	Which performance measure is the most value relevant to investors around the world?	Value relevance (RELEVANCE)	Sales, EBITDA, Net income (NI), Comprehensive income (TCI), Sustainability factor (FACTOR 1) and Articulation with cash flows (FACTOR 2)	117,747 firm-year observations from 46 countries	1996-2005	Simple and multiple regression	Value relevance is higher for items ‘above the line.’ Thus, comprehensive income (CI) is the least value relevant, compared to net income (NI). Subtotals are more value relevant when these contain core items, compared to less transitory items which are part of CI.	The results of this thesis indicate that CI is slightly less value relevant compared to NI, thus, not significantly less value relevant, with high predictive ability of future cash flows and therefore considered useful to investors.	No
Chambers, D., T. Linsmeier, C. Shakespeare, and T. Sougiannis. 2007.	An evaluation of SFAS No. 130 comprehensive income disclosures.	Are comprehensive income and its components priced by market participants, and does the	Buy-and-hold raw return (R), eight months before to four months after fiscal year end.	Net income (NI), other comprehensive income (OCI), Marketable security adjustments (MKTADJ), Foreign currency	Pre-SFAS 130: 1,727 firm-year observations Post-SFAS 130: 2,807	Pre-SFAS 130: 1994-1997 Post-SFAS 130: 1998-2003	Multiple regression models	Other comprehensive income (OCI) is priced by investors in the post-SFAS 130 period, contradicting the transitory economic theory. The location of reporting matters, as investors find OCI	This thesis shows that OCI is indeed useful to investors. The location of reporting CI is mitigated in this thesis, because IFRS only allows	Yes

		location of disclosure affect this pricing?		translation adjustments (FCADJ) and Pension liability adjustment (PENADJ)	firm-year observations			reported in the statement of changes in equity more useful.	OCI to be reported in a statement of performance.	
Dhaliwal, D., K. Subramanyam, and R. Trezevant. 1999.	Is comprehensive income superior to net income as a measure of firm performance?	Is comprehensive income superior to net income as a measure of firm performance?	Share returns (R) over the fiscal year and Market value of common equity at fiscal year-end (share price; P)	Net income (NI), Change in comprehensive income retained earnings plus common dividends (COMPbroad) and Comprehensive income measured under SFAS 130 (COMP130)	11,425 firm-years that have COMPUSTAT and CRSP data to calculate NI and CI	1994-1995	Multiple regression models	NI is more strongly associated with share returns and has a better predictive ability of future cash flows, compared to both CI measures. Marketable security adjustments increase the association of share returns and CI, however this is due to financial industry firms.	While NI is more strongly associated with share returns, this thesis shows that CI is useful to investors, due to the high association with share returns and share prices, and its predictive ability of future cash flows. The sensitivity analysis indicate that this result is not mainly driven by financial sector firms.	Yes

Goncharov, I., and A. Hodgson. 2011.	Measuring and reporting income in Europe.	Is aggregated income more useful in Europe?	Share returns (R) and Market value of common equity (share price; P) four months after balance sheet date	Net income (NI), Comprehensive income (CI), Unrealized held- for-sale security gains and losses (UNREAL), Change in revaluation reserve (REVAL) and Change in foreign currency translation adjustments (FOREX).	56,696 firm- year observations from 16 European countries	1991-2005	Multiple regression models	Aggregate CI is dominated by NI when considering the information, valuation and prediction content of investors. However, this research paper finds that some of the components do add value to investors' decisions (i.e. unrealised gains on held-for-sale securities, foreign currency translations and asset revaluations).	The findings of this thesis indicate that CI is indeed less useful to investors, however, when OCI is added to NI, its usefulness increases, and hence indicating the importance of disaggregated accounting information.	Yes
Kanagaretnam, K., R. Mathieu, and M. Shehata. 2009.	Usefulness of comprehensive income reporting in Canada.	Are comprehensive income and other comprehensive income value relevant and if so, more than net income?	Market capitalization (MVE) and Price per share three months after the end of the fiscal year (PRICE)	Net income (NI), Change in the fair value of available- for-sale investments (SEC_S), Change in the fair value of cash flow hedges (HEDGE_S) and Change in foreign currency translation adjustments (FOREX_S)	228 firm-year observations	1998-2003	Multiple regression models	CI increases the usefulness of financial statements, as the results indicate that CI is more strongly associated with share prices and share returns.	The results of this thesis provide strong evidence that NI is more strongly associated with both share returns and share prices.	No

Mechelli, A., and R. Cimini. 2014.	Is comprehensive income value relevant and does location matter? A European study.	Is comprehensive income value relevant and does location matter?	Share returns (R) over the fiscal year and Share price (P) at fiscal year-end	Net income (NI), other comprehensive income (OCI), dummy variable (=1) if NI is negative and 0 if positive	16,511 firm-year observations	Pre-revised IAS 1: 2006-2008 Post-revised IAS1: 2009-2011	Multiple regression models	In both periods (i.e. pre- and post) NI is more value relevant than CI and OCI has incremental value relevance.	This thesis includes a period before and after the implementation of revised IAS 1, and the results indicate that CI and OCI are indeed useful to investors.	Yes
Ohlson, J. A. 1995.	Earnings, book values, and dividends in equity valuation.	Can one devise a cohesive theory of a firms' value that relies on the clean surplus relation to identify a distinct role for each of the three variables, earnings, dividends and book value?	Not applicable (N/A), this research paper develops empirical models	N/A, this paper develops empirical models.	N/A, this research paper develops empirical models	N/A, this research paper develops empirical models	Theory development	This paper adopts the view that dividends are paid out of book value and not out of the current earnings. Dividends reduce the market value of a firm on a dollar-for-dollar basis, however it does not affect the subsequent expected abnormal earnings. Thus, this paper shows that the value displacement property is closely related with the idea that dividends reduce subsequent period expected earnings. The reason for this close relation is that a firms'	Not applicable (N/A) to results of this thesis. The theory of Ohlson (1995) is employed by other researchers to assess the value relevance of performance measures and hence explained in this thesis.	N/A

								earnings must align with its net investments in assets, which is the book value.	
Ohlson, J. A. 1999.	On transitory earnings	How do transitory earnings differ from core earnings?	N/A, this research paper develops empirical models	N/A, this research paper develops empirical models	N/A, this research paper develops empirical models.	N/A, this research paper develops empirical models	Theory development	The paper shows that two of the following attributes imply the third: first, transitory earnings are irrelevant for forecasting next period aggregate earnings. Second, transitory earnings do not have predictive power and third, transitory earnings are value irrelevant.	Not applicable (N/A) to results of this thesis. The theory of Ohlson (1999) on transitory earnings is used in this thesis to test the usefulness of OCI and CI.

Table 11 presents the summaries of the most important research papers related to this thesis. For each research paper the table portrays the authors, the title, the research question, the dependent variables, the independent variables, the sample, the time period, the methodology and the outcomes. Finally, the table presents the thesis results and whether these results are related to the outcomes of previous research papers.
