# Value-Relevance of Other Comprehensive Income under IFRS

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St. Gallen, October 22, 2014

The President:

Prof. Dr. Thomas Bieger

Dedicated to my father

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Munich, December 15, 2014 Robert Günther

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# List of Abbreviations

| | |
|---|---|
| ABRET | Abnormal Return |
| ABRET_12 | Abnormal Return Based on Expected Return of 12% |
| ABRET_CAPM | Abnormal Return Based on the Capital Asset Pricing Model |
| ABRET_Sector | Abnormal Return Based on Sector Adjusted Returns |
| ACT | Actuarial Gains and Losses on Defined Benefit Plans |
| AFS | Gains and Losses on Available-for-Sale Financial Assets |
| AIC | Akaike Information Criterion |
| ASAF | Accounting Standards Advisory Forum |
| ASC | Accounting Standards Codification |
| ASS | Share of Other Comprehensive Income of Investments in Associates |
| BIC | Bayesian Information Criterion |
| BE | Book Value of Equity |
| CAPM | Capital Asset Pricing Model |
| Cf. | Confer |
| CFH | Gains and Losses on Cash Flow Hedges |
| CI | Comprehensive Income |
| DCF | Discounted Cash Flows |
| DEURCrisis | Dummy Variable for Negative Eurozone Crisis |
| DFINCrisis | Dummy Variable for Financial Crisis |
| DNegCI | Dummy Variable for Negative Comprehensive Income |
| DNegNI | Dummy Variable for Negative Net Income |
| e.g. | For Example |
| EBITDA | Earnings Before Interests, Taxes, Depreciation and Amortization |
| EFRAG | European Financial Reporting Advisory Group |
| EMH | Efficient Markets Hypothesis |
| EPS | Earnings per Share |

| | |
|---|---|
| EQ | Total Common Equity |
| ERN | Earnings |
| et al. | Et Alii |
| EV | Enterprise Value |
| FASB | Financial Accounting Standards Board |
| FATCA | Foreign Account Tax Compliance Act |
| FCT | Foreign Currency Translation Adjustments |
| GAAP | Generally Accepted Accounting Principles |
| GDP | Gross Domestic Product |
| GDPG | Gross Domestic Product Growth Rate |
| GICS | Global Industry Classification Standard |
| H | Hypothesis |
| I/B/E/S | Institutional Brokers' Estimate System |
| IAS | International Accounting Standard |
| IASB | International Accounting Standards Board |
| IASC | International Accounting Standards Committee |
| IFRS | International Financial Reporting Standards |
| i.e. | Id Est |
| LEV | Leverage |
| MVE | Market Value of Equity |
| NI | Net Income |
| No. | Number |
| NumAnalyst | Number of Analysts Covering a Company |
| OCF | Operating Cash Flows |
| OCI | Other Comprehensive Income |
| OLS | Ordinary Least Square |
| OTH | Other not Further Specified Items of Other Comprehensive Income |
| P | Share Price |

| | |
|---|---|
| p. | Page |
| P/E | Price-to-Earnings Ratio |
| pp. | Pages |
| RET | Share Return |
| REV | Changes in Revaluation Surplus of Tangible and Intangible Assets |
| RIV | Residual Income Valuation |
| RQ | Research Question |
| S&P | Standard & Poor's |
| SCE | Statement of Changes in Equity |
| SFAC | Statement of Financial Accounting Concepts |
| SFAS | Statement of Financial Accounting Standards |
| SOCIE | Statement of Changes in Equity |
| SORIE | Statement of Recognized Income and Expense |
| TA | Total Assets |
| TMI | Total Market Index |
| TP | Target Price |
| TPC | Target Price Consensus |
| TPP | Target Price Potential |
| TPR | Target Price Revision |
| TradVol | Relative Trading Volume |
| US | United States of America |
| UK | United Kingdom |
| VIF | Variance Inflation Factor |
| YGOV | 10-Year Government Bond Yield |

# Abstract

This study examines the value-relevance of Comprehensive Income and components of Other Comprehensive Income and establishes if the explicit reporting under IAS 1 (revised 2007) has increased the information value for investors, therefore, better reflecting the economic situation of the company compared to Net Income.

This study adopts existing well-established research models on value-relevance and forecasting ability of Other Comprehensive Income and develops own and new statistical models based on those theories and concepts. Thereby the study provides empirical evidence on value-relevance by examining the statistical association of Comprehensive Income and components of Other Comprehensive Income with (i) share prices, (ii) share returns, (iii) abnormal share returns, and (iv) analysts' target prices and it compares the results to the association with Net Income. Additionally the forecasting ability of Comprehensive Income and Other Comprehensive Income components (v) to predict future Operating Cash Flows and future Net Income is empirically examined.

Using hand collected data for a sample of 559 companies from the Eurozone between 2007 and 2012 this study establishes that Comprehensive Income is more value-relevant than Net Income. In this context certain components of Other Comprehensive Income, namely foreign currency translation adjustments, gains and losses on available-for-sale financial assets, and the effective portion of gains and losses in cash flow hedges proof to be value-relevant and robust for the price and return models. For the target price models in addition actuarial gains and losses turn out to be value-relevant, implying that analysts incorporate this information in their valuations. Conversely, based on the forecasting ability it cannot be established that Comprehensive Income is a superior predictor of future Net Income or future Operating Cash Flows compared to Net Income. Though, the Other Comprehensive Income components foreign currency translation adjustments and gains and losses on available-for-sale financial assets proof to be forecasting relevant for Operating Cash Flows. The effective portion of gains and losses in cash flow hedges and actuarial gains and losses on defined benefit plans proof to be forecasting relevant for Net Income. By the use of Chow tests it is established that the explicit reporting of Other Comprehensive Income components with the implementation of IAS 1 (revised 2007) has significantly changed the value-relevance and forecasting ability of those components.

# Zusammenfassung

Diese Studie untersucht die Wertrelevanz des Gesamtergebnisses sowie einzelner Positionen des sonstigen Ergebnisses für Investoren im Vergleich zum ausgewiesenen Nettogewinn, seit deren expliziter Berichterstattung unter IAS 1 (überarbeitet 2007).

Dabei verwendet die Studie allgemein anerkannte Theorien und Forschungsmodelle zur Wertrelevanz und zur Vorhersagbarkeit des sonstigen Ergebnisses und entwickelt daraus eigene Ansätze. Dabei liefert die Studie wissenschaftliche Belege zur Wertrelevanz anhand von statistischen Abhängigkeiten des Gesamtergebnisses sowie der Positionen des sonstigen Ergebnisses mit (i) Aktienkursen, (ii) Aktienrenditen, (iii) unerwarteten Aktienrenditen sowie (iv) Zielpreisen der Aktienanalysten und vergleicht diese mit der Abhängigkeit des Nettogewinnes. Zusätzlich wird untersucht, ob das aktuelle Gesamtergebnis sowie die Positionen des sonstigen Ergebnisses oder der aktuelle Nettogewinn besser als Grundlage zur Vorhersage (v) des zukünftigen operativen Cashflows und des zukünftigen Nettogewinnes geeignet sind.

Auf der Grundlage von händisch gesammelten Daten für 559 Unternehmen des Euroraums aus den Jahren zwischen 2007 und 2012 bestätigt die Studie, dass das Gesamtergebnis eines Unternehmens eine höhere Wertrelevanz besitzt als der entsprechende Nettogewinn. Für das Preis- und das Renditemodell können Fremdwährungsdifferenzen, Gewinne und Verluste aus zur Veräußerung verfügbaren finanziellen Vermögenswerten sowie der effektive Anteil der Gewinne und Verluste aus Cashflow Hedges als wertrelevant bestätigt werden. Für die Zielpreismodelle können zusätzlich versicherungsmathematische Gewinne und Verluste als wertrelevant identifiziert werden. Dies bedeutet, dass Aktienanalysten diese Information in ihrer Bewertung berücksichtigen. Jedoch kann hinsichtlich einer Vorhersagbarkeit nicht bestätigt werden, dass das aktuelle Gesamtergebnis im Vergleich zum aktuellen Nettogewinn ein besserer Indikator für den zukünftigen operativen Cash Flow oder den künftigen Nettogewinn ist. Allerdings kann bestätigt werden, dass sowohl Fremdwährungsdifferenzen und Gewinne und Verluste aus zur Veräußerung verfügbaren finanziellen Vermögenswerten für operative Cashflows, als auch Cashflow Hedges und versicherungsmathematischen Gewinne und Verluste relevante Informationen zur Vorhersagbarkeit für den Nettogewinn besitzen. Die durchgeführten Chow-Tests bestätigen, dass sich durch die explizite Berichterstattung der Positionen des sonstigen Ergebnisses, seit der Einführung des IAS 1 (überarbeitet 2007), die Wertrelevanz und Vorhersagbarkeit dieser Positionen verändert hat.

# 1 Introduction

## 1.1 On the Way to Globally Applied Accounting Standards

The worldwide financial crisis in 2008/2009, as well as the following Eurozone crisis,[1] has shown that it is becoming increasingly difficult to ignore the interdependence of world economies and that, as a consequence thereof, regulators and standard setters need to act globally in all facets. During the aftermath of the financial crisis and in the course of the still on-going Eurozone crisis, the G20[2] members focused on regulatory changes in the context of stability, such as the capital requirements of Basel III for the financial industry.[3] In addition to these desirable developments from the regulatory side, the area of accounting and auditing also needs strengthening and international cooperation and standardization.[4]

This need for action has also reinforced the efforts for an on-going alignment of accounting standards.[5] On the standard setting side there is consensus among the IASB and the FASB to have in the future, as far as possible, one single accounting standard.[6]

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[1] The Eurozone crisis as such can be grouped into three sub-crises; the crisis of the banks due to insufficient capitalization, the sovereign debt crisis as a result of the high sovereign debt levels followed by the rising government bond yields, and the growth crisis as a result of the two previous crises and reinforced by the unequal distribution of growth across Europe. See Shambaugh et al. (2012) for further details on the components of the crises and their effects.

[2] The Group of Twenty (G20) was formed in 1999 with the aim to generally strengthen the global economy. It consists of 19 countries plus the European Union. The group became especially active in the aftermath of the financial crisis and developed reforms of the global financial system.

[3] Basel III can be viewed as the reaction from the regulatory side to weaknesses that had been disclosed during the financial crisis. The framework of Basel III defines in particular the capital requirements and the supervision for financial institutions.

[4] Cf. Mala and Chand (2012), pp. 21–39. In a speech by Hoogervorst (2014) on "Closing the accounting chapter of the financial crisis" the chairman of IASB emphasized the need for global accounting standard-setting in the context of the financial crisis.

[5] Cf. Whittington (2005), pp. 128–130.

[6] Cf. e.g. IASB (2005), paragraph 7 "The IASB is committed to developing, in the public interest, a single set of high quality, global accounting standards that require transparent and comparable information in general purpose financial statements." and for the FASB the comment on the convergence of accounting standards from the official FASB website „The FASB believes that pursuing convergence - making global accounting standards as similar as possible - is fully consistent with that mission." available at: http://www.fasb.org [accessed 04/02/2014]. In 2009 the G20 encouraged the IASB and FASB in a declaration on strengthening the financial system G 20 (2009) to jointly work on improving the standards governing the valuation and provisioning with the goal of having "a single set of high quality global accounting standards" in the future. However, in a speech by Hoogervorst (2014), the chairman of IASB emphasized that "inability to deliver compatible outcomes with the FASB clearly demonstrates the inherent instability of convergence as a means to achieve a single set of global accounting standards," and stressed the point that the conversion project is currently on hold.

The question remains about when such a common standard will be implemented and how it will be shaped.[7] The goal of convergence among the different accounting standards will be primarily driven by adjustments of IFRS and US GAAP. Other existing accounting standards will most likely follow by means of respective adjustments or will adopt IFRS as a whole.[8]

Several projects have been launched over the past decade to align the worldwide accounting standards of which the convergence project between the IASB and the FASB is the most prominent one.[9] In a meeting of representatives of the IASB and the FASB on April 22, 2004, the two parties agreed to jointly initiate a convergence project to further promote the harmonization of international accounting standards.[10] In particular, the project focuses on the usefulness of the presentation of financial statement information itself as well as a clear definition of content, aggregation and display of the components.[11] The project has been structured into three phases in which phase A has been completed with the implementation of IAS 1.[12]

Phase A addressed the harmonization of presenting financial statements and the requirements for presenting comparative information. This phase thereby reached short-term convergence with the international standards that deal with the presentation of results.[13] Among other topics, the alignment of IAS 1 "Presentation of Financial Statements" and FASB ASC 220 "Reporting Comprehensive Income"[14] have been tackled.[15] One of the major aims of IAS 1 is to bring the reporting of Comprehensive

[7] Cf. Carmona and Trombetta (2008), pp. 455–461.

[8] In the context of the process of aligning worldwide accounting standards, the trustees of the IFRS Foundation formed the Accounting Standards Advisory Forum (ASAF) on March 19, 2013. The objective of this forum is to provide a platform where the members - which include all major worldwide standard setters - can contribute to and can discuss the ongoing developments of International Financial Reporting Standards with the ultimate goal of having one globally accepted standard.

[9] Cf. Thinggaard et al. (2006), pp. 35–36, Whittington (2008), pp. 142–143, Bellandi (2012), pp. 3–8.

[10] Cf. Agenda paper by Sullivan et al. (2005) on the history of the Performance Reporting Project.

[11] Cf. IASB (2008b), pp. 905–906.

[12] Phase A which received a lot of attention by financial statement preparer and users. The controversy in this phase was reflected in consultations of the exposure draft. Cf. Whittington (2008), p. 143.

[13] Cf. IASB (2006), p. 5.

[14] The Accounting Standards Codification (ASC) launched by the by the FASB on July 1, 2009, replaced the Statements of Financial Accounting Standards (SFAS) and has been effective for financial statements ending after September 15, 2009. Since that date the reporting of Comprehensive Income is governed under FASB ASC 220 (previously SFAS 130).

[15] Cf. Zülch and Pronobis (2009), p. 555.

Income under IFRS in line with US GAAP.[16] Companies reporting under IFRS are required to prepare their consolidated financial reports in accordance with IAS 1 (revised 2007) for annual periods beginning on or after January 1, 2009. In addition, in June 2011 the IASB issued another amendment to IAS 1 that primarily aims at a more differentiated display of Other Comprehensive Income components, but does not change the recognition as such. The amendment explicitly reaffirms the revisions made in 2007 and, in addition, requires entities[17] in the future to differentiate among items that are potentially reclassified[18] via profit or loss and items that are not reclassified. Moreover, entities are required to report taxes related to each Other Comprehensive Income item separately, without making changes to the reporting choice of presenting Other Comprehensive Income items either gross or net of taxes.[19]

In Phase B the IASB and the FASB deal jointly with implementing consistent principles for aggregations in income statements, the transactions and events for possible and aligned reclassification, and the presentation of Operating Cash Flows.[20]

Finally, phase C deals with the presentation of interim financial information with special focus on US GAAP.[21] Throughout the entire phase the IASB will reconsider, under IAS 34, the requirements on interim financial reporting.[22] Even though the original time schedule for implementation by 2011 had been set very ambitiously, and could not be kept, it shows that the regulators are encouraged to reach an agreement in the near future.

In the joint update report by the IASB and the FASB published on April 5, 2012, the boards of both institutions provided additional information on the convergence activities. In the report the standard setters published a guideline on how the convergence will be further pursued. Moreover, they provide an update on the projects

[16] Cf. IASB (2006) for a summary of the proposed amendments to IAS 1.

[17] The expression “entity” in this study refers to any commercial business activity independent of its legal structure. It is used interchangeably with “company” and “corporation” in this study.

[18] In this study the term “reclassification” is used interchangeably with the term “recycling”.

[19] Cf. IASB and FASB (2011), p. 1, Bellandi (2012), pp. 292–296.

[20] Cf. IASB (2006), p. 4–5 for an overview of phase B items to be covered.

[21] Cf. Mackenzie et al. (2012), p. 49.

[22] Cf. IASB (2008a), p. 19, Ernst & Young (2011a), p. 6.

they are currently dealing with in connection with the convergence, focusing on financial instruments, leases, and insurance issues.[23]

## 1.2 Motivation and Purpose of this Study

Aligning accounting standards and improving the usefulness of reported information has been the focus of the work by standard setters over the last decade. The spotlight on the standard setters' work has focused on the convergence project that has engaged the IASB and the FASB since 2002 and that will be employed in the near future. The Joint Effort Convergence Project has the ultimate goal of developing a single set of high quality global reporting standards. To achieve this goal the standard setters agreed to cooperatively improve and enhance IFRS and US GAAP thus eliminating differences between them.

The IASB promotes the convergence of national accounting standards, hence further integrating capital markets in Europe by requiring, since January 2005, the mandatory publication of consolidated financial statements pursuant to IFRS for listed companies in Europe. The application of equivalent standards across Europe and worldwide has been highlighted as producing several benefits, most importantly in connection with equity markets. The overall major advantages were described in a statement by the European Commission in 2002,[24] which emphasizes the elimination of barriers to cross-border trading, as well as more reliable, transparent and comparable company accounts, market efficiency reducing the costs of capital raising, and higher competitiveness paired with improved growth opportunities. In addition, the IASB has further enhanced particular reporting standards such as the "Presentation of Financial Statements" under IAS 1 and later under IAS 1 (revised 2007), thereby further aligning the reporting requirements by the IASB and the FASB. This study deals with the implementation of IAS 1 (revised 2007) and the required disclosure of Comprehensive Income, as well as the explicit reporting of components of Other Comprehensive Income.[25] The motivation of the study is to examine whether the introduction of Other

[23] Cf. IASB and FASB (2012), pp. 1–2, PwC (2013a), p. 2, Pellens et al. (2014), p. 42.

[24] Cf. press release by the European Commission (2002) on an International Accounting Standard.

[25] The amendments to IAS 1 in June 2011 are included in the analysis, but are not highlighted at this point because they solely represent additional display requirements rather than changing the recognition as such. This study focuses on the analysis of the application of IAS 1 (revised 2007).

Comprehensive Income was primarily driven by the convergence project or if the inclusion of Other Comprehensive Income has increased the value-relevance and forecasting ability for users of financial statements.

## 1.3 Contribution

The contribution of this thesis is to establish if Other Comprehensive Income, as reported under IAS 1 (revised 2007), is value-relevant for investors. In this context it is analyzed whether Other Comprehensive Income provides value-relevant information for investment decisions by examining the association between different income measures and market values. Moreover, the extent to which Other Comprehensive Income is included in the target prices provided by analysts is examined. Finally, the predicting power of Other Comprehensive Income compared to other income measures is analyzed.

Focusing on value-relevance, the study analyzes the association of Comprehensive Income and components of Other Comprehensive Income with (i) share prices, (ii) share returns, (iii) abnormal share returns, and (iv) analysts' target prices and then compares the results to the association with reported Net Income. This study thereby examines the relative information content and incremental information content of Comprehensive Income and components of Other Comprehensive Income. In addition to the value-relevance, the forecasting ability (v) of Comprehensive Income and components of Other Comprehensive Income, to predict future Operating Cash Flows and future Net Income, is examined.

This study provides empirical evidence on the value-relevance of Comprehensive Income and components of Other Comprehensive Income around the implementation of IAS 1 (revised 2007) by using hand-collected "as-reported" data for a sample of companies from the Eurozone. In addition to the established price and return models, the association between the analysts' target price consensus and different modifications of the target price with Net Income, Comprehensive Income, and components of Other Comprehensive Income are analyzed. Moreover, a change in the value-relevance of Net Income, Comprehensive Income, and components of Other Comprehensive Income reporting as a result of the explicit reporting under IAS 1 (revised 2007) is examined. Furthermore, in the analysis a direct comparison of the results from ordinary least squares (referred to as OLS) and fixed effects regressions

are provided to give a possible explanation for the diverging outcomes of previous studies using these different methodologies.

## 1.4 Structure and Overview

This study focuses on the value-relevance and forecasting ability of Comprehensive Income and components of Other Comprehensive Income and their information content for financial statement users.

- Chapter 2 presents an overview of Comprehensive Income reporting and the disclosure of Other Comprehensive Income components. The chapter provides the theoretical framework for the empirical analysis.
- Chapter 3 provides a literature review of related studies and identifies potential research gaps based on which research questions and hypotheses are developed.
- Chapter 4 illustrates the applied research methodology and introduces the models that are applied in the empirical analysis.
- Chapter 5 presents a qualitative overview of the income measures and presents the results from the empirical analysis.
- In Chapter 6 the study terminates with a discussion of the results and provides practical guidelines for dealing with Other Comprehensive Income components. The chapter concludes with discussing possible limitations of the study and an outlook for further research.

# 2 Background

## 2.1 Overview of Comprehensive Income

The introduction of Comprehensive Income under IFRS was mainly driven by the convergence project between the IASB and the FASB, which had the goal of aligning international accounting standards and increasing their comparability. The IASB emphasizes the focus on the relevance and faithful representation of financial information which was aimed to be promoted with the introduction of Comprehensive Income.[26] The role of Comprehensive Income reporting has evolved internationally with certain delay over the last decades. Before implementation under IFRS, the concept of Comprehensive Income had already been developed under US GAAP and other accounting standards. The general motivation for the publication of Comprehensive Income is the fact that Comprehensive Income includes all items that effect shareholders' equity and are not based on transactions with the shareholders[27] of the company. The aim of introducing Comprehensive Income is not to replace the reporting of Net Income, but to provide additional information about items that otherwise do not directly show up in the profit or loss. The following sections provide an overview of the development, treatment, and display of Comprehensive Income and form the basis for the analysis of the value-relevance in the sections that follow.

### 2.1.1 Goal of Reporting Financial Information

In general, users of financial statements consist of all stakeholder groups of a company. Based on IAS 1.9, stakeholders include providers of equity and debt, employees, suppliers, and customers, as well as the government and the general public. The informational needs of the different stakeholder groups are diverse, considering, however, that including the entire set of information would blast the scope and cost of financial statements. Consequently, information disclosure should be aligned with the needs of investors, because they provide the company with risk capital and have the most comprehensive demand for the financial information. The majority of the information requirements that satisfy the needs of the investors should also satisfy the

[26] Cf. IASB (2010a), QC5.

[27] Pursuant to IAS 1.7 the shareholder is regarded as the owners of the entity.

other stakeholders.[28] The purpose of IAS 1 is to define the nature and dimension of financial statement presentations. The goal is to increase the information content for investors and improve comparability with the financial statements of former financial years, as well as with other companies pursuant to IAS 1.1. In IAS 1.9 is it stated that the purpose of financial statements as follows:

> *"The objective of financial reporting is to provide information about the financial position, financial performance and cash flows of an entity that is useful to a wide range of users in making economic decisions."*[29]

The information provided in financial statements should be useful to existing and potential investors, debt holders, and other creditors in deciding if and on what conditions they are willing to provide capital and resources to a company.[30] The Conceptual Framework for Financial Reporting issued by the IASB (2010a) explicitly states that existing and potential investors, lenders, and other creditors are the primary addressees of financial reporting; other addressees such as regulators and the public are exempt from being the focus group for financial reporting.[31] The general objective for financial reporting also holds true for the reporting of Comprehensive Income. The main objective of financial data for the purpose of investors is predicting future earnings and the valuation of companies in general. Reported information should provide investors and creditors with clear insight into future prospects of the respective company and improve the predictive ability of its future earnings and cash flows.[32] Hence, the main objective of standard setters is to maximize the usefulness of accounting information provided in financial statements and to evaluate financial performance. Comprehensive Income could be a helpful item in predicting future earnings if it contains additional information that is otherwise not available.

This study focuses on the relevance of the reported information of financial earnings to investors for their valuation efforts. It will disregard the evaluation of financial

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[28] Cf. Holthausen and Watts (2001), pp. 25–26.

[29] Cf. IAS 1.9.

[30] Cf. IASB (2010a), OB2–OB11.

[31] Cf. IASB (2010a), OB10, Murphy et al. (2013), p. 73.

[32] Cf. EFRAG (2009), p. 7.

information by other specific users such as creditors or suppliers which might be interested in different information, particularly in risk assessment.[33] This approach was taken as the majority of equity investors in major European corporations are institutional investors, such as asset managers, pension funds, banks, holdings, or hedge funds. Only a minor percentage of the holding shares are in the hands of so-called "retail investors" and, therefore, their impact on the share price is negligible for this assessment.

### 2.1.2 Comprehensive Income in Financial Statements

The definition of Comprehensive Income was introduced by the FASB in its Statement of Financial Accounting Concepts No. 3 in 1980.[34] The basis for the implementation was the fact that the traditional way of reporting income was considered to be too narrow and the assumption prevailed that a different way of presenting results in financial statements was needed.[35] Moreover, the environment of the accounting community was constantly changing and the reporting of company activities was becoming more complex with users of financial statements asking for more detailed presentations.[36] This fact supported the implementation of Comprehensive Income reporting. The approved definition of Comprehensive Income in the FASB Concepts Statement 3 followed the "all-inclusive" concept of income for reporting.[37]

These first thoughts on Comprehensive Income by the FASB reflect the general idea behind the concept that has persisted and that has also been adopted by the IASB in its standard. Based on the definition under IAS 1, Comprehensive Income is defined as follows.

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[33] Cf. Francis and Schipper (1999), p. 319.

[34] Cf. SFAC No. 3 (1980) CON 3.56, p. 23 "Comprehensive Income is the change in equity (net assets) of an entity during a period from transactions and other events and circumstances from non-owner sources. It includes all changes in equity during a period except those resulting from investments by owners and distributions to owners."

[35] Cf. Robinson (1991), p. 107.

[36] Cf. Robinson (1991), p. 110, Johnson et al. (1995), p. 128.

[37] Cf. Johnson et al. (1995), p. 130.

> "*Total comprehensive income is 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. Total comprehensive income comprises all components of 'profit or loss' and of other 'comprehensive income'.*"[38]

In summary, Comprehensive Income consists of Net Income[39] and Other Comprehensive Income components. On the one hand Net Income includes all changes in equity that result from transactions with shareholders and non-shareholders representing the company's total profit or loss for a period.[40] On the other hand, Other Comprehensive Income includes changes in equity that are not recognized in the profit or loss and are not based on transactions with shareholders.[41] Figure 2.1 provides a schematic overview of the shareholders' equity and causes for changes due to transactions with shareholders and non-shareholders.

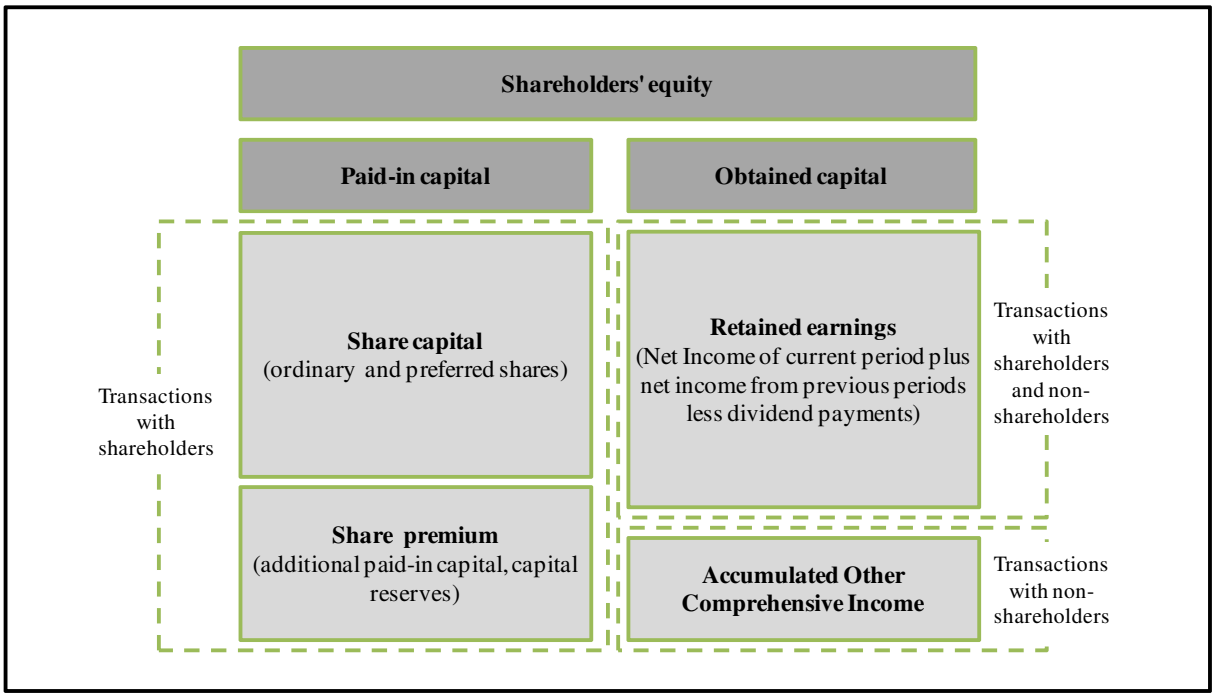
[38] Cf. IAS 1.7.

[39] In this study the terms "Net Income" and "profit or loss" are used interchangeably. The term used under IFRS is "profit or loss" pursuant to IAS 1.81. However, the term used in the majority of comparable studies, especially in studies examining sample reporting under IFRS, is Net Income, which is in line with the US GAAP term.

[40] Cf. Beale and Davey (2001), p. 177.

[41] Cf. Ferraro and Veltri (2012), p. 588, Zhang (2014), p. 203, Pellens et al. (2014), pp. 503–504.

*Figure 2.1: Shareholders' equity and causes for change* [42]




### 2.1.3 Disclosure of Income and Importance of a Differentiated View

When the IASB introduced the reporting of Other Comprehensive Income, the main aim was to provide more comprehensive, consistent, and relevant information to the users of financial statements.[43] The differentiated reporting of recognizing items either in profit or loss or in the statement of Comprehensive Income aims at enhancing the information value and relevance of the financial information. The decision whether to recognize an item partly or completely in profit or loss or in the statement of Other Comprehensive Income is based on several characteristics rather than a single attribute.[44] Items that may distort the reporting of profit or loss are specified as not being realized, non-recurring, non-operating, involving a measurement of uncertainty, are long term, or are outside management control and, therefore, legitimize recognition in the statement of Other Comprehensive Income. Items recognized in profit or loss have opposing attributes. The interaction between the income statement and the balance sheet ensures that in both cases all items are finally recognized in the balance

[42] Illustration following the concepts by Leibfried and Eisele (2009), p. 512 and Pellens et al. (2014), p. 504.

[43] Cf. Cauwenberge and De Beelde (2007), pp. 3–4, Ernstberger (2008), p. 7.

[44] Cf. IASB (2013c), p. 7.

sheet. Items directly recognized under Other Comprehensive Income bypass profit or loss and may be reclassified to profit or loss at a later stage.[45]

The different treatments of Other Comprehensive Income items in connection with reclassification to profit or loss has created major confusion among the users of financial information.[46] The treatment under IFRS follows a unique and obviously not an intuitional approach.[47] Based on this fact several investors seem to ignore Comprehensive Income and continue to use Net Income figures for their valuations and other financial analyses.[48] The simplified overview (Figure 2.2) demonstrates that an exclusive consideration of Net Income bears the risk of losing important value-relevant information. For example, the calculations of established financial ratios such as EPS[49], P / E, or EV / EBITDA do not consider Other Comprehensive Income components at all.[50] These ratios are based solely on Net Income. If certain items that have been recognized in Other Comprehensive Income are offset to retained earnings, those items will not be recognized in Net Income even though they can have a considerable impact on the results.[51] It is important to consider the additional information given by the statement of Other Comprehensive Income, because if users of financial statements rely solely on former ratio calculations the reporting quality may be reduced.[52] In such cases information content is reduced rather than increased.[53]

[45] For a detailed analysis of recycling of Other Comprehensive Income components reference is made to section 2.1.6.

[46] Cf. Bellandi (2012), p. 282, Zhang (2014), p. 232.

[47] Reference is made to section 2.1.6 for a differentiated overview of the treatment of recycling.

[48] Cf. Rees and Shane (2012), p. 802.

[49] According to IAS 33 the earnings per share (referred to as EPS) ratio, which is based on profit or loss, is the only performance indicator required to be published in the financial statement.

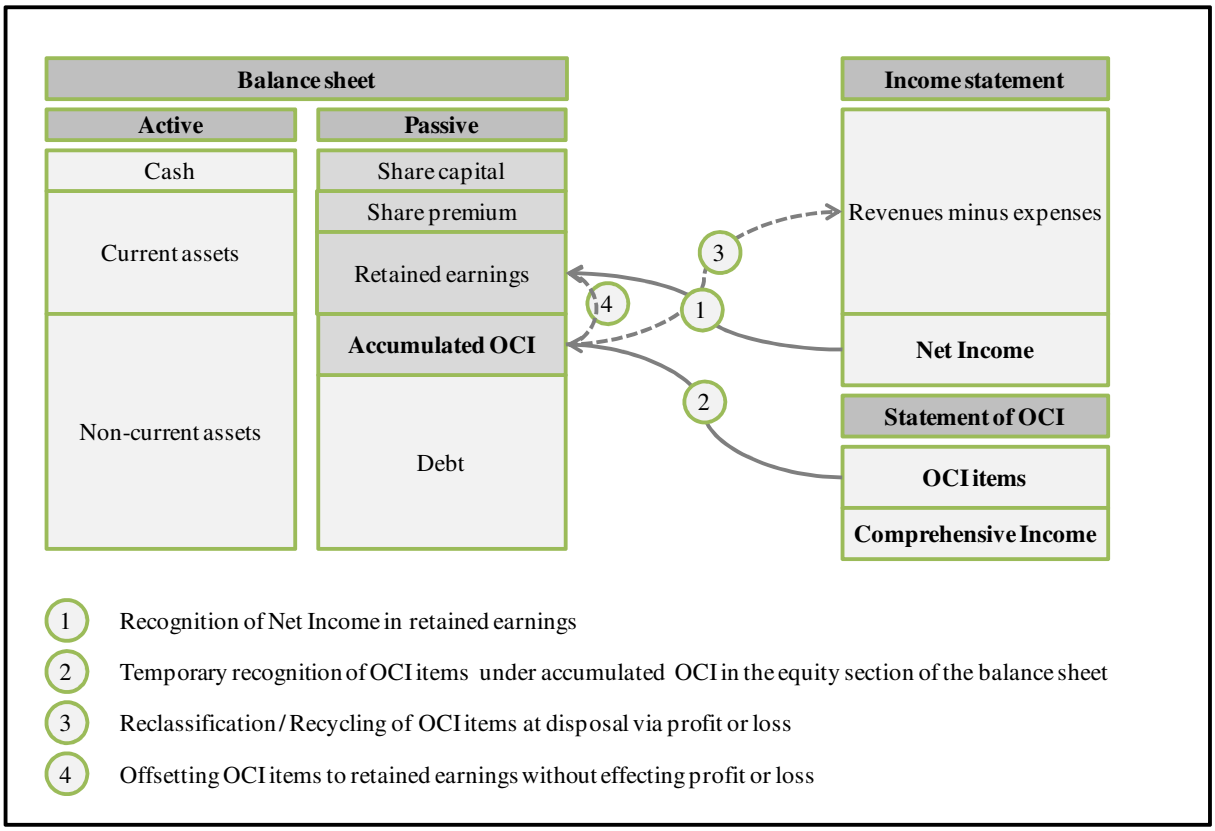
[50] Cf. IASB (2013c), p. 3.

[51] Items not reclassified through profit or loss include for example gains on property revaluation. See also section 2.1.6 for a more detailed illustration of recycling of Other Comprehensive Income components.

[52] Cf. Rees and Shane (2012), pp. 811–812 on the proposal for reporting two EPS figures, one based on Net Income and the other based on Comprehensive Income, thereby pointing users of financial statements to the differences in the two income measures and motivating them to further look into the details whether these figures are significantly different from each other.

[53] Cf. ESMA (2014) for the consultation paper on the alternative performance measures.

*Figure 2.2: Treatment of Net Income and Other Comprehensive Income*[54]




Besides working on improving the clarity, reliability, and comparability of the financial information, the major tasks of the IASB are communication and persuasion. The research community can support this persuasion by providing well founded analyses of the information content and value-relevance. The paper by Cauwenberge and De Beelde (2007) focuses on limitations of solely using Net Income. The authors argue that the publication of two EPS ratios, one based on Net Income and the other based on Other Comprehensive Income, could draw attention to these limitations and promote a more detailed, fundamental analysis of Other Comprehensive Income components.[55]

In summary, the future success of reporting Other Comprehensive Income closely depends on the adoption and acceptance by the preparer and user of financial information. The general acceptance of Comprehensive Income as an additional income measure may improve the discipline of investors, analysts, and other users of

[54] Own illustration.

[55] Cf. Cauwenberge and De Beelde (2007), pp. 21–23.

financial information as they are forced to consider all items that may affect the value of the entities.

### 2.1.4 General Concept of Considering Comprehensive Income

The illustrations in the previous section show that all changes in equity for the period resulting from transactions with non-shareholders are either recognized in Net Income or Other Comprehensive Income.[56] Therefore, Comprehensive Income is composed of all income and expenses, irrespective of the recognition in profit or loss or in the balance sheet, and does not differentiate between ordinary and extraordinary items.[57] The recognition is based on accrual accounting, pursuant to IAS 1.27–28, and focuses on information function of financial accounting.[58]

The idea behind Other Comprehensive Income components is that they are posted to shareholders' equity under accumulated Other Comprehensive Income[59] and do not flow directly through profit or loss.[60] The reason for temporarily posting these components into equity is that the positions are only realized in later periods and are transitory in nature. However, they may provide investors with relevant information about the company and, therefore, are presented in Other Comprehensive Income without effects on the profit or loss. Once the positions temporarily posted under accumulated Other Comprehensive Income are realized, they are dissolved through profit or loss or offset to retained earnings.[61]

If all gains and losses previously posted under accumulated Other Comprehensive Income are dissolved via profit or loss in later periods, the principle of clean surplus accounting holds.[62] The application of recycling income measures avoids the risk of

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[56] Cf. IAS 1.88 "An entity shall recognize all items of income and expense in a period in profit or loss unless an IFRS requires or permits otherwise.".

[57] IAS 1.87 explicitly states that it is not permitted to present items as extraordinary items in the statement of Comprehensive Income. Cf. Pellens et al. (2014), p. 173.

[58] Cf. Pellens et al. (2014), p. 173–174.

[59] As IFRS does not explicitly govern the reporting of the components of Other Comprehensive Income in the equity of a company, the reporting of those items differs significantly across companies. Whereas some companies show explicitly separate reserves for all components of Other Comprehensive Income, others provide a cumulative figure or a mixture of the two ways of presentation.

[60] Cf. Mackenzie et al. (2012), p. 86.

[61] Cf. Pellens et al. (2014), pp. 174–175.

[62] Cf. Boemle and Lutz (2008), p. 199, Pellens et al. (2014), p. 507. Reference is also made to section 2.3.1 for a detailed overview of clean surplus accounting and dirty surplus accounting.

double counting and ensures that all gains and losses finally show up in the profit or loss.[63] In contrast, the concept of dirty surplus accounting allows certain gains and losses previously posted under accumulated Other Comprehensive Income to be offset to retained earnings at realization, thereby permanently bypassing the profit or loss.[64] Based on a pure profit or loss perspective, the permanent bypassing of certain Other Comprehensive Income components represents a breach of the clean surplus principle.[65] However, when considering Comprehensive Income instead of Net Income, the matching principle is kept.[66]

IFRS and US GAAP permit similar presentation formats for the statement of Comprehensive Income and its components.[67] The standard setters allow the display of Other Comprehensive Income either in a single statement of Comprehensive Income or in two independent statements.[68] The single statement approach reports Comprehensive Income prominently in the bottom line of the statement and Net Income only as a subtotal, whereas the two-statement presentation uses the established income statement that concludes with Net Income in addition to displaying the non-recurring items in a statement of Comprehensive Income.[69] In the two-statement approach Net Income and Comprehensive Income coexist and give addressees of financial statements the choice of the two performance indicators.[70]

When considering the motivation for the previously illustrated concepts, there is always a tradeoff between relevance and consistency.[71] The inclusion of additional items in Other Comprehensive Income may increase the relevance of the income figure, but with potentially reducing comparability of the financial statement.[72] In

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[63] Cf. Mackenzie et al. (2012), p. 86.

[64] Cf. Wang et al. (2006), p. 388, Isidro et al. (2006), pp. 303–304, Boemle and Lutz (2008), p. 199, Pellens et al. (2014), p. 507.

[65] The principle was introduced by Preinreich (1937) and further developed by Lücke (1955) and states that the accumulated profit or loss should be equal to the cash surplus.

[66] Cf. Pellens et al. (2014), pp. 174–175.

[67] Cf. IAS 1.81 and FASB ASC 220-10-55.

[68] Cf. Blase et al. (2010), p. 62, Buschhüter and Striegel (2011), p. 277. Reference is made to section 2.1.7 for a summary of the different forms of displays of Comprehensive Income.

[69] Cf. IASB (2008a), paragraph 3.27.

[70] Cf. Cauwenberge and De Beelde (2007), pp. 2–3 on an analysis of dual income display.

[71] Refer to section 2.3.5 for an extensive overview of value-relevance and reliability of accounting information.

[72] Cf. Kanagaretnam et al. (2009), p. 364.

general, value-relevance of accounting information means that the reported income figure is associated with share prices or returns.[73] An association between specific accounting data and market data indicates that the accounting information is associated with information used by investors.[74] However, it is important to note that the examined association does not directly imply causality.[75]

Numerous research studies have analyzed the association of different income measures, in particular Net Income and Comprehensive Income, with market data from around the world, including share prices or share returns over the past decade.[76] The majority of the available research concludes that Net Income is associated more with share prices or share returns than Comprehensive Income. Moreover, it has been found that Net Income is a better predictor of future Operating Cash Flows than Comprehensive Income. The main argument provided for this association is that compared to Net Income, Other Comprehensive Income is transitory in nature.[77] Consequently the argument against the inclusion of Comprehensive Income as a key performance measure is that it is often exposed to high volatility.[78] As a result, it is argued that Comprehensive Income has limited explanatory power for predicting company values and the underlying future Operating Cash Flows. These arguments neglect, however, that also Net Income includes, to some extent, special items that are neither recurring nor from continuous operations and are classified as transitory.[79] From an accounting point of view it is, therefore, not cogent to treat these figures in such a different way.[80]

[73] Cf. Barth et al. (2001), p. 79, Thinggaard et al. (2006), p. 49.

[74] Cf. Francis and Schipper (1999), p. 326.

[75] Cf. Kanagaretnam et al. (2009), p. 364.

[76] Reference is made to the literature review in section 3.3 of this study.

[77] Cf. Ernstberger (2008), p. 11, Kanagaretnam et al. (2009), p. 364.

[78] Cf. Chambers et al. (2007), p. 564, Bamber et al. (2010), pp. 99–101 and Jones and Smith (2011), p. 2066.

[79] Cf. Burgstahler et al. (2002) on the implications of special items on future earnings.

[80] Cf. Jones and Smith (2011), p. 2048.

### 2.1.5 Development of Comprehensive Income

With the introduction of UK FRS 3 in 1992, the UK was the first country that required the reporting of Comprehensive Income, which was then called "total recognised revenues and expenses." Thereafter it was reported in an additional primary statement.[81] The advance initiative taken by the UK with such implementation increased the pressure on international standard setters. The FASB countered by implementing SFAS 130 in June 1997, which dealt with reporting Comprehensive Income.[82] Together with the implementation of SFAS 130, other national standard setters joined the early international development of extending the disclosure of Other Comprehensive Income components.[83] Since 2001 the IASB has worked jointly with the FASB on the Comprehensive Income topic under different project titles, with the so-called convergence project being the most prominent.[84] While the FASB required US companies to separately report Comprehensive Income since 1997, the IASB reacted later by implementing IAS 1[85] on August 18, 2005, which focused on the presentation of financial statements for companies applying IFRS.[86] The new standard replaced IAS 30 and some of the requirements that are listed in IAS 32.[87] A revision followed on September 6, 2007, which included changes regarding the presentation of Other Comprehensive Income separately from changes in equity, as well as the requirement to include a statement of financial position. IAS 1 (revised 2007) had been applied for financial years starting on January 1, 2009, or thereafter. Besides the intended harmonization with US GAAP, the driving forces for implementing IAS 1 was the increased importance for items recognized in Other Comprehensive Income,

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[81] Cf. O'Hanlon and Pope (1999), pp. 460–461, Cahan et al. (2000), p. 1278.

[82] The SFAS 130 was published in June 1997 with application for fiscal years beginning on or after December 15, 1997. Cf. Linsmeier et al. (1997), p. 117 and Ernstberger (2008), p. 4. Even before the implementation of SFAS 130 there existed selected items, e.g. gains and losses from foreign currency translations that were bypassing the income statement and were directly recognized in equity based on SFAS 52. Cf. Ayres (1986), p. 143.

[83] Compare for example the implementation under NZ FRS 2 in New Zealand and under CICA Handbook section 1535 in Canada.

[84] Cf. Thinggaard et al. (2006), pp. 35–36, Whittington (2008), pp. 142–143, Bellandi (2012), pp. 3–8.

[85] Prior to the revision of IAS 1 in 2007 entities had the option of either reporting Comprehensive Income in a statement of changes in equity (SOCIE) or in a statement of recognized income and expense (SORIE). Cf. Leibfried and Eisele (2009), p. 512, Bellandi (2012), p. 288.

[86] Cf. IASB (2008b), pp. 904–905.

[87] Cf. IASB (2005) - press release by the IASB on August 18, 2005.

thereby avoiding recognition in the income statement and the growing popularity for companies to disclose figures of pro forma earnings.[88]

The fact of reporting of Other Comprehensive Income under SFAS 130[89] and IAS 1 has added another round to the long lasting debate on whether to use an "all-inclusive" or a more restrictive "current operating" performance concept. The "all-inclusive" income concept is based on the earlier described clean surplus relation and should show all changes in economic values of assets and liabilities of a company.[90] Even though the "all-inclusive" concept has been advocated by standard setters, several standards have been implemented that have deviated from this principle.[91] Several exemptions have been successively published, which have further diluted the principle idea of the concept.[92]

Those exemptions, as well as the differences between the compulsory and voluntary application of standards under IFRS and US GAAP, demonstrate the need to achieve convergence of the standards. The example of reporting Other Comprehensive Income components demonstrates the discrepancy between the standards. Whereas foreign currency translation adjustments, gains and losses on available-for-sale financial assets, effective portion of gains and losses in cash flow hedges, and share of Other Comprehensive Income of investments in associates must be reported under both standards, the treatment of the reporting of pension accounting differs between the standards. While under US GAAP the standard setter offers a choice for the recognition of actuarial gains and losses on defined benefit plans namely (i) an immediate recognition in the income statement or (ii) a deferred recognition applying the corridor approach, neither of the options exists under IFRS.[93] Moreover, actuarial gains and losses on defined benefit plans based on a deferred recognition are

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[88] Cf. Thinggaard et al. (2006), p. 36.

[89] Reporting of Other Comprehensive Income has been governed under SFAS 130 at the implementation and is governed under FASB ASC 220 after the codification.

[90] Cf. Kanagaretnam et al. (2009), p. 352.

[91] Cf. Epstein and Jermakowicz (2008), p. 82.

[92] The inclusion of components in Other Comprehensive Income has developed over time and has often been criticized for following no comprehensible concept. In the context of performance measures the IASB has focused on Comprehensive Income rather than Net Income to conform with the clean surplus concept.

[93] IAS 19.93 permits the recognition of actuarial gains and losses when applying the direct recognition method. Reference is made to section 2.2.4 for a more detailed presentation of the treatment of actuarial gains and losses under IFRS, as well as the current developments of moving towards a mandatory publication of those positions under Other Comprehensive Income for reporting periods beginning on or after January 1, 2013.

subsequently recycled through profit or loss under US GAAP, whereas these items are not recycled under IFRS.[94] In addition, IFRS permits the reporting of changes in revaluation surplus of tangible and intangible assets under Other Comprehensive Income, creating further deviations from the reporting under US GAAP where this is not permitted.[95]

In addition to these exemptions, IAS 1 and FASB ASC 220 leave room for interpretation and provide conflicting options for the recognition and interpretation. They thereby challenge the comparability between the standards and reduce the transparency of reporting. For example, the concept of reclassification of Other Comprehensive Income components under IAS 1 is not consistent.[96] The initial recognition of Other Comprehensive Income items follows the treatment under certain IFRS standards, but does not rely on a homogenous concept.[97] On the other hand, the reporting under US GAAP accepts no exceptions from reclassification and, therefore, all items temporarily booked into Other Comprehensive Income are recycled.[98]

The treatment of recycling under IFRS created uncertainty and could have been one of the reasons why addressees have been confused about Other Comprehensive Income classifications.[99] As a consequence, on June 16, 2011, the IASB issued another amendment requiring companies to report separate subtotals for elements that may be reclassified and those that will not.[100] The changes had to be applied for reporting periods beginning on or after July 1, 2012. These agreed changes will primarily increase the presentation rather than the composition of Other Comprehensive Income components. They may have a relatively minor effect with respect to the overall financial statements. However, for financial statement users the changes should

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[94] Cf. PwC (2013b), pp. 50-51. Actuarial gains and losses recognized in Other Comprehensive Income are not recycled under IFRS. The current IFRS standard allows this Other Comprehensive Income component to be recognized under other reserves going forward and not immediately to be offset to retained earnings.

[95] Reference is made to section 2.2.5 for a more detailed treatment of changes in revaluation surplus under IFRS.

[96] Cf. Jones and Smith (2011), p. 2050, Pellens et al. (2014), p. 175.

[97] Cf. Barker (2004), pp. 158–159 on IAS 1as well as Kirsch (2012), p. 199 for similar critique on FASB ASC 220.

[98] Cf. FASB ASC 220-10-45-16 „An enterprise shall determine reclassification adjustments for each classification of Other Comprehensive Income…" the previously existing exception for pension liability has been removed under SFAS 158 in September 2006.

[99] Cf. Bellandi (2012), p. 282.

[100] Cf. IASB and FASB (2011), p. 1.

facilitate identification and evaluation of the impact that Other Comprehensive Income components have on future profit or loss.[101]

Subsequent to these changes the boards of the convergence project on financial statement presentation agreed to bring forward certain initiatives separately and make stand-alone changes to IFRS and US GAAP for reasons of practicality.[102] The updated standards, such as the changes to IAS 19 on employee benefits and IFRS 9 on financial instruments under IFRS, are, therefore, advanced in a more focused way. In addition, the advantages of limiting the changes to IAS 1 in the short term increases the consistency and clarity of Other Comprehensive Income presentation by granting statement users more time to become familiarized with its adoption.[103]

### 2.1.6 The General Concept of Recycling and Reclassifications

As a general concept the components of Other Comprehensive Income for each period are posted to the accumulated Other Comprehensive Income. The posted items are regarded as transitory in nature and include components that are realized over time and are, therefore, recognized in profit or loss at a later date.[104] Consequently, these items temporarily recorded under accumulated Other Comprehensive Income are later reclassified into profit or loss. In accounting the concept of recycling is defined as partial or entire transfer of components previously booked under Other Comprehensive Income into profit or loss.[105] In a first step the accumulated Other Comprehensive Income is adjusted for the positions that are reclassified to profit or loss.[106] The reclassification adjustments include the actual changes in value for the period, as well as the accumulated value changes for the preceding periods. In a second step the positions are booked into Net Income under reclassification adjustment.[107] A company

[101] Cf. Ernst & Young Global Limited (2011), p. 2.

[102] Cf. IASB and FASB (2012) for the joint update note from the IASB and the FASB on accounting convergence.

[103] Cf. Ernst & Young Global Limited (2011), p. 2.

[104] Cf. Ernstberger (2008), p. 11, Kanagaretnam et al. (2009), p. 364.

[105] Currently no clear concept is given by the IASB on if or when Other Comprehensive Income components should be recycled (reclassified) into profit or loss. Cf. Hoogervorst (2012), p. 2, Bellandi (2012), p. 282, Zhang (2014), p. 232.

[106] Cf. Antonakopoulos (2007), p. 38.

[107] Cf. Leibfried and Eisele (2009), p. 514, Pellens et al. (2014), pp. 174–175.

may display these recycled items, specifying value changes for the period, as well as cumulated values for previous periods, either in the statement of Comprehensive Income or in the notes.[108]

If all items recognized under Other Comprehensive Income would be recycled, Net Income would equal Comprehensive Income of an entity over the lifetime of such entity. The concept of recycling all objects is also closely linked to the concept of clean surplus accounting, because all changes in equity, excluding transactions with shareholders, are finally booked into profit or loss.[109]

IFRS requires that only selected items may be recycled to profit or loss. These include (i) foreign currency translation adjustments and net investment in foreign operations, (ii) effective portion of gains and losses in cash flow hedges, (iii) gains and losses on available-for-sale financial assets, (iv) share of Other Comprehensive Income in an associate, and (v) the related taxes. Items that are not recycled to profit or loss include (i) changes in revaluation surplus of tangible and intangible assets, (ii) actuarial gains and losses on defined benefit plans, and (iii) corresponding taxes. The IASB has taken this differentiated view on Other Comprehensive Income components because its board argues that there is no single attribute to distinguish reclassifications.[110] The separate reporting of items that will be recycled and items that will not be recycled should give users of financial statements a better understanding of the actual financial performance of the entity. Items that may be recycled and items that may not be recycled under IFRS are listed in Table 2.1.

[108] Cf. IAS 1.94. If reclassification adjustments are presented in the notes, components of Other Comprehensive Income must be displayed net of any reclassifications to increase comparability.

[109] Reference is made to section 2.3.1 for further information on the clean surplus and dirty surplus accounting concepts.

[110] Cf. IASB (2013c), p. 7.

*Table 2.1: Overview of Other Comprehensive Income items to be recycled*

| **Items that may be reclassified subsequent to profit or loss:** |
|---|
| Foreign currency translation adjustments and net investment in foreign operations (FCT) |
| Gains and losses on available-for-sale financial assets (AFS) |
| Effective portion of gains and losses in cash flow hedge (CFH) |
| Share of Other Comprehensive Income of investments in associates (ASS) |
| Income tax relating to items that may be reclassified |

| **Items that will not be reclassified to profit or loss:** |
|---|
| Actuarial gains and losses on defined benefit plans (ACT) |
| Changes in revaluation surplus of tangible and intangible assets (REV) |
| Income tax relating to items that will not be reclassified |

When reviewing the ongoing discussion on recycling under IFRS, it is essential to consider the different positions on this topic.[111] The arguments in favor of general recycling of all Other Comprehensive Income components emphasize that reclassification can increase the usefulness of profit or loss as items in Other Comprehensive Income. Finally it will show up in Net Income and, therefore, capture changes in economic resources more accurately. Additionally, the comparability of financial reports is enhanced through limiting the differences in recognition caused by providing reporting choices. The proponents highlight the additional value that recycling provides on the timing of the actual recognition and realization of Other Comprehensive Income items. However, this timing of realization is also raised by objectors. The untimely recognition of amounts in later periods disturbs the information content on financial performance in that period. It bears the risk of leveling results and earnings by management if management is granted the option to

[111] The views of the investor community were brought to the attention of the IASB via comment letters and have been published on the homepage of the IASB. The arguments supporting and opposing the idea of recycling have been summarized in this work.

decide when to realize certain balance items.[112] In addition, the concept of recycling further increases the complexity of the already often criticized Other Comprehensive Income recognition and is assumed in general not to increase the understandability of financial statements for their users. These arguments demonstrate that, based on the current version of IFRS, an extreme approach of recycling either all or none of the items from the Other Comprehensive Income is not practical. Consequently, it makes sense to take a more differentiated view. For an overview of arguments both in favor of and against recycling, reference is made to a discussion paper issued by the IASB in 2013.[113]

The intense debate about if and how to include recycling of components of Other Comprehensive Income shows the actuality of the topic for standard setters. The discussion paper issued by the IASB in 2013 reviews the Conceptual Framework for Financial Reporting and gives prominence to the topic of recycling.[114] It was open for receiving comments until mid-January 2014 and is aimed to be finalized by the end of 2015.[115] The paper proposes three approaches on how to deal with recycling Other Comprehensive Income items. The first approach, which is the strictest and least supported one by the IASB, prohibits recycling of items from Other Comprehensive Income to profit or loss in general.[116] In addition to the first strict approach, the IASB presents two more differentiated procedures, one being the "narrow" approach[117] and

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[112] If, for example, a financial asset is classified as available-for-sale and has lost value over time, the management could be motivated to hold on to the asset even though a sale and therefore a realization of the loss via profit or loss would be economically reasonable. On the other hand, if a financial asset increases in value, then the management of the entity could postpone the realization and use the items as a reserve for hard times (these reserves are also known as "cookie jaws" in related literature). Cf. Hirst and Hopkins (1998), p. 49 where the authors state that an explicit and more transparent statement of available-for-sale financial assets under Other Comprehensive Income would increase the likelihood of financial analysts detecting potential earnings management of a company. However, the leveling can also be viewed as an advantageous concept when dealing with specific industries; for example, with insurance companies who have significant available-for-sale financial asset portfolios as liquidity reserves. To avoid unnecessary deviation they should be able to match the gains and losses from the available-for-sale portfolio with the gains and losses from the insurance risk.

[113] Cf. IASB (2013b), paragraph 8.24 for arguments supporting recycling and 8.25 for arguments opposing the concept of recycling.

[114] Cf. IASB (2013b), p. 13.

[115] The broad principles that are to be followed based on the discussion paper IASB (2013b) are:
"… (a) Profit or loss provides the primary source of information about an entity's performance in a period.
(b) To support (a), Other Comprehensive Income should only be used if it makes profit or loss more relevant; i.e., enhances the predictive value of profit or loss or makes it more understandable."

[116] Cf. IASB (2013b), paragraph 8.29–8.33.

[117] Cf. IASB (2013b), paragraph 8.40–8.78.

the other being the "broader" approach.[118] Pursuant to the narrow approach, items need to qualify as bridging items or mismatched re-measurements in order to be recognized under Other Comprehensive Income. All items recognized under Other Comprehensive Income under the narrow approach are recycled. The consideration behind the broader approach is to follow a strict relevance approach meaning that only those items that provide additional and more useful information are recognized and recycled.[119,120]

It is not yet clear as to how the final conceptual framework will look with respect to proceeding with the treatment of recycling. One major question remaining is if and how the convergence project between the IASB and the FASB will deal with the situation; namely, will it make use of the strict rule of generally recycling all Other Comprehensive Income items under US GAAP or will it take a more differentiated and case-based approach under IFRS? The challenge is that the treatment of certain Other Comprehensive Income items is designed in a way that some are recycled and others are not. Even the narrow approach could lead to inconsistencies by not adjusting the treatment of Other Comprehensive Income items at the same time by the IASB. However, the IASB currently does not have plans to make further compromises and to accept additional adjustments to IFRS.[121]

In summary, recycling can have a significant impact on the income reporting of a corporation, especially on the reporting of Net Income. The concept of recycling does have shortcomings; for example, the risk of earnings manipulation, which should not be neglected in the discussion. In this study, for reasons of comparability, the information provided on reclassification will not be considered and net values will be used.[122] This approach has been taken because the information on reclassifications was only available for parts of the observation period and for selected companies. The overview has been given for reasons of completeness, since the impact of the treatment has and will have significant effects on the reporting of Other Comprehensive Income

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[118] Cf. IASB (2013b), paragraph 8.79–8.94.

[119] Cf. IASB (2013b), paragraph 8.46 and 8.50, IASB (2013d), paragraph 10.

[120] See appendix 1 (A1) for an overview of the two approaches, the different categories, and the treatment of recycling.

[121] Based on their latest discussion paper on this topic, the IASB notes that there are currently no plans to make adjustments to the respective IFRS requirements. Cf. IASB (2013b), paragraph 8.78.

[122] As the information on recycling is only sporadically reported for companies during the observation period it is currently not possible to make a judgment on the value-relevance of this position.

and Net Income. The net figure for each component of Other Comprehensive Income is calculated by netting the unrealized gains and losses with the reclassification adjustments. This procedure is not only used because of practical reasons, but has also been confirmed as a valid procedure e.g. by Jones and Smith (2011). These authors found that very few corporations actually report split data for Other Comprehensive Income components and reclassifications.[123] Nevertheless, analyzing the reclassification adjustments could be an interesting topic for further research once more robust and comprehensive data are available.

### 2.1.7 Forms of Display of Comprehensive Income

Based on IAS 1.88, as a general rule a company needs to recognize all items of income and expenses for the profit or loss period, unless another standard requires or permits otherwise. Such exemptions are components of Other Comprehensive Income that can be excluded from profit or loss even though they represent an income or an expense for such period. IFRS and US GAAP permit similar presentation formats for the statement of Comprehensive Income and its components.[124] The standard setters allow display in either a single statement of Comprehensive Income or in two independent statements.[125] The information content of the two options is identical as it is derived from the same underlying data, but the prominence and display are different.[126] The single statement approach reports Comprehensive Income prominently in the bottom line of the statement and Net Income only as a subtotal. The two-statement presentation uses the established income statement that concludes with Net Income and also displays the components of Other Comprehensive Income in the statement of Comprehensive Income.[127] In contrast to the single statement, in the two-statement approach Net Income and Comprehensive Income coexist and give addressees of financial statements the choice of the two performance indicators.[128] In a discussion

[123] Cf. Jones and Smith (2011), pp. 2051–2052.

[124] Cf. IAS 1.81 and FASB ASC 220-10-55.

[125] Cf. for a critical review e.g. Buschhüter and Striegel (2011), p. 277, Blase et al. (2010), p. 62.

[126] See appendix 2 (A2) for an illustrative example of a single statement and two statement approach following the IFRS taxonomy.

[127] Cf. IASB (2008a), paragraphs 3.27.

[128] Cf. Cauwenberge and De Beelde (2007), p. 2–3 on an analysis of dual income display. US GAAP previously allowed the publication of Other Comprehensive Income within the statement of changes in equity until the

paper published in October 2008 the boards of the IASB and the FASB proposed permitting only a single statement presentation for the future.[129] However, the FASB reconsidered this proposal and withdrew it after heavy opposition from the business community and investors. As a consequence, the IASB followed this development in order to avoid additional differences between the two standards.[130] The amendments made to IAS 1 (2011) reaffirm the reporting choice of presenting items of Other Comprehensive Income or profit or loss either in a single statement or in two consecutive statements.

## 2.2 Components of Other Comprehensive Income under IFRS

For this study in general and for the empirical analysis in particular, it is essential to provide a general understanding of the different components of Other Comprehensive Income. The classification, the occurrence, and the differentiated treatment are essential for the empirical analysis. The following section provides an overview of the treatment of components of Other Comprehensive Income based on IFRS.[131] The standard setter, under IAS 1.7, distinguishes between the following components of Other Comprehensive Income which will be analyzed in more detail.[132]

FASB (2011) issued Accounting Standards Update 2011–05. For business years starting on or after December 15, 2011, the publication under the changes in equity is prohibited under US GAAP.

[129] Cf. IASB (2008a), paragraphs 3.24–3.34.

[130] Cf. IASB (2011), p. 6.

[131] The overview of the different components of Other Comprehensive Income and their treatment under IFRS is outlined in a way to provide a general understanding of the position as such and differentiates those components from similar items that are differently treated and are not recognized under Other Comprehensive Income. This study always refers to the specific standard.

[132] The Other Comprehensive Income component, share of Other Comprehensive Income of investments in associates, and taxes relating to Other Comprehensive Income are not explicitly stated in IAS 1.7, but the treatment in the corresponding standards implies recognition under Other Comprehensive Income.

*Table 2.2: Overview of Other Comprehensive Income components*[133]

| | |
|---|---|
| Gains and losses arising from translating the financial statements of foreign operations (including net investment in foreign operations) | IAS 21.39(c) (IAS 21.32) |
| Gains and losses on available-for-sale financial assets | IAS 39.55(b) |
| Effective portion of gains and losses in cash flow hedge | IAS 39.95(a) |
| Actuarial gains and losses on defined benefit plans | IAS 19.93A |
| Changes in revaluation surplus of property, plant, and equipment | IAS 16.39 |
| Changes in revaluation surplus of intangible assets | IAS 38.85 |
| Share of Other Comprehensive Income in an associate | IAS 28.11 |
| Taxes relating to components of OCI | IAS 12.61A |

### 2.2.1 Gains and Losses Arising from Translating Foreign Operations

For globally operating corporations in the commercial world the importance of trading in foreign currencies has increased considerably over the past years and will continue to increase in the future. Entities are engaged in the import and export of goods and services and may have subsidiaries and operating branches in countries where currencies differ from the presentation currency. Hence, an entity may be exposed to foreign activities either by having transactions in foreign currencies or by having foreign operations itself.[134] It is obvious that in order to report the entire business on the level of a holding or parent company in a comparable, comprehensive, and concise way, all business activities have to be converted into a single currency.

The rules governing foreign currency translations, as well as translation of foreign reports into the consolidated accounts of the parent company, are provided by IAS 21. The general objective of this standard is to define the functional currency of the individual entities, as well as to define the accounting treatment of transactions denominated in a currency which is different from the presentation currency of the parent.[135] The occurrence of currency translation is based on the functional currency of the parent entity and this functional currency decides which transactions will be classified as foreign currency transactions.[136] IAS 21 defines which exchange rates

[133] The standard stated in the table next to the components of Other Comprehensive Income is the IAS where the Other Comprehensive Income item is explicitly mentioned.

[134] Cf. Muthupandian (2009), p. 809.

[135] Cf. Künkele and Zwirner (2009), pp. 352–353, Alfieri and Gwerder (2012), pp. 68–69, Ernst & Young (2014), p. 1095.

[136] Cf. Oechsle et al. (2006), pp. 21–38.

should be used for the conversion of transactions in foreign currencies and for the translation of foreign accounts. The standard answers the question whether resulting gains and losses should be reported in profit or loss or under Other Comprehensive Income over time.

The scope of applying foreign currency translation is defined under IAS 21.3. In general it differentiates between accounting principles for foreign currency transactions and adjustments from translating financial statements in foreign currencies into the presentation currency. The conversion steps apply to entities with foreign operations, entities of foreign operations, and to stand-alone entities.

The concept of a functional currency is of particular interest. The functional currency of a company is defined under IAS 21.8 and represents the currency of the economic environment in which the entity primarily operates.[137] For each business unit, be it the parent company, a subsidiary, operating branch, or an associated entity, an individual functional currency is determined. Based on IAS 21.9, the primary indicator for this choice corresponds to the currency which predominantly determines and influences the sale price and the operating costs of the business unit. Only in a second step the currency of the financing activity determines the functional currency and is used as supporting evidence. Under IAS 21.11 additional factors are considered for determining whether the functional currency of a foreign operation is identical to the currency of the reporting entity. These factors include (i) operational independence of the parent entity, (ii) the proportion of transactions with the parent entity compared to external transactions, (iii) the effect of the foreign operations cash flows on the cash flows of the parent entity, and (iv) the financial autonomy from the parent entity to service debt obligations. Furthermore, IAS 21.11–14 provides indications in the event that the selection of the functional currency is problematic. This includes the situation in which the functional currency is one of a hyperinflationary economy.[138] Once the functional currency has been determined for an entity, it will not be changed unless the business environment has changed fundamentally and justifies a modification. In the

[137] Cf. Oechsle et al. (2006), pp. 21–38, Pellens et al. (2014), p. 711.

[138] The purchasing power in hyperinflationary economies can significantly lose values during the reporting period and the analogue inter-temporal recognition of transactions is impossible. As a solution, IAS 21.14 requires the use of one homogenous measure on the day of recognition, which is in line with IAS 29.

case of an adjustment, changes in the functional currency are to be booked prospectively starting with the date of change pursuant to IAS 21.35.[139]

**Accounting for foreign currency transactions**

The initial recognition of foreign currency transactions in the functional currency is defined under IAS 21.21. For the translation, the spot exchange rate at the date of transaction is applied, which means the time when the transaction is included in the balance sheet.[140] If the exchange rates are more or less stable compared to those used for various transactions, an average rate for the specific week or month is permitted by the standard as a simplifying approximation.

For reporting in subsequent periods, the general concept is to present the balance sheet items as if they had been originally booked in the functional currency based on IAS 21.34. Furthermore, IAS 21.23 differentiates between three different items:

- Foreign currency monetary items
- Non-monetary items measured at historical costs
- Non-monetary items measured at fair value

Foreign currency monetary items include cash, debt securities, accounts receivable, notes payable, bonds payable, and accruals. These items are received (monetary assets) or paid (monetary liabilities) in a determinable amount of a specific currency. They are translated using the closing rate on the reporting date.[141] Possible gains and losses arising from the translation are directly recognized in profit or loss, except for exchange differences from monetary items that are based on net investment in a foreign operation.[142] Exchange differences relating to net investment result from group internal receivables and payables, which are not related to the ordinary business of the

[139] Cf. Alfieri and Gwerder (2012), p. 73, Ernst & Young (2014), p. 1109, Pellens et al. (2014), p. 711.

[140] The time of the translation is not the date of invoicing, but the date of the actual recognition in the balance sheet. Cf. Künkele and Zwirner (2009), p. 353.

[141] Cf. Ernst & Young (2014), pp. 1102–1103.

[142] The general concept for the recognition of exchange differences of monetary items is governed under IAS 21.28 with the exemption of exchange differences from net investment in a foreign operation being explicitly stated under IAS 21.32.

entity.[143] These differences are treated as quasi equity loans due to their unforeseeable payback date and are recognized in Other Comprehensive Income of the parent entity. The rationale behind this treatment is to achieve a balance-sheet-wise combination of the net investment and monetary items in one valuation unit.[144] Foreign exchange differences already recognized in equity remain as such in further restatements.[145] The translation gains and losses will be recycled and recognized in profit or loss at the disposal of the net investment.[146]

Non-monetary items (e.g., property, plant and equipment, inventory, prepaid expenses, or intangible assets) will not be received or paid in fixed or determinable numbers of currency units. The translation of non-monetary items differentiates between items valued at historical costs and items valued at revalued amounts. Items valued at historical costs will be translated at the historical exchange rate at the time of the purchase or construction. For items valued on the basis of the fair value principle, the exchange rate on the date of the last revaluation is utilized in line with IAS 21.23.[147] Exchange gains and losses on non-monetary items recognized under profit or loss, such as financial assets held for trading, are correspondingly booked under profit or loss. Exchange gains and losses relating to non-monetary items recognized under Other Comprehensive Income, such as gains and losses on available-for-sale financial assets, are booked under the respective Other Comprehensive Income position pursuant to IAS 21.30.[148] Figure 2.3 summarizes the treatment of foreign currency translations according to IFRS.

[143] Cf. Alfieri and Gwerder (2012), p. 73, Pellens et al. (2014), pp. 715–716.

[144] Cf. Oechsle et al. (2006), p. 29.

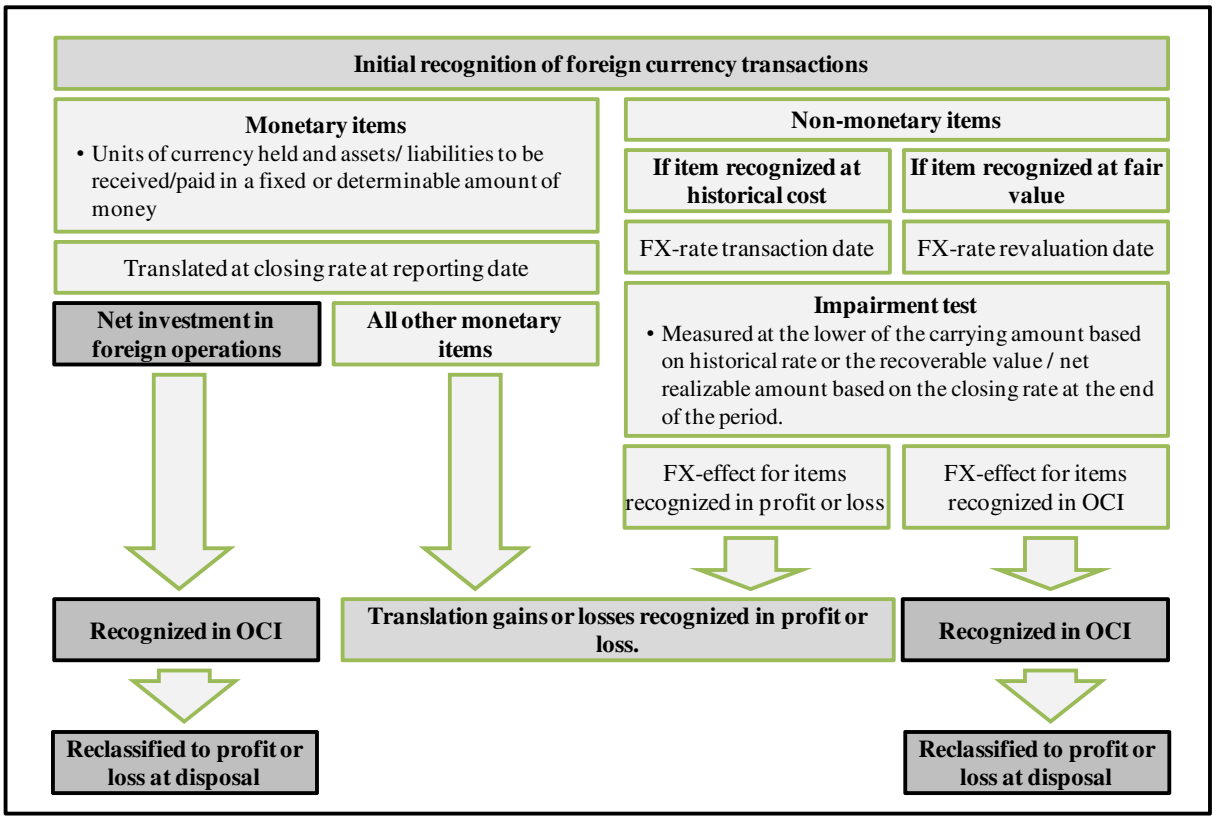
[145] Cf. Alfieri and Gwerder (2012), p. 69.

[146] Cf. Küting and Reuter (2009), p. 175.

[147] Cf. Ernst & Young (2014), p. 1104.

[148] Cf. Pellens et al. (2014), p. 716.

*Figure 2.3: Accounting for foreign currency transactions*[149]




## Adjustments from translating financial statements in foreign currencies into the presentation currency

After demonstrating the treatment of foreign currency transactions and their potential treatment under Other Comprehensive Income and profit or loss, the handling of exchange differences resulting from the conversion of financial statements into the presentation currency is covered. Any gains and losses arising from translating financial statements of foreign operations into the presentation currency are recognized entirely in Other Comprehensive Income pursuant to IAS 21.39.[150]

The concept of the functional currency is also essential for translating financial statements with foreign currencies into the presentation currency. Based on IAS 21.38, an entity can in general present its financial statements in any currency of its choice. If the presentation currency of a group differs from the functional currencies of its

[149] The illustration has been derived from IAS 21 as well as from Alfieri and Gwerder (2012), p. 69 and BDO (2014), p. 38.

[150] Cf. Ernst & Young (2014), pp. 1111–1116.

entities, the financial statements of the subsidiary will be converted into the presentation currency of the group to generate the consolidated financial statement. The conversion procedure for translating foreign currencies into the presentation currency follows the guidelines published in IAS 21.39, unless the currency is the currency of a hyperinflationary economy.[151] The different procedures used are applied to the following items:

- Assets and liabilities
- Income and expenses
- Equity transactions

The standard states that assets and liabilities should be translated at the closing rate at the reporting date. Moreover, income and expenses should be converted into the presentation currency at the exchange rate on the transaction date, or alternatively an appropriate average based on IAS 21.40. Equity transactions are exclusively translated on the exchange rate at the transaction date. All exchange differences resulting from this conversion should be recognized under Other Comprehensive Income under foreign currency translation reserves.[152]

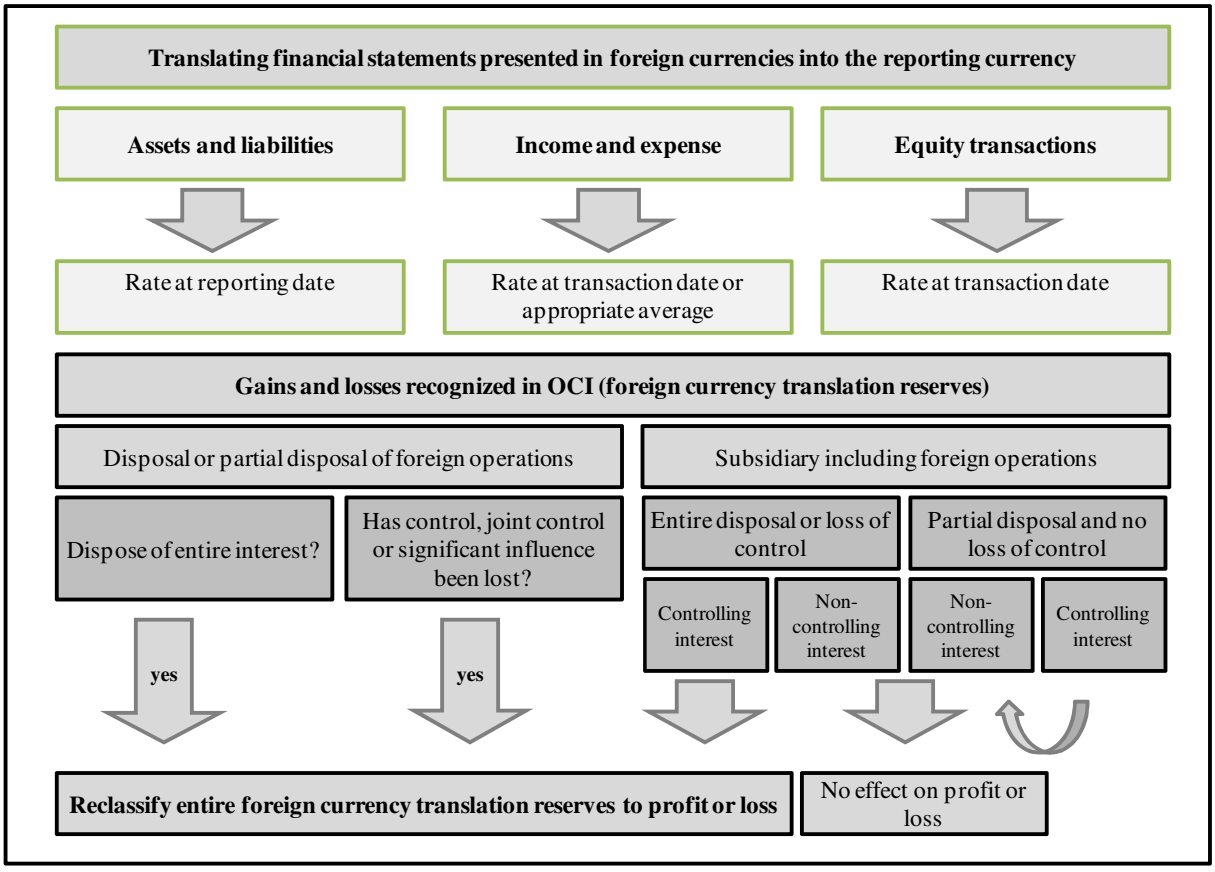
With complete or partial disposal of the foreign operation, the relating foreign currency translation reserves that were initially booked under Other Comprehensive Income are reclassified to profit or loss following IAS 21.48. The standard determines that in the case of (i) loss of control of a subsidiary including foreign operations (IAS 21.48A(a)), (ii) loss of significant influence over an associate that includes foreign operations (IAS 21.48A(b)), and (iii) loss of joint control in a joint venture that includes foreign operations (IAS 21.48A(c)), all related foreign currency translation reserves are to be reclassified to profit or loss. Exemptions to these rules are subsidiaries that include foreign operation. In the case of complete disposal or loss of control of an entity, the controlling interest should be recycled via profit or loss,

[151] The conversion into the reporting currency for entities that report in a currency of a hyperinflationary economy is regulated under IAS 21.42 and IAS 29. In that context all values have to be converted at the exchange rate of the preceding reporting date with the exemption of amounts that are translated into the currency of a non-hyperinflationary economy. Those values should instead be translated at comparative amounts that were presented as current year amounts in the relevant year's prior financial statements.

[152] Cf. Ernst & Young (2014), p. 1123.

whereas an entire or partial disposal of the non-controlling interest does not affect profit or loss based on IAS 21.48B.[153] If the subsidiary is partially disposed, but a controlling stake is kept, then pursuant to IAS 21.48C the foreign currency translation reserves are redistributed to the non-controlling interest not affecting profit or loss. Figure 2.4 summarizes the outlined conversion process.

*Figure 2.4: Translation of foreign exchange transactions into the presentation currency*[154]




This differential treatment of partial or complete disposal of foreign operations highlights the complexity of this standard.[155] Recognizing foreign currency translation

[153] Cf. Küting and Reuter (2009), p. 174, Ernst & Young (2014), pp. 1133–1138 as well as Lüdenbach and Hoffmann (2010), pp. 1389–1390 for a demonstrative example.

[154] The illustration has been derived from IAS 21 as well as from Alfieri and Gwerder (2012), p. 69 and BDO (2014), p. 38.

[155] Cf. Alfieri and Gwerder (2012), pp. 71–73 for a critical review of the handling of foreign operations at disposal.

reserves differently in profit or loss adds complexity for preparers and users of financial statements, with the problem of such treatment not being directly obvious.

In the empirical analysis in this study the net investment in foreign operations and currency translation adjustment are combined under the position foreign currency translation adjustments.

### 2.2.2 Gains and Losses on Available-for-Sale Financial Assets

In this section the recognition and valuation of financial instruments will be analyzed according to current accounting standards, with a focus on available-for-sale assets that are recognized in Other Comprehensive Income. A brief outlook will be given regarding the changes that may affect the reporting of Other Comprehensive Income items in the future.[156]

To understand the concept of recognizing gains and losses on available-for-sale financial assets, it is important to review the classification of financial instruments. Accounting of financial instruments by the current version of accounting standards has often been criticized as being too complex.[157] The lack of practicality and the absence of good risk management have also been criticized in the past. In general two different concepts can be applied, either historical costs or fair values.[158] The unavailability of reliable valuations for financial instruments, as well as the general irrelevance of these concepts for particular situations, gives ground for a more differentiated view. In this context and in view of the financial crisis a fair value[159] measurement for financial instruments has been proposed by experts.[160] However, the fair value concept also has weakness, particularly if no liquid market is available. Furthermore, following the financial crises, the fact that valuation gives substantial room for interpretation has

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[156] As this study deals with the analysis of financial years 2007 to 2012, IAS 39 is used as the basis for the analysis. This study provides a brief outlook on the proposed implementation IFRS 9, which replaces IAS 39 in the future.

[157] Cf. Pickard (2007), p. 38 where the former chair of the IASB, Sir David Tweedie, criticizes the comprehensiveness of IAS 39 in an interview with the Journal of Accountancy "… if you understand it, you haven't read it properly-it's incomprehensible."

[158] Cf. Pellens et al. (2014), p. 556.

[159] Fair value is under IFRS 13.9 defined as "… the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date."

[160] Cf. Gassen and Schwedler (2010) on the evaluation of the utilization of the fair value concept for financial instrument by institutional investors.

become central to the discussion.[161] These examples show that a more complex model approach for the valuation of financial instruments is needed and justifies the multifaceted structure of IAS 39. The different treatments of financial instruments are reflected by their classification under IAS 39.9, which defines four categories for financial assets:

Financial assets

1. at fair value through profit or loss
2. held to maturity
3. loans and receivables
4. available-for-sale financial assets

Financial liabilities are differentiated between those with fair value through profit or loss and those with amortized costs; the latter includes all liabilities that do not fall under the former definition.[162]

Based on IAS 39.14, financial assets or financial liabilities are initially recognized if the entity becomes the contracting party of a financial instrument. When initial recognition applies, all financial instruments are measured at fair value with costs directly attributable to the transaction[163] being subtracted pursuant to IAS 39.43. For subsequent measurements the differences between actual market value and the initial recognition depend on the financial asset categories previously mentioned. Nominal interest gains are treated equally for all financial instruments and directly flow through profit or loss. Financial instruments which are held at fair value through profit or loss[164] are, as the name indicates, valued at fair value for subsequent periods and with all gains and losses being recognized in profit or loss. The measurement of financial assets that are classified as held to maturity follows the amortized cost approach by

[161] Cf. Pellens et al. (2014), pp. 577–578.

[162] Cf. IAS 39.47.The treatment of financial liabilities is not fully covered in this study. For a more detailed and extensive examination, reference is made for example to Kuhn and Scharpf (2006).

[163] Costs directly attributable to the transaction are expenses that would not have occurred if the transactions with the financial instrument had not been executed. Cf. Clubb (2005), pp. 17–18.

[164] Cf. IAS 39.9. Includes all financial assets and financial liabilities that are either held for trading or that have been designated to be valued at fair value through profit or loss at the initial recognition.

using the effective interest method[165] based on IAS 39.46. The same treatment applies to loans and receivables, which are subsequently being measured at amortized cost.[166] Financial liabilities that are classified at fair value through profit or loss are measured at fair value respectively, whereas all other financial liabilities are measured at amortized cost applying the effective interest method as previously mentioned and based on IAS 39.47.[167]

Available-for-sale assets are the only financial instruments that affect Other Comprehensive Income and, therefore, are of particular interest for this study. These assets are defined as financial assets that are either classified as available-for-sale or are not designated to one of the other three categories; namely, at fair value through profit or loss (held for trading), held to maturity, and loans and receivables.[168] An entity may decide to irrevocably classify loans and receivables or financial assets held to maturity as available-for-sale assets, taking into consideration that assets held for trading cannot be classified into this category. Gains and losses resulting from the fair value measurement are recognized under Other Comprehensive Income until realization (IAS 39.55(b)), except for impairment losses (IAS 39.67–70) and foreign exchange gains and losses (IAS 39.83) that flow directly through profit or loss. Interest is calculated by using the effective interest method (IAS 18.30(a)) and dividends relating to any of the financial instruments (IAS 18.30(c)) are also directly recognized in profit or loss. Once a financial asset classified as available-for-sale is abandoned from the balance sheet, the established positive and negative equity position resulting from the revaluation and recognition under Other Comprehensive Income is dissolved via profit or loss (IAS 39.26). The treatment of the different financial instruments is shown in Figure 2.5.

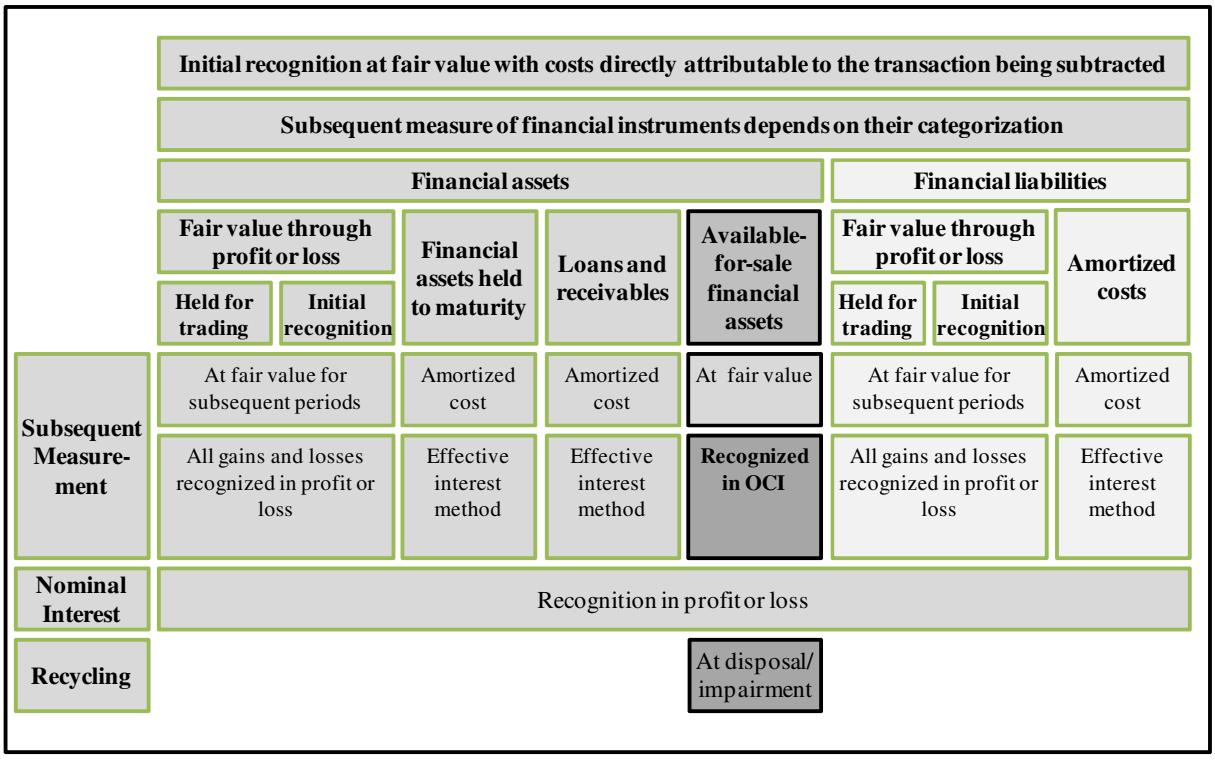
[165] The effective interest method calculates amortized costs by allocating the total expected interest income and interest expenses to financial instruments being distributed equally to the respective period. The constant effective interest rate is the internal rate of return of the financial instrument calculated by taking the expected payment flow of the instrument and discounting it to the book value of the instrument

[166] Loans and receivables in this category only include financial assets that do not have an active market; e.g., supplier credits where the entity acts as the creditor. Cf. Pellens et al. (2014), pp. 573–575.

[167] The linear distribution of the effective interest rate over the lifetime of the instrument is in contrast to other instruments where the distribution follows the effective interest method mentioned above.

[168] Cf. Küting and Reuter (2009), p. 173, Ernst & Young (2014), p. 3136.

*Figure 2.5: Initial recognition and subsequent measurement for financial instruments*[169]




The rationale behind the different treatments of the financial assets is to create a possibility of illustrating the actual market values in the balance sheet, and at the same time not to increase the fluctuation of profit or loss arising from unrealized amounts. The described treatment also differentiates between ordinary operations and special occasion items, which underline the standard setters' goal to provide users of financial statements with additional information on the holding intention of the specific portfolio of a company.[170]

The difference in subsequent measurement for certain categories, and particularly the categorization choice for available-for-sale assets, has been the basis for critique in recent years. The rules were criticized as being complicated and arbitrary.[171] In

[169] The illustration has been derived from IAS 39 as well as from BDO (2014), p. 51.

[170] The business model of the portfolio decides whether the instrument is measured at fair value or amortized costs and respectively recognized in profit or loss or Other Comprehensive Income. Cf. PwC (2013a), p. 4.

[171] Cf. e.g. Barth (2013), p. 9.

conjunction with the comprehensive project on financial instruments,[172] the IASB reacted with the issuance of IFRS 9, which deals with reforms of the financial instrument accounting. It aims to completely replace IAS 39 in the future. The main goal of IFRS 9 is to replace complexity by reducing the classification into two categories, those at amortized costs and those at fair value, aligning measurements with business models of the entities, and giving more emphasis to risk management.[173]

Even though the first version of IFRS 9 was initially published in November 2009, the standard is still currently a work in progress. The IASB recently introduced a new hedge accounting model that makes significant changes to the accounting procedures of entities. It aims at improving risk management within companies. These and other changes will have a significant impact on the reporting entities. The envisaged effective date of January 1, 2015, has been postponed.[174]

### 2.2.3 Effective Portion of Gains and Losses in Cash Flow Hedges

The measurement of hedging instruments is closely linked to the treatment of financial instruments. The general concept of hedging is that fair values or cash flows of the hedging instrument can offset the changes in fair values or cash flows of the hedged item in an optimal way. As previously mentioned in section 2.2.2, certain financial instruments,[175] including hedging instruments, must be recognized in the balance sheet of a company and their change in fair value must be recognized via profit or loss over time. Recognition of fair value changes in the hedging instrument, if not paired with the fair value adjustments of the hedged item in profit or loss, could lead to a significant increase in the volatility of earnings reporting.[176]

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[172] The comprehensive project for financial instruments has been divided into three phases. The first phase deals with classification and measurement (being completed), the second phase deals with impairment methodology (consultations are ongoing), and the third and final phase on hedge accounting (ongoing).

[173] Cf. IASB (2012a), p. 5. Even though the aim was to reduce complexity by limiting the possible classification choices, the reintroduction of additional categories has been considered by the IASB in an exposure draft on limited amendments to IFRS 9. Cf. IASB (2012b), p. 4.

[174] In the agenda paper of the IASB (2013e) in connection with the meeting held between November 18 and 21, 2013, the IASB provisionally decided to postpone the effective date for IFRS 9 to annual periods starting no later than January 1, 2017. At a meeting in February 2014, the IASB tentatively decided to select an effective date of January 1, 2018, as the effective date for mandatory application of IFRS 9. However, this date has not yet been confirmed.

[175] As shown in Figure 2.5, financial assets held to maturity as well as loans and receivables, are subsequently measured at amortized costs and not at fair value.

[176] Cf. Hughen (2010), p. 1028.

The fact that fair value changes over the time of one or more hedging instruments and respective changes in the fair value measurement of the underlying item at least partly neutralize each other has been included in the concept of hedge accounting. The concept of hedge accounting generally matches the changes in fair values of one or more hedging instruments with the hedged item.[177] The concept ensures the accurate recognition of such hedging instruments in the financial statement. The basis for a hedging relationship is the opposing position taken by the hedge in relation to the underlying item. Hedge accounting should, therefore, be beneficial to entities as it avoids the increase in earnings volatility associated with fair value accounting.[178] Hedge accounting can only be applied if all of the following criteria listed under IAS 39.88 are met:

- clear and well documented hedging relationship that is undertaken for risk management purposes,
- the hedge must be highly effective (80–125%) in offsetting fair value and cash flow risks,
- cash flow hedges must be highly probable and must present a potential effect on profit or loss,
- the effectiveness of the hedge must be reliably measurable, and
- the effectiveness of the hedge must be evaluated throughout the reporting period it was designated to.

These strict rules are set in order to prevent the misuse of the standard; for example, to hide speculation positions and ensure the positions are only offset if the effectiveness of the hedge can be confirmed in advance.[179]

After having provided an overview of the criteria that need to be met in order to apply hedge accounting, the different hedges and the treatment of fair value gains and losses are examined. There are three types of hedges that can be measured using hedge accounting pursuant to IAS 39.86:

[177] Cf. Glaum and Klöcker (2011), p. 460.

[178] Cf. Hughen (2010), p. 1028.

[179] Cf. Ernst & Young (2014), pp. 3420–3422.

1. Fair value hedges (IAS 39.89–94)
2. Cash flow hedges (IAS 39.95–101)
3. Hedge of a net investment in foreign operations (IAS 39.102 in connection with IAS 21)

A fair value hedge protects the issuing entity against the risk of changes in fair value of assets and liabilities recognized in the balance sheet, or against a previously unrecognized contractual and / or legally binding commitment having an impact on the profit or loss of an entity.[180] Examples of fair value hedges are the hedging of fixed-rate positions such as a fixed-rate loan against changes in fair value arising from interest rate movements. Also, assets from the working capital such as stock on hand can be hedged against movements in commodity prices.[181] Gains and losses arising from changes in fair value of the hedging instrument are immediately booked into profit or loss. Simultaneously, the book value of the hedged item is also adjusted and directly recognized via profit or loss compensating the result from the hedging contract. For a perfect hedge the gain in one position would equal a loss in another position, resulting in a zero effect in profit or loss.[182]

Gains and losses arising from hedging activities can not only have an impact on profit or loss, but can also be recognized in Other Comprehensive Income as the example of cash flow hedges shows. In contrast to fair value hedges, the hedged item is not a recognized position in the balance sheet of a company, but is a future cash flow that is not yet recognized. In order to be recognized as a cash flow hedge, theses cash flows must comply with rules pursuant to IAS 39.86(b). These rules state that the cash flows need to be attributable either to a particular risk that is associated to an already on-balance sheet asset or liability or must be a highly probable and predictable transaction that would have an effect on profit or loss. The portion of gains and losses resulting from the fair value measurement of the hedging instrument that are determined to have resulted from an effective hedge are recognized in Other Comprehensive Income, the ineffective portion of the gains and losses on the hedging instrument are directly recognized in profit or loss. In the period when the anticipated

[180] Cf. IAS 39.86. Also the identifiable portion of such an asset, liability or firm commitment can be hedged using fair value hedges if they are attributable to an identifiable risk and could affect profit or loss for the period.

[181] For example, a company producing chemical products and having sizable quantities of crude oil in stock could enter into a future contract to hedge against a possible devaluation of the value of the crude oil in stock.

[182] Cf. Ernst & Young (2014), pp. 3415–3420.

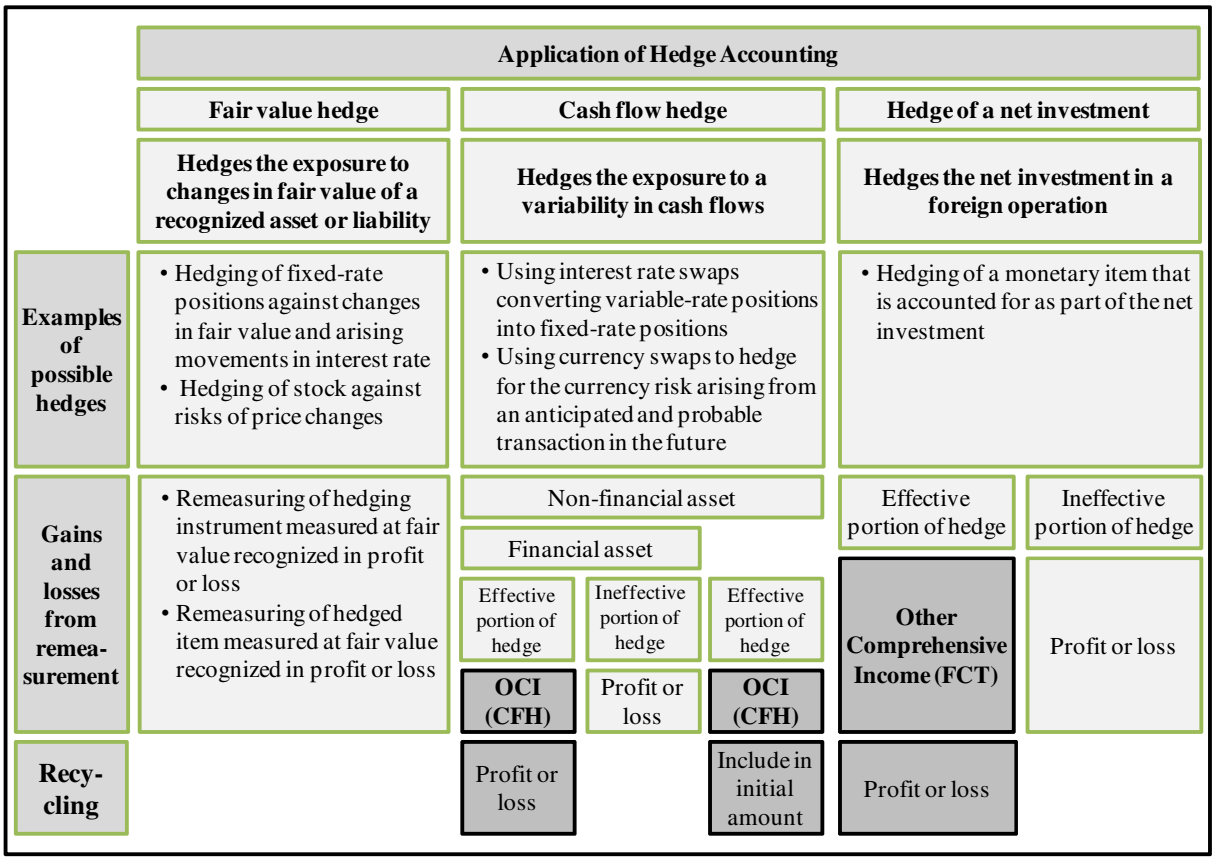
financial asset or liability underlying the cash flow hedge affects profit or loss, all gains and losses on the hedging instrument that have previously been recognized under Other Comprehensive Income are recycled to profit or loss pursuant to IAS 39.97. If the hedge of the forecasted transaction results in the recognition of a non-financial asset or liability, the entity has two choices.[183] The first choice includes treating those gains and losses as financial assets and liabilities and recycling the items in profit or loss. In the second choice the entity can remove the gains and losses recognized in Other Comprehensive Income and include them in the initial cost or the carrying amount of the acquired non-financial asset or liability pursuant to IAS 39.98.

Another hedging position that can have an effect on Other Comprehensive Income is hedges relating to net investments in foreign operations. As the name indicates, this position refers to a hedging instrument on the one hand and foreign currency translation on the other hand. Hedges of foreign net investments, including hedges on monetary items, are recorded similarly to cash flow hedges based on IAS 39.102. Accordingly, the effective portion of gains and losses on the hedging instrument should be recognized in Other Comprehensive Income, and the ineffective portion should be recognized in profit or loss. The recycling of the Other Comprehensive Income items should be carried out at the complete or partial disposal of the foreign operation in accordance with IAS 21.48–49.

Hedge accounting needs to be discontinued prospectively if (i) the hedging instrument expires, is sold, terminated, or exercised, (ii) the hedge no longer meets the hedge accounting criteria, (iii) the forecasted transaction is no longer expected to occur, and (iv) the entity revokes the designation; all are based on IAS 39.91 and IAS 39.101. The treatment of the hedging relations is shown in Figure 2.6.

[183] Cf. Ernst & Young (2014), p. 3423.

*Figure 2.6: Treatment of hedge accounting under Other Comprehensive Income*[184]




The overview on hedge accounting shows that the concept is complex and restrictive in its application, but that it is also based on several exemptions. These and other points have often been raised by investors, researchers, and preparers of financial statements. It shows that there is still room for improvement on the standard setters' side. Glaum and Klöcker (2011) condemn the set of exemptions and the highly restrictive and complex application of hedge accounting. They criticize that companies may modify, and not necessarily improve, their risk management practices only with the aim of being able to apply hedge accounting. Hughen (2010) criticizes that the application of hedge accounting has lifted the focus from economic earnings to the stability of accounting earnings and could thereby influence decisions to use hedging activities. For example, a hedge could be preferred from an accounting perspective but, at the same time, a hedge that would be optimal from an economical and risk management perspective would be neglected. Another point that was brought forward in the summary of comment letters by the IASB and the FASB published in 2009 was

[184] The illustration has been derived from IAS 39 as well as from BDO (2014), p. 54.

the aspect of manipulation.[185] Even though the rules for applying hedge accounting are strict, they do not distinguish between genuine hedging and speculative hedging.[186]

The implementation of IFRS 9 as replacement of IAS 39 aims at these critics and phase 3 of the replacement project focuses on hedge accounting. Following the exposure draft on hedge accounting by IASB (2010b), several comments have been received and have been considered in finalizing the new hedge accounting model proposal. The document that IASB (2013a) published on November 19, 2013, finalizes the phase on hedge accounting by introducing the application of a new hedge accounting model. The improved model aims at entities being able to improve the publication of risk management activities in their financial statements.[187] The most significant improvements apply to those companies that hedge non-financial risk. The effective date for the mandatory application of IFRS 9 has been tentatively fixed for January 1, 2018.[188]

The empirical analysis carried out in this study focuses on cash flow hedges and the recognition of the effective portion of the hedges in Other Comprehensive Income. The values for the effective portion of gains and losses in cash flow hedges are analyzed as a separate item in the analysis. Finally, the effective portion of hedges of net investments in a foreign operation will be summarized under the foreign currency translation adjustments in the Other Comprehensive Income.

### 2.2.4 Actuarial Gains and Losses on Defined Benefit Plans

In this study one other important aspect for analyzing Other Comprehensive Income is the accounting treatment of employee benefits, as outlined in IAS 19. The standard deals with short-term benefits and post-employment benefits, as well as other long-term benefits of employees. The treatment with all of the corresponding reporting choices has often been criticized as one of the most distorting and distracting standards of the IFRS, particularly because it may lead to manipulations.[189] This study focuses

[185] Cf. IASB and FASB (2009), paragraph 17.c.

[186] Cf. Hughen (2010), p. 1034.

[187] Cf. IASB (2013a), p. 6.

[188] The effective date for the mandatory application of IFRS 9 was set to January 1, 2018 at a meeting of the IASB in February 2014, however, has not been officially been confirmed.

[189] Cf. Pellens et al. (2014), p. 469.

on the treatment of post-employment benefits that may affect Other Comprehensive Income and the corresponding reporting choices. Moreover, a critical review of the reporting choices will be shown and an overview of the current changes with respect to employee benefits will be given.

Post-employment benefits are classified as either defined contribution plans to be satisfied by an external fund or as defined benefit plans to be satisfied exclusively by the employer. Under the defined contribution plan the employer pays fixed premiums to an external pension fund that is responsible for the payment of future pension benefits.[190] Under this plan the employer has no further obligations, even if the pension fund is not able to pay the entitled pension benefits to the former employees. Based on IAS 19.25, the employee bears both the actuarial and investment risk of the defined contribution plan. Payments to the defined contribution plan are recognized as expenses through profit or loss when the employee renders the service.[191] On the other hand, for the defined benefit plan the employer is obliged to make the pension benefit payments when they become due in the future. The payments usually depend on the job tenure and the actual salary of the employee. The employing company has to ensure that it has sufficient funds available to cover the benefits of current and former employees when those obligations become due. For those plans the actuarial risk, as well as the investment risk, stays with the employing company following IAS 19.27. Generally all pension promises that do not fall under the defined contribution plan are treated as defined benefit plans.[192] On the financing side, the company has the option to either finance the defined benefit externally, as already described for defined contribution plans, or to arrange for internal funding of future commitments of the company. The major difference between externally financed defined benefit and defined contribution on the basis of a plan is that for the latter the investment and actuarial risk remain with the company based on IAS 19.49, whereas the premium to the defined contribution plan shows up as an expense for the respective period. The handling of defined benefit plans is more distinctive. Already the pure number of paragraphs for defined benefit plans (IAS 19.48–125) compared to the number of

[190] Cf. Ernst & Young (2014), pp. 2308–2309. It is also possible for companies to pay into external pension plans, which are also organized as defined benefit plans.

[191] In cases where contributions do not fall entirely in the twelve month period, the payments are discounted to their present values after the end of the reporting period according to IAS 19.45.

[192] These cases include pension promises that exceed the amount that is covered by the defined contribution, but also any other commitment whereby the legal obligation remains with the company based on IAS 19.26.

standards on defined contribution plans (IAS 19.43–47) gives an idea of the complexity of the concept.

The remainder of this section covers the different handling and reporting choices for defined benefit plans and is based on the standards that are valid at the time of the observation period of this analysis. The following discussion starts with outlining the valuation of defined benefit obligations, followed by external financing through plan assets. Furthermore, the appearance and accounting treatment of actuarial gains and losses are covered.

The valuation of the resulting liabilities of employees' benefit plans is based on certain actuarial techniques whereby it does not matter if the defined benefit plan is internally or externally financed. It is essential to determine in a first step the absolute amount of future pension payments individually based on the contractual commitment, but also considering such aspects as expected wage development, fluctuation rate, or mortality rate of employees (following IAS 19.73). In the second step the calculated absolute amount must be discounted to the end of the reporting period.[193] In a third step the calculated and discounted amount must be spread over the remaining active time of the employee in the company.[194] The discount rate used for this calculation should be the one of a high quality corporate bond; therefore, primarily reflecting the time value of money.[195] It is important to differentiate between the present value of the pension that has already been earned and the part that will be earned by the employee in the future. By means of this so-called projected unit credit method, only that part of the entitlement for benefit that the company has made promises for is recognized. This very simplified procedure shows how complicated such calculations can be for large corporations, especially when these payments are evaluated on an individual basis. Based on this complex appraisal and the rapidly changing environment from the regulator's side, the IFRS recommends for reasons of practicality the involvement of a qualified actuary pursuant to IAS 19.57.

[193] The present value of the defined benefit obligation should be estimated on the basis of IAS 19.56 with sufficient regularity so as to avoid a material discrepancy between the amounts reported in the financial statement and the amounts at the end of the reporting period.

[194] Cf. Pellens et al. (2014), pp. 471–472.

[195] Only in countries with no liquid market for such bonds the government bond yield should be used as an alternative based on IAS 19.78.

Pension payments for employees are granted for previous periods, as well as for the current period, but will only result in later payouts. The company has to accrue assets in order to meet the pension obligations when they become due in the future. Thereby, the company can choose whether to accumulate those assets internally in the company or via so-called plan assets in external dedicated funds. External funds must be legally and economically independent from the company and the assets must be protected from access by the company in the case of the company's insolvency. The money transferred by the company to the fund is normally invested in different asset classes to best cover the required return for the pension obligations without taking excessive risks.[196] Plan assets should be recognized at fair value and need to be revaluated with adequate regularity.

In general pension expenses for the reporting period result from an increase in the fair value of obligations mitigated by a positive return or even reinforced by a negative development of the plan assets. The pension expenses can be subdivided into the following components: (i) current service costs representing the value of all earned pension obligations in that period, (ii) interest costs representing the interest for existing pension obligations for the period, and (iii) return on plan assets representing yield achieved through interest, dividends, and share price increases. The outlined pension expenses only represent the starting point for further adjustments as outlined in subsequent sections.[197] In addition, past service cost curtailment and settlement, as well as actuarial gains and losses, need to be considered.[198]

The pension obligation is determined based on several assumptions that can change over time and can have a significant impact on the amount of the commitment. On the one hand changes in the actuarial assumptions can have a positive or negative effect on the obligation and, on the other hand, the achieved return can affect the value of plan

[196] Presently, it becomes more and more difficult in an environment with an ongoing low interest period to achieve the interest rate levels promised in previous years with a comparable risk profile. Cf. Schich et al. (2011), pp. 245–250.

[197] Cf. Pellens et al. (2014), pp. 477–482.

[198] Past service costs occur if an entity introduces a benefit plan that attributes benefits to past service based on IAS 19.97. Past service costs that are not vested should be distributed linearly over the future vesting period. If benefits are already vested, the expense should directly be recognized in profit or loss. Curtailment and settlement occur if significant changes are made to the current pension commitment; for example, the reduction in employees as a consequence of a shutdown of a subsidiary. The gains and losses resulting from the curtailment should be directly recognized via profit or loss. Actuarial gains and losses on defined benefit plans are covered in more detail in the next section as they may affect Other Comprehensive Income.

assets.[199] Additionally, changes in the interest rate can have an impact on the discount rate. Those actuarial gains and losses can also occur if the assumptions for life expectancy, early retirement, or fluctuations need to be revised based on available updated figures. Furthermore, the plan assets may need to be adjusted because the actual returns on the assets deviate from the expected returns. Changes in the discount rate used to determine the present value of the defined benefit obligations can also have an impact on those gains and losses.[200]

For the recognition of such actuarial gains and losses, IFRS allowed the following three options at the time of the analysis, which should not be changed once selected:[201]

- faster recognition via profit or loss,
- recognition via profit or loss using the corridor method, and
- direct recognition in Other Comprehensive Income not affecting profit or loss.

Based on the faster method, all actuarial gains and losses for the period are directly recognized in profit or loss. This may result in high volatility on the basis of immediate changes in pension liabilities and, therefore, could distort the informational value of income figures.[202] Moreover, actuarial gains and losses may offset each other and revert over the long-term.[203] To mitigate distortion and to level the values over time, the regulator has allowed two additional options for recognizing actuarial gains and losses.

Under the corridor method, actuarial gains and losses should only be recognized in profit or loss if a certain threshold is reached or exceeded. The cumulated non-recognized gains and losses for each defined benefit plan are booked into an ancillary account; therefore, allowing a reversion over time. IAS 19.92 states that if the non-recognized cumulative actuarial gains and losses exceed 10% of the benefit

[199] Cf. Ernst & Young (2014), pp. 2310–2327.

[200] Cf. Ernst & Young (2011b), p. 5.

[201] After the revision of IAS 19 that was published in June 2011, only the direct recognition in Other Comprehensive Income is allowed.

[202] A direct recognition is the extreme form of a faster recognition, whereas the corridor method is the other extreme for the slower recognition via profit or loss. Any faster recognition other than under the corridor method is permitted with the direct method being the fastest. Cf. Blecher (2012), p. 662.

[203] Cf. IAS 19.95 “In the long-term actuarial gains and losses may offset one another.”

obligation and the fair value of plan assets, the exceeding value needs to be recognized in profit or loss. The exceeding value is distributed over the average remaining term of service of the respective employee for profit or loss recognition.

The third option for recognizing actuarial gains and losses is the only method not affecting profit or loss. This method directly recognizes actuarial gains and losses in Other Comprehensive Income following IAS 19.93 and can reduce the volatility of profit or loss. This method illustrates all actuarial gains and losses in the current period and gives an undistorted summary of the current status of the pension assets and potential funding gaps. Any recognized gains and losses will not be recycled pursuant to IAS 19.93D.[204] However, the argument delivered by the board of the IASB in connection with the discussion paper on the "Preliminary Views on Amendments to IAS 19 Employee Benefits" sounds to some extent arbitrary. "The decision […] not to recycle actuarial gains and losses is made because of the pragmatic inability to identify a suitable basis."[205] This statement demonstrates the need for additional empirical research on Other Comprehensive Income components in general and actuarial gains and losses on defined benefit plans in particular.

Not only the complicated way of recognition and the different reporting choices for the recognition of actuarial gains and losses, but also the presentation as such has been criticized by users and prepares of financial statements. The difficult comparability as a result of the different reporting choices and the fact that reporting net numbers sometimes removes informational content from financial reports has been the focal points of criticism.[206] The expressed criticism led the IASB to review the standard and, as a result, the board of the IASB published a discussion paper IASB (2008a) on preliminary views on amendments to IAS 19. The negative international reaction to the discussion paper, as well as the awareness of a need for change within the IASB, led to the issuance of an exposure draft by the IASB (2010c) that dealt with several of the issues. It was the basis of the final version of IAS 19 that was published in June

[204] Cf. Pellens et al. (2014), p. 484.

[205] Cf. IASB (2008c), paragraph 3.9.

[206] When applying the corridor method unrecognized gains and losses attributable to past periods may distort the reporting of the current period.

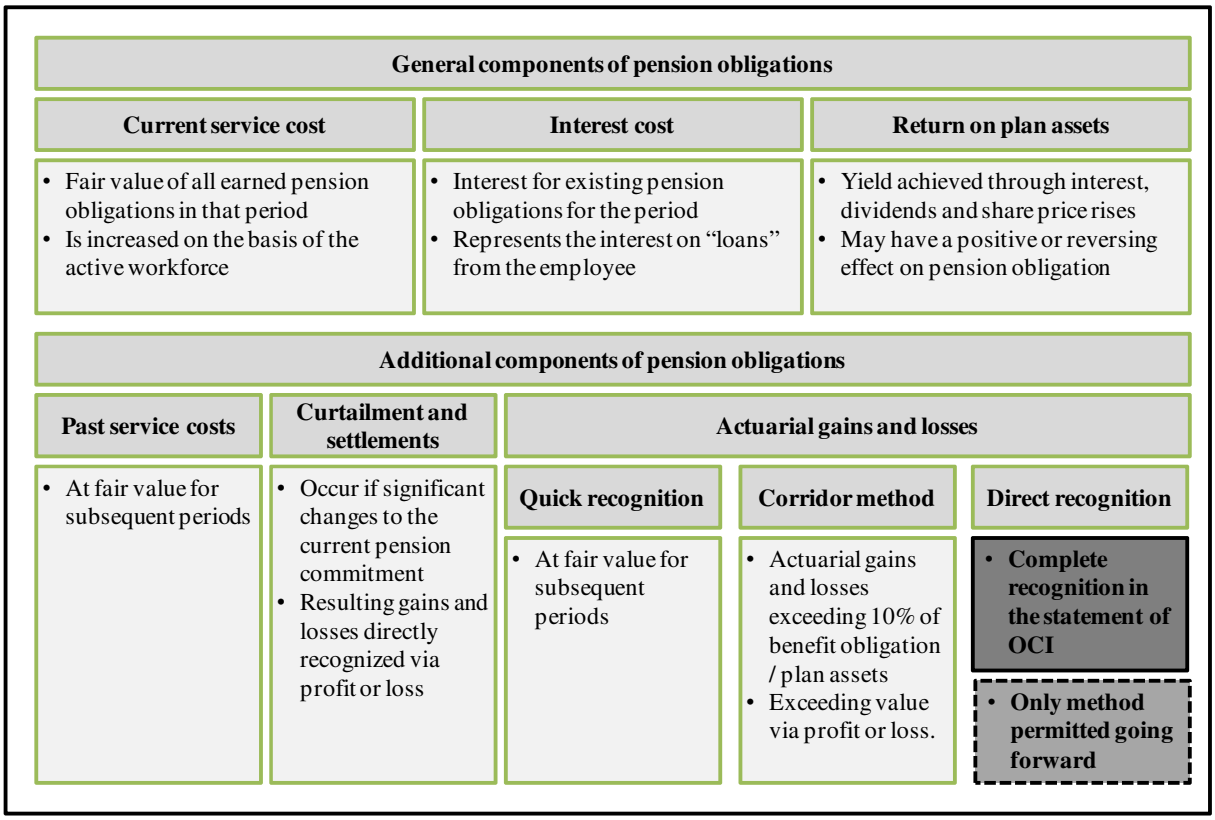
2011.[207] Several major changes have been made in IAS 19 (2011) that became effective for reporting periods beginning on or after January 1, 2013. The new standard firstly eliminates the reporting choices for actuarial gains and losses and only allows a consistent, direct recognition in Other Comprehensive Income. Second, it requires the mandatory recognition of net assets or liabilities from defined benefit plans, including the breakdown of defined benefit cost into components. Third, expected returns will not be recognized going forward and will be replaced by the recognition of interest income in profit or loss. And fourth, the deferral of unvested past service costs over the future vesting period will no longer be allowed and will be recognized prior to the amendment or the curtailment.

Even though numerous changes have been implemented, the disapproval remains that the IASB has not gone far enough with this revised new standard and critical voices dispute that it is a missed chance for resolving all outstanding issues.[208] They argue that the convergence project with the FASB has led the standard setters to issue a softer version and remove conflicting points, as already discussed in the discussion paper issued by the IASB (2008a). Conceptual impropriety, particularly in relation to the disaggregation of pension-related expense and income components, is also a basis of criticism. This discussion shows that there will always be a lively discussion in the future among the research community and practitioners and that there is room for further revisions. Figure 2.7 summarizes the different components of pension obligations with a focus on actuarial gains and losses.

[207] Cf. IASB (2010d) Sir David Tweedie, chairman of the IASB, in a press release on the exposure draft acknowledged the awareness by the board for changes to the standard "IAS 19 was inherited from our predecessor body and an overhaul of pension accounting is long overdue. The proposals, if adopted, will significantly improve the transparency and comparability of pension obligations."

[208] Cf. e.g. Blecher (2012), p. 662, Walter (2011), p. 250.

*Figure 2.7: Treatment of actuarial gains and losses and their recognition*[209]




### 2.2.5 Changes in Revaluation Surplus of Tangible and Intangible Assets

Changes in revaluation surplus as part of Other Comprehensive Income are dealt with in this section. In general, IFRS distinguishes between the revaluation of property, plant, and equipment under IAS 16 and the revaluation of intangible assets under IAS 38. Even though the two concepts follow the same idea of a cost model and a measurement model, some differences have to be considered. The two concepts will be introduced, followed by a brief explanation on how the items will be utilized in the empirical analysis of this study.

#### Revaluation Surplus based on tangible assets

Based on IAS 16.7, costs for an item being property, plant, and equipment should be recognized as assets if it is probable that future economic benefit of the asset will flow to the entity and the cost for the item can be reliably measured.[210] Recognized tangible

[209] The illustration has been derived from IAS 19 as well as from BDO (2014), p. 36.

[210] Cf. Ernst & Young (2014), pp. 1268–1269.

assets are initially measured at cost including initial setup and the expected dismantling costs.[211] For subsequent measurements IFRS allows either the cost model or the revaluation model to be followed.[212] The cost model measures assets at cost less accumulated depreciation and impairment losses and does not affect Other Comprehensive Income. Application of the revaluation model is only possible if the fair value of a property, plant, and equipment is reliably measurable. The revalued amount of an asset is equal to the fair value at the date of recognition, reduced by any subsequent accumulated depreciation and impairment. The revaluation of each class of assets should be performed on an ongoing basis. The valuation amounts should also be updated regularly[213] to prevent substantial differences from the fair value measure at the reporting date following IAS 16.31. Pursuant to IAS 16.36, the revaluation model chosen by an entity must be applied simultaneously and not selectively to the entire class of assets.[214] An increase in the value of an asset is credited to Other Comprehensive Income under revaluation surplus, except for situations where the value change represents the reversal of a value decrease of the same asset in a previous period. In line with the treatment of a decreased value, an appreciation in value is directly recognized in profit or loss accordingly, pursuant to IAS 16.39. On the other hand, a decrease should be recognized as an expense via profit or loss to the extent that it exceeds any amount previously booked under Other Comprehensive Income in revaluation surplus relating to the same asset following IAS 16.40. In the case that a revalued asset is disposed of, any revaluation surplus recognized under Other Comprehensive Income is directly transferred to retained earnings not affecting the profit or loss.[215]

Depreciation in the context of property, plant, and equipment is regulated in IAS 16.43–62. The depreciation method, as well as the depreciation volume, must

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[211] In addition to the purchase price described in IAS 16.16, the total initial cost also includes all expenses directly attributable to the construction or acquisition of the fixed asset including preparation of the site, delivery and handling costs, installation and assembly costs, costs resulting from testing the functionality and professional fees based on IAS 16.17. Also the expected obligations for dismantling, removing, and restoring should be included following IAS 16.18.

[212] Cf. Ernst & Young (2014), pp. 1289–1305.

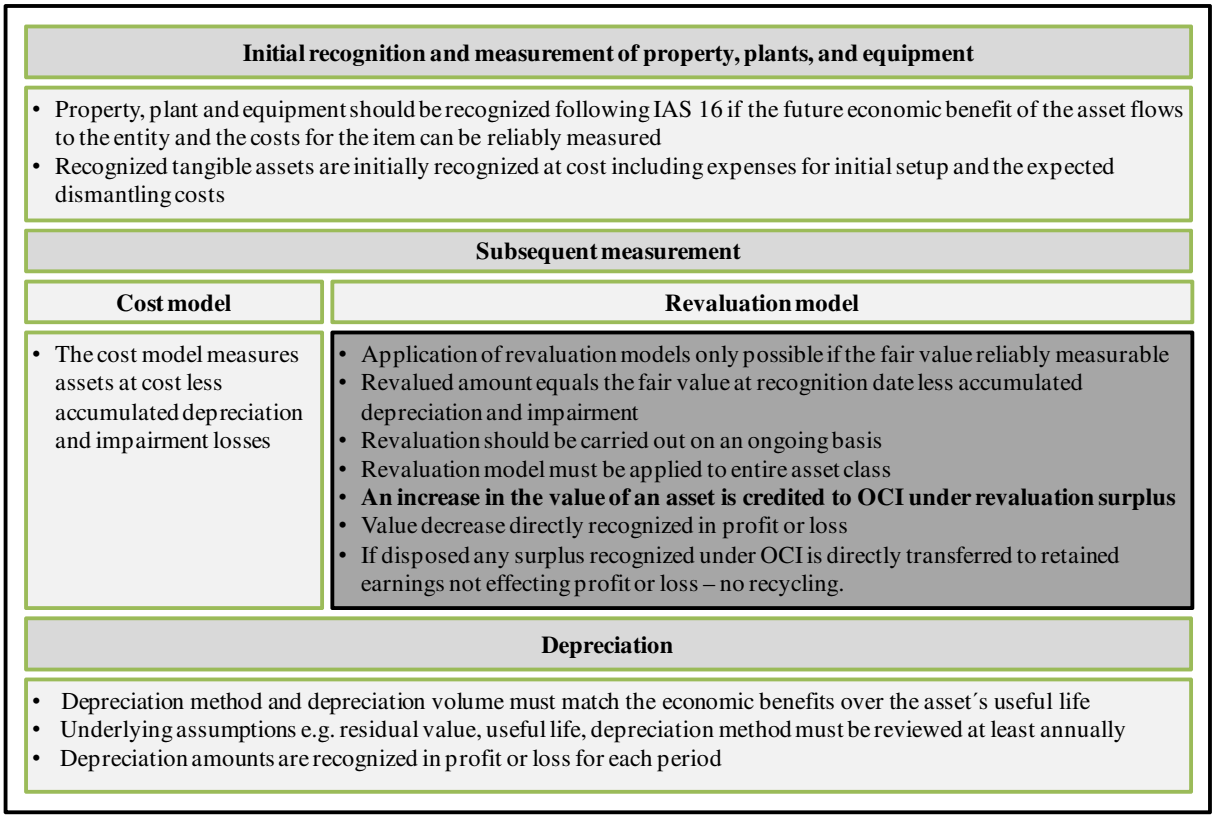
[213] IAS 16.34 requires annual revaluation for assets with volatile changes and three to five years for others.

[214] IAS 16.37 lists examples of separate classes that are grouped by the similar nature of the assets.

[215] If the asset is used by the entity, only the difference between the depreciation based on the initial cost and depreciation on the revalued carrying amount of the asset would be transferred as surplus to retained earnings following IAS 16.41.

match the economic benefits expected by the entity over the useful life of the asset. Underlying assumptions such as residual value, useful life, and the depreciation method must be reviewed at least at each financial year-end; changes are accounted for prospectively according to IAS 8. Depreciation amounts are recognized in profit or loss for each period, except for situations when it is included in the carrying amount of another asset. Depreciation starts when the asset becomes available for use. Figure 2.8 provides an overview of the treatments of revaluation surplus based on tangible assets.

*Figure 2.8: Treatment of revaluation surplus of tangible assets*[216]




## Revaluation Surplus based on intangible assets

As already mentioned, revaluation surpluses do not only occur based on tangible assets, but can also occur based on the revaluation of intangible assets regulated under IAS 38. Several of the rules governing the reporting are similar to the ones discussed previously, but as these items are directly linked to recognition in Other

[216] The illustration has been derived from IAS 16 as well as from BDO (2014), p. 33.

Comprehensive Income and for matters of completion, a detailed overview is given. Intangible assets are defined as being non-monetary and non-physical assets, which can be differentiated from each other and over which the entity has control of disposal based on IAS 38.85.[217] Moreover, the future economic benefit of the intangible asset to the entity must be probable and the costs must be reliably quantifiable based on IAS 38.21. If any of these requirements are not fulfilled for an intangible item, then, based on IAS 38.68, the expense of the item needs to be directly recognized in profit or loss. Furthermore, based on IAS 38.71, once an intangible asset is charged to expenses, it is not possible to restate it at a later date.

On the basis of IAS 38.24, intangible assets are initially measured at cost.[218] The initial recognition of intangible assets depends on the acquisition method. IAS 38.19 expressively differentiates five possible sources for the item:

- by separate purchase,
- as part of an acquired business combination,
- by government grant,
- by exchange of assets,
- by self-creation (internal generation).

Separately acquired items are initially recognized at costs in the form of the price paid and expenditures corresponding to the purchase. With respect to such separate purchases, the intended economic benefit of such a transaction is assumed given the fact that the entity decides to acquire a particular and separable item.[219] For the other four sources listed above, such intended economic benefit cannot be automatically assumed. As a consequence, the more cautious approach of fair value measurement is taken for example for business combinations. The application is only possible if the intangible item can be separated effectively from other items in the transaction and the

[217] Cf. Ernst & Young (2014), p. 1191.

[218] For the initial recognition of property, plants, and equipment, the initially recognized costs do not only include the purchase price of the intangible assets, but also all duties and taxes corresponding to the acquisition after excluding discounts and including all expenses that are directly attributable to the preparation for utilization following IAS 38.27.

[219] Cf. Ernst & Young (2014), pp. 1197–1201.

fair value can be reliably measured.[220] If an intangible asset results from a government grant[221] for which the company may or may not have paid, or for nominal consideration, then an entity has the option to either recognize both the intangible asset and the grant initially at fair value or initially at the nominal value plus any expenditure directly attributable to the initiation.[222] Alternatively, a company might acquire intangible assets through an exchange of assets for other monetary or non-monetary assets pursuant to IAS 38.45. In the case of a reliable and circumvent measurement of the intangible asset, the initial recognition follows the fair value measurement as described for the separate purchase.[223] If such a measurement is not possible or if the exchange of the intangible asset is missing economic substance, then the acquisition expense of the item is measured at book value by the dispensing entity.[224] The most differentiated view is taken by the regulator in IAS 38.48 regarding internally generated intangible assets, since the measurement, due to a missing market transaction, is rather difficult. As a general rule IAS 38.48 clarifies that internally generated goodwill as an intangible asset is never recognized because there is no reliable and independent source as basis for valuation. However, for the evaluation of other intangible assets such as inventions or patents, a more distinguished approach is applied. The initial recognition of expenses relating to such items depends on the phase in which they occur; a difference is made between the research and development phases. Whereas the expenses of the development phase can to a great extent be attributed to a specific item, this is not possible for expenses during the research phase. Accordingly, expenses from the research phase are directly recognized in profit or loss. Expenses from the development phase are capitalized if the criteria stated under IAS 38.54 are met. Development costs are capitalized if the technical feasibility of the asset can be confirmed and the intention for completion can be given. Moreover, the usefulness and economic benefit has to be proven either by use within the entity or through a sale in accordance with IAS 38.57.

[220] Cf. Ernst & Young (2014), pp. 1203–1210.

[221] A government grant could include, for example, airport landing rights and licenses to operate radio or television stations.

[222] Cf. Ernst & Young (2014), p. 1201.

[223] Cf. Pellens et al. (2014), p. 328.

[224] Cf. Ernst & Young (2014), pp. 1201–1202.

For the subsequent measurement, IFRS differentiates between indefinite useful life and finite useful life of an intangible asset.[225] Intangible assets with no foreseeable limit to the generation of future cash flows should not be amortized, but the useful life should be reviewed in each reporting year pursuant to IAS 38.107. If the indefinite usefulness has changed, then changes from the useful life assessment should be accounted for in accounting estimates pursuant to IAS 8, which is governed under IAS 38.109. Intangible assets with a finite life have a limited effect on cash flows of the entity over time. If a finite useful life is identified, then the entity can choose between the cost model and the revaluation model corresponding to property, plant, and equipment covered earlier in this section. When applying the cost model, intangible assets should be carried forward at cost less accumulated amortization and impairment losses pursuant to IAS 38.74. Only if an active market[226] is available for the intangible asset the revaluation method can be used and the items are carried forward at fair value less subsequent amortization and impairment losses. Moreover, a regular revaluation is required and any revaluation surplus net of deferred taxes is credited to Other Comprehensive Income; however, only if the surplus does not reverse a previous revaluation decrease of such asset[227] pursuant to IAS 38.85. In line with the treatment of revaluation surpluses of tangible assets under IAS 16.41, the surplus is not recycled for intangible assets via profit or loss following IAS 38.87.

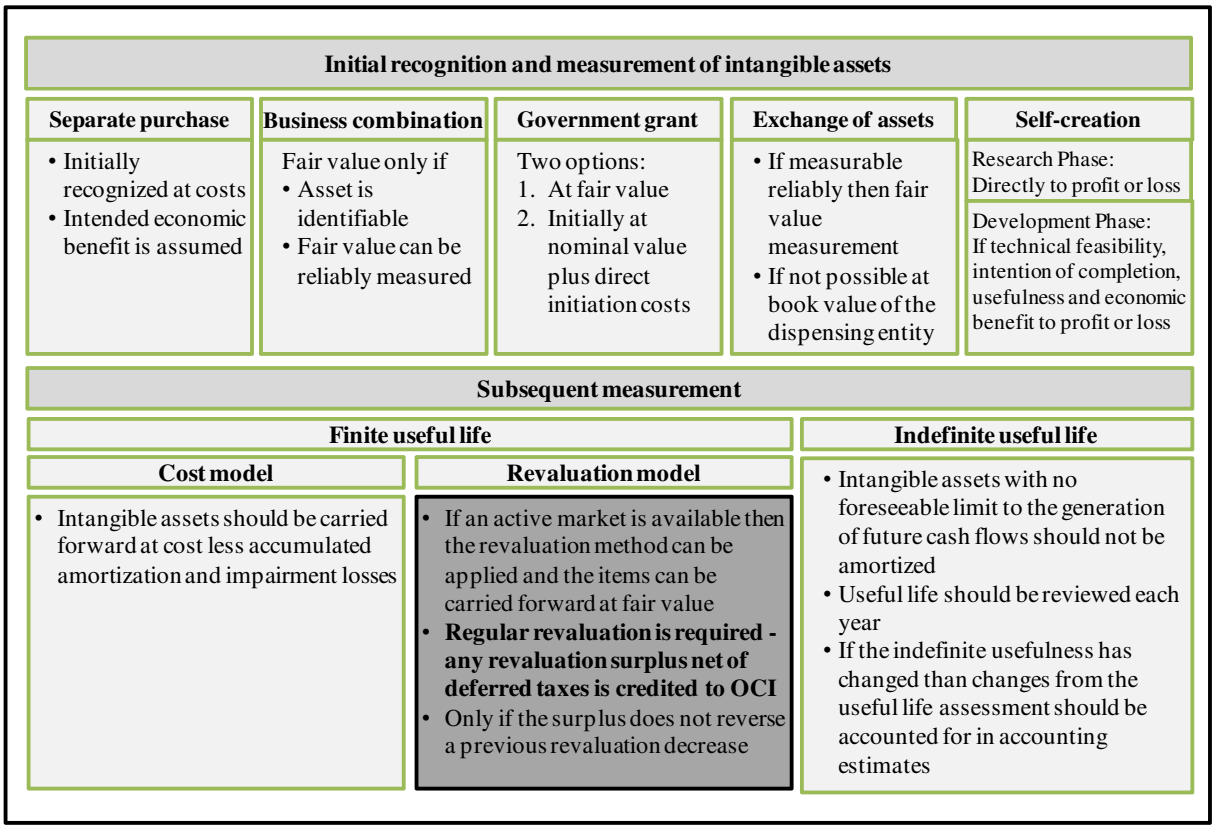
Finally, it can be said that the recognition of intangible assets is far more restrictive than for property, plant, and equipment due to their immaterial character and difficulty evaluating them. Following the principle of prudence, entities should directly recognize expenses for intangible and tangible assets via profit or loss if there is doubt of reliable, separate and impartial measurement. Only if all requirements for recognition are fulfilled, a valuation at fair value is possible with the consequence of having an impact on Other Comprehensive Income. Figure 2.9 provides a summary of the individual treatments of revaluation surplus of intangible assets.

[225] Cf. Ernst & Young (2014), pp. 1229–1232.

[226] The availability of an active market for intangible assets is also seen as very uncommon by the regulator; IAS 38.78 provides some examples, namely taxi licenses, fishing licenses, or production quotas.

[227] If the same asset was revaluated in one of the previous periods, then the surplus should be recognized in profit or loss up to the reversed amount.

*Figure 2.9: Treatment of revaluation surplus of intangible assets*[228]




The main difference between the revaluation surplus of tangible and intangible assets is that there is no active market required for tangible assets pursuant to IAS 16.33. The revaluation model is also applicable to intangible assets with indefinite use based on IAS 38.107–110. Due to the same handling and the fact that these revaluation surpluses are only recognized as a cumulative net figure in financial statements, this study uses this net figure for changes in revaluation surplus of tangible and intangible assets (REV) in the empirical analysis.

### 2.2.6 Share of Other Comprehensive Income of Investments in Associates

In general, the IFRS differentiates investments by the level of control that an investor has over an investee. Thereby the regulator focuses on the influence an investor has through the execution of voting rights.[229] The influence ranges from control

[228] The illustration has been derived from IAS 38 as well as from Pellens et al. (2014), pp. 326–343 and BDO (2014), p. 50.

[229] Cf. Ernst & Young (2014), pp. 706–709.

representing more than 50% of the voting shares to less than 20% and thereby having no significant influence. Consequently, controlled investments are fully consolidated into the investor's financial report with a separate statement of third party minority interests. Investments with no significant influence, which are also called non-controlling interests, are valued at initial costs less necessary depreciation and amortization.[230] Investments with significant influence usually represented by a voting share between 20% and 50% are referred to as investments in associates and are recognized by using the equity method pursuant to IAS 28.11. Based on the equity method, the share of changes in the Other Comprehensive Income of the investee is recognized in a separate component of the Other Comprehensive Income of the investor. A special form of investment with significant influence represents an investment in a joint venture. Depending on the number of partners, the voting share may vary; for example, from 50% for investments with two joint parties, 33.3% for three parties with unanimous decision making and so on, assuming that a partner independent of his shareholding does not have a statutory right to block a decision. The major difference is the fact that the entity is jointly managed and that all partners have the same voting share with the absence of other investors. Accordingly, the share of assets and liabilities of the jointly controlled entity is reflected in the balance sheet of the venture according to IAS 31.33. Figure 2.10 summarizes the different forms of consolidation for investments.

[230] For the measurement of financial instruments reference is made to section 2.2.2 on gains and losses on available-for-sale financial assets.

*Figure 2.10: Consolidation of investments in associates and their treatment*[231]

| Consolidation of investments | | | |
|---|---|---|---|
| **Full consolidation** | **Proportionate consolidation** | **Equity consolidation** | **Initial cost** |
| Subsidiary | Joint venture | Associate | Minority |
| Voting rights: >50% | Voting rights: 50%, 33.3% | Voting rights: 20% - 50% | Voting rights: 0% - 20% |
| Control | Jointly managed | Significant influence | No significant influence |
| • Consolidation<br>• Fiction of legal unit<br>• Full consolidation of the financial information of the controlled entity<br>• Separate statement of third party minority interests | • Consolidation<br>• No fiction of legal unit<br>• Proportionate consolidation of share of assets and liabilities of the joint venture and included in the venture's balance sheet<br>• No separate statement of third party minority interests | • No Consolidation<br>• Investment is initially recognized at cost and thereafter adjusted according to the investor's share of changing net assets of the investment<br>• **The share of changes in the OCI of the investee is recognized in the OCI of the investor** | • No consolidation<br>• Valuation at initial costs less necessary depreciation and amortization |

The treatment of investments in associates is governed by IAS 28.[232] An associate is an entity over which an investor has a significant influence and it is not part of a subsidiary or a joint venture.[233] Significant influence is indicated by the holding of 20% or more of the voting rights of an entity, either directly or indirectly through subsidiaries.[234] Unless it can be demonstrated otherwise the holding of 20% or less is assumed to have no significant influence.[235] Even though there are general rules about the grade of control an investor may have, it is necessary to evaluate the factual and legal influence an investor has on a case-by-case basis.[236] It is especially important to

[231] The illustration has been derived from IAS 28 as well as from BDO (2014), p. 43.

[232] Under IAS 28.1 venture capital organizations, mutual funds, unit trusts, and similar entities such as investment linked insurance funds are explicitly mentioned, because these entities have the choice of valuing their investments at fair value through profit or loss pursuant, or to account for their investments in accordance with IAS 39. With the update of IAS 28 (revised 2011), such entities may choose to measure their investments in associates and joint ventures at fair value through profit or loss pursuant to IFRS 9.

[233] The disclosure requirements for investments in associates are now governed in IFRS 12.20-23.

[234] Cf. Pellens et al. (2014), pp. 824–825.

[235] The cases in which significant influence is evident for an investment are listed under IAS 28.7.

[236] Cf. Morris (2004), p. 23.

consider the relative share, based on his voting rights, compared to the whole company, but also compared relative to other major shareholders.[237]

If the investment qualifies as an associate, then the equity method is applied.[238] The equity method is used at the moment when the significant influence first arose and the associate is initially recognized at cost. For succeeding periods, the carrying amount is subsequently increased or decreased to represent the investor's share of Comprehensive Income.[239] The recognition of the share of balance sheet and profit or loss positions of the investee in the financial statement of the investor is more complex. The investor's share in profit or loss in the associate is directly recognized in his profit or loss. The same procedure applies for distributions from the associate that reduce the carrying amount of the investment. The recognition affecting Other Comprehensive Income of the investor closely relates to the subsequent measurement of Other Comprehensive Income components of the associate. Adjustments in the carrying amount of an investment can also arise from changes in equity; more specifically, from changes in Other Comprehensive Income. These changes can result from foreign currency translation adjustments, gains and losses on available-for-sale financial assets, or the effective portion of gains and losses in cash flow hedges of investee as previously outlined in sections 2.2.1, 2.2.2, and 2.2.3. The share of those changes is directly recognized under the position share of Other Comprehensive Income of investments in associates in the investor's Other Comprehensive Income.[240]

The interpretation of this Other Comprehensive Income item is not as consistent as the other positions covered in this study so far. This position includes foreign currency translations, gains and losses on available-for-sale financial assets, and actuarial gains and losses on defined benefit plans and it needs to be treated in a separate Other Comprehensive Income position. Therefore, the explanatory power of this figure might be limited and needs further investigation.

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[237] For example, a share of 10% in an enterprise, representing the largest single shareholding, with a diverse shareholder base may be regarded as having a significant influence on the management of the company. Otherwise an investment of 20% in an entity may not be regarded as having significant influence if there are, for example, two other investors who hold 50% and 25% of the voting rights of the same company.

[238] Cf. Pellens et al. (2014), pp. 826–828.

[239] Cf. Küting and Reuter (2009), p. 175.

[240] Cf. Pellens et al. (2014), pp. 831–833.

In May 2011 the IASB published an update of IAS 28 with effect from January 1, 2013. The objective of the modification is to clarify the accounting regulations for investments in associates. A further objective included setting rules for the application of the equity method when investments and joint ventures should be accounted for in addition to the procedure already in place for associates.[241] As the empirical analysis in this study is not affected by these changes, the changes in connection with IAS 28 (revised 2011) will not be further examined.

### 2.2.7 Other Items Recognized in Other Comprehensive Income

In addition to the Other Comprehensive Income components previously discussed, there are also a small number of items within financial statements that are classified under a section "other" or "miscellaneous" of Other Comprehensive Income. The items are not further specified in the notes and, therefore, are included as other items for the sake of completeness in the analysis of this study. There are some items in financial statements that are classified as Other Comprehensive Income items, but do not clearly match the definition given under IFRS. In this analysis they are summarized and combined with the other items of components. In cases where additional clarifying information is provided in the notes of the financial statement, concerning the assignment of such other items to one of the categories previously outlined, the item is then attributed to that Other Comprehensive Income component. The fact that there is a category in addition to the officially stated presentation under IFRS already indicates the level of arbitrariness associated with this position.[242] Therefore, the statement of these items shows that there is probably limited information associated with these positions as they are a kind of "dammed pool" for positions that cannot be otherwise assigned.

### 2.2.8 Taxes Relating to Components of Other Comprehensive Income

This section deals with the disclosure of tax items in connection with Other Comprehensive Income and the treatment of those items in this study. Under IFRS

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[241] Cf. Zülch et al. (2014), pp. 38–39.

[242] In the discussion paper DP/2013/1 by the IASB (2013b) under paragraph 8.3 (b) one of the critique points of the Other Comprehensive Income reporting in general is that it is "… a 'dumping ground' for anything controversial."

entities must disclose income tax relating to components of Other Comprehensive Income either as gross of tax or net of tax values. In general, IAS 1.82 requires the disclosure of tax expenses and tax income that relates to items in the statement of Comprehensive Income. The allocation of taxes relating to Other Comprehensive Income components can be directly reported in the statement of Comprehensive Income or in the notes of the financial statement pursuant to IAS 12.81.[243] In addition, IAS 12.61A states more explicitly that current and deferred income taxes relating to Comprehensive Income should be recognized in the same or different period and should, therefore, reflect the location where such items are recognized.[244]

The advantage of attributing the individual tax effects to the components of Other Comprehensive Income is that the information is presented in a traceable and transparent way, especially for financial analysis and valuation purposes. However, the inclusion of entities with different tax rates can also be seen as a disadvantage in terms of comparability between companies. As stated by Bellandi (2012), the allocation of taxes differs across industries and may lead to inconsistencies in presentation and arbitrary behavior.[245]

The comparison shows that there is no single solution to this question and that both alternatives have their advantages, but also their shortcomings. However, it seems to be a distorting assumption not to consider tax effects at all in the analysis when arguing about not being able to allocate them to the underlying transactions. The approach of separating after tax Other Comprehensive Income figures and discrete reported taxes, as taken by Höhn (2011), increases comparability, but does not fully incorporate the information in a stringent way. This is significant for the analysis in this study.[246] Contrary to the paper by Zülch and Pronobis (2010), tax effects corresponding to Other Comprehensive Income items are considered in the analysis of

[243] Cf. Bellandi (2012), p. 307.

[244] The treatment following a single rule under IFRS is in contrast to the differentiated handling under US GAAP and has been attempted during the financial statement presentation project. See Bellandi (2012), pp. 381–385 for further details.

[245] Cf. Bellandi (2012), p. 308.

[246] Although the methodology used in his dissertation is reasonable for the purposes of his analysis, the application does not fit the objective of this study. The split into net of tax items and separately reported taxes on Other Comprehensive Income components would reduce comparability and would have a distorting effect on the empirical analysis in Chapter 4.

this study. Hence, in this study net of tax[247] figures are used in the analysis comparing bottom line income figures after tax, such as Comprehensive Income with after tax Net Income.[248]

### 2.2.9 Critical Reasoning of Other Comprehensive Income Components

The reporting of Comprehensive Income has been the basis for several critical debates since its initial introduction under IFRS. The main opposition was formed because the need for an additional and potentially more complex and transitory income measure was not supported by the majority of preparers and users of financial statements. The recognition of certain positions under Other Comprehensive Income was regarded as arbitrary and the application of recycling to selected items was seen as hardly comprehensive. Moreover, rather than providing a deliberated concept, the current developments in connection with Other Comprehensive Income are viewed as a legitimating process for changes that have continuously been made during past years to the standard.

But the critique initially brought forward neglected the additional value that a publication of Comprehensive Income produces.[249] The overview presented in the preceding sections has shown that looking at Comprehensive Income requires a careful and differentiated view on the single components of Other Comprehensive Income. Furthermore, the sole reliance on bottom-line figures is not appropriate and constructive in this context. Users have, to some extent, departed from the sole reliance on Net Income figures to make use of the reporting of Comprehensive Income. Addressees of financial statements generally rely on summaries, such as Net Income, instead of complete financial reports for an initial valuation of an entity.

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[247] The presentation of net of tax Other Comprehensive Income figures is also described as "post-tax" display or "net presentation."

[248] If the Other Comprehensive Income figures were reported net of tax, these numbers are used in the analysis. In case the figures were reported as gross values and the taxes on Other Comprehensive Income components as totals, the taxes are allocated to the components on the basis of the information given in the notes or in the changes of equity provided in the financial statements. If there was no information given on the distribution of the total tax figure on Other Comprehensive Income components in the notes, the investor relations department of the respective company was contacted for clarification on the allocation. If no information was available for the past years, the average of the available ratio of allotment was used as an alternative.

[249] The IASB has no intention to withdraw the publication of Comprehensive Income and is continuously working on extensions and improvements, implying that there must be good reasons for staying on that track besides securing the convergence with international standards.

In this context Net Income should be regarded as a starting point for potential analyses. The comparison of different multiples on Net Income and Comprehensive Income and possible differences between them can provide an indication if certain Other Comprehensive Income items are considered in more detail.[250] In addition, the components of Comprehensive Income may provide indicators that can help to identify risks and help users of financial statements in their decision making. If not carefully examined, the undifferentiated use of Comprehensive Income figures may even lead to a loss of information compared to Net Income.

Besides all the advantages that the reporting of Comprehensive Income may have, there is still room for improvement from the regulatory side. The standard setters need to continuously work on the development of the required reporting of Comprehensive Income, but they need to avoid the impression of the governing standard as being constantly changing. Furthermore, it is essential to continue the dialog with preparers and users of financial statements in the standard setting process. This will be fundamental for the acceptance and persuasion of preparers and addressees of financial statements. In addition, the theoretical confirmation of value-relevance in the research community can help to convince interest groups of the usefulness of the publication of Comprehensive Income.

## 2.3 Theoretical Framework for the Value-Relevance of Comprehensive Income

In connection with the general aim of implementing more comprehensive and comparable accounting standards, several corresponding issues have, in particular, been at the heart of accounting research. These issues are covered in this section to gain a better understanding of the motivation behind the application of certain accounting standards in general and the concept behind the application of Comprehensive Income in particular. The following topics have been the focus of accounting research during the past years and have significantly influenced the recognition, measurement, and reporting of certain accounting items:[251]

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[250] Cf. e.g. Rees and Shane (2012) propose the publication of two different EPS figures, one based on Net Income and another based on Comprehensive Income.

[251] Cf. Kanagaretnam et al. (2009), p. 352 for interrelated fundamental issues that are at the heart of the ongoing debate.

- recognition of changes in capital using clean surplus vs. dirty surplus accounting,
- valuation of assets and liabilities using historical costs vs. fair value,
- efficiency of capital markets,
- decision usefulness of accounting information, and
- value-relevance and reliability of accounting information.

### 2.3.1 Clean and Dirty Surplus Accounting

The use of different accounting concepts and its area of applications is a controversially discussed topic in accounting research and has engaged the research community for the past decades. Ijiri and Jaedicke (1966) and Beaver et al. (1968) already pointed out that researchers and accountants have been searching for principles to best assess the accounting methods and capture the needs of different interest groups.[252] On the one hand, financial statements should provide predictive ability and, on the other hand, they should be reporting the facts as completely as possible.[253] This concept of conflicting objectives can be transferred to the ongoing debate on clean surplus and dirty surplus accounting.[254] Whereas clean surplus accounting focuses on reporting the complete facts in the income statement, dirty surplus accounting allows certain transitory and nonrecurring items to bypass the income statement, thereby creating a Net Income figure that is assumed to have superior predicting power.[255] In general, the structural concept of clean surplus accounting assumes that all accounting gains and losses, other than transactions with the shareholders,[256] should be recognized in the profit or loss statement over time. Quite to the contrary, under the dirty surplus accounting concept certain items that have a direct effect on the company's equity bypasses the profit or loss statement and are directly booked into retained earnings under the shareholders' equity.[257]

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[252] See Brief and Peasnell (1996) for a chronological overview of the research conducted in this area.

[253] Cf. Brief and Peasnell (1996), p. 11.

[254] Cf. Dhaliwal et al. (1999), pp. 44–45.

[255] Cf. e.g. Black (1993) and Brief and Peasnell (1996) as supporters of this "superior predicting power".

[256] Transactions with shareholders include, for example, payment of dividend, capital increases, as well as share buybacks.

[257] Cf. e.g. Linsmeier et al. (1997), Holthausen and Watts (2001), Isidro et al. (2004) for a critical view on dirty surplus accounting.

There has been a long and continuing debate about clean surplus and dirty surplus accounting in the research community. One of the core points of the critique argued by several researchers is the lack of transparency of dirty surplus items due to different treatments.[258] As pointed out by Frankel and Lee (1999) and Isidro et al. (2004), one of the major shortcomings is that the application of dirty surplus accounting differs among countries, which makes transnational comparisons complicated and inaccurate. Linsmeier et al. (1997) emphasize that the use of dirty surplus accounting for valuation purposes could lead to biased and incorrect results. The continuing debate about the shortcomings of dirty surplus accounting has led regulators to rethink the use of the concept. As a reaction thereto the statement of Comprehensive Income was introduced, capturing all recognized gains and losses and thereby increasing transparency and comparability.[259]

### 2.3.2 Fair Value Accounting

Another important aspect in connection with Comprehensive Income reporting is the concept of fair value accounting. Since the 1980s the IASB and the FASB have made great efforts to substitute cost-based measures for market-based measures represented by fair value[260] evaluation.[261] The implementation of fair value accounting marked a change in direction from a revenue expense approach to a balance sheet approach.[262] This was primarily driven by the fact that standard setters aimed at improving the information on valuation purposes provided to investors. In particular, the standard setters' aim was to focus on better assessment, timing, and certainty of future cash flows and, therefore, improve the assessment and valuation by investors.[263] At first the motivation for fair value approach was primarily aimed at the valuation of financial instruments, but as time passed it has also found its way into the application of other

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[258] Cf. Isidro et al. (2006), p. 303.

[259] Cf. Isidro et al. (2006), p. 304, Penman (2007), pp. 33–34.

[260] Based on IFRS 13 appendix A "fair value" is defined as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date." Before the implementation the definition and guidance on fair value measurement was spread across several different standards and sometimes was not consistent or incomplete.

[261] Cf. Carroll et al. (2003), p. 2, Fülbier et al. (2009), pp. 460–463, Pellens et al. (2014), p. 996.

[262] Cf. Le Manh (2010), p. 10 for an overview of the revenue expense and the balance sheet approach.

[263] Cf. Penman (2007), p. 34, Pellens et al. (2014), p. 104. An independent price based on the fair value is also denoted as the exit price.

assets.[264] Since its effective date of January 1, 2013, the treatment of fair value measurement is explicitly regulated under IFRS 13. With the implementation of IFRS 13, the standard setters of the IASB and the FASB have jointly achieved their goal of aligning accounting standards in relation to fair value measurement.[265] Even though the standards IFRS 13 and FASB ASC 820 are more or less identical, the question remains of when to apply fair value measurement. The application is governed in the corresponding standards and, therefore, still leaves room for assimilation of the standards.

The basis for a fair value measurement is the availability of a comparable price. But, as there is not always a liquid market available for all specific assets and liabilities, three different levels[266] have been developed for differentiation, namely market based measures, modified market measures, and theoretical measures.[267] Level 1 input, which is based on the so-called mark to market model, is the prevailing methodology in connection with the measurement of items based on market measure if an active market[268] is available.[269] This is based on the fact that market data is regarded as more reliable and unbiased than internal estimates.

If, however, market prices from active markets are not available or not reliably measurable, then market prices of comparable assets[270] are used for level 2 inputs. It is important that comparability of assets is based on (i) similar assets or liabilities in an active market, (ii) identical items in non-active markets, (iii) quoted input for evaluation of items, and (iv) market-corroborated inputs.[271]

Level 3 input includes items where the appropriate underlying market is not available or rarely active for assets or liabilities. In such a situation the entity may generate valuation input from other sources, such as own data, and combine it in a model with

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[264] One example of the fair value measurement of non-financial assets is the application for investment properties under IAS 40.

[265] IFRS 13 is practically congruent with ASC 820 on Fair Value Measurement (formerly known as FAS 157).

[266] See IFRS 13.76–90 for further details on the categorization of the fair value hierarchy into the three levels.

[267] Cf. Hitz (2007), p. 326.

[268] "Active markets" are defined under IFRS 13 as "A market in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis."

[269] Cf. IFRS 13.76–80.

[270] Those prices can also be generated from valuation models with level 2 observable inputs; for example, for valuation of bonds or interest rate swaps.

[271] Cf. IFRS 13.81–84.

all reasonable assumptions that are available in the market. This use of market to model input for valuation is seen as the option of last resort as the input factors of the model are already based on data that is sometimes barely comprehensive or resilient.[272]

Both IFRS and US GAAP require the disclosure of fair values for practically all financial instruments in line with IFRS 7 and FASB ASC 820.[273] However, the IASB has adopted the fair value concept more as a consequence, whereas the FASB has taken a more cautious approach, especially concerning non-financial assets.[274] Some criticism arose concerning the issue of fair value accounting in connection with the financial crisis. This topic is briefly discussed because the financial crisis occurred during the observation period of the empirical analysis of this study. The downward spiral of share prices and asset-fire sales of financial institutions were at least partially triggered by the use of fair value accounting.[275] Moreover, fair value accounting was criticized for leading to the excessive and unreasonable asset write-downs of banks. Laux and Leuz (2009b), Barth and Landsman (2010), and Badertscher et al. (2012) came to the conclusion from their research that fair value accounting was unlikely to have significantly added to the seriousness of the financial crisis. However, Magnan (2009) and Kothari and Lester (2012) suggested from their empirical analyses that fair value reporting may have contributed to the worsening of the financial crisis.

It is obvious that fair value accounting had a severe effect on the valuation of financial assets during the financial crisis. The crisis may have shown that fair value accounting has overstated assets and, in addition, had a reinforcing effect on the downturn. However, the concept has always delivered timely and reliable valuations at the reporting date and should not be changed as such. Although the information provided by fair value accounting may not have been entirely understood, or perhaps there was no intention to understand possible consequences, it should be the basis for improvements. Standard setters have continuously worked to enhance the consistency and comprehensiveness of financial information. The issuance of IAS 1 and its revisions has focused on generally providing all relevant information. The explicit

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[272] IFRS 13.86–89.

[273] Cf. Hitz (2007), p. 330.

[274] Cf. Hitz (2007), p. 331. For non-financial assets and liabilities US GAAP currently allows fair value measurement solely for impairment losses. The recognition of gains from fair value valuation in excess of the costs ceiling is consistently excluded.

[275] Laux and Leuz (2009a), p. 1. The critique has mostly been cited without profound evidence on how fair value accounting has reinforced the financial crisis.

illustration of changes in fair value measurement in the statement of Other Comprehensive Income has additionally improved the information given on this topic.

### 2.3.3 Market Efficiency

As a theoretical basis for the empirical analysis carried out in this study, the concept of market efficiency is briefly discussed. The proposition of a certain degree of market efficiency is the basis for the analysis. The efficient market hypothesis is based on the assumption that capital markets include all available information in their valuation and, therefore, the share price fully reflects all available information of an entity. Based on Fama (1965), Fama (1970), and Fama (1991), markets are regarded as efficient if they fully reflect all available information. In these papers the degree of efficiency is defined depending on the adjustment of share prices to available information; namely, weak form, semi-strong form, and strong form. In the weak form historical prices cannot be used as an indicator of the development of current and future share prices as the information already factors past market trends. The best estimate for future share prices would be the current share price; the inclusion of technical analyses of past performances would not enhance the prediction. For the semi-strong form all publicly available relevant market information is incorporated in the share price. An additional analysis of fundamentals would not result in better predictions of future prices as that information is already included in the current share price. The strong form of market efficiency suggests that the current share price incorporates all information on the entity whether they are publicly available or private/insider information.[276] Under the strictest form it is assumed that share prices cannot be predicted and any forecast on the basis of current and past information would lead to random predictions. Also, the advantage of insider information would not be given as this non-public information is already reflected in the share price.[277] In

[276] Cf. Sewell (2011), p. 7. The strongest form of market efficiency implies that all publicly available as well as insider information is reflected in the share price. Consequently, no capital market could ever be efficiently based on this very narrow definition, implying that the efficient market theory almost never holds true.

[277] This implies that the share price follows a random walk and therefore cannot be predicted. Under the strict form of market efficiency the reporting of income figures would not have an impact on share prices as the information would have already be incorporated in the valuation of the entity.

this study it is assumed that semi-strong market efficiency is implied and that all publicly available information is impounded in the current share price.[278]

Even though there are obvious and legitimate limitations, the impact of the market efficiency theory has proven in the past to be robust, as well as in current studies in accounting research.[279] This shows on the one hand that the theory is not without doubts, but on the other hand no other method has prevailed that is able to combine simple economic theory with an information-based view on share prices.[280] The financial crisis has reanimated the critique discussion on the validity of the efficient market theory. The strongest argument brought forward by the commentators is that financial economists are to some extent responsible for the financial crisis, as the efficient market theory has created false safety and does not incorporate information about the skew position of the global financial industry.[281] It seems to be somewhat unjustified to hold financial economists responsible for the crisis.

### 2.3.4 Decision Usefulness of Accounting Information

Financial information is regarded as decision useful if it qualifies as being *relevant* and *faithfully represented*[282] based on the Conceptual Framework for Financial Reporting by IASB (2010a).[283] These fundamental qualitative characteristics of decision usefulness of financial information are enhanced if the information is, in addition, *comparable*, *verifiable*, *timely*, and *understandable*.[284]

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[278] One of the assumptions for using the framework by Ohlson (1995) and Feltham and Ohlson (1995) to analyze the association between accounting figures and market data is at least a semi-strong form of market efficiency. Consequently, studies applying this framework also assume at least semi-strong market efficiency. See Kothari et al. (2010), p. 110 for a literature overview on market efficiency tests in accounting research.

[279] Due to the absence of a feasible and accepted alternative, the general efficiency should be assumed. Cf. Malkiel (2005), p. 2. See also Fama (1991) for an overview of studies challenging the empirical validity of market efficiency.

[280] Cf. Ball (2009), p. 16.

[281] Cf. Brown (2011), p. 93. "They were blinded by an irrational faith in a discredited EMH and failed to see the bubble in asset prices and to give due warning of its collapse."

[282] Cf. IASB (2010a), BC3.20: "Concepts Statement 2 and the Framework (1989) used the term reliability to describe what is now called faithful representation." Consequently, previous studies have primarily used the term reliability.

[283] Cf. Ernst & Young (2014), pp. 51–54.

[284] Cf. IASB (2010a), QC4.

*Relevant* information may influence the decision making of users of financial statements by helping them to predict future cash flows or confirm previous assumptions. The relevant information needs to *faithfully represent* the facts that it claims to represent. Three characteristics are needed for being perfectly faithfully represented; namely, being complete, neutral, and free from error.[285] In general, faithfully represented accounting information is achieved by the obligation to transparently report results according to particular standards (e.g., IRFS, US GAAP) and the assurance of the accounting information given by an independent auditor.

Furthermore, information is more decision useful for users of financial statements if it is *comparable* to similar information of the entity for previous periods, as well as comparable to information provided for different entities for current or past periods. A standardized presentation following a particular accounting standard makes it possible to compare certain positions, such as components of Other Comprehensive Income, and understand the differences between such positions.[286] Information is *verifiable* if observers with different knowledge (e.g., employees from the internal audit and external auditors) can directly or indirectly verify the information provided in the financial statement.[287] A direct verification in this context relates either to an observation, such as verifying the amount of inventory, or to an indirect verification which relates to checking the input factors included in an estimation model. Financial information is regarded as *timeliness* if the information does have an impact on the decision making of investors based on the point of time it is provided.[288] The characteristic of *understandability* assumes that users of financial information have reasonable knowledge of business and economic activities in order to analyze the information with adequate diligence. With this prerequisite, users should be able to understand the essentials of the clearly and concisely presented information.[289] All these characteristics have the persuasive constraint of costs, because the benefit produced by the additional information must always justify the additional costs it

[285] Cf. IASB (2010a), QC12.

[286] Cf. IASB (2010a), QC20–25.

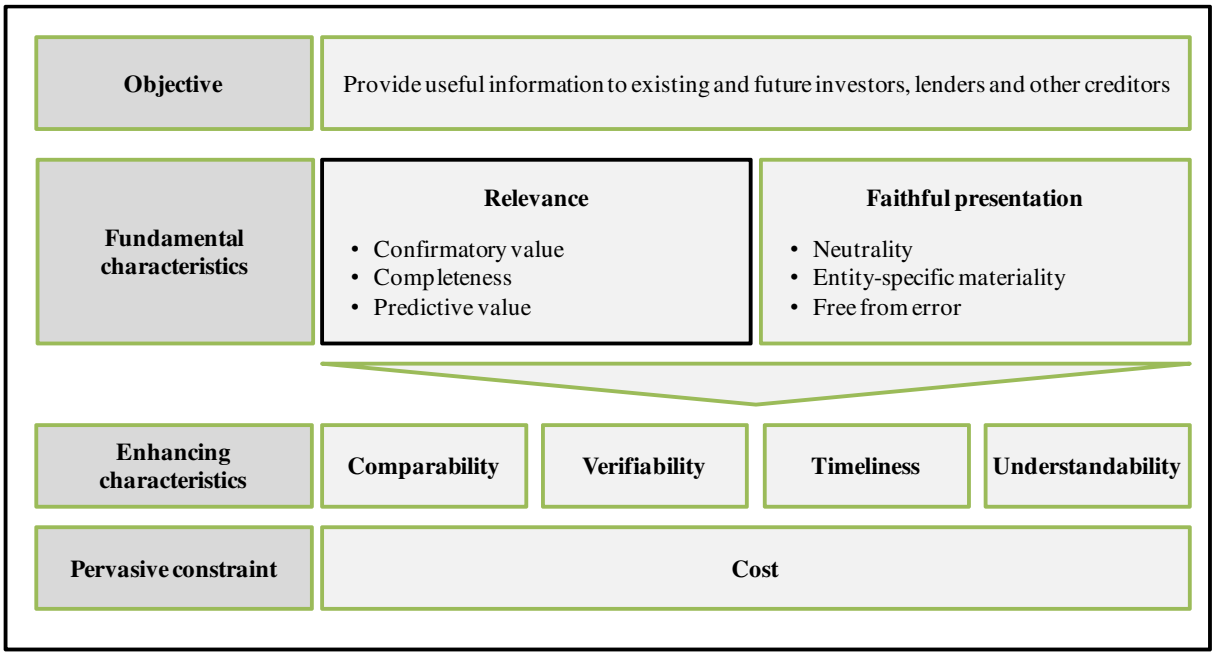
[287] Cf. IASB (2010a), QC26–28.

[288] Cf. IASB (2010a), QC29.

[289] Cf. IASB (2010a), QC30–32.

incurs.[290] Figure 2.11 provides a schematic overview of the components of the conceptual framework.

*Figure 2.11: Schematic overview of the Conceptual Framework for Financial Reporting*[291]




The previous considerations have shown that decision usefulness of financial information is primarily defined by fulfilling the characteristics of being relevant and faithfully representing the facts. Whereas, faithfully represented financial information is achieved by committing companies to follow particular standards with the involvement of independent auditors, the characteristic of relevance requires empirical validation. This can explain the fact that most empirical studies in this research area have focused on analyzing the value-relevance of financial information.[292] Consequently, value-relevance will be covered in more detail in the next section as it is the elementary characteristics for the usefulness of accounting information.

[290] Cf. IASB (2010a), QC35–39.

[291] Based on Ernst & Young (2014), p. 50.

[292] Cf. Deol (2013), p. 117–119.

### 2.3.5 Value-Relevance of Accounting Information

The theory of value-relevance is closely linked to the concept of decision usefulness of accounting information. As previously pointed out, the primary goal of published accounting data is to provide relevant and faithfully presented information to investors. Accounting values are regarded as value-relevant if they have a significant association with market values such as share prices and returns.[293] The concept of relevance has engaged researchers and standard setters all around the world for some time with the American Accounting Association (1966) being one of the first to quote relevance as the primary standard.[294]

The general idea behind the value-relevant concept under IFRS is stated in the Conceptual Framework for Financial Reporting published by the IASB in 2010.[295] It states that:

> *"Relevant financial information is capable of making a difference in the decisions made by users. Information may be capable of making a difference in a decision even if some users choose not to take advantage of it or are already aware of it from other sources.*
>
> *Financial information is capable of making a difference in decisions if it has predictive value, confirmatory value or both."*[296]

Predictive values relate to the accuracy with which future values can be forecast on the basis of current figures. Moreover, predictive values of financial information can be increased if the additional information given (e.g., by displaying Other Comprehensive Income) has an impact on the accuracy of predictions. The confirmatory value relates to the association of current figures with past results and can provide persistency for users of financial statements. In addition, the information given by past period associations should enhance the predicted associations in the following periods.

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[293] Cf. e.g. Ohlson (1995), pp. 661–687, Shevlin (1996), p. 32, Barth et al. (2001), p. 79, Alexander et al. (2012), p. 317.

[294] Cf. American Accounting Association (1966), p. 7 "Relevance is the primary standard and requires that the information must bear upon or be usefully associated with actions…"

[295] Cf. IASB (2010a), QC6–11.

[296] Cf. IASB (2010a), QC6–7.

Value-relevance studies examine the relative and incremental associations of income measures with share prices and other market data. Essentially, it should be noted that accounting information can be value-relevant, but not decision relevant if there is additional and more current information available in the market.[297] Hence, accounting information is only regarded as decision relevant if it adds additional information to the already available information, meaning that the information is new and unexpected.[298]

## 2.4 Chapter Summary of Comprehensive Income Reporting

The previous sections have provided an overview of the general concept of Comprehensive Income, the development of Comprehensive Income reporting over time, and the explicit occurrence and treatment of Other Comprehensive Income components under IFRS. The reporting of Comprehensive Income has developed over time, but the development has not yet come to an end. The development in relation to Comprehensive Income reporting over the past decades can, to some extent, be viewed as a "moving target." Although cooperation of the standard setters from different interest groups is desirable, as is extensive feedback in connection with the introduction of new standards, clear and adequate communication is not less important.

One of the main objectives of the standard setters is to achieve cohesive, consistent, and understandable financial information for the addressees. It is clear that a certain level of detail is not only unavoidable, but also necessary to allow for the different information from financial statements that users require. However, developments in recent years have reached a level whereby several users perceive the changes as an information overflow. Certain well thought through and high-quality approaches seem to perish in the tangle of larger projects that are as a whole not easy to fully understand. Addressees of financial statements are looking for cohesive and definite guidelines that can be smoothly used for publications of financial information. The constantly changing expressions for the profit or loss statement and the statement of Comprehensive Income are only exemplary for the confusion created in this context.

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[297] Cf. Barth et al. (2001), p. 80.

[298] Cf. Barth et al. (2001), p. 80, Cauwenberge and De Beelde (2010), p. 85.

There is no consistent or distinct concept for the diverging treatment of items recognized in profit or loss and in Comprehensive Income under the different accounting standards.[299] The different treatments have a significant impact on the achievability of the ultimate goal of having a homogeneous and consistent worldwide accepted accounting standard. Consensus on a general principle in this respect between the IASB and the FASB will probably be difficult to achieve. But, at least reasonable criteria should be introduced by the IASB and the FASB to provide a certain level of consistency. Another major issue with respect to the different treatment between IFRS and US GAAP is the concept of recycling of items initially recognized under Other Comprehensive Income. Currently US GAAP follows a strict concept of recycling all items recognized under Other Comprehensive Income, whereas IFRS follows a more differentiated approach of only recycling particular items via profit or loss and directly booking others into retained earnings without a profit or loss effect. Even though both approaches have their advantages and disadvantages, strictly holding onto their approaches will prevent further convergence of the standards and will put the ultimate goal of a comparable accounting standard out of reach.

Currently the perceived uncertainty about future developments relating to Comprehensive Income persists from the sides of preparers and users of financial information. As a result, users of financial statements tend not to put enough focus on the reported Other Comprehensive Income figures or ignore them completely due to their transitory nature, both from an economic and standard setting perspective. This development is a risk for addressees of financial information, because the direct recognition of certain Other Comprehensive Income items in equity and non-recycling via profit or loss makes them invisible in case only Net Income is considered. Users of financial information tend to base initial decisions on summaries, such as Net Income, rather than analyzing the complete financial report. Consequently, it is important to understand the general concept of Comprehensive Income and to be aware which items of Other Comprehensive Income the focus should be on.

A differentiated communication approach, which distinguishes between a complete approach for sophisticated users of the information and a summary of the core consequences from reporting changes for non-professional users of financial statements, could be of interest. The differentiated approach could avoid information

[299] Cf. Hoogervorst (2012), p. 2.

overflow and may circumvent further confusion. In addition, it could also be useful to provide empirical evidence on particular topics such as the value-relevance of Comprehensive Income. This could provide profound evidence on the usefulness of certain Other Comprehensive Income items and could help to promote the use of such figures.

The summarized challenges outline the need for standard setters to regain trust and get the support of the preparer and investor community for implementing new standards. In the context of Comprehensive Income reporting, a greater focus on tutoring could increase confidence in the information provided for financial statement users. Understanding the motivation behind the discussed concept is the first step to get parties involved and to gain the support for change. This study provided in previous sections a comprehensive and complete overview of the occurrence and corresponding treatment of different components of Other Comprehensive Income. A number of shortcomings such as the general reporting choices under IFRS have been identified. Empirical evidence on the importance of evaluating Comprehensive Income and components of Other Comprehensive Income should convince users of financial information of the value of considering such income measures.

# 3 Literature Review and Research Motives

## 3.1 Actual State of Research

Reporting of Comprehensive Income as required by the standard setters has been controversially discussed since its introduction. Opponents of the need to report Comprehensive Income, in particular preparers and users of financial statements have emphasized, among other issues, the additional complexity and costs of reporting. In this context, the higher volatility and, as a consequence, the higher perceived risk and the possible inherent confusion created by this transitory income measure affected by judgmental treatment have been criticized.[300] Regulators on the other hand have highlighted the consistent provision of important information about the underlying earnings strength for investors and, in particular, the relevance of Comprehensive Income for predicting future earnings and cash flows.[301] Standard setters have repeatedly emphasized the need to increase the transparency and information value of reporting data for users of financial statements. They are aiming at aligning international reporting standards and intend to increase the use of Comprehensive Income in practice and to establish the figure as a key performance indicator.[302] Most preparer and user of financial statements, however, have a tendency not to see the need to redefine their concept of income and prefer the traditional reporting under Net Income. They are demanding empirical validation of the dominance of Comprehensive Income over Net Income or at least the proof of usefulness of this supplementary information. As a consequence, several empirical research studies have focused on analyzing the value-relevance of Comprehensive Income. These studies analyze the statistical relationship between market data and different performance measures in order to provide empirical evidence for the standard setter and the research community. However, the studies carried out so far have been conducted over different time periods and are based on various regions and accounting standards, consequently providing mixed results. The studies are not able to provide consistent evidence that Comprehensive Income or components of Other Comprehensive Income are

[300] Cf. IASB (2006) for an overview of comments on the exposure draft dealing with the amendments to IAS 1.

[301] Cf. Barth (2000), p. 10, Holthausen and Watts (2001), p. 26.

[302] Cf. Cauwenberge and De Beelde (2007), pp. 2–3.

value-relevant or value-irrelevant for investors. This creates the need for an enhancement of existing concepts and to conduct further research to validate presently available results.[303]

## 3.2 Capital Market Research in Accounting

Whereas, the theoretical framework including the treatment of Other Comprehensive Income components under IFRS has been illustrated in the previous section, this section provides an overview of capital market research in accounting. Thereby the types of value-relevance research and the different research perspectives are demonstrated. The overview provides the basis for comprehending the different approaches illustrated in the literature review in section 3.3 and forms the basis for the empirical analysis in chapter 4.

The publication of the studies by Ball and Brown (1968) and Beaver et al. (1968) are regarded as the beginning of the market-based accounting research analyzing the mutual influence and impact between financial accounting and capital markets.[304] Using event studies and associate studies, the authors analyze the question whether accounting numbers stated at that time can provide accurate information about the financial performance of an entity.[305] Before those publications, accounting theory was primarily normative and driven by assumed and not affiliated accounting objectives.[306] From those studies, several research areas have evolved such as valuation studies, associate studies, or information content studies.[307] The mentioned research fields are based on the assumption that income measures can provide information on the future performance of the entity. For that purpose, the relationship of share prices and other market data has been analyzed.

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[303] Cf. Fülbier et al. (2009), pp. 456–457 where the authors emphasize the immediacy, comprehensiveness and conclusiveness of research that could be relevant for policy makers.

[304] See Walker (1997) for a chronological overview of the development of market-based accounting research.

[305] Cf. Lev (1989), p. 153.

[306] Cf. Kothari (2001), p. 113.

[307] For a comprehensive summary of the development of capital market research in accounting reference is made to the paper by Lev and Ohlson (1982) and Kothari (2001).

### 3.2.1 Types of Value-Relevance Studies

In the last decade several academics in accounting research have focused on valuation perspective research / value-relevance research.[308] The academics empirically analyzed the relationship between market values such as share prices or share returns and specific accounting numbers. In this context, accounting numbers are regarded as value-relevant if they are included in the valuation process of an entity by investors.[309] If the accounting numbers are included in the valuation practice by investors, then the resulting decision of whether to buy or sell shares in the corresponding company would have an effect on the share price. Consequently, the reported financial data should be associated with the company value if the accounting data is considered as being value-relevant.[310] To identify such an association, most studies use linear regression models.[311] In those studies, accounting figures are regarded as being value-relevant if the estimated regression coefficient is statistically significantly associated with the dependent variable.[312] Tests on the value-relevance of accounting numbers are typically also tests of reliability as value-relevance and reliability cannot be separated from each other.[313] The primary objective of these studies is to provide standard setters and the research community with findings on the value-relevance of accounting numbers.[314]

Literature on value-relevance suggests that investors are the main users of accounting information and that they primarily use the provided data to predict future cash flows and company values in connection with their investment decisions.[315] It is important to emphasize that the purpose of value-relevance perspective research is not to provide the best prediction for the development of share prices or share return or company

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[308] Cf. Holthausen and Watts (2001), p. 4, Kothari (2001), p. 105.

[309] Cf. Barth (2000), p. 10 where the author emphasizes that the investors are interested in value-relevant information because they want to base their investment decisions on this information. The paper points out that valuation is a well researched topic in financial research and therefore can provide a founded base for extending research into accounting.

[310] Cf. Ferraro and Veltri (2012), p. 588.

[311] Cf. Cauwenberge and De Beelde (2010), p. 84.

[312] Cf. Lui and Thomas (2000), p. 72, Cauwenberge and De Beelde (2010), p. 84.

[313] Cf. Barth et al. (2001), p. 81.

[314] Since the primary addressees of value-relevance research are academic audience and standard setters, the interpretation of findings implies profound knowledge of accounting issues. However, Barth et al. (2001) underline the need of simplifying findings for the broader research community. A more explanatory approach has also been taken in this study.

[315] Cf. Barth (2000), p. 10, Holthausen and Watts (2001), p. 26.

values, but to analyze if and to what extent information is used by addressees of financial information.[316] It should be noted that literature on value-relevance distinguishes between relative association studies and incremental association studies.[317]

### Relative Association Studies

Studies on relative association of market data and accounting values investigate if a given income measure, such as Net Income or Comprehensive Income, contains more information than another also providing a ranking on the information content if desired.[318] Addressees of such studies would be interested in the relative association of market data such as share prices and different income measures. Studies in this category analyze if a certain income measure is more suitable than another in explaining the association with market values. In the context of this study "relative association studies" are used to test if Net Income is relatively more associated with market values, namely share prices, share returns, abnormal returns, and target prices, than Comprehensive Income on a consolidated basis. Moreover, the relative association approach is used to investigate the association between forecasted accounting numbers and different income measures. The association between accounting and market figures is measured by using adjusted $R^2$ or AIC and BIC.[319] The income measure providing the highest $R^2$ or lower AIC and BIC is considered as being the most value-relevant.[320] In addition Vuong tests[321] are performed to validate the findings which income measure is superior over another.[322]

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[316] Cf. Barth et al. (2001), p. 90.

[317] Cf. Holthausen and Watts (2001), pp. 5–6, Cauwenberge and De Beelde (2010), pp. 84–85.

[318] Cf. Biddle et al. (1995), p. 2.

[319] The $R^2$ as well as the Akaike Information Criterion (AIC) and Schwarz Bayesian Information Criterion (BIC) are statistical model selection criteria and compare the models against each other. See section 4.4.3 for further explanations on the model selection process.

[320] Cf. Cauwenberge and De Beelde (2010), p. 84.

[321] See section 4.4.3 for further details on the Vuong test.

[322] Cf. Kanagaretnam et al. (2009), pp. 361–362, Zülch and Pronobis (2010), p. 11, Goncharov and Hodgson (2011), p. 38.

### Incremental Association Studies

Studies on incremental association investigate if successively adding items to income figures increases the association with market data.[323] These studies examine whether one income measure (e.g., Net Income including foreign currency adjustments) can provide additional information to the information provided by Net Income on a stand-alone basis.[324] The incremental association study is used to investigate if the inclusion of selected components of Other Comprehensive Income is increasing the association with market values, namely share prices, share returns, abnormal returns, and target prices.[325] Furthermore, it is tested if the inclusion of additional income measures increases the association with forecasted accounting numbers. The inclusion of an additional Other Comprehensive Income component is regarded as value-relevant if the estimated regression coefficient is significantly different from zero or if the adjusted $R^2$ or AIC and BIC improve with subsequently adding components of Other Comprehensive Income.[326] In line with the relative association studies Vuong tests are performed to validate the findings from the model selection criteria adjusted $R^2$, AIC, and BIC.[327]

## 3.2.2 Different Perspectives in Value-Relevance Research

In addition, to the different types of various associations that are tested under value perspective research, also the perspective of value-relevance needs to be looked at in more detail. In this context, especially two perspectives have been established, namely the measurement perspective and the information perspective.[328]

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[323] Cf. Holthausen and Watts (2001), p. 20.

[324] Cf. Biddle et al. (1995), p. 2.

[325] Cf. Biddle et al. (1995), pp. 2–3, Cauwenberge and De Beelde (2010), pp. 84–85.

[326] Cf. Cauwenberge and De Beelde (2010), p. 82.

[327] For the analysis in this study it is essential to establish that the inclusion of an additional independent variable increases the association with the dependent variable. It is therefore core to apply the appropriate model selection criteria which are further explained in section 4.4.3.

[328] Cf. Cauwenberge and De Beelde (2010), pp. 84–85.

### Measurement Perspective

Under the measurement or valuation perspective, the association between market data and accounting numbers is founded on a *level-based* valuation model where the market value of a company (e.g., share price) is expressed as a function of accounting numbers.[329] Studies using the measurement approach are investigating the relevance and reliability of accounting numbers by analyzing predictions for regression coefficients.[330] The significance of coefficients in the regression analysis indicates that the independent variables include value-relevant information.[331] By using the market value or the share price of an entity, the approach incorporates expected and unexpected information. The expected information is the information already known to the market and included in the share price and the unexpected information is represented by the share price change as a reaction of the release of accounting data. In the context of this study, the level-based measurement approach is applied in the price model in section 4.2.1 and the model including the target price consensus in section 4.2.4.

The motivation for applying the valuation perspective can also be linked to the objectives of the IASB to provide investors with accounting information that can help to predict future Operating Cash Flows.[332] In this context the association between different income measures such as Net Income or Comprehensive Income and future Operating Cash Flows and future Net Income is analyzed. The goal is to establish whether certain income measures are better predictors of future Operating Cash Flows and Net Income than others. The application in the forecasting models is applied in section 4.2.5.

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[329] Cf. Cauwenberge and De Beelde (2007), pp. 11–12.

[330] As pointed out in section 2.3.5, value-relevance and faithfully presentation of accounting numbers are the primary objectives of the IASB. Faithfully presentation is secured by the obligation to apply generally accepted accounting standards, whereas the value-relevance needs to be examined empirically. Consequently, the focus areas of empirical Comprehensive Income research are the validation of value-relevance, aiming at providing information to the standard setters.

[331] Cf. Cauwenberge and De Beelde (2010), p. 84.

[332] Cf. IASB (2010a), QC7–10.

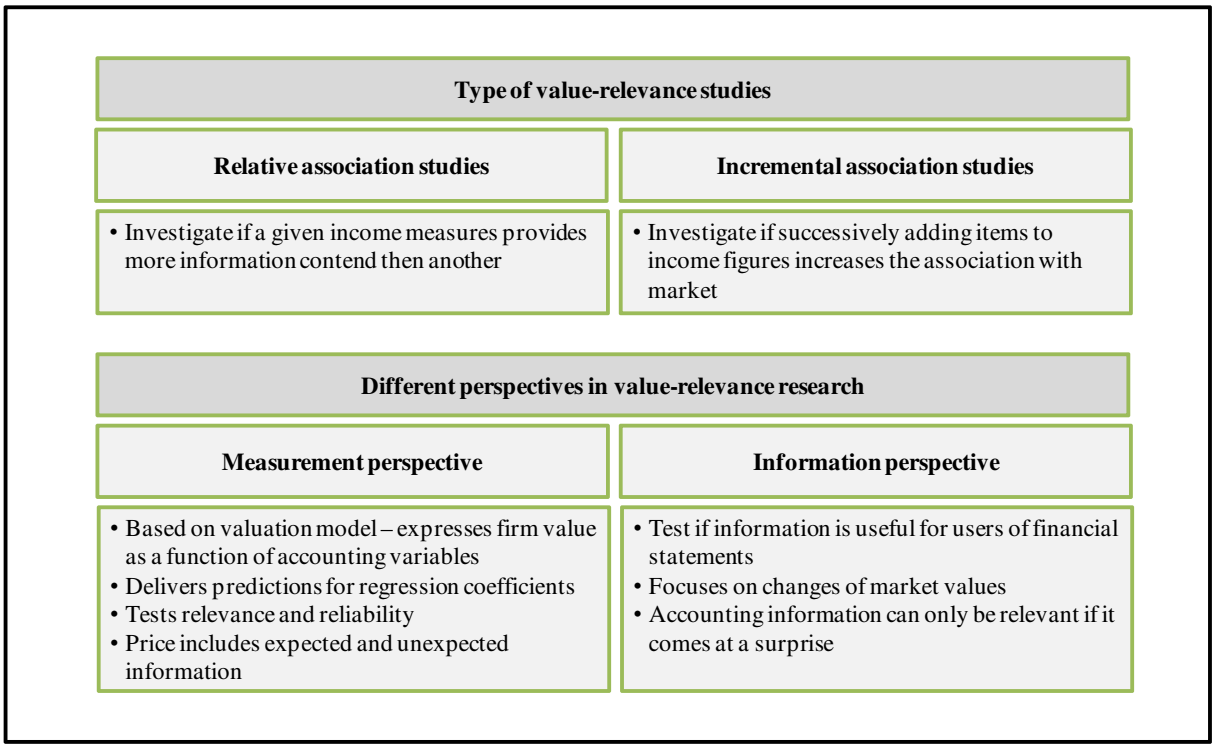
### Information Perspective

Alternatively, the information perspective focuses on *changes* in share price and, therefore, primarily reflects unexpected information and earnings surprises. Whereas the measurement perspective focuses on the value-relevance and reliability of accounting information by incorporating the share price level in the model, the information perspective focuses on the change in share prices and, therefore, analyzes if the additional information is useful for users of financial statements.[333] In this context accounting information is only regarded as value-relevant if the information is unexpected and provides additional information to the already available information in the market, implying that it comes at a surprise. Accounting numbers are only regarded as having information value if they incrementally adjust prices by taking all other value-relevant information as given.[334] In the context of this study, the information approach is applied in the return model in section 4.2.2, the abnormal return model in section 4.2.3, and the models on target price revision and target price potential in section 4.2.4. Figure 3.1 summarizes the types and perspectives of value-relevance research used in this study.

[333] Cf. Lev (1989), pp. 156–158, Cauwenberge and De Beelde (2010), p. 85.

[334] Cf. Goncharov and Hodgson (2011), p. 38.

*Figure 3.1: Types and perspectives of value-relevance research*




## 3.3 Literature Review

Research carried out in recent years on value-relevance of Comprehensive Income is extensive and diverse. The first wave of research in this field was carried out in the US in connection with the implementation of SFAS 130. Following the subsequent worldwide adoption of accounting standards dealing with Comprehensive Income, such as NZ FRS 2 in New Zealand and CICA Handbook section 1535 in Canada, several other studies examined the value-relevance of income measures. The focus has recently shifted towards Europe and countries applying IFRS with the implementation of IAS 1 and IAS 1 (revised 2007). One of the primary objectives of these examinations has been to provide the standard setter with information on the value-relevance of Comprehensive Income. The value impact, the usefulness and the accuracy of Comprehensive Income and components of Other Comprehensive Income has controversially been discussed in several research papers. The objective of this review of various academic positions is to analyze the major research streams relating to this study:

i. General value-relevance studies on SFAS 130 in the US
ii. International value-relevance studies on Comprehensive Income
iii. Studies on value-relevance of Other Comprehensive Income components
iv. Studies on reporting location of Other Comprehensive Income
v. Studies on value-relevance of Other Comprehensive Income for financial analysts

The first research stream deals with value-relevance research conducted with US data and focuses on the application of SFAS 130. The second research stream uses international data from countries which adopted Comprehensive Income reporting on the heels of the US such as UK, Canada or Australia. The third stream includes studies conducted on value-relevance on the basis of European samples, in particular in connection with the implementation of IAS 1. The fourth stream consists of studies focusing on the reporting location and its value-relevance on Comprehensive Income and components of Other Comprehensive Income. The last stream of research provides an overview of studies dealing with value-relevance in this context of financial analysts and their price estimates.

### 3.3.1 General Value-Relevance Studies on SFAS 130 in the US

Even before the introduction of SFAS 130 in the US in 1997, research had been carried out on the value-relevance of income figures. With the implementation of SFAS 130, the attention on this topic was further activated. The majority of the research which was carried out focused largely on the value-relevance of Comprehensive Income and, in particular, of the components of Other Comprehensive Income. The studies vary with respect to the time horizon and industry specification which could be one of the explanations for the heterogeneous results examined in literature.

Before the implementation of SFAS 130 Cheng et al. (1993) evaluate the usefulness of reporting Operating Income, Net Income and Comprehensive Income by comparing residual share returns for a sample of US companies collected between 1972 and 1989. They suggest that the information content of Operating Income hardly dominates Net Income. Both Operating Income and Net Income clearly dominate Comprehensive Income in information content.

The paper by Dhaliwal et al. (1999) examine whether Comprehensive Income or Net Income can better summarize company performance based on share returns after the introduction of SFAS 130, using samples from 1994 and 1995 for their study. No evidence can be found, with exception of financial institutions, that Comprehensive Income is more related to market returns and share price than Net Income. Furthermore, Comprehensive Income does not enhance predicting power for future Operating Cash Flows compared to Net Income. Solely the available-for-sale securities adjustment component of Other Comprehensive Income improves the association.

The analysis by Dehning and Ratliff (2004) tries to provide empirical evidence that the disclosure of Comprehensive Income is useful for investors and that the explicit disclosure as required by FAS 130 provides incremental information. The sample consists of US companies in the years 1998 and 1999 providing data in connection with the implementation of SFAS 130. The results do not provide evidence that the implementation of explicit disclosure of Comprehensive Income under SFAS 130 changed investor considerations compared with the publications in the notes in previous years. The explicit disclosure of Comprehensive Income and components of Other Comprehensive Income does not provide additional information content compared to a disclosure in diverse parts of the financial statement.

The analysis of Biddle and Choi (2006) evaluates different definitions of income in terms of information content, predictive ability and executive compensation contracting using samples of US companies between 1994 and 1998. The explicit disclosure of Other Comprehensive Income components is helpful for the decision usefulness of investors. They suggest that the information content of Comprehensive Income (based on the definition adopted by SFAS 130) dominates the information content of Net Income as well as on broader definitions of Comprehensive Income (in addition to SFAS 130 definition, also including other items). Furthermore, Comprehensive Income under SFAS 130 is superior over either Net Income or deviating definitions of Comprehensive Income in explaining share return; however, traditional Net Income dominates Net Income under SFAS 130 in connection with explaining executive compensation.

The Study by Choi and Zang (2006) analyzes the association of Comprehensive Income with subsequent period Net Income and earnings forecasts from analysts. Using data between 1998 and 2003, the paper provides evidence that current

Comprehensive Income is better suited than Net Income in the current period for predicting changes in Net Income for subsequent periods. Moreover, their results show that components of Other Comprehensive Income are associated with subsequent period's forecast revision and forecast errors.

The study by Chambers et al. (2007) provides evidence that Other Comprehensive Income is priced by investors on a dollar-for-dollar basis using companies from the S&P 500 from 1998 to 2003. In addition the study suggests that required reporting of Other Comprehensive Income and its components under SFAS 130 has improved the transparency of reporting. One of their explanations for their results is the fact that their study used „as-reported" data and not „as-if" data such as several other studies have done before.[335]

### 3.3.2 International Value-Relevance Studies on Comprehensive Income

Another stream of research has focused on the value-relevance of Comprehensive Income, using international samples. The following studies have been carried out thus far and have been arranged in a chronological order. The results of the research papers of both US and international samples are summarized at the end of this section.

The research by O'Hanlon and Pope (1999) examines the value-relevance of accumulated share returns and accounting flows focusing on ordinary profits and extraordinary items for a UK sample between 1972 and 1992. Evidence is provided that accounting flows, excluding extraordinary items, are value-relevant. Moreover, strong evidence is provided that ordinary profits are value-relevant, however, no evidence is found that extraordinary items provide more value-relevant information than ordinary profits. Furthermore, only little evidence is provided that other flows excluded from ordinary profit are value-relevant.

The paper by Cahan et al. (2000) investigates whether the separate statement of Other Comprehensive Income components is incrementally more value-relevant than the aggregated figure. The study explores whether the incremental value-relevance of Other Comprehensive Income items relative to Net Income increased subsequent to the "Statement of Changes in Equity" period, the SCE. The analysis is conducted for

[335] The term "as-reported" data refers to Other Comprehensive Income numbers explicitly reported in the statement of comprehensive income, whereas "as-if" data refers to Other Comprehensive Income numbers calculated implicitly from the statement of changes in equity or from the notes.

companies in New Zealand covering the years 1992 to 1997. The results show that Comprehensive Income on an aggregated basis is more value-relevant than Net Income. However, there is no benefit from separately reporting the components of Other Comprehensive Income. Moreover, no evidence can be found that the SCE made a difference in the incremental value-relevance of fixed asset revaluations and Other Comprehensive Income components relative to the Net Income.

Using data from Australian companies over the period 1988 - 1997 Brimble and Hodgson (2005) replicate Comprehensive Income based on the IAS adjustments to test the value-relevance of Comprehensive Income and Other Comprehensive Income components. The authors find that Comprehensive Income has lower value-relevance than Net Income, and that the Other Comprehensive Income components are incrementally value-relevant beyond Operating Income. However, Other Comprehensive Income components provide little pricing information even after considering a non-linear model which has been introduced as a new valuation aspect.[336]

Wang et al. (2006) concentrate on a sample from the Netherlands between 1988 and 1997 and examine the value-relevance of dirty surplus accounting flows using a return regression model. Results suggest that both reported income and clean surplus income are relevant in predicting share returns but that aggregated dirty surplus flows are not value-relevant for investors. Nevertheless, asset revaluation and currency-translation differences may provide incremental value-relevant information.

A study by Lin (2006) analyses the incremental price information of standard UK FRS 3 for a UK sample between 1993 and 1998. The author examines the disclosure of performance components and asks if it can offer price-relevant information for investors. The author demonstrates that Other Comprehensive Income components, such as gains and losses from foreign currency translations, other recognized gains and losses and adjustment in the value of purchased goodwill are significantly related to share returns.

The study by Lin et al. (2007) uses a sample of companies from Germany, France, Italy, Spain and the UK between 1992 and 2004. It examines whether Operating

[336] The non-linear model has been applied in the study assuming that the association between share prices or share returns and income measures is correlated with income persistence as suggested by Brimble and Hodgson (2005), pp. 13–14.

Income, Net Income and Comprehensive Income provide value-relevant information to investors. The study provides evidence that all income measures are throughout the examined countries statistically associated with share returns. Nevertheless, the usefulness of these figures varies significantly. More specifically Comprehensive Income is less value-relevant than Operating Income and Net Income figures. In addition, for most of the countries, aggregate Other Comprehensive Income is value-relevant and provides incremental price-relevant information beyond Net Income. The authors conclude that the increased transparency requirements under FRS 3 and SFAS 130 may have increased the association between Comprehensive Income and share returns.

Ernstberger (2008) in his analysis compares the value-relevance of Net Income and Comprehensive Income by using a sample of German companies that voluntarily adopted IFRS or US GAAP for the time period between 2001 and 2004. The results suggest that Comprehensive Income is not more value-relevant than Net Income in explaining share returns. The author suggests that Comprehensive Income reported under IFRS is more value-relevant compared to Comprehensive Income reported under US GAAP. In addition, comparing the "as-reported" data and the calculated "as-if" data show that no significant difference can be observed and consequently the results also hold true for the "as-if" data.

The study by Saeedi (2008) examines the value-relevance of Net Income compared to Comprehensive Income for a sample of companies listed on the Tehran Stock Exchange for the business years 2001 to 2003. The results show that Comprehensive Income is not a better predictor of company performance than Net Income. No evidence can be shown that predicting cash flows on the basis of Comprehensive Income delivers superior results compared to Net Income.

Kanagaretnam et al. (2009) use „as-reported" data on Comprehensive Income for a sample of Canadian companies that are cross-listed in the US for the years 1998 - 2003. They find evidence that aggregate Comprehensive Income is stronger associated to share prices and share returns than Net Income but the authors show that Net Income is superior in forecasting future Net Income compared to Comprehensive Income.

The paper by Zülch and Pronobis (2010) uses a sample of German companies between 1998 and 2007 to test the value-relevance of Comprehensive Income and Other Comprehensive Income components. The study examines if the predicting power of

Comprehensive Income is better suited for future performance than Net Income. The results could not provide evidence that Comprehensive Income has superior predictive power over Net Income for subsequent operating performance. Also the examination of Other Comprehensive Income components, on an individual as well as on an aggregate level, suggests that Net Income is superior over Comprehensive Income in predicting the future companies' operating performance. On the other hand the analysis of more than one period suggests that there is an incremental predicting power of Other Comprehensive Income components in the long run.

The article by Kubota et al. (2011) uses a sample of Japanese companies between 2000 and 2008 to analyze the information content of Net Income, items of Other Comprehensive Income and (pseudo) Comprehensive Income. Analyzing the incremental information by means of testing the association between cumulative abnormal returns and the different income measures, the results show that items of Other Comprehensive Income provide significant information content. However, the relative information content test concludes that it is not possible to differentiate between Net Income and alternative Comprehensive Income figures.

The dissertation by Höhn (2011) analyses the value-relevance of Comprehensive Income as well as of Other Comprehensive Income components for listed companies in Switzerland applying IFRS for an observation period between 1987 and 2009. The study investigates the relationship between Net Income, Comprehensive Income and Other Comprehensive Income components and the share price or share return and analyses which of the income measures are best suited to predict future cash flows. The author evaluates the persistency of Comprehensive Income and other income measures. Empirical results show that currency translation adjustments and gains and losses on available-for-sale securities are statistically significant associated with share returns and share prices. Also for the predictability of cash flows the prior mentioned items of Other Comprehensive Income provide significant results. For the other components of Other Comprehensive Income the study cannot confirm statistically significant results.

The paper by Goncharov and Hodgson (2011) studies the empirical impact of Net Income and Comprehensive Income components for a sample from 16 European countries between 1991 and 2005. The study analyses the usefulness of Comprehensive Income information by examining how the information, valuation and prediction affects the investor base in general and analysts' forecasts more specifically.

Results show that Net Income has a stronger predictive power than Comprehensive Income and that Net Income dominates aggregated Comprehensive Income in predicting future cash flows.

The study by Devalle and Magarini (2012) focuses on the IFRS adoption in Europe and analyses the value-relevance of Net Income and Comprehensive Income by using a sample of the largest companies listed on stock exchanges in UK, France, Germany, Spain and Italy between 2005 and 2007. The authors analyze the value-relevance but fail to provide uncontested evidence that Comprehensive Income is a superior performance measure as compared to Net Income. A robustness test on the regression model reinforces that Comprehensive Income is not more value-relevant than Net Income on the basis of the entire sample and on an individual country level.

The paper by Mechelli and Cimini (2014) analyzes the value-relevance of Comprehensive Income and Net Income for a sample of countries belonging to the European Union between 2006 and 2011. The study analyzes if Net Income is more value-relevant than Other Comprehensive Income on a consolidated basis. The authors find that Net Income is more value-relevant than Comprehensive Income on the basis of the complete observation period. Moreover it suggested that the introduction of IAS 1 (revised 2007) has not had an effect on the value-relevance of the income measures.

The following summary provides a general overview of the value-relevance studies carried out so far. The overview differentiates between the kinds of data used („as-if“ or „as-reported“ data) for the analysis and differentiates between the results from the studies.

*Table 3.1: Studies using „as-if“ data*

| **Comprehensive Income** is **more** value-relevant than **Net Income** | **Comprehensive Income** is **less** value-relevant than **Net Income** |
|---|---|
| Cahan et al. (2000); Biddle and Choi (2006); Lin (2006); Lin et al. (2007); Kubota et al. (2011); Deol (2013) | Cheng et al. (1993); Dhaliwal et al. (1999); O'Hanlon and Pope (1999); Brimble and Hodgson (2005); Wang et al. (2006); Lin et al. (2007); Ernstberger (2008); Saeedi (2008); Kubota et al. (2011); Höhn (2011); Goncharov and Hodgson (2011) |

*Table 3.2: Studies using „as-reported“ data*

| **Comprehensive Income** is **more** value-relevant than **Net Income** | **Comprehensive Income** is **less** value-relevant than **Net Income** |
|---|---|
| Choi and Zang (2006); Chambers et al. (2007); Kanagaretnam et al. (2009) | Dehning and Ratliff (2004); Ernstberger (2008); Zülch and Pronobis (2010) , Devalle and Magarini (2012); Mechelli and Cimini (2014) |

### 3.3.3 Studies on Other Comprehensive Income Components

In addition, to examining the general value-relevance of Comprehensive Income and aggregated Other Comprehensive Income compared to Net Income, several studies have been more explicit and have focused on the value-relevance and forecasting ability of Other Comprehensive Income components.

The study by Dhaliwal et al. (1999) analyses the value-relevance of three components of Other Comprehensive Income, namely gains and losses on marketable securities, foreign currency translation adjustments and changes in pension liabilities, which were required to report pursuant to SFAS 130. The results show that only the gains and losses on marketable components improve the association of alternate income measures with returns. An additional analysis suggests that this finding is derived at by the inclusion of companies from the financial sector.

Using a sample of companies from New Zealand between 1993 and 1997, Cahan et al. (2000) investigate the value-relevance of Comprehensive Income and Other Comprehensive Income items compared to Net Income. The results show that aggregated Comprehensive Income is more value-relevant than Net Income. In addition, no evidence can be established that the explicit reporting of Other Comprehensive Income components, namely fixed asset revaluations and foreign currency translation adjustments, provides incremental value-relevant information.

The paper by Louis (2003) focuses on the value-relevance of foreign currency adjustments. Thereby the study investigates if and how the foreign currency adjustments are associated with the company value for a sample of manufacturing companies from US between 1985 and 2001. Results show that foreign currency adjustments are associated with a loss in company value for their sample. Furthermore, currency translations in general create opposite results compared to the economic effects of exchange rate changes.

Also the study by Pinto (2005) concentrates on the value-relevance of foreign currency translation adjustments for a sample of US companies that have direct investments primarily located in Mexico or Germany between 1991 and 1996. In contrast to previous research, the author includes an interaction term in the estimation equation as a proxy for the exchange rate exposure. By using an earnings and book value model, the study establishes that foreign currency translation adjustments are significantly value-relevant when the analysis is conducted on a cross-section base.

Biddle and Choi (2006) focus their Other Comprehensive Income components analysis on adjustments for unrealized gains and losses on available-for-sale marketable securities, foreign currency translations, and minimum required pension liabilities. The authors find evidence that a broader definition of income, including additional components of Comprehensive Income, enhances the decision usefulness. The broadest income definition, including all components of Comprehensive Income, yields the highest decision usefulness. Nevertheless, with respect to predictive ability, the study does not provide consistent support for the dominance of broader defined income figures.

In the article by Wang et al. (2006), which uses a Dutch sample between 1988 and 1997, the authors accumulate share returns and accounting information over a period of one, two, five, and ten years. This approach has been adopted to avoid a potential mismatch of market values and accounting information. The findings suggest that

aggregated dirty surplus flows are not associated with share returns for accumulation intervals up to 10 years; however, asset revaluations and currency-translation differences are at times incrementally relevant to returns. The results suggest that aggregated Other Comprehensive Income components (dirty surplus flows) are not associated with share returns for the accumulated intervals.

The study by Chambers et al. (2007) examine the value-relevance of foreign currency translation adjustments and unrealized gains and losses on available-for-sale securities. The authors provide evidence that the two components of Other Comprehensive Income are value-relevant and priced by investors. Their findings suggest that investors pay more attention to Comprehensive Income information reported in the statement of changes in equity than in a statement of financial performance.

The study by Ernstberger (2008) analyses the value-relevance for gains and losses on available-for-sale financial assets, change in cumulative foreign currency translation adjustment, and gains or losses on cash flow hedges. The results cannot confirm an incremental value-relevance of Other Comprehensive Income components for the entire sample. Nevertheless, unrealized gains and losses from available-for-sale financial assets under IFRS show clearly incremental value-relevance.

Mitra and Hossain (2009) analyze the Other Comprehensive Income components for companies from different S&P indices in 2005 and 2006, the years of the initial SFAS 158 adoption. Besides the value-relevance of pension transition adjustments, the study investigates foreign currency translation adjustments, gains or losses from available-for-sale securities and gains or losses hedging activities. The value-relevance of Comprehensive Income and Other Comprehensive Income components compared to Net Income is tested by using cross-sectional regression analysis. Results show a positive and statistically significant association between share returns and pension transition adjustments as well as for foreign currency translation adjustments.

Kanagaretnam et al. (2009) focus on analyzing the value-relevance of individual components of Other Comprehensive Income. The analysis of the correlation between components of Comprehensive Income based on US GAAP, namely fair value of cash flow hedges, fair value of available-for-sale investments and foreign currency translation adjustment, and share prices or share returns show a significant correlation. More explicitly there is a high correlation between available-for-sale investments and cash flow hedges and share prices or share returns. Moreover, gains and losses from

available-for-sale investments are confirmed to increase the predictive power of future cash flows.

Jones and Smith (2011) in their study combine the use of hand-collected data and figures from Compustat for the US between 1986 and 2005 to compare the gains and losses reported under Other Comprehensive Income with those reported under special income. Using a model to examine value-relevance, predictive value and persistency, the authors find that both income measures are value-relevant. Furthermore, they find that gains and losses under Other Comprehensive Income show negative persistence and partially reverse over time. The study provides evidence that the gains and losses reported under special income have superior predicting power for future Net Income and cash flows.

The paper by Kubota et al. (2011) covering Japanese companies between 2000 and 2008 analyzes the information content of Net Income, gains and losses from available-for-sale securities, cumulative foreign currency adjustments and (pseudo) Comprehensive Income based on the two Other Comprehensive Income components. The authors find that it cannot be distinguished between Net Income and Comprehensive Income when testing for incremental information between the two income measures. However, they find that gains and losses from available-for-sale and cumulative foreign currency adjustments have significant information content, even though the sign of the coefficient is negative and counter-intuitive.

Höhn (2011) in his dissertation analyzes the value-relevance and predicting power of the components of Other Comprehensive Income. The author establishes that only currency translation adjustments and gains and losses on available-for-sale securities are statistically significant associated with share prices or share returns and provide incremental information for predicting future cash flows. However, the author stresses the fact that there is a high probability that the findings could have been biased as a result of limited data availability.

Goncharov and Hodgson (2011) in their study focus on the value-relevance and forecasting ability of Other Comprehensive Income components that are available in Worldscope, namely asset revaluations, unrealized foreign exchange gains and losses, and unrealized gains and losses on securities. For an extensive European sample before the mandatory IFRS implementation, the authors investigate if components of Other Comprehensive Income have a variable impact across the researched countries. The value-relevance of Other Comprehensive Income components is tested for

investors using share prices and share return as well as for financial analysts using cash flow forecasts. The results show that gains and losses from held-for-sale securities and unrealized foreign exchange gains and losses are deemed value-relevant by investors in the context of cash flow forecasting. Asset revaluations are confirmed of being value-relevant from the financial analysts' and forecasting perspective.

The paper by Devalle and Magarini (2012) uses a price regression model to analyze which components of Comprehensive Income are more value-relevant. The authors collect the components of Other Comprehensive Income required under IAS 1 and include them as independent variables in the model. Most of the coefficients do not significantly deviate from zero and, therefore, results are not being considered. The only components of Other Comprehensive Income that can be identified as value-relevant are currency translation adjustments but the results were only established for companies from the UK.[337]

The dissertation by Deol (2013) uses a sample of Canadian companies between 2001 and 2010 to investigate the decision usefulness of the reporting of Comprehensive Income. The study builds on the findings from the paper by Kanagaretnam et al. (2009) and analyses the decision usefulness of Comprehensive Income and Other Comprehensive Income components. The analysis is extended by examining the predictability of Other Comprehensive Income components, future Net Income, and future abnormal earnings. Moreover, the study investigates the correlation between analysts' forecasts of earnings and Other Comprehensive Income components. The author finds that some components of Other Comprehensive Income exhibit negative persistence, but, are useful for decision making. Changes in the fair value of cash flow hedges are positive and significantly associated with current share prices and share returns as well as analysts' forecasts. Gains and losses on available-for-sale securities are positive and highly significantly associated with share prices, share returns and

[337] The results from this study need further examination for several reasons. Firstly, the sample includes four countries where the official currency is the Euro, namely France, Germany, Spain, and Italy and only one country where the currency is different, namely the UK with the British Pound. It is, therefore, not surprising to find significant results for foreign currency translation adjustments. Companies from the UK, mainly reporting in British Pounds, will have to report foreign currency translations based on the Euro or the US Dollar which are not comparable with the ones made by companies from the Eurozone. Secondly, there is no comprehensible selection criterion for choosing the countries and the selection follows a rather random approach. This selection process cannot be viewed as providing a general overview of European Stock exchanges rather than a selected and biased interpretation. Thirdly the study randomly selects five different major indices, with a different number of constituents, the FTSE100, CAC40, DAX30, IBEX35 and S&PMIB40. This random selection, again, makes the results hardly comparable. Due to the shortcomings of the study the reported results are considered with special care in this study.

with future Operating Cash Flows. However, the association is negative for foreign currency translation adjustments and actuarial gains and losses with share prices.

### 3.3.4 Studies on Value-Relevance of Comprehensive Income for Financial Analysts

The majority of research has focused on value-relevance, predicting power and the reporting of Comprehensive Income and components of Other Comprehensive Income. Some scientists have, in addition, analyzed the information usefulness and valuation relevance of Net Income, Comprehensive Income and Other Comprehensive Income components on specific users of financial statements, namely financial analysts.

The study by Hirst and Hopkins (1998) analyses the effect of a clear reporting of Comprehensive Income on financial analysts. The authors conduct an experiment with 96 buy-side equity analysts and portfolio managers of non-financial institutions. In the experiment the authors test whether the explicit disclosure of Comprehensive Income, either as part of the income statement or in the changes of equity, has an impact on their individual valuation. More specifically, they examine if the reporting of Other Comprehensive Income components help analysts to improve their target price estimates when evaluating companies that do, and do not pursue earnings management. The results show that a transparent disclosure of Comprehensive Income in the income statement made earnings management more visible; however, it did not eliminate the valuation difference between companies that do, and do not pursue earnings management.

The paper by Choi and Zang (2006) evaluates for a US sample between 1998 and 2003 the association of current period Comprehensive Income with subsequent Net Income and, in addition thereto, whether financial analysts tend to use Comprehensive Income to estimate their earnings forecasts. The results show that Comprehensive Income is superior in predicting subsequent Net Income over the Net Income of the actual period. The analysis suggests that analysts do not fully make use of the Comprehensive Income information, but rather that Comprehensive Income is associated with earnings forecast by analysts as well as with revisions and forecasting errors. Though, the study establishes that the reporting of actuarial gains and losses provides incremental value-relevant information for analysts' earnings forecasts.

The study by Goncharov and Hodgson (2011) investigates the incremental usefulness of Net Income and Other Comprehensive Income components for the revision of analysts' target prices per share. The results show that changes in foreign currency translations and changes in revaluation reserves are drivers for the incremental usefulness of Other Comprehensive Income. The authors find that the price revisions tend to be negative for companies with lower intangible assets.

The paper by Cotter et al. (2012) investigate for a sample of 145 listed companies in Australia between 2003 and 2007 whether analysts have benefitted from the IFRS adoption and evaluate the role of disclosure by companies in the adoption process. The results show that the analysts' forecasting accuracy has improved with the implementation of IFRS. Nevertheless, the analysis fails to provide empirical evidence on the association between the impact of the IFRS disclosures and the forecasting error for the year of implementation, challenging the usefulness and timeliness of the reporting.

The dissertation by Deol (2013) tests the association of Net Income, Comprehensive Income, and Other Comprehensive Income components with analysts' earnings forecasts and with analysts' forecast errors for a sample of Canadian companies. Using forecasted earnings per share figures the author finds that foreign currency translation adjustments and gains and losses on cash flow hedges are found to be significantly and positive associated with forecast errors. Moreover, the minimum pension adjustment are significantly, but negatively associated with earnings forecasts.

Table 3.3 provides an overview of the studies on the value-relevance and forecasting ability of Other Comprehensive Income components and the observed relation with market data and accounting values in the different models (price models, return models, forecasting models, and analysts' target price models) used. On an individual basis or combined with other models, the return model has been applied in 71% of the studies, the price model in 47%, the cash flow forecasting model in 35%, and the analysts' target price models in 18% of the studies. It becomes obvious that the majority of the studies find positive associations of income measures with prices, returns, cash flow forecasting, and target prices when significant results are discovered. Especially for studies with a European samples as well as for studies on companies applying IFRS the results are either positive or non-significant with one exception. The negative results for foreign currency translations discovered by Devalle and Magarini (2012) are the result of questionable model specifications as previously

demonstrated. The overview shows that all studies except for Choi and Zang (2006) and Devalle and Magarini (2012), using fixed effects models, have used either OLS or pooled OLS regressions to analyze the association. As expected, the number of components and their composition varies among the countries and time due to the different accounting standards applied.

*Table 3.3: Value-relevance studies on Other Comprehensive Income components*

| Study | Period | n | Country | Statistic used | Price model | | | | | | Return model | | | | | | Forecasting models | | | | | | Analysts' target price models | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FCT | AFS | CFH | ACT | REV | OTH | FCT | AFS | CFH | ACT | REV | OTH | FCT | AFS | CFH | ACT | REV | OTH | FCT | AFS | CFH | ACT | REV | OTH |
| Dhaliwal et al. (1999) | 1994-1995 | 11,425 | US | OLS | 0 | 0 | | 0 | | | 0 | +[8] | | 0 | | | 0 | 0 | | 0 | | | | | | | | |
| Cahan et al. (2000) | 1992-1997 | 237 | NZ | OLS | 0 | | | | 0 | | | | | | | | | | | | | | | | | | | |
| Louis (2003) | 1985-2001 | 4,972 | US | OLS | | | | | | | - - | | | | | | | | | | | | | | | | | |
| Pinto (2005) | 1991-1996 | 1,002 | US | OLS | + + | | | | | | | | | | | | | | | | | | | | | | | |
| Biddle and Choi (2006) | 1994-1998 | 18,700 | US | OLS | | | | | | | + + | + + | | + + | | 0 | 0 | | | 0 | | 0 | | | | | | |
| Wang et al. (2006) | 1988-1997 | 820 | NL | OLS[6] | | | | | | | + + | | | | + + | 0 | | | | | | | | | | | | |
| Choi and Zang (2006) | 1998-2003 | 5,237 | US | Fixed effects | | | | | | | | | | | | | | | | | | | +[11] | 0 | | + + | | |
| Chambers et al. (2007) | 1994-2003 | 4,534[1] | US | OLS | | | | | | | + + | + + | | | | | | | | | | | | | | | | |
| Ernstberger (2008) | 2001-2004 | 430 | GER | OLS | | | | | | | 0 | + + | 0 | 0 | | | | | | | | | | | | | | |
| Mitra and Hossain (2009) | 2005-2006 | 697 | US | OLS | | | | | | | + + | 0 | | + + | | | | | | | | | | | | | | |
| Kanagaretnam et al. (2009) | 1998-2003 | 203[2] | CAN | OLS | 0 | + + | - | | | | 0 | + + | - - | | | | 0 | + + | 0 | | | | | | | | | |
| Jones and Smith (2011) | 1998-2005 | 1,888[3] | US | OLS | | | | | | | | | | | | (+)[9] | | | | | | (+) | | | | | | |
| Kubota et al. (2011) | 2000-2008 | 13,753 | JAP | OLS | | | | | | | - -[10] | - - | | | | | | | | | | | | | | | | |
| Höhn (2011) | 2005-2008 | 628 | CH | OLS | + + | + | 0 | 0 | 0 | 0 | + + | + | 0 | 0 | 0 | 0 | + + | + | 0 | 0 | 0 | 0 | | | | | | |
| Goncharov and Hodgson (2011) | 1991-2005 | 56,696 | EUR[4] | OLS | 0 | 0 | | | 0 | | 0 | + | | | 0 | | + + | + + | | | + + | | + + | 0 | | | + + | |
| Devalle and Magarini (2012) | 2005-2007 | 585 | EUR[5] | Fixed effects | - -[7] | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | |
| Deol (2013) | 2001-2010 | 1,464 | CAN | OLS | - - | + + | + | - - | | | + | + + | + + | 0 | | | 0 | + + | 0 | 0 | | | + + | 0 | + + | - - | | |

+ + (high) statistical significant positve association (1% / 5%), + weak statistical significant positve association (10%), 0 no statistical significant impact, - - (high) statistical significant negative association (1% / 5%), no value -> no test conducted

1 1,727 observations for "as-if" data between 1994 and 1997 and 2,807 obsevations for "as-reported" data between 1998 and 2003.

2 Before exclusion of financial firms 228 observations.

3 Hand-collected part of the sample focussing on the value relevance of Other Comprehensive Income components.

4 Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

5 France, Germany, Italy, Spain, and United Kingdom.

6 Models have been rerun with the fixed-effect panel-estimation procedure along the time dimension as robustness test

7 Shortcomings in the data selection and interpretation - results primarily driven by companies from United Kingdom .

8 Weak statistical results only for financial entities, otherwise not significant results.

9 Comparison of OCI items with Special Items on a consilidated basis, therefore limited comparibility in this context.

10 The analysis is based on cummulative abnormal returns

11 The analysis uses forecasted earnings per share figures instead of target prices

FCT - Foreign currency translation adjustments
AFS - Gains and losses on available-for-sale financial assets
CFH - Effective portion of gains and losses in cash flow hedges
ACT - Actuarial gains and losses on defined benefit plans
REV - Changes in revaluation surplus
OTH - Other items relating to Other Comprehensive Income

### 3.3.5 Studies on Reporting Location of Other Comprehensive Income Components

The widely accepted efficient markets hypothesis developed by Samuelson (1965) and Fama (1965) suggests that market prices fully reflect all available information with the consequence that the availability of information is essential and not the format of the presentation of such information. In several studies; however, the impact of the format of the presentation of financial information produces contradictory results.

Dehning and Ratliff (2004) found no evidence for a US sample after the implementation of SFAS 130 that the market participants value the publication of Comprehensive Income. Based on the fact that components of Comprehensive Income had already been available in the notes prior to the explicit presentation, the authors confirm the validity of the efficient markets hypothesis. On the other hand, Hirst and Hopkins (1998) previously found out that a clear and detailed presentation of Comprehensive Income components in connection with the implementation of SFAS 130 does have an effect on the predictability and judgment of share prices by financial analysts. Analyzing the same effect for nonprofessional investors with respect to the implementation of SFAS 130, Maines and McDaniel (2000) find that the format of reporting does significantly influence investors' performance weighting. It supports the statement that the format of presenting Comprehensive Income does have an impact on investor's decision making. The study by Mitra and Hossain (2009) supports this argumentation by suggesting that investors tend to evaluate accounting information more effectively if the information is reported explicitly in financial statements rather than in the notes of annual reports. More recently Bamber et al. (2010) show in their study that managers act as if they believe that reporting location of Comprehensive Income matters and that users of financial statements are evaluating Comprehensive Income differently depending on the reporting location. This behavior can be explained by the fear of a higher perceived volatility of Comprehensive Income compared to Net Income. In a recent study by Mechelli and Cimini (2014) the authors analyze if the reporting location of Comprehensive Income matters for a sample of European companies before and after the implementation of IAS 1 (revised 2007). The authors conclude that the reporting location of the explicit reporting of Comprehensive Income did not affect the value-relevance of Comprehensive Income.

## 3.4 Objectives of the Study

Even though the concept of reporting Comprehensive Income has been implemented under all noteworthy accounting standards, the practical relevance for users of this information could so far not be reliably assessed in empirical studies. Based on the mixed results on the value-relevance of the above mentioned studies, it is so far not possible to make a consistent statement if the requirement to report Other Comprehensive Income figures as part of the financial statements adds incremental information for addressees of the reporting. This shows the need for further research on value-relevance of Comprehensive Income as well as components of the Other Comprehensive Income in this study.

The objective of this study is to provide empirical evidence with respect to the question if the inclusion of Comprehensive Income as such or the components of Other Comprehensive Income provides investors with incremental information for companies in the Eurozone under IFRS. Investors are likely to make use of Comprehensive Income and its components if it has been comprehensively verified that it is value-relevant for valuation matters. This study examines the grade of success of the IASB in increasing the relevance of accounting information about earnings by implementing IAS 1 and IAS 1 (revised 2007). These findings could be of particular interest for the two standard setters, the IASB and the FASB, and the convergence project because the results from previous studies for US samples as well as on an international level have been mixed and the evidence of value-relevance has been weak.

This study makes use of well-established pricing, return and forecasting models and develops them further on the basis of findings from recent regulatory developments and enhancements in the research community. The inclusion of target price consensus[338] as well as different modifications of the target price in the examination of the value-relevance of Other Comprehensive Income represents an innovative approach deviating from the commonly used approaches in the research community. Furthermore, the study proposes an improvement to the commonly used time-series or cross-section ordinary least square (OLS) regressions. The use of a different panel

[338] The target price consensus is the average of all predicted price levels by "sell-side" analysts for a particular company and combined by data providers such as I/B/E/S. Reference is made to section 4.2.4 for further information on the treatment of the target price consensus treatment in the empirical analysis of this study.

estimation method, such as fixed effects regressions, controls for the heterogeneity of the sample and may reduce a bias in the results. It is also examined how users of financial statements, with a focus on investors and financial analysts, value Other Comprehensive Income after the implementation of IAS 1 (revised 2007) and if the information value of this income measure has changed over time. In addition, the objective of the study is to provide a comprehensive overview of Other Comprehensive Income components for users of financial statements.

The aim of this study is to contribute additional insights to the ongoing discussion on value-relevance of income measures in the research community as well on the standard setter side. It is not aimed at providing an exclusive recommended course of action but it is a contribution to assist to further develop the ongoing discussion of aligning and enhancing the reporting of income figures.

## 3.5 Research Gap

An evaluation of the studies conducted so far shows that the classification of Comprehensive Income as well as components of Other Comprehensive Income varies across industries, countries and has also developed over time. Thereby it is relatively difficult to compare the results of the presented available studies.[339] Neither Europe as a region nor with respect to the Eurozone has been strongly researched with reference to the impact of Comprehensive Income reporting. This can be explained by the fact that European standard setters introduced principles on the disclosure of Comprehensive Income only much later than for example the FASB. Only few studies have been conducted for Europe and most of the studies focus on countries rather than Europe or the Eurozone as a whole. Moreover, the majority of existing studies conducted in Europe does not find any or only limited incremental information content of Comprehensive Income and Other Comprehensive Income components compared to Net Income. There are several possible explanations why these studies could not provide significant and consistent results and further research is required to fill those gaps.

[339] Even though the international standard setters have worked on the convergence of accounting standards this is still an ongoing process. Especially the different treatment of certain components of Other Comprehensive Income over time as well as throughout countries and accounting standards may have influenced the data and complicates a robust comparison.

The following challenges have been identified based on the research carried out so far.[340] Those will be the basis for the extension and development of the research questions in the following section.

Limited research on value-relevance research in Europe:

There are only few studies that deal with the value-relevance of accounting numbers in Europe. Before the mandatory IFRS implementation, the majority of these papers (e.g., Ernstberger (2008), Goncharov and Hodgson (2011)) deal with the adoption of IFRS for listed European companies in 2005 and focuses on comparing the value-relevance of income measures before and after the implementation. Moreover, in the past proposals and decisions by the IASB and the FASB (e.g., IASB (2008a), paragraph 3.31) have primarily referred to empirical research that was based on US data and US GAAP.[341]

No value-relevance study explicitly focusing on companies from the Eurozone:

The studies conducted so far for European samples have all included non-Euro companies in their sample. Goncharov and Hodgson (2011) and Mechelli and Cimini (2014) include Denmark, Sweden, Switzerland and UK, Devalle and Magarini (2012) include the UK[342]. The presentation currency, however, may have a major effect on foreign currency translation, as the Other Comprehensive Income item primarily results from the exchange differences from the translation into the presentation currency. This fact distorts a comparison across companies with different reporting currencies. Given the importance of foreign currency translations as part of Other Comprehensive Income shown in previous research, the inclusion may have produced biased results.

[340] An overview of the past research has been illustrated in the literature review in section 3.3.

[341] The academic evidence provided in the discussion paper "Preliminary views on financial statement presentation" by the IASB (2008a) relies solely on studies using US data. More specific the discussion focuses on the studies by Hirst and Hopkins (1998), Maines and McDaniel (2000), Chambers et al. (2007).

[342] In their analysis, UK companies account for more than 35% of the sample.

Few studies published following the implementation of IAS 1 (revised 2007):

There are only few studies dealing with the value-relevance of Comprehensive Income after the implementation of IAS 1 (revised 2007), namely Zülch and Pronobis (2010) for Germany, Höhn (2011) for Switzerland, Devalle and Magarini (2012), and Mechelli and Cimini (2014) on selected European countries. The study of Zülch and Pronobis (2010) with the German sample examines the predictive power of income measures, the research of Höhn (2011) from Switzerland focuses on the economic relevance of Comprehensive Income. These studies focus on specific countries and their specifics rather than on cross border regions. The only study analyzing the value-relevance of comprehensive on a European basis and under IFRS is by Devalle and Magarini (2012), examining companies from selected European stock markets but use only "as-if" data from before the implementation of IAS 1 (revised 2007). In a recent study by Mechelli and Cimini (2014) the authors analyze the value-relevance of Net Income and Comprehensive Income before and after the implementation of IAS 1 (revised 2007); however, the study focuses of Comprehensive Income on a consolidated basis and uses data from Datastream but not hand collected data used in this study.

Use of "as-if" data and not "as-reported" data in the majority of studies:

Several researchers such as Chambers et al. (2007), Kanagaretnam et al. (2009), and Jones and Smith (2011) have recently emphasized the importance of using "as-reported" instead of "as-if" data in their analysis. They suggest that a study using "as-reported" data for Comprehensive Income and components of Other Comprehensive Income as provided in financial statements and comparing its results with "as-if" data could add valuable input to this discussion.

Limited availability and quality of data:

The IASB introduced the mandatory adoption of IFRS for listed corporations with financial years starting on or after January 1, 2005.[343] As a result, comparable accounting data for European companies has only been available since that date.

[343] Cf. European Parliament and Council of The European Union (2002), p. 3 - article 4 on "Consolidated accounts of publicly traded companies".

Moreover, the revision of IAS 1, and, therefore, the explicitly of reporting of Other Comprehensive Income components is only mandatorily applied for financial years starting on or after January 1, 2009.[344] Reinforced by the uncertainty of further developments in this area and the unsteadiness of the final design of the standards, only very few companies acted as early adopters in publishing additional information. Machine-readable databases have so far focused on the presentation of Comprehensive Income under US GAAP and therefore do not completely match the data presentation under IFRS.

No study so far has included all Other Comprehensive Income items required under IAS 1 (revised 2007):

The US studies have focused on Other Comprehensive Income items that have to be mandatorily reported under US GAAP, namely foreign currency translations, available-for-sale assets, and additional minimum liabilities adjustments relating to pension accounting. In addition to these items, few studies have included revaluations on fixed and on intangible assets, the share of associate companies and actuarial gains and losses in their examination. The reporting of Other Comprehensive Income items differs amongst accounting regimes and also over the years. Previously published studies could not base their research on data that is only available for analysis since the introduction of IAS 1 and explicitly since IAS 1 (revised 2007). Only the inclusion of all available information secures a complete and resilient analysis of Comprehensive Income and Other Comprehensive Income items.

Only few studies analyze the connection between Other Comprehensive Income and analyst recommendation:

The impact that analyst recommendations have on the share price of an entity have been confirmed in several studies such as Fried and Givoly (1982), Lys and Sohn (1990), Hirst et al. (1995), Francis and Soffer (1997), or Healy and Palepu (2001). The target prices and recommendations are regarded as an indicator for share price movements but do not incorporate the income measure of Comprehensive Income.

[344] As companies in most cases provide comparable information for the previous reporting year also explicitly reported numbers for 2008 are available for the majority of the examined entities.

There is only little research in connection with the impact of Comprehensive Income on analyst recommendations with the corresponding studies being Hirst and Hopkins (1998) , Choi and Zang (2006), Goncharov and Hodgson (2011), and Deol (2013). The study by Hirst and Hopkins (1998) focuses on the question whether the reporting location of Comprehensive Income has an impact on their valuation. Choi and Zang (2006) analyze the association between total Comprehensive Income and Net Income and analysts' forecasts of subsequent periods. The study is carried out for a US sample and uses „as-if" data for the analysis. More recently, Goncharov and Hodgson (2011) have investigated the incremental usefulness of Net Income and Other Comprehensive Income components in the context of analysts' target price revisions. However, as previously mentioned, the study includes companies not reporting in Euro and is based on "as-if" data from a Worldscope. The dissertation by Deol (2013) tests association of Net Income, Comprehensive Income, and Other Comprehensive Income components with analysts' earnings forecasts for a sample of Canadian companies but not to target prices used in this study.

The scope of market data has been oversimplified:

The majority of studies dealing with market values (e.g., Kanagaretnam et al. (2009), Cormier et al. (2009), and Devalle & Magarini (2012)) use the share price (market value) that has been collected three months after the fiscal year-end. As all companies had to file their annual reports 90 days after the fiscal year-end at the latest, this should ensure that the market had access to the information provided in the annual reports. However, assuming a certain degree efficient capital markets, where the available information from financial statements is immediately reflected in the share price; the extension of the period to be reviewed to three months is random and problematic.[345] The random extension of the observation period has the potential disadvantage to include external effects that are not related to the publication of accounting data.[346]

[345] Cf. Kanagaretnam et al. (2009), p. 363. The authors point out that the simplification applied in their study, is particularly accurate for their data set, as the filing date for 190 out of 209 observed companies falls into the third month after the fiscal year-end. However, this also shows the potential shortcoming of this procedure.

[346] Cf. e.g. Ball and Brown (1968), p. 176 "… many other bits of information are usually released in the same month as reported income (e.g., via dividend announcements, or perhaps other items in the financial reports)".

Most studies use the same econometric model not questioning its explanatory ability:

Econometric studies conducted on the value-relevance of Comprehensive Income so far generally make use of pooled OLS models with cross-sectional or time-sectional regressions to analyze the association between market and accounting numbers. For example, studies by Biddle and Choi (2006), Kanagaretnam et al. (2009), or Goncharov and Hodgson (2011) which are closely linked to the approach taken in this study solely perform pooled OLS regressions. The use of pooled OLS models could have produced misleading results as they estimate a single intercept for all companies. The generalization to such an extent may be considered as questionable. Other panel estimation methods such as the fixed effects model or the random effects model, incorporating the heterogeneity of the companies in the analysis, have not yet sufficiently been applied.

## 3.6 Research Questions and Statement of Hypotheses

Based on the current state of discussion, the described shortcomings and the identified research gaps, the following general research questions are formulated and form the basis for the statement of the hypotheses to answer the research questions. These hypotheses will then be tested in the empirical analysis.

### Research Questions

The initial consideration draws special attention to the fact that Comprehensive Income in general and components of Other Comprehensive Income, in particular, are often regarded as being transitory in nature as discussed previously. Comprehensive Income is expected to follow a random walk model and revert over time and, therefore, should have an expectation value of zero.[347] As a consequence, Comprehensive Income should not have a higher association with market values (e.g., share prices or share returns) compared to Net Income. Moreover, investors regard Comprehensive Income as distorting and, therefore, would not include this information in their valuation. On the basis of these considerations the following first research question has been developed:

[347] Cf. Chambers et al. (2007), p. 544.

*[RQ1]: Does reported Comprehensive Income, at an aggregated level, deliver value-relevant information relative to Net Income?*

Closely linked to the first research question is the value-relevance of the individual components of Other Comprehensive Income. Some individual items of Other Comprehensive Income may provide additional value-relevant information for investors. Therefore, the second research question discusses whether Net Income expanded by individual components of Other Comprehensive Income is more strongly associated with market values than Net Income on a standalone basis. It is suggested that the expected sign of the components of Other Comprehensive Income differs amongst items and, therefore, an aggregation in the form of Comprehensive Income may produce less meaningful or even misleading results. Consequently, the second research question has been developed to incorporate this potential effect:

*[RQ2]: Do components of Other Comprehensive Income provide incremental value-relevant information compared to Net Income?*

Investors are confronted with diverse investment decisions and often include the opinion of research analysts in their investment decisions. The impact that analyst recommendations in the form of target prices have on the share prices has been confirmed in several studies so far. The question is, as to what extent research analysts incorporate the information provided on Comprehensive Income and components of Other Comprehensive Income in their valuation. The third research question is as follows:

*[RQ3]: Are target prices as well as target price revisions between two announcement dates of annual results more associated with Comprehensive Income and its individual components or with Net Income?*

Since Comprehensive Income is transitory in nature and is reverting over time, it should also be unpredictable and irrelevant for the forecasting of future Operating Cash Flows and Net Income. Consequently, Comprehensive Income as well as the

components of Other Comprehensive Income should not have a higher association with future Operating Cash Flows and future Net Income compared to current Net Income. The fourth research question was developed, based on those considerations:

> *[RQ4]: Does the inclusion of Comprehensive Income and the components of Other Comprehensive Income increase the forecasting ability compared to the use of Net Income?*

In addition, to the value-relevance of Comprehensive Income and components of Other Comprehensive Income it is also important to know if, and to which extent, the value-relevance has developed over time. Of particular interest is the implementation of IAS 1 (revised 2007) which requires the explicit reporting of Comprehensive Income as well as components of Other Comprehensive Income in the financial statements for annual periods beginning on or after January 1, 2009. It might be of relevance to establish if investors have changed their attitude towards the inclusion of Comprehensive Income in their valuation over the observation period. The fifth research question summarizes this topic:

> *[RQ5]: Has the value-relevance of Comprehensive Income increased with the explicit reporting of Comprehensive Income and components of Other Comprehensive Income under IAS 1 and IAS 1 (revised 2007)?*

**Statement of Hypotheses**

Based on the shortcomings of existing research the *purpose of the research* carried out in this study has been summarized by the research questions. Based on the research questions the hypotheses making *predictions about potential outcomes* on the basis of theoretical foundation are developed and form the basis for the empirical analysis. The results of examining the hypothesis through the empirical analysis can directly be transferred to the answering of the research questions. The corresponding hypotheses to be tested are defined as follows:

*[H1]: Compared to Net Income, Comprehensive Income (on a consolidated basis as well as on a basis including individual components of Other Comprehensive Income) is stronger associated with share prices implying value-relevance of the additional provided information.*

*[H2]: Compared to Net Income, Comprehensive Income (on a consolidated basis as well as on a basis including individual components of Other Comprehensive Income) is stronger associated with share returns or abnormal returns implying value-relevance of the additional provided information.*

*[H3]: Compared to Net Income, Comprehensive Income (on a consolidated basis as well as on the basis including individual components of Other Comprehensive Income) is more associated with target prices as well as revisions of target prices, implying that analysts incorporate the information on Comprehensive Income in their valuations.*

*[H4]: Compared to current Net Income, current Comprehensive Income (on a consolidated basis as well as on the basis including individual components of Other Comprehensive Income) is a better predictor of future Operating Cash Flows and future Net Income.*

*[H5]: The association of Comprehensive Income (on a consolidated basis as well as on the basis including individual components of Other Comprehensive Income) with shares price, share return, abnormal returns and target prices has increased relatively to Net Income since the implementation of IAS 1 (revised 2007).*

## 3.7 Practical and Academic Contribution

The results of this study provide contributions to the scientific discussion in several aspects that might be of interest for investors, governments, standard setters, research community, and all other users of financial statements. As indicated in the research gap, the approach of this study differs from other studies that were previously conducted in value-relevance research. On the basis of this research this study provides first-time evidence on the following topics:

- Testing the value-relevance of Comprehensive Income and components of Other Comprehensive Income for the largest companies in the Eurozone.

- Using hand-collected "as-reported" data to test the value-relevance of Comprehensive Income and components of Other Comprehensive Income around the implementation of IAS 1 (revised 2007).

- Analyzing the association between the analysts' target price consensus and different modification of the target price with Net Income, Comprehensive Income, and components of Other Comprehensive Income.

- Examining the changes of value-relevance of Net Income, Comprehensive Income, and components of Other Comprehensive Income reporting as a result of the explicit reporting under IAS 1 (revised 2007) via empirical evidence.

- Showing a direct comparison of the results from OLS and fixed effects regressions and therefore providing a possible explanation for the diverging outcomes of studies using these methodologies

Apart from the contribution to academia and standard setters, this study may also serve as guideline for users of financial statements. This study aims at providing a comprehensive and explanatory overview of the treatment of Other Comprehensive Income component paired with an empirical analysis of such possible effects. Thus, this study might be of use to addresses of financial statements, fostering the understanding of the treatment of Other Comprehensive Income components and thereby making better use of the additionally published information.

# 4 Empirical Analysis

This study develops an empirical analysis based on the discussed theoretical background and the review of existing studies on Comprehensive Income reporting. The chapter commences with a description of the research methodology and design which is used to test the formulated hypotheses. Thereafter, the different models and approaches are outlined in more detail followed by an overview of the variables used in the study. The statistical design used is illustrated with a focus on the regression analysis. Finally, details about the source of data, the data selection process and the challenges with the data in this analysis are provided.

## 4.1 Research Methodology and Design

Based on the different research perspectives and the theoretical framework, the research methodology for this study has been developed. It uses an empirical quantitative research approach to examine the relative association between market data and selected accounting numbers as well as among selected accounting numbers.[348] By means of a time series analysis, the study examines the statistical association between specific market figures and accounting data between 2007 and 2012. In particular linear regression models using cross-sectional as well as panel data are analyzed in order to examine whether reporting of Comprehensive Income and components of Other Comprehensive Income have increased the value-relevance of accounting data in the Eurozone.[349]

Following a measurement perspective, the analysis commences with a levels-based model or price model in order to assess the value-relevance of Comprehensive Income compared to Net Income. Using this approach, the association between share prices and Net Income are compared to other earnings figures such as Comprehensive Income and components of Other Comprehensive Income.

Following an information perspective the change based return model is applied to evaluate the association between share return and the same earnings figures mentioned

[348] This specific approach of examining the statistical relation between market data and different income measures in connection with Comprehensive Income has been referred to as “empirical comprehensive income research” by Cauwenberge and De Beelde (2010), p. 82.

[349] This study uses relative and incremental association approaches on the basis of price, return, abnormal return, target price and forecasting models.

above. The analysis uses a marginal information content model which investigates if the explicit publication of income measures, in this context of components of Other Comprehensive Income, provides additional value compared to the information available under Net Income. The regression is modified by using abnormal share return, instead of raw share returns in order to incorporate the relative performance based on the comparison of the industry returns.

Furthermore, the predicting power of the different income measures used to forecast Operating Cash Flows and Net Income is assessed. By the use of fixed effects regressions and pooled OLS regressions, the association of current Operating Cash Flows and Net Income with last year's income measures is analyzed. The analysis makes use of the relative association approach to investigate if Comprehensive Income on an aggregated level serves as a superior predictor of future Operating Cash Flows and Net Income. An incremental association approach is taken to investigate if the inclusion of additional components of Other Comprehensive Income in the regression increases the quality of the forecasted Operating Cash Flows and Net Income.

Finally, the study analyzes the impact of Comprehensive Income reporting on analysts' forecasts by comparing the association between the changes in target prices to Net Income, Comprehensive Income and components of Other Comprehensive Income. The relative and incremental association approach is used to investigate if Comprehensive Income or components of Other Comprehensive Income are incorporated in the revision of analysts' forecasts.

The model specifications that have been developed to investigate the research questions and to examine the hypotheses deployed in the previous sections will be explained in the following sections in more detail.

## 4.2 Model Specification

On the basis of existing literature in the area of capital market research in accounting as well as in combination with applications of capital market research in finance, the models illustrated in this section have been developed. Thereby, the study makes use of adoptions and extensions of existing and well-established models in the research area and develops own approaches based on these theories and concepts. Based on the approaches of market-based accounting research outlined in section 3.2, this section commences with the measurement or valuation approach by using a price model

investigating the association between share price levels with income figures to test [H1]. Thereafter, an information perspective is taken by the application of a return model investigating the association between price changes or returns as well as abnormal returns and different income measures testing [H2]. To analyze the association between the revisions of the analysts' target prices and certain income measures a modification of the price model and return model is applied to test [H3]. The predictability of certain accounting numbers is analyzed by using the forecasting model testing [H4]. To test [H5] if the implementation of IAS 1 (revised 2007) had an effect on the association between market values and accounting numbers Chow tests are performed for the previously outlined models.

The models illustrated in the rest of this section apply those two concepts to analyze the value-relevance of Net Income, Comprehensive Income, and components of Other Comprehensive Income based on different market values. On the basis of regression analyses the associations between those income measures and share prices, share returns, abnormal share returns, and different forms of analyst recommendations is examined. In addition, the forecasting model examines the association of these income measures with future accounting numbers.

### 4.2.1 Price Model – Price Level Regression

The approach used in this study in connection with valuation or measurement approach is a price level regression. The model is based on the often cited theoretical framework by Ohlson (1995) and tests whether Comprehensive Income and components of Other Comprehensive Income are more associated with share prices than Net Income. The model developed by Ohlson (1995) and Feltham and Ohlson (1995) is regarded as one of the most important landmark works in financial accounting and capital market research in the last decades.[350] The model refocuses on the residual income relation which provides a direct link between company value and accounting data.[351] Even though praised by several researchers as one of the most significant achievements in accounting research in the 1990s, other authors are more restrictive and only attribute a limited innovativeness to existing attempts, mainly in

[350] Cf. e.g. Bernard (1995), p. 733, Lundholm (1995), p. 749, Lo and Lys (2000), pp. 337–338, Penman (2005), p. 367.

[351] Cf. Cauwenberge and De Beelde (2007), p. 12.

comparison with the dividend-discount model.[352] Due to the variety of specifications in the methodology as well as the different data samples across countries and time, it is difficult to generally argue in favor or against the weight of the theory by Ohlson (1995) and Feltham and Ohlson (1995).[353] The fact that leading researchers across the world have commented on or further developed the model at least confirms the impact of this study on the research community. Also the application in recently conducted studies justifies the application of the concept in this study.

The basis for the studies by Ohlson (1995) and Feltham and Ohlson (1995) is the Residual Income Valuation (RIV) concept dating back to a publication by Preinreich (1938). The concept assumes that the share price (P) equals the book value of equity (BVE) divided by the number of shares outstanding at time (t) plus the sum of all expected future dividend payments (E(DIV)) discounted with the appropriate interest rate (r) and is summarized in the following formula:

$$P_t = \left(\frac{BVE}{S}\right)_t + \sum_{t=1}^{\infty} \frac{E(DIV)_t}{(1+r)^t} \tag{4.1}$$

The additions by Ohlson (1995) and Feltham and Ohlson (1995) add information dynamics[354] to the RIV model by including testable propositions.[355] Based on the additions, their model looks as follows:

$$MVE_t = BVE_t + \alpha_1 OE_t^a + \alpha_2 OA_t + \beta_1 v_1 + \beta_2 v_2 \tag{4.2}$$

The market value of equity (MVE) of an entity - representing the share price multiplied by the number of shares outstanding - is equal to the book value of equity (BVE) adding residual operating earnings (OE), operating assets (OA) and disturbing terms for other relevant information for estimating future abnormal earnings (βv). On the basis of this model, the residual operating earnings are replaced by the general

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[352] Cf. among others: Dechow et al. (1999), p. 3, Myers (1999), p. 1, Morel (2003), p. 1357, Callen and Segal (2005), p. 409.

[353] Cf. Alexander et al. (2012), p. 320.

[354] In addition to the first assumption of RIV holding true, three other assumptions have been formulated by Feltham and Ohlson (1995), namely clean surplus to hold, the discount rate is assumed to have no impact in the valuation of investment and that abnormal earnings evolve following linear information dynamic.

[355] See Lo and Lys (2000) for further details on the contributions provided by Ohlson (1995) and Feltham and Ohlson (1995) to the RIV approach. Even though the authors rely on the approach the "…RIV is neither implementable nor testable" before the application by Ohlson (1995) and Feltham and Ohlson (1995).

earnings figure in the equation. The disturbing terms for other relevant information have been combined into one error term capturing all information not provided in the financial statement. The resulting valuation function is in line with the modification shown by Dechow et al. (1999) and Kanagaretnam et al. (2009) and is as follows:

$$MVE_{it} = \alpha_{01} + \alpha_1 BVE_{it} + \alpha_2 ERN_{it} + \varepsilon_{it} \quad (4.3)$$

This formula expresses the market value of equity (MVE) as a function of the book value of equity at the beginning[356] of the observation period and the earnings related to each company (i) and the respective period (t). The error term ($\varepsilon$) reflects the part of the expected and unexpected information not captured by the share price. To arrive at a formula relating the earnings figures to the share price, all terms are divided by the number of shares outstanding (S). The formula, therefore, is as follows:

$$P_{it} = \alpha_{01} + \alpha_1 (BVE/S)_{it} + \alpha_2 (ERN/S)_{it} + \varepsilon_{it} \quad (4.4)$$

To test the association of share prices and different income measures, the earnings figure (ERN) is replaced by Net Income, Comprehensive Income as well as the components of Other Comprehensive Income.

[356] The use of the book value from the current year is favored in this study because the association between income measures and balance sheet items is compared for the same reporting period. This application is in line, for example, with Cahan et al. (2000) and Kanagaretnam et al. (2009). On the other hand recent studies, for example, Höhn (2011) as well as Goncharov and Hodgson (2011) use the book values at the beginning of the observation period from the previous year's financial statement. It could be argued that taking book values of equity from the previous reporting year are superior as they represent the basis on which the earnings for the period were generated. However, using book values of equity from the previous reporting year may lead to distortions based on equity revaluations in the period. At the same time, the price regressions calculated in this study were not delivering significantly different results when calculating them either on the basis of the current or on lagged book value of equity. This means that the sign of none the coefficient changed when applying the different models and that the significance level of coefficient was not changed. Similarly for gains and losses on available-for-sale financial assets, the significance level dropped from $p<0.05$ to $p<0.1$ for the application of the regression with the lagged book value of equity.

$$P_{it}= \alpha_{0,1}+ \alpha_1 BVE/S_{it}+ \alpha_2 NI/S_{it}+\varepsilon_{it}+v_i \quad (1a)$$

$$P_{it}= \alpha_{0,2}+ \alpha_3 BVE/S_{it}+ \alpha_4 CI/S_{it}+\varepsilon_{it}+v_i \quad (1b)$$

$$P_{it}= \alpha_{0,3}+ \alpha_5 BVE/S_{it}+ \alpha_6 NI/S_{it}+ \alpha_7 OCI/S_{it}+\varepsilon_{it}+v_i \quad (1c)$$

$$P_{it}= \alpha_{0,4}+ \alpha_8 BVE/S_{it}+ \alpha_9 NI/S_{it}+\alpha_{10} FCT/S_{it}+\alpha_{11} AFS/S_{it}+\alpha_{12} CFH/S_{it} \quad (1d)$$
$$+\alpha_{13} ACT/S_{it}+\alpha_{14} REV/S_{it}+\alpha_{15} ASS/S_{it}+\alpha_{16} OTH/S_{it}+\varepsilon_{it}+v_i$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$P_{it}$ share price at the reporting date of results

$BVE_{it}$ book value of equity at the beginning of the reporting period

$\varepsilon_{it}$ error term

$v_i$ fixed company effect

The income components are divided by number of shares for each entity and year ($S_{it}$)[357]

$NI_{it}$ Net Income as reported

$CI_{it}$ Comprehensive Income as reported

$OCI_{it}$ aggregated Other Comprehensive Income as reported

$FCT_{it}$ foreign currency translations as reported

$AFS_{it}$ gains and losses on available-for-sale financial assets as reported

$CFH_{it}$ effective portion of gains and losses on cash flow hedges as reported

$ACT_{it}$ actuarial gains and losses on defined benefit plans as reported

$REV_{it}$ changes in revaluation surplus of tangible and intangible assets as reported

$ASS_{it}$ share of Other Comprehensive Income of associated companies as reported

$OTH_{it}$ other items recognized in Other Comprehensive Income as reported

[357] Number of shares in this study always refer to the total number of shares outstanding which are defined as all issued shares held by the investor base less treasury shares, which are own shares held by the company.

The relative association between share prices and Net Income, Comprehensive Income and components of Other Comprehensive Income is tested by running fixed effects panel regressions.[358] In addition pooled OLS regressions are performed to make the results comparable with other studies.[359] By the use of those regressions, it is examined whether one of the income measures is more related to the share price than another. In particular, a relative association test is carried out to determine whether certain income measures such as Net Income and Comprehensive Income are more associated to the share price than the others. An incremental association test is carried out to explore whether the individual components of Comprehensive Income increase the association with share price in addition to the sole use of Net Income figures. The association tested in these models provides implications in connection with relevance and reliability of accounting numbers.[360] The statistical significance of independent variables indicates a value-relevant impact on the share price. As pointed out by Barth et al. (2001), a higher association of income measures and share price implies that the additional accounting information is likely to be used in the valuation by investors.[361] The estimated regression coefficients provide an indication on the impact that particular independent variables have on the share price. In addition, with respect to the general regression and in line with literature on this topic, several modifications have been made to the model to incorporate certain effects that may bias the analysis.

The fact that certain effects may have a distorting influence on the regression is accommodated by the inclusion of control variables in the regressions.[362] The treatment of the inclusion of such variables is exemplarily shown for the price model, but has also been applied to the other models used in this study. Additional examinations have been carried out to control for potentially distorting effects that had been identified in previous studies.

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[358] The decision for using the fixed effects model in this study is based on the Breusch-Pagan and Hausman test which are further described in section 4.4.2.

[359] The majority of studies analyzing the value-relevance of Other Comprehensive Income components uses OLS regressions and pooled OLS regression. Reference is made to Table 3.3.

[360] Reference is made to section 3.2.2 for further information on the different perspectives in value-relevance research used in this analysis.

[361] Cf. Barth et al. (2001), p. 79.

[362] Reference is made to section 4.3.4 for details on the different control variables applied in this study.

**Control Variables**

Negative earnings may have a distorting effect on the price regressions as they might have a stronger impact on the valuation than positive results. This so-called differential valuation of negative earnings impact has initially been researched in a paper by Hayn (1995). According to the application by Chambers et al. (2007) and Zülch and Pronobis (2010), this study controls for the discrepancy in valuation resulting from negative earnings. The model includes a dummy variable for negative Net Income and one for negative Comprehensive Income. The variables take the value "one" if the earnings are positive or the value "zero" if the results are negative, thereby controlling for negative earnings in the equation.

The observation period ranging from 2007 to 2012 has been largely effected by economic developments which might have distorted the results from the regression carried out in this analysis. The financial crisis which started in 2008 with the collapse of Lehman Brothers as well as the Eurozone crisis which especially affected Europe could have had a major influence on the analysis. The impact of the former is captured by creating a dummy (DFINCrisis) which is primarily based on the GDP growth rate of the countries.[363] The latter is captured by the dummy variable (DEURCrisis) which is primarily based on the 10-year government bond yield of the respective country thereby creating a dummy variable for countries from the Eurozone which were particularly negatively affected by the Eurozone crisis.

Closely related to the crisis variables are the underlying country specific variables controlling for the financing rate based on the 10-year government bond yield (YGOV) and the general economic sentiment based yearly growth rate of the Gross Domestic Product (GDPG). The two variables control for country specific effects resulting from the refinancing rate of the government as well as the GDP growth rate in general that may have distorted the regression. A similar application has been carried out in the analysis by Deol (2013).

The sample used in this study consists of entities of different sizes. This may have a disturbing effect on the regression carried out in this study as already outlined in the previous section. This so-called scale effects is illustrated in more detail in section 4.3.1 and provides an overview as to how to deal with size effects in the context of this

[363] Reference is made to section 4.3.4 for a more detailed explanation on the variables used for the analysis.

study. In order to control for the effects, the regressions are re-run with the inclusion of indicators for size. Significantly different results would indicate an impact of company size on the regression. According to the application by Cahan et al. (2000), Devalle and Magarini (2012) and Deol (2013), the natural logarithm of total assets has been identified as useful indicators of size to be controlled for in this study.

Also the financing structure of an entity may have an effect on the association between income measures and share prices. As pointed out, among others by Graham et al. (2005), the management of entities with higher debt to equity ratio are more likely to be involved in earnings management thereby reducing volatility and related risks. An active earnings management could have an effect on the realization of reporting gains and losses and, therefore, could have a disturbing effect on Net Income, Comprehensive Income and components of Other Comprehensive Income. Consequently a variable for the debt to equity ratio or leverage ratio (LEV) is added to the regression to control for possible effect. A similar application in this research field has been carried out by Bamber et al. (2010).

**Additional Examinations**

One of the motivations for conducting this study is to examine if the implementation of IAS 1 (revised 2007) and therewith the explicit reporting of Other Comprehensive Income components has increased the value-relevance of certain income components. Before the implementation of IAS 1 (revised 2007) components of Other Comprehensive Income had to be collected from the statement of changes of equity or in the notes to calculate „as-if“ Comprehensive Income values. Since the implementation of IAS 1 (revised 2007) Other Comprehensive Income components have to be explicitly stated in the financial statement leading to the availability of “as-reported” data. The impact of using „as-if“ data as opposed to “as-reported” data has been cited by several authors such as Chambers et al. (2007), Kanagaretnam et al. (2009) and Jones and Smith (2011) as being one of the potential sources of the different results of the value-relevance studies on Comprehensive Income. This study includes hand-collected “as-if” data for the periods 2007 and 2008 and “as-reported” data for the period 2009 to 2012. A Chow test is performed if the explicit reporting of Comprehensive Income and Other Comprehensive Income components since the

implementation of IAS 1 (revised 2007) has caused structural breaks in the association between market values and accounting numbers.[364]

The industry sector a company is operating in, as well as the difference of financial and non-financial companies can have a significant impact on the association between share price and income measures. Especially certain Other Comprehensive Income components will have a more severe effect only in some industries and, therefore, it is necessary to control for these effects. Based on their business model, financial institutions, for example, will have a larger exposure to financial assets and as a result the effect of revaluation of available-for-sale financial assets will be higher compared to other industries. To capture this effect the regressions have been rerun without the inclusion of companies from the financial industry. In addition, the regressions have also been calculated solely using observations from the financial industry.

Kothari and Zimmerman (1995) and Kanagaretnam et al. (2009) argue that relying exclusively on price or return models could lead to a misinterpretation of the results. The authors show, on the one hand, that there is a higher probability that a price model wrongly rejects homoscedasticity than for return models. On the other hand, they demonstrate that the regression coefficient relating to earnings responses is more biased for return models than for price models. Consequently, they recommend the use of both forms to avoid a possible model specific interference and to improve the validity of results.[365]

### 4.2.2 Return Model – Price Change Model

Whereas the price level regression analyzes the association between absolute market values in the form of share prices and income measures, the return model is based on the relation between changes in share prices and income measures.[366] While the price model incorporates all available market information, expected and unexpected, the return regression focuses on unexpected information, represented by the return. The

[364] The interaction variables are calculated by generating a dummy variable which takes the value "zero" for the years before the implementation of IAS 1 (revised 2007), 2007 and 2008, and the value "one" for the years 2009 to 2012. This dummy variable is then multiplied with the income measures to generate the interaction variable.

[365] Cf. also Kothari and Zimmerman (1995), p. 157, Kanagaretnam et al. (2009), p. 356.

[366] Whereas the price model is built on a valuation model, which relates the company value to the book value of a company, the return model is a built on the first difference relation between changes in the share price and changes in different income measures. Cf. Cauwenberge and De Beelde (2010), p. 85–86.

assumption of the return model is based on the already earlier cited study of Ball and Brown (1968) who demonstrate that information is only relevant to investors if they incorporate the information in their valuation and that this is resulting in price revisions. In this context, income measures are only regarded as value-relevant if they incrementally adjust the share price under the assumption that all other available information is already reflected in the share price.[367] Based on this assumption the unexpected part of the information needs to be separated from the expected part.[368] In this study the application of a random walk model is applied to predict the expected part of the information which implies that the expectations for the income components are equal to the reported income components in the current period which is in line with the findings in other studies.[369] Consequently the surprising part of the information is equal to the difference between the income components of two periods. On the basis of these considerations the following value-relevance regression is formulated indicating that the change in price as represented by the share return is equal to the change in the income component (ERN):[370]

$$RET_{it} = \beta_{01} + \beta_1 \Delta ERN_{it} + \varepsilon_{it} \quad (4.5)$$

Applying this formula analogously to the price model, the earnings figure (ERN) is replaced by Net Income, Comprehensive Income as well as by the components of Other Comprehensive Income to test the association between share return and the different income measures. All variables are measured on a per share basis as it has been performed for the price model.[371] The regression applied in this study is

[367] Cf. Cauwenberge and De Beelde (2010), p. 85.

[368] The specification of return models differs significantly across studies which are primarily based on the different underlying models to predict the expected part of the accounting information. Cf. Cauwenberge and De Beelde (2010), p. 90.

[369] Cf. Lev and Ohlson (1982), p. 259, Kothari and Zimmerman (1995), pp. 155–192, Kothari (2001), pp. 133-134, Cauwenberge and De Beelde (2007), p. 19, Cauwenberge and De Beelde (2010), p. 85.

[370] Cf. Cauwenberge and De Beelde (2010), p. 86.

[371] This study does not scale the variables by the market value of equity at the beginning of the reporting period, as proposed, for example, by Kanagaretnam et al. (2009), Höhn (2011) or Goncharov and Hodgson (2011), because the application of the fixed effects model already incorporates the company specific differences including scale effects. The scaling of the variables with the market value of equity resulted in significant coefficients for all test variables and confirms that an application in this study does not make sense because the inclusion of the market value would distorts the results.

comparable to the regressions applied by Dhaliwal et al. (1999) and Chambers et al. (2007) and is as follows:[372]

$$RET_{it} = \beta_{0,1} + \beta_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad (2a)$$

$$RET_{it} = \beta_{0,2} + \beta_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad (2b)$$

$$RET_{it} = \beta_{0,3} + \beta_3(\Delta NI/S)_{it} + \beta_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad (2c)$$

$$RET_{it} = \beta_{0,4} + \beta_5(\Delta NI/S)_{it} + \beta_6(\Delta FCT/S)_{it} + \beta_7(\Delta AFS/S)_{it} + \beta_8(\Delta CFH/S)_{it} + \beta_9(\Delta ACT/S)_{it} + \beta_{10}(\Delta REV/S)_{it} + \beta_{11}(\Delta ASS/S)_{it} + \beta_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad (2d)$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$RET_{it}$ cum-dividend raw return per share between two reporting dates of results

$\Delta$ changes in the income component between t and t-1

All other variables are the same as defined for the price model.

The return model tests the relative association between share price changes and changes in Net Income / Comprehensive Income by running panel regressions and pooled OLS regressions. The analysis investigates if investors include the additional information provided by Comprehensive Income as surprising information and, therefore, regard this information as being useful. In this context, usefulness is assumed if the estimated coefficient of the reported income figure is statistically different from zero. The incremental association between return and changes in Net Income / Comprehensive Income tests whether the inclusion of the components of Other Comprehensive Income increases the association with return, assuming that investors incorporate the provided information in their valuation. The main difference to the price model is that the return model, as from its definition, investigates the association between changes in share prices and income measures and not on absolute levels. The statistical significant association between returns and income measures

[372] For a transformation of the explicit return regressions to the initial value-relevance regression applied in this study reference is made to Cauwenberge and De Beelde (2010), pp. 88–89.

indicates that the surprising part of the information provided by annual accounts is valued by the investor.

On the basis of the study by Freeman and Tse (1992) and in line with the application by Brimble and Hodgson (2005), Francis and Schipper (1999) and Goncharov and Hodgson (2011) the inverse tangent (arctan) of the coefficients is included in the regression. The model examines if the association between income measures and share return is correlated to the persistence of income figures. Consequently, the relation between an increase in earnings and share price reaction may not follow a linear form.[373] The inclusion of the income measures in a non-linear form, using the inverse tangent, controls for this income persistency. With the specifications the model looks as follows:

$$RET_{it} = \theta_{0,1} + \theta_1 \arctan(\theta_2(\Delta NI/S_{it})) + \varepsilon_{it} + v_i \quad \text{(2a\_arctan)}$$

$$RET_{it} = \theta_{0,2} + \theta_2 \arctan(\theta_4(\Delta CI/S_{it})) + \varepsilon_{it} + v_i \quad \text{(2b\_arctan)}$$

$$RET_{it} = \theta_{0,3} + \theta_3 \arctan(\theta_4(\Delta NI_{S_{it}})) + \theta_5(\Delta OCI_{S_{it}})) + \varepsilon_{it} + v_i \quad \text{(2c\_arctan)}$$

$$RET_{it} = \theta_{0,4} + \theta_6 \arctan(\theta_7(\Delta NI/S)_{it} + \theta_8(\Delta FCT_S)_{it} + \theta_9(\Delta AFS_S)_{it} + \theta_{10}(\Delta CFH_S)_{it} + \theta_{11}(\Delta ACT_S)_{it} + \theta_{12}(\Delta REV_S)_{it} + \theta_{13}(\Delta ASS_S)_{it} + \theta_{14}(\Delta OTH_S)_{it}) + \varepsilon_{it} + v_i \quad \text{(2d\_arctan)}$$

where subscripts (i) stands for the entity and (t) denotes the observation year

arctan inverse tangent of the coefficients

All other variables are the same as defined for the price model.

Control variables as already illustrated under the price model are also included for the return model to test for effects that may have biased the results in the regressions.[374]

[373] Cf. Goncharov and Hodgson (2011), p. 40.

[374] Reference is made to the paragraph on control variables in section 4.2.1.

### 4.2.3 Abnormal Return Model

Closely related to the application of raw share returns is the utilization of abnormal share returns in the respective model. Abnormal returns represent the relative performance of an entity for a period compared to a selected benchmark used for comparison such as a share price index. In this study abnormal returns are calculated in relative terms to achieve comparability with the relative performance of the benchmark. The approach solely includes returns in excess of the performance of the benchmark. The abnormal return (ABRET) is calculated by subtracting the expected return (E(RET)) from the actual return (RET) for an entity (i) and a year (t).

$$ABRET_{it} = RET_{it} - E(RET_{it}) \quad (4.6)$$

The actual return presents the cum-dividend share return between two reporting dates of results. The expected return is calculated by using a benchmark model. The benchmark models commonly applied in literature to calculate expected returns use mean adjusted returns, market adjusted returns, the Capital Asset Pricing Model (CAPM) or the market model as a benchmark.[375] In this study three models are utilized to estimate the expected returns for the abnormal return calculation for validation purpose and to obtain robust results.

- Abnormal returns based on CAPM (ABRET_CAPM)
- Abnormal returns based on sector adjusted returns (ABRET_Sector)
- Abnormal returns based on a fixed expected return of 12% (ABRET_12)

The expected return is estimated based on the CAPM[376] and is calculated by multiplying the difference between the risk free rate[377] ($RFR_t$) market return[378] ($RMK_{it}$) with the beta factor ($\beta_i$) and adding the risk free rate ($RFR_t$).

$$E(\widetilde{RET}_{it}) = RFR_t + \beta_i * (RMK_{it} - RFR_t) \quad (4.7)$$

[375] Cf. Strong (1992), pp. 536–538, MacKinlay (1997), pp. 17–19 for an overview of the various estimation methods.

[376] Cf. Sharpe (1964), pp. 425–442, on the Nobel prize-winning paper on the CAPM.

[377] The risk free rate is equal to the 10-year government bond yield for the respective country.

[378] The market return has been calculated on the basis of the STOXX Europe 600 value-weighted index.

The beta factor is a company specific variable and indicates how the return of a specific company relates to the return of the market portfolio. The beta factor for each company is derived from the following equation.[379]

$$\beta_i = \frac{COV\ (R_{it};RMK_{it})}{VAR\ (RMK_{it})} \tag{4.8}$$

In addition abnormal returns have been calculated based on sector adjusted returns. The expected returns have been generated by calculating the performance of the STOXX Europe index relating to the industry classification.[380] The index performance has been calculated on the basis of the current years' and last years' announcement dates of results for each company and has been compared to the calculated returns based on the share price performance.

Moreover, the abnormal return is calculated by using 12% as a proxy for the estimated return, which is in line with applications in this accounting research stream and has also been applied, for example, by Dechow et al. (1999), Barth et al. (1999) and Deol (2013).

The differently calculated abnormal returns have been included in the regression model which looks as follows:

[379] The beta factor is calculated separately for each year and each company based on the one year lagged company and market returns.

[380] For the calculation of the abnormal returns, the following STOXX Europe indices have been used: Consumer (Staples & Discretionary) - STOXX Europe 600 Consumer Goods, Energy (Oil & Gas) STOXX Europe 600 Oil & Gas, Financials - STOXX Europe 600 Banks, Health Care - STOXX Europe 600 Health Care, Industrials - STOXX Europe 600 Industrial Goods & Services, IT (Technology) - STOXX Europe 600 Technology, Materials (and Construction) - STOXX Europe 600 Construction & Materials, Telecommunication - STOXX Europe 600 Telecommunications, and Utilities - STOXX Europe 600 Utilities.

$$ABRET_{it} = \delta_{0,1} + \delta_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad (3a)$$

$$ABRET_{it} = \delta_{0,2} + \delta_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad (3b)$$

$$ABRET_{it} = \delta_{0,3} + \delta_3(\Delta NI/S)_{it} + \delta_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad (3c)$$

$$ABRET_{it} = \delta_{0,4} + \delta_5(\Delta NI/S)_{it} + \delta_6(\Delta FCT/S)_{it} + \delta_7(\Delta AFS/S)_{it} + \delta_8(\Delta CFH/S)_{it} + \delta_9(\Delta ACT/S)_{it} + \delta_{10}(\Delta REV/S)_{it} + \delta_{11}(\Delta ASS/S)_{it} + \delta_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad (3d)$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$ABRET_{it}$ abnormal return – difference between the actual return and the expected return between two reporting dates (relative basis)

All other variables are the same as defined for the price model.

In line with the application for the return model, this model tests the association of abnormal returns and different income measures. By running fixed effects regressions and pooled OLS regressions the analysis investigates if the information provided by the income measures is included in the valuation in addition to the expected return based on the benchmark. In this context, the provided information is regarded as being value-relevant if the coefficient calculated for the association between Net Income, Comprehensive Income or components of Other Comprehensive Income with abnormal return is significant.

In line with the application for the price model control variables are included for the abnormal return model to test for effects that may have biased the results in the regressions.[381]

### 4.2.4 Target Price Models

Investors are important addresses of financial statements. However, due to the wide range of businesses from different industries, countries and jurisdictions, they usually do not solely rely on information which is provided directly by the companies. In addition, they base their investment decision on the opinion of specialists in the form of “buy-side” analysts (employed by the investor) and “sell-side” analysts (brokerage

[381] Reference is made to the paragraph on control variables in section 4.2.1.

firms and investment banks). Whereas the assessment and opinion of "buy-side" analysts on particular companies remains internal, the view as well as forecasts on earnings and target prices from "sell-side" analysts is usually released to the investment community. Most "sell-side" analysts include earnings forecasts, analyst ratings and target price forecasts in their research reports.[382] Data providers such as Thomson One and Bloomberg collect such data and derive a consensus for the different reported analyst recommendations.[383] Consequently, as the information is public knowledge, it is important to not only consider the share price reaction or movements in share returns in connection with earnings announcements but also the reaction by analysts represented by changes in price targets.[384] Target price consensus provides information to the research community in the form of an expected share price and it has been shown that it influences the decision making of the investor community.[385]

As pointed out by Lorenz (2009) companies typically focus their projections on forecasting revenues, EBIT, EBITDA and Net Income figures and do not predict Other Comprehensive Income items separately.[386] Likewise, also research analysts tend to solely forecast revenues and core income measures as pointed out by Gu and Chen (2004). Even though financial information might be presented using dirty surplus accounting, pursuant to Bernard (1995), financial analysts will base their earnings expectations on clean surplus income.

Previous studies on US GAAP reports, e.g., Bhattacharya et al. (2003) or Bradshaw (2004) have established that the target prices by analysts are more closely associated with current share prices than with income measures indicating that analysts do not tend to base their valuation primarily on accounting information. Moreover, analyses

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[382] Cf. Bradshaw et al. (2013), p. 931.

[383] In this study target prices are used to analyze the association of analyst recommendations with income measures as opposed to analyst earnings forecasts or analyst ratings (e.g. buy, hold, and sell). This approach is in contrast to the application by Deol (2013), using earnings forecasts, but in line with the application by Goncharov and Hodgson (2011). In the context of this study target prices, as opposed to earnings forecasts, have been used because the target price potentially provides value-relevant information to investors. Asquith et al. (2005) confirm that target prices have a proven impact on the decision making of investors. Cf. Goncharov and Hodgson (2011), p. 39 for additional considerations.

[384] Reference is made to Jun. Prof. Dr. Jan-Christoph Rülke for his valuable input and the fruitful discussion on the inclusion of analysts' forecasts in panel regressions during the Campus for Finance 2014 - WHU New Year's Conference.

[385] Cf. e.g. Loh and Mian (2006), p. 456, Hall and Tacon (2010), p. 18.

[386] Cf. Lorenz (2009), p. 137 on the forecasting of income measures by companies.

have been carried out by Hirst and Hopkins (1998) in connection with the ability of analysts to detect earnings management, by Choi and Zang (2006) on the association of Comprehensive Income with analysts' earnings forecasts and by Goncharov and Hodgson (2011) analyzing which income measure is better to explain revisions in analysts' forecasts. Cotter et al. (2012) analyze the impact of the IFRS adoption on analysts' earnings forecasts and Deol (2013) examines the correlation of earnings forecasts with different definitions of income measures.

On the basis of the approaches applied in studies conducted so far this study investigates the association of different definitions of income measures and varying modifications of target price consensus. By the use of fixed effects regressions it is investigated if Net Income, Comprehensive Income or components of Other Comprehensive Income can best explain changes in analysts' price target consensus compared to Net Income.[387] More precisely, this study examines the relative and incremental association between Net Income, Comprehensive Income and components of Other Comprehensive Income on the one hand and the (i) target price consensus, (ii) target prices revision, and (iii) target price potential on the other hand.

The target price consensus is the average of current analysts' forecasts for the 12-month-ahead share price.[388] The changed based revisions of analyzing revisions in target prices record the difference between the target prices between two announcement dates. The target price potential is defined as the difference between the target price consensus and the current share price. The different modifications of the target price consensus show analogies to the previously illustrated model specifications, namely the price model and the return model. Accordingly, similar models are applied to test the association between modified target price definitions and income measures.

[387] In this study the median of the target price is used as opposed to the mean of the target price, which is in line with the application, for example, by and Cotter et al. (2012). As other closely related studies in this area use the mean of the target price the models have been recalculated on that basis, however, the results were not qualitatively different.

[388] The consensus excludes analyst recommendations older than 30 days on the announcement date of results. Cf. Brown (2001), p. 48, Burgstahler and Eames (2006), p. 649 for similar application.

#### 4.2.4.1 Target Price Consensus Model

In line with the application for the price model, this model takes the measurement perspective to test the association between target price consensus and Net Income, Comprehensive Income as well as the components of Other Comprehensive Income applying the following regressions.

$$TPC_{it} = \mu_{0,1} + \mu_1 BVE/S_{it} + \mu_2 NI/S_{it} + \varepsilon_{it} + v_i \quad \text{(4a\_TPC)}$$

$$TPC_{it} = \mu_{0,2} + \mu_3 BVE/S_{it} + \mu_4 CI/S_{it} + \varepsilon_{it} + v_i \quad \text{(4b\_TPC)}$$

$$TPC_{it} = \mu_{0,3} + \mu_5 BVE/S_{it} + \mu_6 NI/S_{it} + \mu_7 OCI/S_{it} + \varepsilon_{it} + v_i \quad \text{(4c\_TPC)}$$

$$TPC_{it} = \mu_{0,4} + \mu_8 BVE/S_{it} + \mu_9 NI/S_{it} + \mu_{10} FCT/S_{it} + \mu_{11} AFS/S_{it} + \mu_{12} CFH/S_{it} + \mu_{13} ACT/S_{it} + \mu_{14} REV/S_{it} + \mu_{15} ASS/S_{it} + \mu_{16} OTH/S_{it} + \varepsilon_{it} + v_i \quad \text{(4d\_TPC)}$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$TPC_{it}$ target price consensus at the reporting date of results

All other variables are the same as defined for the price model.

#### 4.2.4.2 Target Price Revision Model

Closely linked to the return model is the change based regressions, analyzing the association between target price consensus revisions and Net Income, Comprehensive Income as well as the components of Other Comprehensive Income.[389] The model takes on the information perspective to tests if the adjustments in the target price are more associated with changes in Net Income or with changes in Comprehensive Income or components of Other Comprehensive Income. The regressions applied to test the association are as follows:

[389] Cf. Goncharov and Hodgson (2011), p. 39 for a similar application, however, the authors include absolute values as well as value changes for Net Income, Comprehensive Income and aggregated Other Comprehensive Income as independent variables but absolute values for Other Comprehensive Income components.

$$TPR_{it} = \sigma_{0,1} + \sigma_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4a\_TPR)}$$

$$TPR_{it} = \sigma_{0,2} + \sigma_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4b\_TPR)}$$

$$TPR_{it} = \sigma_{0,3} + \sigma_3(\Delta NI/S)_{it} + \sigma_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4c\_TPR)}$$

$$TPR_{it} = \sigma_{0,4} + \sigma_5(\Delta NI/S)_{it} + \sigma_6(\Delta FCT/S)_{it} + \sigma_7(\Delta AFS/S)_{it} + \sigma_8(\Delta CFH/S)_{it} + \sigma_9(\Delta ACT/S)_{it} + \sigma_{10}(\Delta REV/S)_{it} + \sigma_{11}(\Delta ASS/S)_{it} + \sigma_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4d\_TPR)}$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$TPR_{it}$ target price revisions are defined as the difference of the target price between two announcement dates

All other variables are the same as defined for the price model.

#### 4.2.4.3 Target Price Potential Model

Not only the change in the target prices itself, but also the difference between target prices and current share prices are of interest for investors as it indicates the potential upside or downside of the target price based on the current share price. The difference between the two prices is referred to as target price potential (TPP) in this study. In this context the following regressions test the association between the forecasting error and the previously mentioned income measures. Thereby, this study examines if the target price potential is more associated with Net Income or Comprehensive Income and components of Other Comprehensive Income.

$$TPP_{it} = Ø_{0,1} + Ø_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4a\_TPP)}$$

$$TPP_{it} = Ø_{0,2} + Ø_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4b\_TPP)}$$

$$TPP_{it} = Ø_{0,3} + Ø_3(\Delta NI/S)_{it} + Ø_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4c\_TPP)}$$

$$TPP_{it} = Ø_{0,4} + Ø_5(\Delta NI/S)_{it} + Ø_6(\Delta FCT/S)_{it} + Ø_7(\Delta AFS/S)_{it} + Ø_8(\Delta CFH/S)_{it} + Ø_9(\Delta ACT/S)_{it} + Ø_{10}(\Delta REV/S)_{it} + Ø_{11}(\Delta ASS/S)_{it} + Ø_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad \text{(4d\_TPP)}$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$TPP_{it}$ target price potential is defined as the difference between the target price and the actual share price at the announcement date

All other variables are the same as defined for the price model.

#### Target Price Specific Control Variables

In addition to the control variables described for the price model, two other variables have been included in the regression to control for specific effects in connection with analyst recommendations. The target price consensus used in this analysis is based on the average of the current analysts' forecasts for the 12-month-ahead share price. However, the number of analysts providing target prices for a specific company varies significantly between the observed entities in the sample.[390] For example, blue chip

[390] Cf. Kross et al. (1990), pp. 462–463, Lys and Soo (1995), p. 764, where the authors find that the number of analysts following a stock is correlated with forecasting precision.

companies will tend to have a higher coverage than second-tier companies.[391] As the consensus target price is built on the basis of a larger group of analysts for some entities the number of analysts covering a company (NumAnalyst) has been included as a control variable. In addition to the coverage of companies from certain indices, the target price consensus could also be influenced by the relative trading volume (TradVol) of the company.[392] Covering a certain company and providing a target prices may also be influenced by the relative trading volume of the share. High relative trading volumes could be an indicator of particular investor focus and could influence the target price.[393]

### 4.2.5 Forecasting Models

Users of financial statements and especially investors are, in particular, interested in the forecasting ability of accounting information. This fact has also been emphasized as one of the objectives of financial statements by the IASB.[394] Addressees of financial information use expected Operating Cash Flows[395] to predict the future performance of an entity and to derive therefrom the current value of a company.[396] Whereas the previous models have focused on the association between current market data and accounting information, the following models analyze the association between two different accounting numbers. This section introduces the model on predictability and forecasting ability of Operating Cash Flows and Net Income. As the forecasting models examine the association between two accounting numbers, this model provides a robustness check for the findings of previous models.[397]

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[391] Cf. Bhushan (1989), pp. 261–262, where the author shows that the number of analysts following a stock increases with the market capitalization of the company. Similar application has been used in the study by Cotter et al. (2012), p. 403.

[392] Cf. Bhushan (1989), p. 261, Lys and Soo (1995), p. 764, Beyer and Guttman (2011), p. 469.

[393] This assumption is based on the fact that equity research indirectly relies on commissions earned for share trading. As a result researchers may focus, in particular, on heavily traded stocks, because their earnings potential on those shares is higher compared with other shares with less trading activity.

[394] Compare section 2.1.1 on the primary addressees of financial statements and the goal of financial information.

[395] Operating Cash Flows are also referred to as e.g. cash flows from operations, cash flows from operating activities, cash inflow / outflow from operating activities or cash provided by operating activities in annual reports.

[396] Cf. Barton et al. (2010), p. 753, where the authors emphasize that an income measure is regarded as more relevant if it is able to capture information about the companies' cash flows in a concise and timely way.

[397] Cf. Goncharov and Hodgson (2011), p. 39.

As the foundation for this concept the paper by Ohlson (1999) evaluates the concept of transitory earnings and states that transitory earnings can be characterized as being

- forecasting irrelevant,
- value irrelevant, and
- unpredictable

in connection with aggregated earnings. The study is based on the previously illustrated model by Ohlson (1995) and Feltham and Ohlson (1995), but with the addition that earnings in the model are differentiated in transitory earnings and recurring earnings. The inclusion of transitory earnings in the analysis provides the direct link to Comprehensive Income and components of Other Comprehensive Income. Based on the study by Ohlson (1999), forecasts should solely be based on Net Income as Comprehensive Income and components of Other Comprehensive Income are transitory in nature and are ineffective from a valuation perspective. The effect that transitory earnings, and as a consequence Other Comprehensive Income components, have on the book value of equity can be compared to dividends. Consequently, Other Comprehensive Income components should have a "dollar-for-dollar" effect on the valuation of the company.[398] The fact that, contrary to distributed earnings (dividends), Other Comprehensive Income components can revert over time and are predominantly[399] "recycled" via the income statement they could, however, provide information about future Operating Cash Flows and Net Income. If Other Comprehensive Income components do not provide forecasting-relevant information for Operating Cash Flows and Net Income, then the inclusion of those components in the forecasting model in addition to Net Income, would not deliver additional forecasting-relevant information.[400] Consequently, when analyzing the association between current Operating Cash Flows and previous year's Comprehensive Income and Other Comprehensive Income components, the coefficients for the aggregated Other Comprehensive Income as well as the individual components should be non-significant.

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[398] Cf. Ohlson (1999), p. 145.

[399] See section 2.1.6 on the components that are recycled and the different treatment of the recycling of Other Comprehensive Income items under IFRS and US GAAP.

[400] The importance of the prediction of future OCF mainly relates to the commonly used discounted cash flow (DCF) model by investors as well as in research.

#### 4.2.5.1 Forecasting Model for Operating Cash Flows

In this study the forecasting ability of Operating Cash Flows (OCF) on the basis of Net Income, Comprehensive Income and Other Comprehensive Income components is analyzed in line with approaches carried out in previous studies, for example by Dhaliwal et al. (1999) and Goncharov and Hodgson (2011) and is as follows:

$$OCF/S_{it} = \vartheta_{0,1} + \vartheta_1 NI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5a\_ OCF)}$$

$$OCF/S_{it} = \vartheta_{0,2} + \vartheta_2 CI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5b\_ OCF)}$$

$$OCF/S_{it} = \vartheta_{0,3} + \vartheta_3 NI/S_{i(t-1)} + \vartheta_4 OCI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5c\_ OCF)}$$

$$OCF/S_{it} = \vartheta_{0,4} + \vartheta_5 NI/S_{i(t-1)} + \vartheta_6 FCT/S_{i(t-1)} + \vartheta_7 AFS/S_{i(t-1)} + \vartheta_8 CFH/S_{i(t-1)} \quad \text{(5d\_ OCF)}$$
$$+ \vartheta_9 ACT/S_{i(t-1)} + \vartheta_{10} REV/S_{i(t-1)} + \vartheta_{11} ASS/S_{i(t-1)} + \vartheta_{12} OTH/S_{i(t-1)} + \varepsilon_{it} + v_i$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$OCF_{it}$ Operating Cash Flows as reported in the cash flow statement

All other variables are as described for the price model.

#### 4.2.5.2 Forecasting Model for Net Income

For investors not only the forecasting ability of Operating Cash Flows on the basis of Net Income, Comprehensive Income and Other Comprehensive Income components is of particular interest, but also the forecasting ability of Net Income on the basis of current income measures as such. The study by Jones and Smith (2011) finds that gains and losses reported under special income have superior predicting power for future Net Income. Based on their analysis this study analyses the predictability of Net Income. The forecasting ability of Net Income is tested by the association between the current Net Income and lagged Net Income, Comprehensive Income and Other Comprehensive Income components and is as follows:

$$NI/S_{it} = \varphi_{0,1} + \varphi_1 NI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5a\_NI)$$

$$NI/S_{it} = \varphi_{0,2} + \varphi_2 CI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5b\_NI)$$

$$NI/S_{it} = \varphi_{0,3} + \varphi_3 NI/S_{i(t-1)} + \varphi_4 OCI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5c\_NI)$$

$$NI/S_{it} = \varphi_{0,4} + \varphi_5 NI/S_{i(t-1)} + \varphi_6 FCT/S_{i(t-1)} + \varphi_7 AFS/S_{i(t-1)} + \varphi_8 CFH/S_{i(t-1)} \quad (5d\_NI)$$
$$+ \varphi_9 ACT/S_{i(t-1)} + \varphi_{10} REV/S_{i(t-1)} + \varphi_{11} ASS/S_{i(t-1)} + \varphi_{12} OTH/S_{i(t-1)} + \varepsilon_{it} + v_i$$

where subscripts (i) stands for the entity and (t) denotes the observation year

$OCF_{it}$ Operating Cash Flows as reported in the cash flow statement

All other variables are as described for the price model.

The same control variables as outlined for the price model are included in the regressions, but on a time lagged basis to align them with the theoretical foundation of the forecasting model.

## 4.3 Variable Definition

This section provides an overview of the variables that are used in the empirical analysis. The focus is on providing specific information on the source and the calculation of the selected variables. Moreover, the use of the variables in other comparable studies is assessed. As pointed out by Barth et al. (2001) the determination and the motivation behind the inclusion of particular variables in the estimation regression is essential for a comprehensive value-relevance research design and is, therefore, illustrated in more detail.[401]

### 4.3.1 Deflating Variables in the Context of Scale Effects

The sample used in this study consists of entities of different size. This may have added noise to the results of the carried-out regressions. This so-called scale effect can have an impact on the inferences made from the regression analyses when accounting

[401] Cf. Barth et al. (2001), p. 96.

variables are associated with the market value of a company due to omitting a variable related to scale.[402] In order to control for this effect, there are several deflators discussed in the research community.[403]

Whereas Barth et al. (2001) explicitly state in their paper that they are not addressing the issue of using the number of shares outstanding to control for scale effects, this topic has been later absorbed by several researchers in the context of market-based accounting research. The question of using the appropriate deflator for the variables used in regression analyses has also been one of the major controversies within the research community.

The paper by Easton and Sommers (2003) promotes market capitalization as the deflator to be applied in market-based accounting research. By stating "scale is market capitalization", the authors conclude that market capitalization can best capture the scale effects, thereby eliminating coefficient bias and heteroscedasticity. As a direct response to their paper the study by Akbar and Stark (2003) comes to the conclusion that the use of market capitalization as a deflator is not suitable of eliminating undue influence of large companies. The authors find that the market capitalization is also not a superior deflator to other deflators in removing heteroscedasticity from the regression and seems to have relatively similar effects. However, the authors suggest using the market capitalization of the company as a control variable for the robustness-test in a regression analysis. The paper concludes that searching for one single deflator to scale the variables in the regression for size effects is not the only approach. It could be possible that the inclusion of other control variables, such as industry variables, could have a corresponding effect with market size and therefore solely controlling for size is not appropriate. An even more drastic view is taken by Gu (2005), where, the author points out that controlling for size via deflation is not possible at all because neither the variability of the scale factor nor the economic relation is known. The author emphasizes the threat that removing the scale effect could also remove the economic relation that is to be analyzed.

Barth and Clinch (2009) provide evidence that using the number of shares outstanding as a deflator performs best in reducing scale effects in the modified price and return

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[402] Cf. Barth and Beaver (2000), p. 27.

[403] Deflators discussed in literature include market values such as market value of equity, lagged share price, share returns but also accounting numbers such as book value of equity, total assets, number of shares outstanding.

models based on the framework provided by Ohlson (1995). Moreover, they explicitly state that other deflators, namely equity book value, lagged price, returns, and equity market value are performing worse in reducing the scale effects in this context. Furthermore, in a recently published paper on the value-relevance of fair value hierarchy by Song et al. (2010), the authors explicitly confirm the use of shares outstanding as a deflator in their regression analysis.

In this study, the different deflators have carefully been considered and initial tests have been carried out. It has finally been decided to use the number of shares outstanding as a deflator best capturing the size effect. The approach has been selected as a result of (i) the explicit confirmation of using the number of shares outstanding as a deflator in closely linked and highly regarded papers, (ii) the critique and empirical evidence that has been provided on the use of other deflators, in particular market value, book value of equity and total assets, and (iii) finally, the fact that the majority of studies on the value-relevance of Other Comprehensive Income components have used the number of shares outstanding as a deflator.[404] In line with Barth et al. (2008), control variables are added to the regression as a test for robustness. The procedure of selecting the variables and the motivation for inclusion is presented in section 4.3.4 in more detail.

### 4.3.2 Dependent Variables

The following dependent variables have been utilized in the empirical analysis of this study:[405]

- **Share price ($P/S_{it}$):** The share price used in the analysis has been calculated by taking the average of the closing share price one day before and three days after the manually verified announcement date. This approach has been applied to incorporate the share price reaction to the earnings announcement.[406] The share

[404] The exemptions are, for example, the papers by Cahan et al. (2000), p. 1289, using the opening market value of equity and Devalle and Magarini (2012), p. 51, using the market value of the equity.

[405] The underlying market data is generated from the Bloomberg database as a primary source and cross checked against the data from the Thomson One database.

[406] Using a time window for the determination of the share price as opposed to a particular date ensures that all the provided information surrounding the announcement of annual results is captured in the price. The use of a rather short time window ensures that the information included in the share price is primarily related to the announcement of annual results.

prices have been taken from the Bloomberg database and are adjusted for dividends.[407]

- **Share return ($RET/S_{it}$):** The cum-dividend share return used as a dependent variable in the return model has been calculated by subtracting the last year's share price ($P/S_{it}$) around announcement date from the share price at the announcement date for the current financial year.

- **Abnormal return (ABRET):** The abnormal return represents the relative performance of each company in the sample compared to an index or comparable value. It is calculated by subtracting the expected return from the actual return. The expected return for the abnormal return model is calculated by using three different approaches.
    - **Expected return based on the Capital Asset Pricing Model (ABRET_CAPM):** The expected return is estimated based on the Capital Asset Pricing Model (CAPM) and is calculated by multiplying the difference between the risk free rate market return with the beta factor and adding the risk free rate to the result. The risk free rate is equal to the 10-year government bond yield for the respective country. The market return is calculated on the basis of the STOXX Europe 600 value-weighted index. The beta factor is calculated by dividing the covariance between the market return and company return by the variance on the market return for the previous year.
    - **Expected return based on sector adjusted returns (ABRET_Sector):** The expected return is generated by calculating the return of the corresponding industry index for each observation between the two individual announcement dates.[408]

[407] Share price as used in the analysis is the last price provided by the exchange on the respective date using the Bloomberg command (PX_LAST).

[408] The industry has been classified by using the GICS (Global Industry Classification Standard) – see appendix 3 (A3) for an overview of the sectors. For the calculation of the abnormal returns, the following corresponding STOXX Europe indices have been used. Consumer (Staples & Discretionary) - STOXX Europe 600 Consumer Goods, Energy (Oil & Gas) STOXX Europe 600 Oil & Gas, Financials - STOXX Europe 600 Banks, Health Care - STOXX Europe 600 Health Care, Industrials - STOXX Europe 600 Industrial Goods & Services, IT (Technology) - STOXX Europe 600 Technology, Materials (and Construction) - STOXX Europe 600 Construction & Materials, Telecommunication - STOXX Europe 600 Telecommunications and Utilities - STOXX Europe 600 Utilities.

- **Expected return based on 12% (ABRET_12):** For the calculation of the abnormal return an expected return of 12% is assumed for all companies across all years.

- **Operating Cash Flows (OCF):** Date on the Operating Cash Flows[409] has been collected from the Bloomberg database as a primary source and has been cross checked against the data from the Thomson One database. In cases where the two databases provide deviating values or no values at all, the corresponding annual financial statements have been used to generate the date.
- **Target price (TP):** Thomson One, more specific I/B/E/S data, has been used as a primary source to gather the target prices for each company for a specific date. In this study target prices are included in three different ways, namely the target price consensus (TPC), target price revisions (TPR), and target price potential (TPP).
  - **Target price consensus (TPC):** The target price consensus is calculated by taking the median of all available analyst recommendations in the I/B/E/S database one day before and three days after the manually verified announcement date of results.[410] The consensus excludes analyst recommendations that were older than 30 days on the announcement date of results in the calculation.[411]
  - **Target price revisions (TPR):** Target price revisions are calculated by subtracting the last year's target price consensus (TPC) at announcement date from the target price consensus at the announcement date for the current financial year.
  - **Target price potential (TPP):** The target price potential is calculated as the difference between the current target price consensus (TPC) and the current share price ($P/S_{it}$) around the announcement date.

[409] Cash Flow from Operating Activities = Net Income + Noncash Expenses + Changes in Working Capital using the Bloomberg command (CF_CASH_FROM_OPER).

[410] The time window of one day before and three days after the announcement date has been selected to solely capture the target price revisions surrounding the announcement dates of results. Actually, the use of a time window ranging from one day before the announcement date to 15, 30, and 60 days after the announcement date does not qualitatively change the results in this study. Cf. Gu and Chen (2004), p. 139 for a similar approach.

[411] Cf. Brown (2001), p. 48, Burgstahler and Eames (2006), p. 649 for similar application.

- **Number of shares outstanding (S):** The deflator used in the analysis in the form of number of shares outstanding is calculated by taking the average of the issued shares held by the investor base subtracting treasury shares[412]. The values for the number of shares outstanding and treasury shares held by the company are taken from the Bloomberg database.[413]

### 4.3.3 Independent Variables

For the empirical analysis in this study the independent variables have been hand collected from the financial statements because of the insufficient quality of data provided by databases.[414] Independent variables used in the analysis are used as net figures where recycling is reported. All coefficients for the independent variables are expected to be positive.

- **Book value of equity (BVE):** The values for the book value of equity have been collected from the balance sheets of the respective companies and are equal to the shareholders' equity. The shareholders equity including non-controlling interest has been selected instead of equity attributable to the owners of the parent company to align the figure with the income measures Net Income and components of Other Comprehensive Income which are reported on a gross basis.

- **Net Income (NI):** Values for the consolidated Net Income have been collected from the income statements as a gross figure including minority interests. This approach has to be taken because the majority of the companies report gross figures for the components of Other Comprehensive Income and do not provide information on the distribution of the positions attributable to the owners of the parent and attributable to non-controlling interests.

[412] Treasury shares are shares issued by the company that have been bought back by the company, reducing the number of shares outstanding.

[413] Current shares outstanding (EQY_SH_OUT) based on the Bloomberg database and has been obtained from annual reports, press releases, or stock exchanges.

[414] Reference is made to section 4.5.1 for additional details on the data quality of machine-readable data.

- **Other Comprehensive Income (OCI):** Is the sum of all components of Other Comprehensive Income for the period on a gross basis and including minority interest.

- **Comprehensive Income (CI):** Is calculated by adding Other Comprehensive Income to Net Income.

The components of Other Comprehensive Income have been collected as reported in the financial statement under the statement of comprehensive income, the statement of changes in equity or in the notes of the respective company. The values are calculated net of tax and including recycling[415] for that period if separately reported.

- **Foreign currency translation adjustments (FCT):** Net figure as reported in financial statement. Includes net investment in foreign operations as stated in the financial statement.

- **Gains and losses on available-for-sale financial assets (AFS):** Net figure as reported in financial statement.

- **Changes in revaluation surplus of tangible and intangible assets (REV):** Net figure as reported in financial statement. The changes in revaluation surplus of tangible and intangible assets are combined under this position because of their similar treatment under Other Comprehensive Income.

- **Actuarial gains and losses on defined benefit plans (ACT):** Net figure as reported in financial statement.

- **Effective portion of gains and losses in cash flow hedges (CFH):** Net figure as reported in financial statement.

[415] Only few companies in the sample provide sufficient information on the breakdown of unrealized gains and losses and of the recycled portion of those items to enable a separate investigation of the two positions. Consequently the net amounts, including recycling, have been used for comparing purposes. Cf. Jones and Smith (2011), p. 2052 for a similar approach.

- **Share of Other Comprehensive Income of investments in associates (ASS):** Net figure as reported in financial statement.

- **Other not further specified items (OTH):** Includes all items that are included in Other Comprehensive Income but are not attributable to any of the previously specified components of Other Comprehensive Income.

### 4.3.4 Control Variables

In order to accommodate the omitted variable bias the regressions have been expanded by adding non-accounting control variables which is in line with other value-relevance research such as Cauwenberge and De Beelde (2007), Kanagaretnam et al. (2009), or Goncharov and Hodgson (2011). This study expands the typically used control variables for specific effects such as the financial crisis and the Eurozone crisis. This section differentiates between company-specific and country-level control variables as follows.

**Company-Specific Control Variables**

- **Negative income (DNegNI / DNegCI):** The differential valuation of negative income may have an impact on the association and is controlled for by the inclusion of control variables. The approach of controlling for the possibly distorting effect of negative income is in line with the application in studies by Hayn (1995), Chambers et al. (2007), and Zülch and Pronobis (2010). The variable takes the value “one” if the Net Income / Comprehensive Income is positive and the value “zero” if the income measure is negative. In addition, the variables are multiplied by the corresponding Net Income / Comprehensive Income to arrive at the control variable applied in the analyses. Consequently, if Net Income or Comprehensive Income is negative the values are not included in the calculation of the regression.
- **Leverage (LEV):** The leverage of the entity is used to control for different financing structures of the entities. The ratio controls for possible agency incentives and is in line with the application for example by Dhaliwal et al. (1999), Bamber et al. (2010), or Turktas et al. (2013). The leverage ratio is

calculated by dividing the total debt by the value of total equity at the beginning of the year. The leverage ratio is calculated for each company (i) and time (t) based on data from the Bloomberg database and validated with data from the Thomson One database.[416] The coefficient for leverage is expected to be either positive or negative.

- **Total assets (TA):** The size effect of a company is incorporated by including measured by the total assets of the entity at the reporting date of the annual financial information. The application is for example in line with studies by Cahan et al. (2000), Devalle and Magarini (2012) and Deol (2013). The values for total assets are taken from the Bloomberg database and cross-checked with the data from the Thomson One database. In case of a mismatch the value has been verified with the respective annual statement. The coefficient for total assets is expected to be positive.

- **Number of analyst recommendations (NumANR):** This variable controls for a potential bias in the target price for entities based on the coverage by analysts. If fewer analysts follow the entity the reaction to earnings announcement could lack comparability. In line with the application by Bhushan (1989), Lys and Soo (1995), Beyer and Guttman (2011), and Cotter et al. (2012) the number includes all analysts which have been considered for the calculation of the target price consensus. The data has been collected from the I/B/E/S database and has been cross checked with the Bloomberg database. The coefficient for the number of analyst recommendations is expected to be positive.

- **Trading volume (TradVol):** The level of the relative trading volumes may have an effect on the target price as it is an indicator of the investor focus of a company. The use of this control variable is in line for example with studies by Bhushan (1989), Lys and Soo (1995), and Beyer and Guttman (2011). The trading volume is calculated by multiplying the number of shares traded on a specific date with the Volume Weighted Average Price (VWAP) around the announcement date of the results. The final value is calculated by taking the

[416] The leverage ratio defined as the total debt divided by the value of total equity is based on Bloomberg data using the command (TOT_DEBT_TO_TOT_EQY).

mean of the trading volumes of one day before the announcement and three days after the announcement date of results. The data is taken from the Bloomberg database. The coefficient for the trading volume is expected to be positive.

**Country-Specific Control Variables**

- **Yearly growth rate of the Gross Domestic Product (GDPG):** The GDP growth rate at the end of the reporting year has been included in the regression.[417] The GDP growth rate has been extracted from Eurostat for each country from the sample.[418] The coefficient for GDP growth is expected to be positive.

- **10-year government bond yield (YGOV):** For each country from the sample the generic 10-year government bond yield has been extracted from the Bloomberg database at year-end.[419] The yield is a good indicator for the "risk free rate" and therefore the basis for the refinancing rate in the specific country excluding company specific risks. The coefficient for the 10-year government bond yield is expected to be negative.

**Crisis Dummies**

In the observation period between 2007 and 2012 fall two different crises which had diverse impact on the companies in the countries of the Eurozone. On the one hand there was the financial crisis that was triggered by the collapse of Lehman Brothers in September 2008 which led to a crash of equity markets and a global economic crisis. On the other hand there was the Eurozone crisis that led to a drifting apart in terms of government bond yields for countries using the Euro. Driven by an exploding debt

[417] Cf. Deol (2013), pp. 104–105 for a similar application.

[418] Gross domestic product at market prices and as percentage change on previous period. The data has been extracted from Eurostat. Available at: http://epp.eurostat.ec.europa.eu [accessed 23/09/2013].

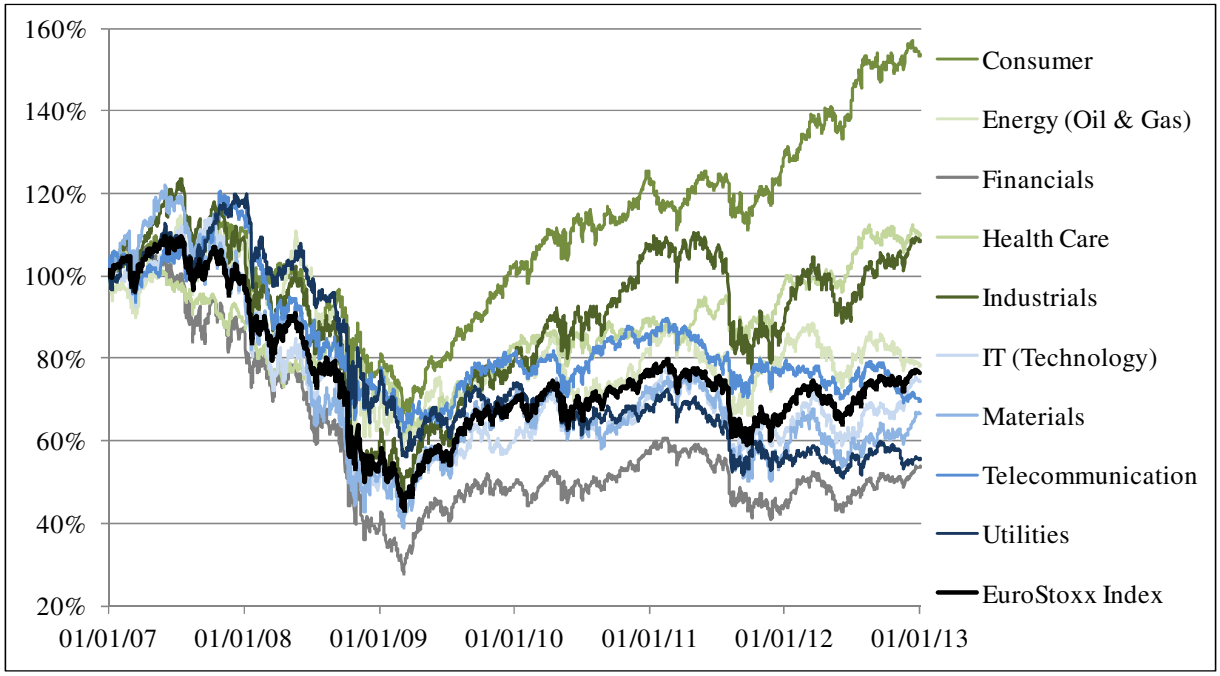
[419] The values have been extracted from the Bloomberg database using the generic 10-year government bonds yield at year-end (GAGB10YR Index - Austria, GBGB10YR Index - Belgium, GFIN10YR Index - Finland, GFRN10 Index - France, GDBR10 Index - Germany, GGGB10YR Index - Greece, GIGB10YR Index - Ireland, GBTPGR10 Index - Italy, 1376623 Index - Luxembourg, GNTH10YR Index - Netherlands, GSPT10YR Index - Portugal, GSPG10YR Index - Spain).

level and budget deficits of countries in the Eurozone the crisis hit its peak with a second bailout package for Greece from the IMF and ESM in July 2011 to prevent an apparent default of the country.

The following figures and tables demonstrate the motivation behind the inclusion and the design of crisis dummies in this study. They illustrate how severe the impact of the financial crisis and the Eurozone crisis was on the countries from the Eurozone and how the impact was different from country to country. It also shows that neither the financial crisis nor the Eurozone crisis should be neglected in the analysis in this study.

Figure 4.1 illustrates that the financial crisis has hit all industries with the leading STOXX Europe index losing more the 50% of its value between January 2007 and January 2009. The Financial industry was even worse hit by the financial crisis almost loosing 70% of its value in the trough based on the indexing on January 2007.

Figure 4.1: Indexed development of the STOXX Europe 600 sector indices[420]




[420] The values have been taken from the Bloomberg database for the years 2007 to 2012 using the following indices: STOXX Europe Index - STOXX Europe 600, Consumer (Staples & Discretionary) - STOXX Europe 600 Consumer Goods, Energy (Oil & Gas) - STOXX Europe 600 Oil & Gas, Financials - STOXX Europe 600 Banks, Health Care - STOXX Europe 600 Health Care, Industrials - STOXX Europe 600 Industrial Goods & Services, IT (Technology) - STOXX Europe 600 Technology, Materials (and Construction) - STOXX Europe 600 Construction & Materials, Telecommunication - STOXX Europe 600 Telecommunications, and Utilities - STOXX Europe 600 Utilities.

The impact that the financial crisis had on the member states of the Eurozone is shown in Table 4.1 by the GDP growth rate development between 2007 and 2012. The development of the growth rates during the financial crisis shows that all countries from the Eurozone were negatively affected by the crisis represented by a negative GDP growth rates in 2009; however, the beginning and the gravity of the recession differed. The table shows that some countries did not recover from the financial crisis until 2012 and directly drifted into the Eurozone crisis such as Greece.

*Table 4.1: Development of GDP growth rates[421] Eurozone countries[422]*

| Country / Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| **Greece** | 3.5% | -0.2% | -3.1% | -4.9% | -7.1% | -6.4% |
| **Portugal** | 2.4% | 0.0% | -2.9% | 1.9% | -1.3% | -3.2% |
| **Spain** | 3.5% | 0.9% | -3.8% | -0.2% | 0.1% | -1.6% |
| **Italy** | 1.7% | -1.2% | -5.5% | 1.7% | 0.4% | -2.4% |
| **Ireland** | 5.4% | -2.1% | -5.5% | -0.8% | 1.4% | 0.9% |
| **Austria** | 3.7% | 1.4% | -3.8% | 1.8% | 2.8% | 0.9% |
| **Belgium** | 2.9% | 1.0% | -2.8% | 2.4% | 1.8% | -0.3% |
| **Finland** | 5.3% | 0.3% | -8.5% | 3.4% | 2.7% | -0.8% |
| **Luxembourg** | 6.6% | -0.7% | -4.1% | 2.9% | 1.7% | 0.3% |
| **Netherlands** | 3.9% | 1.8% | -3.7% | 1.5% | 0.9% | -1.2% |
| **Germany** | 3.3% | 1.1% | -5.1% | 4.0% | 3.3% | 0.7% |
| **France** | 2.3% | -0.1% | -3.1% | 1.7% | 2.0% | 0.0% |
| **Average** | 3.7% | 0.2% | -4.3% | 1.3% | 0.7% | -1.1% |

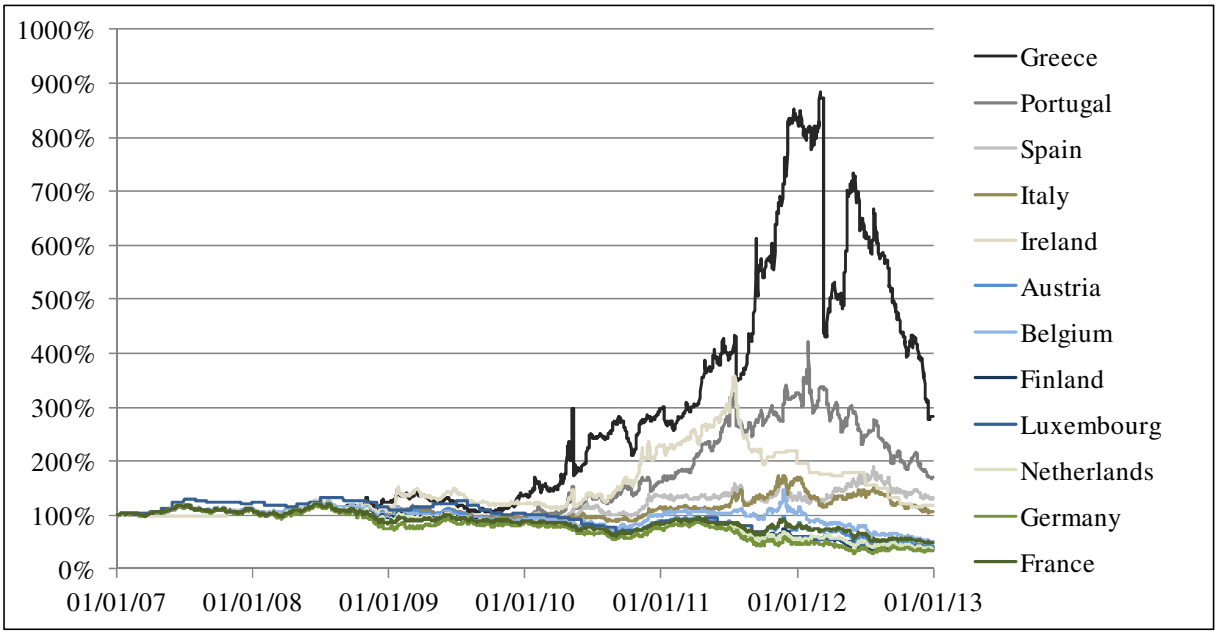
The full impact of the Eurozone crisis becomes apparent when considering the development of the 10-year government bond of the Euro member countries shown in Figure 4.2. The crisis had the most severe effect for Greece followed by Portugal, Ireland and Spain respectively Italy. However, the other countries of the Eurozone in the sample benefitted from the crisis, at least from the financing side, as the refinancing of government debts became more advantageous with the expiry of

[421] The gross domestic product (GDP) is measured at market prices and as a percentage change compared to the same date of the previous year.

[422] The table is based on data provided by Eurostat for the years 2007 to 2012. Available at: http://epp.eurostat.ec.europa.eu [accessed 23/09/2013].

previously issued government bonds. This unequal development has been considered in the construction of the dummy variables.

*Figure 4.2: Indexed development of the 10-year government bond yield*[423]




The Financial-Crisis Dummy

The financial crisis was triggered by the bankruptcy of Lehman Brothers in autumn 2008 and led to a worldwide economic recession thereafter. This recession can best be captured by examining the development of GDP growth in the countries from the Eurozone before and during the crisis. The development after 2010 was mainly influenced by the Eurozone crisis and the tail of the financial crisis had a reinforcing effect on the development that is not incorporated in this analysis. Starting from an average GDP growth rate of 3.7% in 2006 and 2007 this rate significantly dropped to 0.2% in 2008 and even further to -4.3% in 2009 with a recovery to an average of 1.3% in 2010. The year 2008 already indicated a severe decline with all countries from the Eurozone falling into the negative GDP growth range in 2009. Finland was hardest hit in the year 2009 with the GDP growth dropping to -8.5% but immediately recovering

[423] For selected Euro member countries included in the sample for the years 2007 to 2012. The values have been extracted from the Bloomberg database using the generic 10-year government bonds yield at year-end.

to a positive GDP growth rate of 3.4% in the year thereafter. In 2010 there was a positive GDP growth trend for all countries from the Eurozone except for Greece whose growth rate declined even further from -3.8% in 2009 to -4.9% in 2010. See also Table 4.1 for the entire development of the GDP growth rate development in the countries from the Eurozone on the December 31, of each year. From these implications and in order to capture these rather extreme developments in the performed regressions a dummy variable has been generated. The dummy variable (DFINCrisis) takes the value "one" if the GDP growth in the specific country was equal to or below 0.2% between 2008 and 2009 and the value "zero" if the GDP growth was above 0.2% otherwise.[424] For the analysis in the empirical part of this study the coefficient for the financial crisis dummy is expected to be negative.

The Eurozone crisis Dummy

To capture the development during the Eurozone crisis (2010 – 2012) the 10-year government bond yields of the individual countries from the Eurozone have been compared. This provides an indirect indication of the level of confidence investors have in investing in the country and a direct indicator of current and future interest payments on government debt. In the years before the Eurozone crisis the yield for 10-year government bonds was evenly distributed across the countries from the Eurozone with an average of 4.0% in 2006 and 4.5% in 2007. The country with the highest yield was Greece with 4.2% in 2006 and Italy with 4.7% in 2007. The countries with the lowest yield were Luxembourg with 3.8% in 2006 and Germany with 4.3% in 2007. This indicates that the yields before the outbreak of the Eurozone crisis were evenly distributed across the Euro-member countries with a low variance. In the following years this difference between the lowest and the highest yield increased to its heights in 2011 when the average yield amounted to 7.3% with the yield of Greece amounting to 35.0% and the yield of Germany amounting to 1.8%. This shows the widening of the gap between the yields of the different member states from the Eurozone and indicates a split of the countries from the Eurozone. The northern countries mainly Germany, Netherlands, Luxembourg, Finland, and France benefitted from the Eurozone crisis in terms of lower government bond yields whereas

[424] The cutoff rate of 0.2% has been selected because it represents the average growth rate for the year 2008 and is an indicator for the below average development of one country compared with the other countries from the sample.

southern members from the Eurozone such as Greece, Italy, Spain, and Portugal were losing because of rocketing yields. See Figure 4.2 for the entire development of the 10-year government bond yield over the observation period. From the generated data a negative Eurozone crisis dummy (DEURCrisis) has been created to capture the negative development of the mainly southern countries and taking the value "one" if the 10 year government yield is larger or equal to 3.5% and the value "zero" otherwise for the years 2010 to 2012. In the empirical analysis in this study the coefficient for the Eurozone crisis dummy is expected to be negative.

## 4.4 Statistics Applied in the Empirical Analysis

The empirical analysis makes use of statistical methods which are outlined in more detail in this section. In this study panel data[425] is used to test the association between market data and accounting numbers as well as in between accounting numbers. The statistical approaches dealing with panel data are covered in more detail because it is important to provide details on the motivation why different procedures have been chosen in the light of the different models in previous studies. As pointed out in the literature review in section 3.3.3, previous studies on value-relevance of Comprehensive Income have almost exclusively utilized pooled OLS regressions in their studies. However, one of the shortcomings is that those studies do not control for potential unobserved heterogeneity.[426]

This study presents the results from both the fixed effects and pooled OLS regressions and elaborates on the possible interpretations. Additionally, various robustness-tests are applied to the same data. All statistical analyses of the empirical part have been conducted with the Stata 12 program.[427]

[425] Panel data is also referred to as longitudinal or cross-sectional time-series data.

[426] Ferraro and Veltri (2012), pp. 592–593 for an overview of the shortcomings of previous studies on value-relevance of Comprehensive Income.

[427] The Stata program has been used in this analysis as it is commonly used in comparable studies in this research area. For the calculation of the model comparison on the basis of the Vuong test in addition the program "R" has been used.

### 4.4.1 Motivation for the Use of Panel Data in this Study

In general, panel data are multi-dimensional, combining the information of cross-sectional and time series data. The current panel data contains information about individual behavior across companies and over time.[428] The main advantage of panel data is that it allows for analyzing additional variation in observations across time and individual companies, which cannot be observed when analyzing cross-section or time series data on an individual basis.[429]

Furthermore, panel data allows the identification of associations between economic variables accounting for company specific heterogeneity and for dynamic effects that cannot be identified in cross section analyses.[430] The use of panel data, as compared to solely cross-sectional analyses such as OLS, helps to understand the economic connection by modeling differences across individual companies. Moreover, panel data allows incorporating observable and unobservable individual heterogeneity in the econometric model.

In addition, to the observable effects that can be incorporated in an OLS regression there may be other unobservable effects which cannot be controlled by the inclusion of additional control variables. Panel data can overcome this shortcoming by controlling for factors that cannot be observed or measured such as cultural factors, risk profile or specific business practices.[431] More specifically, panel data allows controlling for variables that change over time but are constant for each entity such as industry regulations, state interventions or international agreements and thereby accounting for individual heterogeneity.[432] Moreover, in situations in which the unobserved heterogeneity is correlated with one or more of the explanatory variables, the use of pooled OLS regressions may produce inconsistent or biased results.

Based on these considerations it is essential for the current study to identify potential unobserved heterogeneity that may have affected the analysis. As the analysis spans

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[428] Reference is made to Prof. Christina Felfe from the Swiss Institute for Empirical Economic Research at the University of St. Gallen for her constructive input on the use of panel regressions with respect to this study.

[429] Cf. Baltagi (2008), pp. 6–8 on the theoretical background for the motivation of using panel data in general.

[430] Cf. Greene (2003), p. 343.

[431] Cf. Baltagi (2008), pp. 6–7.

[432] Cf. Chamberlain (1978), pp. 49–82, Wooldridge (2002), pp. 247–297, Baltagi (2008), pp. 220–226 for further details on unobserved heterogeneity and the omitted variable bias in connection with panel data models.

over many individual companies from different countries and industries there are several unobservable effects that may have influenced the data in the analysis.

First of all the regulatory framework may differ between countries as well as across industries. The implementation of such frameworks (e.g., environmental protection laws) is mandatory; however, companies may take their discretion a proactive or reactive approach to the changed regulation or even go beyond the minimal requirements. Such a decision by a specific entity may have an unobservable effect on the income measures. Another example of such an unobservable effect could be the unions' strength in a country that impacts the tendency to go on strike for higher income possibly resulting in lower sales and thereby effecting income measures. On an industry base there could be different regulations such as an embargo on an oil exporting country having a direct impact on the oil price affecting earnings of companies relying on crude oil as raw material. There might be special regulations for example for the financial industry (e.g., Basel III), which may have an unobservable impact on the individual risk aversion of players in the market. Finally, the corporate culture being applied in a company can have an impact on the earnings measures of a company while it is difficult to evaluate it. In a nutshell, the amount of potential unobservable effects influencing the data in the regression analysis is vast. Hence, focusing on pooled OLS regressions may yield biased results. The use of fixed effects or random effects models can eliminate or at least mitigate the omitted variable bias.[433]

### 4.4.2 Panel Data Models

As illustrated in the previous section panel data are repeated observations of multiple variables on a group of entities over a specified period of time forming cross-sectional time-series data. When using panel data three approaches can be distinguished, namely the pooled model, the fixed effects model and the random effects model which is dealt with in more detail.

[433] The inclusion of fixed effects on the basis of companies incorporates all time constant differences between companies, e.g. country and sector specific fixed effects.

**Pooled OLS Model**

The pooled OLS model ignores the panel structure of the data and simply estimates constant coefficients for all groups. Since all observations are pooled over groups, the model can only yield correct results in the absence of company specific cross-sectional or time specific effects. The model pools the available observations and assumes that the coefficients and intercepts are equal for all entities.[434] The general regression looks as follows:

$$y_{it} = \alpha + x'_{it}\,\beta + \varepsilon_{it} \tag{4.9}$$

where $\varepsilon_{it}$ does not include any individual cross-sectional or time specific effects

Based on Wooldridge (2002), Greene (2003), Kennedy (2008) the OLS regression is based on five major assumptions:

i. Linear relation between dependent and independent variables / error term
ii. No perfect multicollinearity implying that each variable provides additional information about the response
iii. Homoscedasticity and non-autocorrelation – constant variance of error term
iv. Exogeneity of independent variables – expected value of error term is zero
v. Independence of observations in the data collection

The third and fourth assumptions are particularly important in the context of panel data. If the individual effect is not equal to zero these assumptions may be violated. As illustrated in the previous section potential unobservable effects may influence the variance of the distribution of the error term among companies leading to heteroscedasticity.[435] Also the unobservable individual effects may be correlated with each other leading to potential autocorrelation issues.

[434] Cf. Mundlak (1978), p. 69, Cameron and Trivedi (2005), pp. 702–703.

[435] Cf. Freedman et al. (2007), pp. 190–192, Wooldridge (2009), pp. 265–275 on the distorting effect that heteroskedasticity has a on the standard errors. To control for heteroskedasticity all regressions in this study have been calculated using the Huber–White standard errors on the basis of the studies by Huber (1967) and White (1980). Cf. Baltagi (2008), p. 87–91 for an application on panel data, but also Stock et al. (2008) for a critical

Overall the use of pooled OLS models is very restrictive and the strict conformance to these assumptions is questionable for the analysis of income measures.

**Fixed Effects Model**

In contrast to the pooled OLS model, which estimates only one intercept for all observations, the fixed effects model allows for different intercepts across individuals or time. The fixed effects model includes any potential unobservable individual effects in the intercept. As the individual effect $u_i$ is time invariant and only differs across individuals, it is part of the intercept and not of the error term, and thus does not violate the exogeneity assumption. With these modifications the regression for the fixed effects model looks as follows:

$$y_{it}=(\alpha+v_i) + x'_{it}\,\beta + \varepsilon_{it} \qquad (4.10)$$

where $v_i$ is the fixed effect relating to a certain company, the error $\varepsilon_{it}$ is independent and equally distributed.

The motivation for using the fixed effects model is to control for a potential bias within the individual company by including a company specific constant in the model. As a result the time-invariant fixed effect is separated from the other independent variables enabling an unbiased assessment of the net effect. The Hausman test, examining the potential correlation is used as an indicator to decide whether the fixed effects model is appropriate in this context.[436] One limitation of the fixed effects model is that time-invariant variables such as dummy variables cannot be included in the model as they are assumed to be collinear with the company and therefore being omitted from the regression.

review on using robust standard errors used in panel data regression. The Stata command "robust" has been used to calculate the Huber-White standard errors. Cf. StataCorp LP (2013), p. 79.

[436] Cf. Hausman (1978), pp. 1251–1271.

### Random Effects Model

In general the random effects model should be preferred over the fixed effects model if the specified fixed effects do not provide additional information about the distribution of the independent variables. While the fixed effects model includes the unobserved individual effect in the intercept, the random effects model includes the individual effect in the merged error, assuming heterogeneity of the effect. This means, the random effects model looks as follows:

$$y_{it} = \alpha + x_{it}^{'} \beta + (u_i + \varepsilon_{it}) \quad (4.11)$$

where $u_i$ is the random effect relating to a certain company, the error $\varepsilon_{it}$ is independently identically distributed.

If, however, the individual random effect is correlated with the independent variables, then the regression may produce biased and inconsistent coefficients.[437] One advantage of the random effects model compared to the fixed effects model is that it allows for including dummy variables (e.g., a dummy for financial industry affiliation), controlling for time invariant effects. In this research, the Breusch-Pagan test is used to examine if the random effects models is applicable in this study.[438]

## 4.4.3 Model Selection Criterion

In general, there is no "best model" that should be preferred over another; however, it is possible to select the "best model" on the basis of self selected evaluation criteria (e.g., adjusted R2, AIC, BIC).[439] In line with other studies in this research area, the adjusted $R^2$ is used to compare the goodness of fit of the model in general, and for a comparison of different specifications on a model level. In addition, the selection criteria AIC and BIC are applied in this analysis. These are briefly described as they have not been explicitly used in comparable analyses. Moreover, Vuong tests are

[437] Cf. Greene (2003), pp. 200–201.

[438] Cf. Breusch and Pagan (1980), pp. 239–253.

[439] The adjusted $R^2$ is calculated on the basis of the "areg" command in Stata, because the command for fixed effects regressions calculates the values on the basis of the within model without adjusting $R^2$.

performed in this study to compare the different models against each other on the basis of performing Z-tests.

The **Akaike Information Criterion (AIC)** measures the goodness of fit of a statistical model compared to other models based on a similar set of data.[440] The criterion can be used to compare different models considering the tradeoff between an increase in complexity through the inclusion of additional parameters and the increase in the goodness of fit. Thereby, the goodness of fit of a model is penalized by the infusion term that increases with the inclusion of additional parameters. The criterion is calculated as follows:

$$AIC_M = -2\log(L_M) + 2P_M \tag{4.12}$$

Where $L_M$ is the likelihood of model M and $P_M$ is the number of independent variables, including the intercept. Based on identical observations, the model with the lowest AIC value is to be preferred.[441]

The **Bayesian Information Criterion (BIC)** is an alternative statistical criterion for model selection and is closely related to the AIC. The BIC penalizes additional independent variables more severely than the AIC. The main difference between the BIC and AIC is that it includes a punishing term for the additional independent variables that increases with the sample size.[442] The criterion is calculated as follows:

$$BIC_M = -2\log(L_M) + P_M \log(n) \tag{4.13}$$

where the first term is defined similar to the AIC. The second term is calculated by multiplying the number of independent variables ($P_M$) with the natural logarithm of the number of observations. Similar to the AIC the model that yields the lowest value for BIC is to be preferred.

[440] Cf. Wagenmakers and Farrell (2004), pp. 192–193.

[441] Cf. Wagenmakers and Farrell (2004), p. 193.

[442] Cf. Jain et al. (1994), p. 320.

By the use of a **Vuong test** which has been developed by Vuong (1989) and is based Bayesian Information Criterion (BIC), it is examined if two models are equally close to the true distribution. The null hypothesis is that the models are equally close; the alternative hypothesis is that one of the models, with the higher adjusted $R^2$ and the lower BIC, is to be preferred. The advantage over a simple F-test is that the Vuong test can examine two non-nested or overlapping non-nested models, which is necessary for the analysis in this study.[443] The Vuong test is performed to determine which income measure, on the basis of the inclusion in different models, is superior over another. More precisely, it is tested if the model including Comprehensive Income and components of Other Comprehensive Income is to be preferred over the model solely including Net Income as an income measure.[444] The calculation of the Vuong test in this study follows the application described in the initial paper by Vuong (1989) and later by Dechow (1994).[445] When comparing the model including Net Income with the other models larger positive F values favor the Net Income model and larger negative F-values favor the alternative model.

### 4.4.4 Test for Structural Change

With respect to the introduction of IAS 1 (revised 2007) it is examined if the explicit reporting of Other Comprehensive Income components has caused structural breaks in the association between market values and accounting numbers. Thereby, it is examined if the value-relevance of Comprehensive Income increased with the explicit reporting of Other Comprehensive Income components under IAS 1 (revised 2007). In this context the statistical test by Chow (1960) is used to establish if the regression coefficients differ between the data before and after the explicit reporting of Other Comprehensive Income components.[446] The years 2007 and 2008 are defined as "pre

[443] Cf. Dechow (1994), pp. 23–40.

[444] Cf. Kanagaretnam et al. (2009), pp. 361–362, Zülch and Pronobis (2010), p. 11, Goncharov and Hodgson (2011), p. 38.

[445] As Stata 12 so far does not include the calculation of a Vuong test in one of their packages a manual calculation has been performed. The calculations have been cross checked against the calculation based on the statistical program "R". This application is in line with other studies e.g. Mechelli and Cimini (2014). Reference is made to Riccardo Cimini from University of Rome for his helpful input on the application of the Vuong test in the context of value-relevance studies on Comprehensive Income.

[446] Similar tests have for example been performed in studies by Zülch and Pronobis (2010), Devalle et al. (2010), Mechelli and Cimini (2014).

IAS 1 (revised 2007) reporting" and the years 2009 to 2012 are defined as the period "post implementation".

## 4.5 Sample Selection

After illustrating the model specifications and the procedure to be followed in the empirical analysis, this section focuses on the data collection and the final selection of the sample used in the analysis. The sample selection depicted in this section is essential for the empirical analysis as the procedure in certain aspects differs from the approaches taken in other studies in this research area. As indicated, the data available for Other Comprehensive Income components from all machine readable databases is currently not accurate enough, thus making a hand collection of the accounting data unavoidable. The procedure of the manual hand collection of accounting data differs from other recently carried out studies, e.g., Kanagaretnam et al. (2009) and Goncharov and Hodgson (2011) but is in line with procedures carried out in studies such as Jones and Smith (2011) and Devalle and Magarini (2012).[447] Most of the recent studies on value-relevance of Other Comprehensive Income under IFRS show that studies have either used large number of observations from databases for time periods before the publication of Other Comprehensive Income under IFRS or smaller but hand-collected higher quality samples since the publication of Other Comprehensive Income. The approach of using qualitative hand-collected data is also followed in this study. As the basis for the companies analyzed in this study, the EURO STOXX TMI index has been chosen to capture the major corporations from the Eurozone. Moreover, the treatment of missing data in connection with Other Comprehensive Income components is discussed in more detail in the following sections.

[447] The number of observations is as follows: Kanagaretnam et al. (2009) n= 228 , Goncharov and Hodgson (2011) n= 56,696, Jones and Smith (2011) n= 1,888 (n= 236 for companies with hand-collected data for 1998–2005), and Devalle and Magarini (2012) n= 585. In the paper by Goncharov and Hodgson (2011) on page 32 the authors express that the pooled tests eliminate the problem of an error-in-variable which was mentioned as a possible shortcoming in the analysis by Chambers et al. (2007).

### 4.5.1 Data Source

Data providers Thomson One[448] and Bloomberg have been considered for the analysis in this study. The providers have been selected because they have been used in comparable studies in connection with the analysis of Other Comprehensive Income components. Initially, it can be stated that the data quality significantly differs between accounting data, in particular Comprehensive Income and its components, and market data. Whereas the data quality provided for the former is insufficient, the quality of the latter is adequate for the use in this analysis. The issue of dealing with insufficient data quality in the context of Comprehensive Income studies has also been highlighted by other researchers on European data.[449] Also Jones and Smith (2011), with their comparable study for US companies, highlight the importance of using hand-collected data instead of data provided by the commonly used databases.

In the context of this study, the data quality provided by the data providers has been compared to the values generated from a hand collection of the data. As a first step, the data for all Other Comprehensive Income components had been generated from the databases Thomson One and Bloomberg for the sample over the observation period using the corresponding Excel link.[450] Based on the generated data, a qualitative comparison has been carried out, comparing the data provided by the databases, from a randomly selected sample of 100 data points,[451] with hand-collected data based on the financial reports. The results show that Bloomberg data provided identical values to the hand-collected data for only 64 out of the 100 selected observations.[452] The data quality based on Thomson One was even worse with only 52 of the 100 observations

[448] The data sources accessed via the Thomson Reuters Spreadsheet Link (TRSL), include the I/B/E/S database, Datastream and Worldscope.

[449] Cf. Zülch and Pronobis (2010), p. 3, Höhn (2011), p. 137.

[450] The data for Thomson One from the I/B/E/S database, Datastream, and Worldscope have been consolidated favoring the Wordscope data as the primary source as it is used in comparable studies with European samples, e.g. Goncharov and Hodgson (2011), Barth et al. (2013).

[451] The command “sample” in STATA has been used to randomly select the sample. This procedure ensures that the sample includes observations across industries, countries and reporting years.

[452] The observations for which the results from the Bloomberg database and the manual selection provided identical results were primarily companies that reported few or no Other Comprehensive Income components. The data quality was more accurate for the reporting of foreign currency translation adjustments and gains and losses on securities classified as available-for-sale, than for the other components of Other Comprehensive Income. Especially the Other Comprehensive Income components actuarial gains and losses on defined benefit plans and share of Other Comprehensive Income of investments in associates showed severe discrepancies.

matching the values from the hand-collected data.[453] On this basis, the data from the Bloomberg database would have been favored for the use in the analysis; however, the general poor data-quality of both providers makes the efficient use of machine readable data in the context of this analysis obsolete.[454]

The deviation in the results can possibly be explained by the fact that the databases report "as-reported" and "as-adjusted" data; but a lack of consistency on a country and industry base makes the data incomparable for the proposed analysis. Moreover, the break-down of Other Comprehensive Income figures in the databases is based on US GAAP and is not always in line with IFRS rules. As demonstrated in this study, not all the positions stated under IFRS exactly match the positions reported under US GAAP. In addition, there are items under IFRS, e.g., gains and losses from revaluation of tangible and intangible assets which do not exist under US GAAP. Moreover, the treatment of Other Comprehensive Income components in connection with pension liabilities is different and not directly comparable. In addition, several components which are explicitly stated under Other Comprehensive Income in financial statements are often grouped under "other items" by the databases and, therefore, need further investigation for a correct and comprehensive consideration. The reservation on the data provider side to extend their framework to the reporting under IFRS can possibly be explained by the ongoing discussions about the final composition of Comprehensive Income. Also the still ongoing discussion about the value-relevance of Other Comprehensive Income items can be an explanation for the fact that none of the considered data providers yet provide consistent Comprehensive Income data for European companies.

Moreover, the analysis includes the years before the introduction of IAS 1 (revised 2007) where the components of Other Comprehensive Income have been reported in the

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[453] In line with the data from the Bloomberg database, and also from the Thomson One database the manual selection provided identical results, primarily with respect to companies that reported few or no Other Comprehensive Income components. The similarity continuous as the data quality was more accurate for the reporting of foreign currency translation adjustments and gains and losses on securities classified as available-for-sale, than the other components of Other Comprehensive Income. For the remaining Other Comprehensive Income items the data quality was poor. If there was additional data provided on Other Comprehensive Income then those items were mostly recognized under "other items". Also the treatment of taxes was neither consistent nor comprehensive.

[454] An F-test has been conducted to control if the data from the databases was significantly different from the hand-collected data. The test confirmed that both the data on Comprehensive Income and its components provided by the databases Bloomberg and Thomson One, are different from the hand-collected data at the $p<0.01$ significance level.

statement of changes of equity. For several companies the information on Comprehensive Income has been reported in the notes and has not been included in the commonly used databases. The components were explicitly reported under Other Comprehensive Income only in the years following the revision. This explicit reporting could be an explanation for the fact that, before the revision, the components of Other Comprehensive Income have only rudimentary been provided by the databases. Especially the focus of this study on the transformation phase with the implementation of IAS 1 (revised) makes a thorough data collection unavoidable. Furthermore, as already outlined in section 2.2.8, the reporting choice for taxes related to Other Comprehensive Income components, either on a gross or net basis, has created incomparable figures. Finally, the consideration of restatements is not following a traceable rule and the adjusted figures are only partially updated in the database.[455]

All these facts demand the hand collection of data in connection with Other Comprehensive Income figures to have a comparable basis for the analysis. To sum up accounting data, in particular Comprehensive Income and components of Other Comprehensive Income are incomplete and lack consistency based on data provided by the considered providers. Consequently, this data has been hand-collected from the annual reports for all the companies in the sample. This procedure counters the shortcoming of incompleteness and presentation of the data provided by databases. The method is in line with the approach taken by Chambers et al. (2007), Zülch and Pronobis (2010), Jones and Smith (2011), and Devalle and Magarini (2012).

For the market data used in the analysis, the databases Thomson One and Bloomberg have been considered. The quality of market data in the databases is adequate for both providers. This can be an explanation for the fact that the databases used for data collection differs across studies in this research area.[456] For this study, Bloomberg data has been selected as the primary source of market data (e.g., share prices, returns, market capitalization) because Bloomberg is widely used by the investment community to obtain market information. Moreover, Thomson One, more specifically I/B/E/S data, has been used for the analysis in connection with the analysts' target

[455] There seems to be a bias towards only adjusting the results for companies with higher market capitalization, thereby creating inconsistency in the reported figures.

[456] Cf. e.g. Kanagaretnam et al. (2009), p. 354 on Bloomberg data or e.g. Alexander et al. (2012), p. 327 on Compustat data.

prices, because the options in which data on analyst recommendation can be provided best fit the analysis in the study.

### 4.5.2 Data Selection

The EURO STOXX TMI has been chosen as the basis for the analysis in this study as the index that best reflects the prerequisites for the analysis carried out in this study. On the one hand the index is used because it includes the largest listed European companies by market capitalization.[457] The selection of core companies in the economic region ensures the availability of the required data and the focus by analysts and investors.[458] On the other hand, only companies from countries in the Eurozone[459] are included in this sub-index excluding disturbing currency alignment of market and accounting data in the analysis.[460]

The data for the empirical analysis has been collected for the financial years 2007 to 2012 to ensure the reporting of Comprehensive Income and to capture the transition period from IAS 1 and IAS 1 (revised 2007) and the explicit reporting of Other Comprehensive Income components.

The companies for the analysis have been selected by capturing the entities which are or have been members of the EURO STOXX TMI during the observation period from January 1, 2007 to December 31, 2012.[461] From this population, in a first step, all duplicates have been deleted that had been listed over more than one period (on the basis of identical ISIN and Bloomberg Ticker) leading to a total sample size of 1050 companies. On the basis of data from the databases Thomson One and Bloomberg, all

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[457] Cf. Gordon et al. (2013), p. 145 on the importance of outlining the motivation of using a particular sample.

[458] The EURO STOXX Total Market Index (TMI) is subset, only including Eurozone countries, of the STOXX Europe TMI Index which covers approximately 95% of the free float market capitalisation of companies listed in Europe based on the factsheet provided by STOXX Limited (2014).

[459] Countries in this sample are: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain.

[460] There are still some entities in the index that report in a currency different from the Euro. These companies have been identified based on their reporting currency in the financial statement and have been removed from the sample as can be seen in Table 4.2.

[461] The members of the index have been gathered on a half-yearly basis during the six-year observation period based on data provided by STOXX Limited. This approach has been taken to avoid a negative selection bias of the sample due to dropping out of the index. A comparison of the sample including companies which dropped out and the sample used for this analysis yielded no significant difference with regards to industry distribution, country distribution and average market capitalization.

inactive, acquired and delisted companies have been deleted with the cut-off date being December 31, 2012, removing 168 companies.[462] Moreover, all companies have been removed from the sample that were not reporting in Euro and reporting under US GAAP[463] reducing the sample by 267 companies. This first general data adjustment resulted in a reduced sample of 615 companies.

In a second step, a hand-sorting process to the sample has been applied by evaluating the financial statements, online available information and information provided by investor relations offices for all companies from the sample. For companies that had common and preferred shares outstanding, the observations for preferred share has been removed from the sample to avoid duplication in counting, eliminating eight observations.[464] Companies were deleted that had been acquired, merged with or demerged from other companies or went bankrupt during the period from January 1, 2007 to December 31, 2012, thereby eliminating eight observations. In addition, companies were removed that were not reporting in Euro, but had been falsely classified by the databases and also included companies that changed their presentation currency during the observation period, eliminating 10 observations. Furthermore, companies not following IAS / IFRS reporting standards were removed reducing the sample by four observations. 13 companies have been deleted from the sample which did not provide information on at least three financial years[465] and included companies that went public in the observation period.[466] Lastly, another 13 companies were removed from the sample were the required information was not available online and could not be gathered via the investor relations departments or

[462] This procedure has been carried out because Bloomberg does not provide historical data for companies which fall into this category.

[463] In this first step only companies following US GAAP reporting have been removed. Companies following e.g. BE GAAP or companies where the accounting standard was not displayed were kept in the sample for a further manual evaluation in the second selection step.

[464] Ordinary and preferred shares are related to the same underlying accounting figures. In the empirical analysis income measures are examined which relate to the residual payout to ordinary shareholders and not to the fixed payout to preferred shareholders. Therefore it makes sense to solely relying on ordinary shares. For a similar handling in this context see e.g. Liao et al. (2012), p. 163.

[465] This procedure is in line with the approach taken by Goncharov and Hodgson (2011), p. 32.

[466] Only companies with IPOs during the observation period have been deleted where the required information for the analysis of this study was not provided in the offering memorandum or comparable document for at least three years in the observation period.

any other trustworthy or official source. An overview of the adjustments carried out in this passage is provided in Table 4.2.[467]

*Table 4.2: Data selection process on company basis*

| | Removed Companies | Total Companies |
|---|---|---|
| Initial Sample based on the constituents of the EuroSTOXX TMI between H1 2007 and H2 2012 excluding duplicates | | 1,050 |
| *Initial adjustments made on the basis of information from database:* | | |
| Remove inactive, acquired and delisted companies | 168 | 882 |
| Remove companies not reporting in Euro | 256 | 626 |
| Remove companies reporting under US GAAP | 11 | 615 |
| *Manual adjustments on the basis of in debth analysis:* | | |
| Remove duplicates (preferred and ordinary shares) | 8 | 607 |
| Remove acquired, merged, demerged or bankrupt companies | 8 | 599 |
| Remove companies not reporting in Euro | 10 | 589 |
| Remove companies not reporting under IAS/ IFRS | 4 | 585 |
| Remove companies with less than three available financial years | 13 | 572 |
| Remove companies with insufficient data available | 13 | 559 |
| Number of companies after the adjustments made | | **559** |
| Based on six years this leads to an observation size of | | **3,354** |

### 4.5.3 Sample Selection

On the basis of the data selection process previously demonstrated, this section determines the final sample used as the basis in the empirical analysis. Thereby all observations from the initial population have been deleted where all components of Other Comprehensive Income were equal to zero. This was done by carrying out list wise deletion for the identified observations thereby avoiding having observations in the sample for which components of Other Comprehensive Income were not reported at that time.[468] Such observations result in a Comprehensive Income which is equal to

[467] After the adjustments carried out the sample was non-significantly different from the composition of the initial sample especially relating to industry distribution, country distribution and average market capitalization.

[468] The use of list wise deletion is the preferred approach for dealing with situations where data is potentially "truly" missing in accounting research. Even though this elimination has the disadvantage of reducing the sample size it is the correct approach in cases where it is not clear if the data was left out intentionally.

Net Income and have the possible risk that the data was missing either because the values were not being reported or because the company had no Other Comprehensive Income position to report. Moreover this procedure is in line for example with the method carried in the analysis by Kanagaretnam et al. (2009) and Jones and Smith (2011). This correction reduces the initial sample size by 93 observations.

For companies where at least one component of Other Comprehensive Income was reported, zeros were inserted for the remaining components.[469] For example, if a company has only reported values for gains and losses on available-for-sale financial assets and effective portion of gains and losses in cash flow hedges, then zeros for the remaining components foreign currency translation adjustments, actuarial gains and losses on defined benefit plans, changes in revaluation surplus of tangible and intangible assets, and share of Other Comprehensive Income of investments in associates have been inserted.[470] This procedure assumes that the reporting company followed the concept of Comprehensive Income reporting and by this method it is avoided that the values in the final sample were truly missing.[471] Moreover, all observations have been eliminated from the sample where the equity value was below zero. The 22 observations were removed from the sample to avoid including companies in extreme financial situations close to bankruptcy.[472] This leads to a final sample size of 3,239 observations in the analysis.

[469] Cf. Kanagaretnam et al. (2009), p. 354, Goncharov and Hodgson (2011), p. 32 for a similar application.

[470] This procedure is not problematic as the values are in fact missing and not missing because they were not recorded as pointed out by one of the often referred to reference by Day (2007), p. 121 - ”Missing data refers to a data value that should have been recorded but, for some reason, was not.”. Moreover the missing values do not “hide true values that are meaningful for analysis” as pointed out by Little and Rubin (2002), p. 8 and are therefore not problematic.

[471] If the non existence of values would be falsely assumed but were in reality not truly missing this could distort the results significantly. The hand collection of data in addition ensures that there was no information mistakenly lost due wrong classification.

[472] See Barth et al. (1998) on the information value that negative book value of equity provides on the financial situation of the entity. Reference is also made to Lins (2003), p. 163, Goncharov and Hodgson (2011), p. 32 for similar application in the data selection process.

*Table 4.3: Sample selection and final sample size*

| | Removed Observations | Total Observations |
|---|---|---|
| Sample size after the data selection process | | 3,354 |
| Remove all observations where all OCI componentswere equal to zero | 93 | 3,261 |
| Remove all observations where the BVE was below zero | 22 | 3,239 |
| Final sample size used for the analysis | | **3,239** |

### 4.5.4 Missing Values for Other Comprehensive Income Components

As already mentioned in section 4.5.3, there is a challenge of dealing with missing values when analyzing Other Comprehensive Income components.[473] Due to currently prevailing reporting choices, industry specific occurrences, and the fact that the explicit reporting of components of Other Comprehensive Income has only recently been required, the reported figures vary significantly across entities. Not only in relative size of the position but also in the reporting of entries as such. In empirical research, the issue of missing data is generally dealt with in two ways, either by totally excluding them or by setting the observations to zero. However, both approaches can have a significant effect on the results.[474] An omission of observations may significantly reduce the sample size, whereas setting observations to zero may produce a bias towards zero.

For this study, the value of Other Comprehensive Income components have been hand-collected from the annual report of the respective companies and, therefore, a missing of data due to wrong classification in the database or random non-availability can be limited. Nevertheless, in this context, it has been controlled if the inclusion of zeros for the missing data had an information value for the regression carried out.[475]

[473] Reference is made to Prof. Igor Goncharov for his valuable input on the treatment of missing values in the context of studies on Other Comprehensive Income components.

[474] Cf. Casey et al. (2014), p. 3.

[475] Reference is made to Prof. Christina Felfe from the Swiss Institute for Empirical Economic Research at the University of St. Gallen for her very useful input on the test on information value of missing values in the context of this study.

To test for this possible information value, dummy variables for each Other Comprehensive Income component are included in the regressions which take the value “one” if the component is equal to zero and “zero” otherwise. Moreover, two regressions are calculated, one including all independent variables and another one including the same variables but also the previously generated dummy variables. Based on the results an F-test is performed to test if the models are being significantly different from each other. The unconstrained model is the regression including the dummy variables and the constrained model is the regression solely with the independent variables.

The F-Statistic with the initial sample generates value between 11.0 and 14.2 for all models at a $p<0.01$ significance level.[476] The results show that the regression including the dummy variables is significantly different from the regression not including the dummies. This suggests that the missing values do have an impact on the regression analysis. The results emphasize the importance of using comprehensible and verified data for the analysis.[477]

### 4.5.5 Unusual and Influential Data

In the sample, single unusual observations can have a significant influence on the results of a regression and should be further investigated. The potential identification procedures especially look for unusual observations which are (i) identified as an outlier based on a large residual, (ii) an observation with extreme values deviating significantly from the mean of the other variables together resulting in (iii) an observation that has a considerable effect on the estimated coefficient when included in the regression.[478]

The outlier deletion method applied in this study is trying to identify bad data-points rather than looking for mild or extreme outliers to increase the pattern quality of the regression. This study uses the approach of dropping observations of the main test variables in the 1$^{st}$ and the 99$^{th}$ percentile, which is in line with comparable studies in

[476] The F-values for the different models are as follows: Price model 14.07, return model 14.16, abnormal return model 11.83, average target price models 13.70, and average of forecasting models 10.98.

[477] The use of hand collected data in this study addresses this potential shortcoming.

[478] Cf. UCLA: Statistical Consulting Group (2013), chapter 2.1.

this research area such as Ernstberger (2008) or Goncharov and Hodgson (2011).[479] Another motivation for this approach is the possible occurrence of "fat-tailed distributions" in the context of the test for normality.[480]

### 4.5.6 Selection of Announcement Dates

The date on which the information on the annual financial results is made available to the market can significantly differ amongst companies and reporting years and can considerably deviate from the publication of the annual report. The identification of the correct date when the annual information was first officially available to the investor community is of particular importance for the value-relevance of income measures examined in this study. Even though the accounting figures published in the annual report are value-relevant to investors, they may lose their decision relevance due to the earlier announcement of results in a previously published ad hoc[481] notice. The motivation for an advanced publication can be diverse. One example from the observation period was that several companies chose to report their annual results earlier than expected during the downturn in 2008 / 2009 to remove the uncertainty and the corresponding downwards trend from the share price. There were also situations when companies announced their results during a positive market sentiment, for example when they announced an acquisition simultaneously with an increase in profits of the company. Both situations have in common the fact that investors immediately react to such information. Hence, this study uses the first announcement date of the relevant results to the market. This date can either be the publication of preliminary results or the publication of Q4 figures.[482] These dates can be identical to the date of publication of the annual report but can also significantly vary from this

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[479] Cf. Ernstberger (2008), p. 15, Goncharov and Hodgson (2011), p. 32 for similar approaches. A similar, more differentiated approach has been used in the paper by Barth et al. (2013), p. 20 using the 1% and 99% levels as an initial indicator and then deletion based on extreme DFBETA values. See also Belsley et al. (2004), pp. 69–75 for the identification of influential data.

[480] When controlling for the normality of residuals for the models in this study, the potential occurrence of the so called "fat-tail" and skewed distributions has been identified. This potential disturbance may affect the normality assumption of the linear regression analyses carried out. A regression following a "fat-tail" distribution has more extreme observations than expected under normality and is often observed when dealing with financial data. Cf. Wu and Shieh (2007), pp. 248–259.

[481] A company is obliged to immediately issue an ad hoc announcement if the stated facts materially affect the share price of a listed company or if the information may affect the possibility to meet obligations for an outstanding listed bond.

[482] The use of preliminary results and Q4 figures has been selected because the majority of the information for the full financial year is already included in that information.

date. This concept is in contrast to most of the value-relevance studies conducted so far who calculate the value-relevance on the basis of share prices and returns three months after the fiscal year-end not incorporating the actual announcement date of the results.[483] To compare the results of this study to the findings of earlier studies, the regressions have been recalculated with data generated three months after the fiscal year-end to see if there are any significant differences.

As a primary source for the earnings announcement date this analysis uses publication dates provided by the databases Thomson One and Bloomberg. A validity check has been performed for a sample of 100 data points. The announcement dates for preliminary results / Q4 results as well as the dates for the announcement date of final annual results have been manually verified by performing cross-checks. As a primary source the respective corporate website has been mainly used; however, in case of unavailable announcement dates, the information has been generated from the company news function[484] on Bloomberg. The validity check confirms the use of announcement dates for the publication of annual results. However, the generated data does not provide resistant outcomes for the preliminary results / Q4 results. For the sample of 100 observations the announcement date for 29 reported announcements in the databases was different from the manually checked dates. As a consequence, for all companies in the sample the announcement dates have been manually collected from the corporate news section of the investor relations homepage and from the company news function on Bloomberg, as mentioned above. The motivation for this procedure is supported by the fact that the announcement dates in the databases for non-US companies is often equal to the date of the physical or digital publication annual report instead of the release of results. In some cases the information provided mistakenly shows the date the data has been entered into the database which in many cases differs from the actual announcement date.[485] The insufficient data quality for announcement dates for international companies from the I/B/E/S database source has been confirmed by DeFond et al. (2007) and Griffin et al. (2011) where they compare the

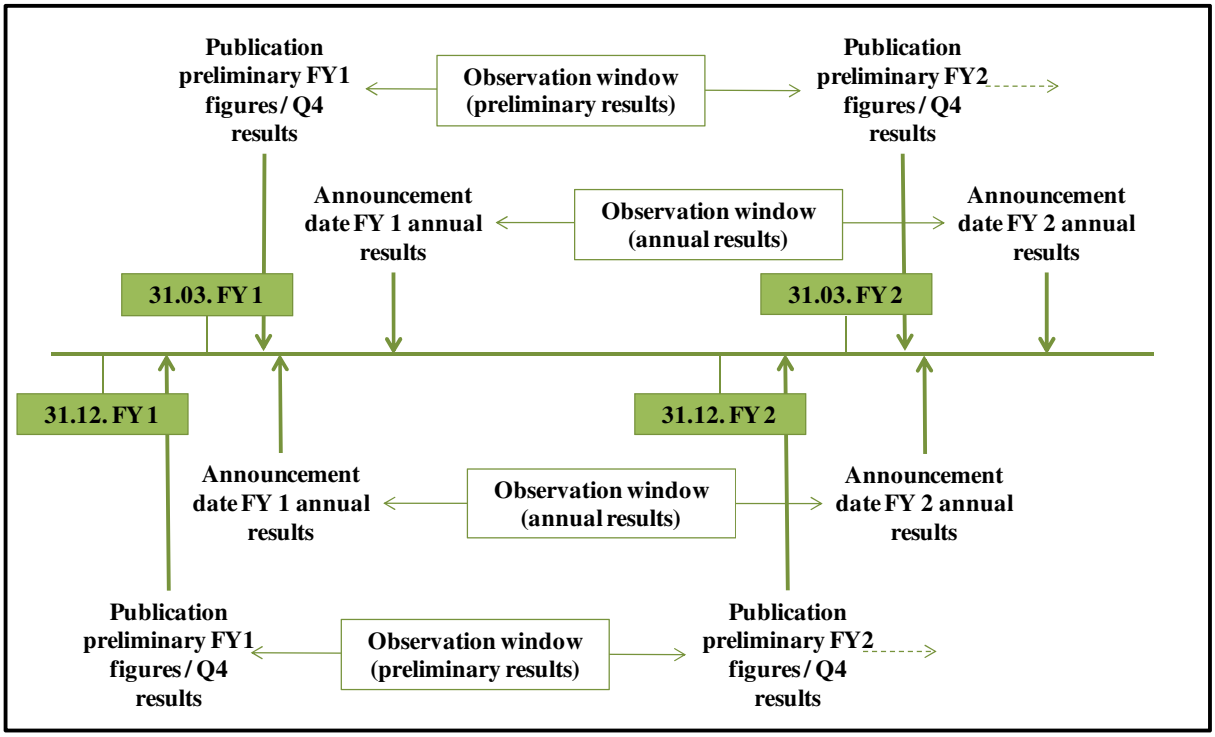
[483] Cf. e.g. Biddle and Choi (2006), p. 11, Kanagaretnam et al. (2009), p. 383, Jones and Smith (2011), p. 2054, Goncharov and Hodgson (2011), p. 38.

[484] The company news function (CN) by Bloomberg shows the relevant news for the selected security from all major news providers. It is therefore possible to identify the exact date and time when the information of interest (even if not officially announced) has been available to the market.

[485] Cf. DeFond et al. (2007), p. 39, Barber et al. (2013), p. 120.

announcement date in the database with the dates in the financial press.[486] In the empirical part of the study the analysis has been executed for preliminary results / Q4 results as well as final annual results in order to give an indication of data quality for other research in this area. Figure 4.3 demonstrates the motivation for a differentiated view on the announcement date of results. The illustration shows that the observation windows of various companies can on the one hand differ because of the deviating fiscal year end and on the other hand because of the difference between the date of publishing preliminary figures and the announcement date of annual results.

*Figure 4.3: Example of the differences between announcement dates of results*[487]




## 4.5.7 Adjustment of Share Prices for Shares Outstanding and Dividends

In the context of the empirical analysis carried out in this study, it is of particular importance to adjust share prices for changes in the number of shares outstanding[488]

[486] Cf. Griffin et al. (2011), p. 3949. In only 23% of the cases for developed markets and 8.4% for emerging markets the announcement date on I/B/E/S could be confirmed by an article in the financial press.

[487] Own illustration.

[488] If for example a stock split by the factor of ten during the financial year is assumed then the non-adjusted price will be distorted by the factor of ten as well. The contrary effect can be observed in case of a share consolidation.

and the dividends[489] paid during the financial year to ensure a comparable dataset. To avoid distracted and incorrect results the historical prices as well as the trading volumes taken from the Bloomberg database have been adjusted for share splits / consolidation, rights offerings, dividend and spin-offs. By using the Bloomberg function "DPDF" the historical share prices and corresponding trading volumes are adjusted for the previously described changes in the number of shares outstanding and dividend payments by calculating back those changes to the historical data.[490] This ensures that the data is comparable across companies and over time. Cross-checks on the basis of Thomson One data confirm the validity of these adjustments.

### 4.5.8 Treatment of Restatements

The requirement for the publication of restatements is stated in IAS 8 and obliges the publication of a corrected statement if the previously published statement contained material inaccuracies which may have influenced the decision making of users of financial statements. The restatements can relate to accounting policies, changes in accounting estimates and errors. As a general rule all restatements have been considered in this analysis and the updated figures have been used in the reporting period with a more differentiated approach taken for the reporting year 2012.[491] Restatements to the financial statements for the year 2012 have not been considered if they relate to reporting adjustments that need to be applied for financial years beginning on or after January 1, 2013.[492] These changes in accounting policy do not have an effect on the results from the observation period and are excluded to secure the comparability of data.

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[489] The dividend paid to the shareholders differs significantly among companies in absolute as well as relative terms and has a significant impact on the development of the share price.

[490] See Kothari and Zimmerman (1995), p. 164, Dhaliwal et al. (1999), p. 62, Pinto (2005), p. 118, Barth et al. (2008) for a similar treatment.

[491] Even though the effect that restatements may have on the share price and share return are not explicitly examined, e.g. by Efendi et al. (2007), the inclusion of restatements in the analysis and the incorporation in the share price over the year captures this influence in the analysis of this study.

[492] One of the most significant changes to the companies from the sample relating to those restatements is the application of IAS 19 (revised) for annual periods beginning on or after January 1, 2013. If not already previously voluntarily applied, companies need to report actuarial gains and losses on defined benefit plans directly in Other Comprehensive Income, eliminating the choice of reporting those changes using the corridor method or the faster recognition. See also section 2.2.4 for a comprehensive overview of the treatment of actuarial gains and losses on defined benefit plans.

# 5 Results

After illustrating the procedure for the empirical analysis in the previous chapter, this chapter presents the results of the analysis. The chapter begins with a quantitative overview of Net Income, Comprehensive Income and the components of Other Comprehensive Income based on the sample used in the analysis. In the following section the descriptive statistics provide an overview of the main characteristics of data, including the correlation matrices. The then following section, as the center of the analysis, presents the results from the different regression models. As a matter of clarity and to increase the explanatory power of the results presented in the following two chapters, abbreviations for the income measures have been used.[493]

## 5.1 Quantitative Overview of Income Measures

The qualitative overview provides a first impression of the distribution and development of the different income measures and serves as a basis for the regression analysis and the interpretation of the results carried out in the following sections. In a first step, a general overview of the distribution of Net Income (referred to as NI), Comprehensive Income (referred to as CI), and components of Other Comprehensive Income (referred to as OCI) in the sample is provided. In addition, the development of the publication of those income measures is analyzed over the observation period. In a second step, the development of NI and CI over the observation period is analyzed via graphical examination. In a third step, the components of OCI components are examined in more detail across industries.

Table 5.1 shows the development of the number of observations for NI, CI and, components of OCI with non-zero counts over the observation period. Whereas, NI and CI are reported for all observations, the number of published OCI components differs significantly across observations. The number of observations for foreign currency translation adjustments (referred to as FCT) on average amounts to 84%, for the effective portion of gains and losses in cash flow hedges (referred to as CFH) on

[493] The following abbreviations are used: NI – Net Income, CI – Comprehensive Income, OCI – Other Comprehensive Income, FCT – Foreign currency translation adjustments, AFS – Gains and losses on available-for-sale financial assets, CFH – Effective portion of gains and losses in cash flow hedges, ACT – Actuarial gains and losses on defined benefit plans, REV – Changes in revaluation surplus of tangible and intangible assets, ASS – Share of Other Comprehensive Income of investments in associates, OTH – Other items recognized in Other Comprehensive Income, OCF – Operating Cash Flows, BVE – Book Value of Equity, and EQ – Total Common Equity.

average to 74%, gains and losses on available-for-sale financial assets (referred to as AFS) are reported for 50% of the observations, and actuarial gains and losses on defined benefit plans (referred to as ACT) on average are reported for 35% of the observations. The other components are on average less often reported for the observations in the sample, with the share of Other Comprehensive Income of investments in associates (referred to as ASS) amounting to 20%, changes in revaluation surplus of tangible and intangible assets (referred to as REV) to 6%, and other items recognized in Other Comprehensive Income (referred to as OTH) to 14%.

When assessing the development of the individual income components over time, two items are particularly striking: ACT and ASS. The increase in the number of observations for ACT from 27% in 2007 to 46% in 2012 can be explained by the anticipation of the revision of IAS 19. This development might have been caused by the restriction of only permitting a direct recognition via OCI.[494] The changes in the development in the ASS from 8% in 2007 to 25% in 2012 could be explained by the changes that have been introduced to IAS 28 in the Business Combination Phase II project by the IASB. The changes made to IAS 28 in connection with the project relate to the classification of significant influence. Hence, companies might have reconsidered their reports of investments in associates.[495]

[494] Reference is made to section 2.2.4 for further details on ACT and the changes recently made by the regulator.

[495] Cf. IASB (2008d). The changes introduced in January 2008 became effective for annual periods starting on January 1, 2009.

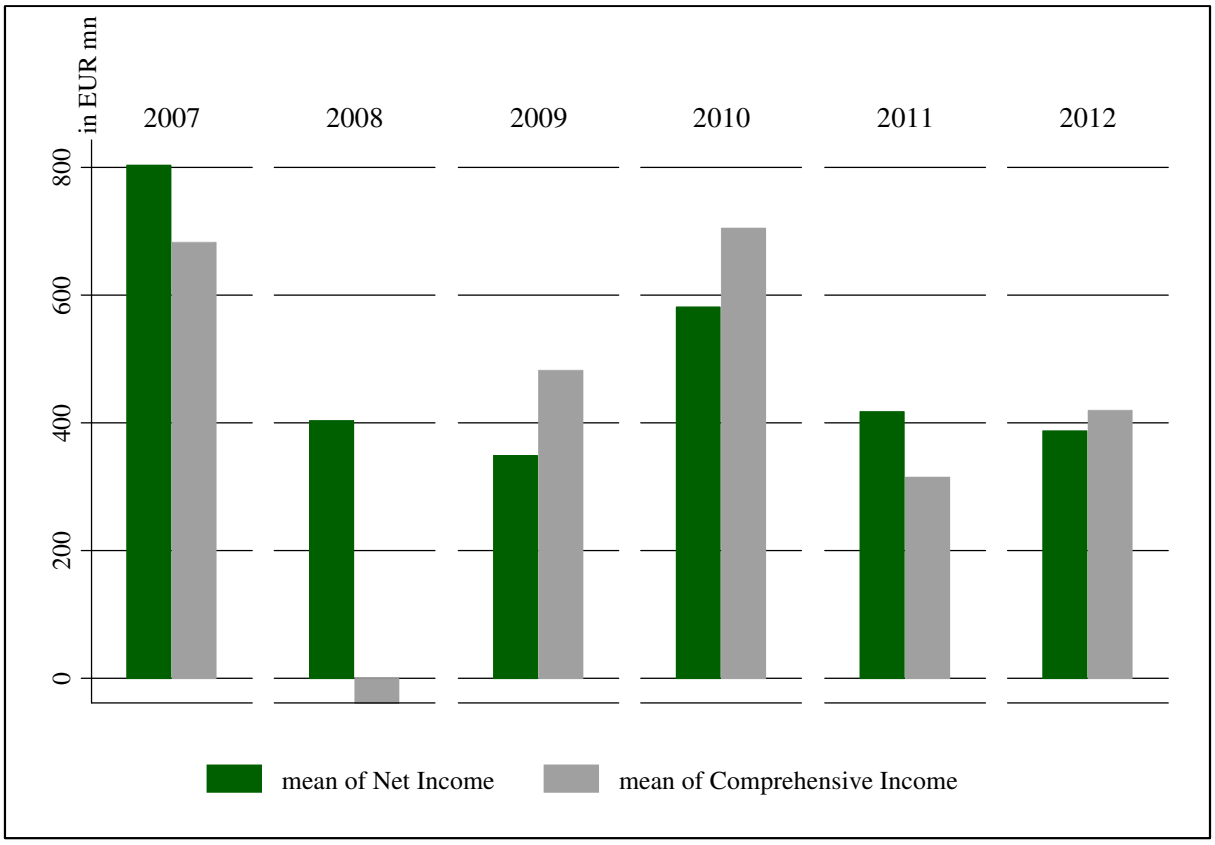
*Table 5.1: Observations of income measures with non-zero counts over time*

| | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Obs.** | **in %** | **Obs.** | **in %** | **Obs.** | **in %** | **Obs.** | **in %** | **Obs.** | **in %** | **Obs.** | **in %** | **Obs.** | **in %** |
| **NI** | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% |
| **CI** | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% | 559 | 100% |
| **FCT** | 440 | 79% | 474 | 85% | 480 | 86% | 484 | 87% | 478 | 86% | 477 | 86% | 472 | 84% |
| **AFS** | 254 | 45% | 289 | 52% | 296 | 53% | 289 | 52% | 281 | 50% | 280 | 50% | 282 | 50% |
| **CFH** | 351 | 63% | 410 | 73% | 429 | 77% | 432 | 77% | 435 | 78% | 440 | 78% | 416 | 74% |
| **ACT** | 144 | 26% | 171 | 31% | 176 | 31% | 186 | 33% | 247 | 44% | 256 | 44% | 197 | 35% |
| **REV** | 26 | 5% | 36 | 6% | 39 | 7% | 28 | 5% | 35 | 6% | 34 | 6% | 33 | 6% |
| **ASS** | 41 | 7% | 94 | 17% | 126 | 23% | 131 | 23% | 136 | 24% | 134 | 24% | 110 | 20% |
| **OTH** | 73 | 13% | 83 | 15% | 83 | 15% | 82 | 15% | 75 | 13% | 74 | 13% | 78 | 14% |

One of the major aspects covered throughout this study is the comparison of NI and CI. In Figure 5.1 the development of the two income measures is illustrated over the observation period of the empirical analysis. From an initial examination, one could suggest that CI is more volatile than NI. Moreover, the figure shows, that especially for the crisis year 2008, CI is not only lower than NI but turning a positive average NI of about 400 million Euro into a negative average CI of about 40 million Euro.[496] Figure 5.1 also shows that the analysis of NI and CI requires a more differentiated examination.

[496] Cf. Leibfried and Amann (2002), pp. 195–197. The authors suggest that for the companies of the German DAX 100 Index the sum of OCI exceeded the sum of NI reported in 2001 leading to a negative CI. The situation after the burst of the technology bubble in 2001 is mutatis mutandis transferrable to the aftermath of the financial crisis in 2008.

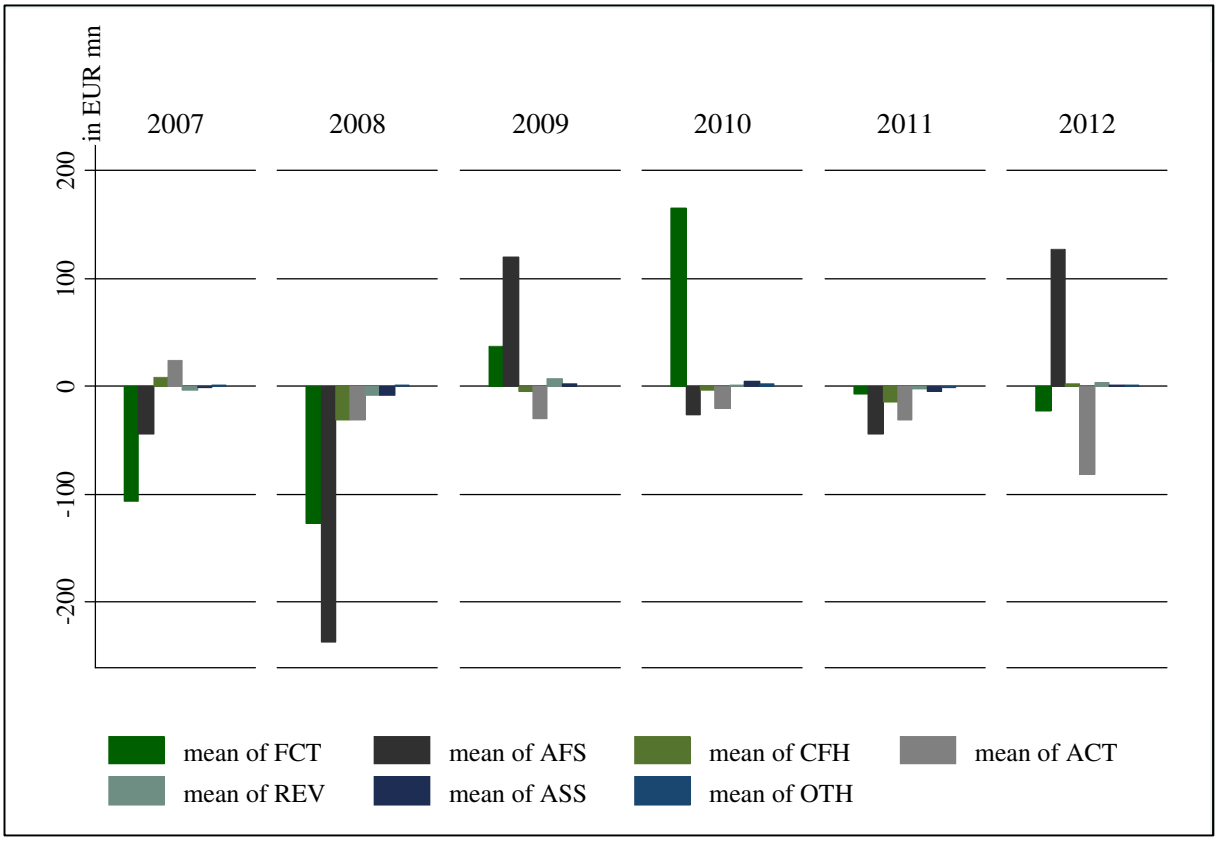
*Figure 5.1: Mean of NI an CI over time*




The difference between NI and CI, namely OCI and its components are displayed in more detail in Figure 5.2. The figure illustrates that the mean composition of the OCI components significantly vary over time. The changes in CI are mainly driven by FCT and AFS. The impact of ACT on CI continuously increases over time. In addition, CFH and the remaining components only have a marginal impact on CI. Moreover, the illustration shows that the importance of the OCI components significantly changes over time and that the majority of components seem to be reverting over time.[497] In particular, FCT and AFS show extreme values in both directions over time. The development of ACT is negative and increasing in value over time, with the exception of 2007.

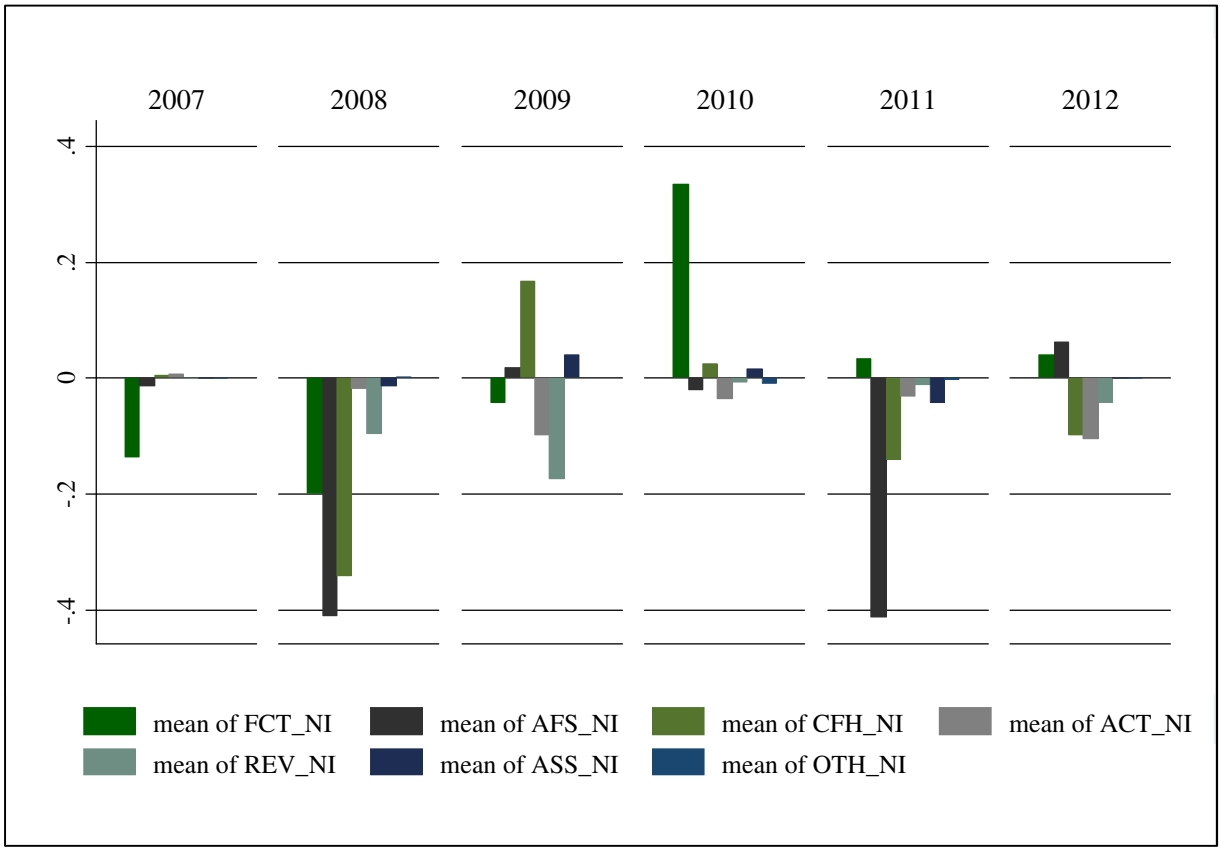
[497] The exclusion of the financial industry as a potential distorting factor led to qualitatively similar results.

*Figure 5.2: Mean of OCI components by year*




Not only the means of the absolute values of the components of OCI are of interest for the analysis but also the relative values compared to NI. Figure 5.3 illustrates the relative importance of OCI components for the observed period. Comparing the previous illustration with the figure shown below, shows that the relative importance of CFH and REV increased significantly. This display illustrates that there might be companies where those components are non-significant on an absolute basis (based on absolute values) but are significant on a relative basis (relative to e.g., NI). This result is an indicator for the fact that a comparison solely based on means is insufficient and the use of a fixed effects model including company specific fixed effects could be appropriate.

Figure 5.3: Mean of OCI components relative to NI by year

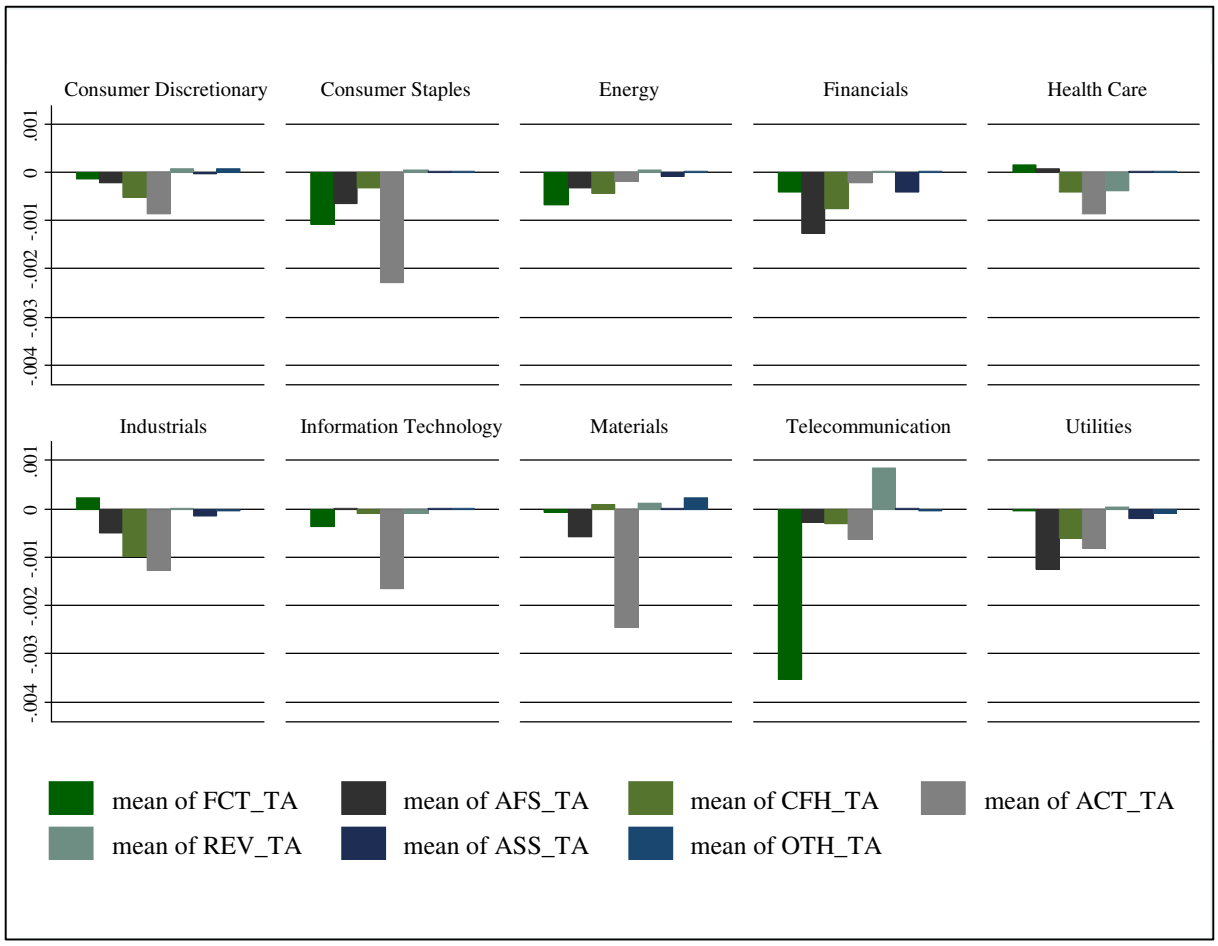



As business models significantly differ across industries and because business sectors react differently to extreme effects, e.g., the Financial Crisis, Figure 5.4 illustrates the mean of OCI relative to NI by industry. This reflects the fact that OCI components not only vary over time but especially depend on the industry the company is operating in. The illustration shows the mean for components of OCI divided by total assets[498] across industries. Combining the observations made in Figure 5.3 with the observations from Figure 5.4, the indicated revising effect of OCI components becomes even more apparent. The illustration shows that when combining the development of OCI components on an industry level and, therefore, neglecting the time component, most of the previously observed changes revert over time. Only ACT seem to be accumulating rather than reverting over time and, therefore, have a

[498] To incorporate potential effects relating to company size the OCI components have been scaled by the total assets at the end of the financial year.

significant impact across industries. Moreover, FCT seem to be a non-reverting position for the Telecommunication Service.[499]

*Figure 5.4: Mean of OCI components relative to NI by industry*[500]




The initial examination shows that OCI components can be substantial for certain years even though they seem to be reverting over time. Concluding, CI on a consolidated basis can only be one source of information for investors. A detailed analysis of components of OCI is necessary in the context of value-relevance and forecasting ability. The quantitative overview shows that the inclusion of the different components of OCI in the regressions carried out needs special attention. The

[499] The non-reverting position of FCT scaled by total assets for the Telecommunication Service industry has majorly been influenced by Portugal Telecom and Hellenic Telecom. The two companies had comparably high foreign values for FCT scaled by total assets for the years 2007 to 2010 which did not revert thereafter. After the outlier deletion process at the 1% and 99% level the impact has been smoothed.

[500] The values have been scaled by total assets.

inclusion of control variables, interaction variables, and thoroughly carried out robustness checks are key to make the results from the analysis resilient.

## 5.2 Descriptive Statistic

The sample has been initially selected on the basis of the EuroSTOXX TMI which includes the largest companies from the Eurozone. Table 5.2 provides an overview of the distribution of the observations by industry and country based on the number of observations.

*Table 5.2: Industry and country distribution of the sample by number of observations*

| | GICS Secor Name | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Con-sumer Discr. | Con-sumer Staples | Energy | Finan-cials | Health Care | Indu-strials | IT | Mat-erials | Tele-com | Utilities | Obser-vations | in % |
| Austria | 0 | 6 | 12 | 54 | 6 | 41 | 12 | 24 | 6 | 12 | 173 | 5.3% |
| Belgium | 12 | 18 | 0 | 63 | 29 | 12 | 18 | 36 | 6 | 6 | 200 | 6.2% |
| Finland | 36 | 18 | 6 | 24 | 12 | 96 | 18 | 53 | 6 | 6 | 275 | 8.5% |
| France | 146 | 42 | 24 | 108 | 48 | 132 | 70 | 46 | 12 | 35 | 663 | 20.5% |
| Germany | 112 | 24 | 0 | 84 | 35 | 156 | 66 | 65 | 6 | 18 | 566 | 17.5% |
| Greece | 35 | 6 | 6 | 47 | 8 | 41 | 0 | 36 | 6 | 23 | 208 | 6.4% |
| Ireland | 6 | 18 | 0 | 18 | 0 | 30 | 0 | 12 | 0 | 0 | 84 | 2.6% |
| Italy | 105 | 18 | 22 | 159 | 24 | 80 | 0 | 18 | 6 | 36 | 468 | 14.4% |
| Luxembourg | 12 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 19 | 0.6% |
| Netherlands | 21 | 42 | 12 | 54 | 6 | 54 | 18 | 12 | 6 | 0 | 225 | 6.9% |
| Portugal | 5 | 6 | 6 | 18 | 0 | 12 | 0 | 18 | 6 | 6 | 77 | 2.4% |
| Spain | 41 | 18 | 12 | 59 | 14 | 70 | 8 | 11 | 6 | 42 | 281 | 8.7% |
| Observations | 531 | 216 | 100 | 689 | 188 | 724 | 210 | 331 | 66 | 184 | 3,239 | |
| in % | 16.4% | 6.7% | 3.1% | 21.3% | 5.8% | 22.4% | 6.5% | 10.2% | 2.0% | 5.7% | | |

The remaining of this section provides an overview of the descriptive statistics for the models used in this study, focusing on summary statistics and correlation matrixes.

### Descriptive Statistics Price Model

The summary statistics illustrated in Table 5.3 provides an overview of the different variables used in the price model. The total sample size used to examine the association between share price and income measures amounts to 2,744 observations due to the outlier deletion in the 1st and the 99th percentile. The share price ($P/S_{it}$) has a mean of 21.5 and due to the large variation of the share prices in the sample a standard deviation of 21.8. A similar pattern can be observed for the Book Value of Equity (referred to as BVE) where the mean is 13.7 and the standard deviation amounts to 15.1. The median and mean for NI and CI are positive and confirm the expected outcome. The price / earnings ratio[501] calculated for the mean of all observations amounts to 14.5x based on NI and 15.7x based on CI and are in line with the comparable ratios provided on the EURO STOXX TMI.[502] The mean and the average for OCI on an aggregated basis is negative, because of the negative mean values for all components of OCI. The mostly negative values for the components of OCI could be a result of the economic downturn for the observation period with the financial as well as the Eurozone crisis. All components of OCI have, as expected, a median of 0 and most of the components amount to 0 in the 25% and the 75% quartiles, which is a result of the infrequent reporting of those items as has been demonstrated in the previous section.[503]

[501] The price / earnings ratio is calculated by taking the share price of a company (or an average / mean of a group) and dividing it by the last reported book value of equity per share of the company (or an average / mean of a group).

[502] Cf. STOXX Limited (2014), where the trailing price / earnings ratio based on NI amounts to 13.6x and 14.6x based on projections.

[503] This distribution of the observation for OCI components is in line with descriptive statistics carried out by comparable studies. Cf. e.g. Kanagaretnam et al. (2009), p. 357, Goncharov and Hodgson (2011), p. 33.

*Table 5.3: Summary statistics price model*

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $P/S_{it}$ | 2,744 | 21.532 | 21.849 | 0.435 | 5.599 | 14.303 | 29.893 | 151.675 |
| $BVE/S_{it}$ | 2,744 | 13.659 | 15.128 | 0.595 | 4.194 | 8.366 | 17.437 | 112.131 |
| $NI/S_{it}$ | 2,744 | 1.481 | 2.243 | -6.173 | 0.253 | 0.938 | 2.233 | 16.368 |
| $CI/S_{it}$ | 2,744 | 1.374 | 2.314 | -7.887 | 0.182 | 0.855 | 2.086 | 16.932 |
| $OCI/S_{it}$ | 2,744 | -0.109 | 0.698 | -4.472 | -0.224 | -0.015 | 0.079 | 2.732 |
| $FCT/S_{it}$ | 2,744 | -0.005 | 0.476 | -2.956 | -0.068 | 0 | 0.057 | 3.025 |
| $AFS/S_{it}$ | 2,744 | -0.029 | 0.415 | -3.618 | -0.001 | 0 | 0 | 2.602 |
| $CFH/S_{it}$ | 2,744 | -0.027 | 0.210 | -1.987 | -0.030 | 0 | 0.011 | 0.954 |
| $ACT/S_{it}$ | 2,744 | -0.046 | 0.180 | -1.545 | -0.001 | 0 | 0 | 0.416 |
| $REV/S_{it}$ | 2,744 | 0.001 | 0.016 | -0.150 | 0 | 0 | 0 | 0.257 |
| $ASS/S_{it}$ | 2,744 | -0.003 | 0.027 | -0.357 | 0 | 0 | 0 | 0.138 |
| $OTH/S_{it}$ | 2,744 | 0.000 | 0.007 | -0.058 | 0 | 0 | 0 | 0.104 |

Table 5.4 shows the Spearman's rank correlation coefficients for the price model. In general, values above or close to 0.8 can be problematic in the context of multicollinearity and need further investigation.[504] The high values for the correlation between NI and CI of 0.95 at $p<0.1$ are expected, as the former is nested in the latter income measure. However, this correlation is not problematic because the current analysis never uses the two components jointly in the same model. Moreover, the high correlation between BVE and share price ($P/S_{it}$) of 0.70 is expected and relates to the model construction and underlying theory. A rather low value in this context would give an indication of model misspecification. The variance inflation factor (VIF) is used to revalidate the results for potential indicator of multicollinearity between variables.[505] For the price model the highest observed VIF score is 1.7 which is clearly below the critical value of 10 and indicates that an issue of multicollinearity is not predominant for the observed data.

As anticipated, both NI and CI significantly correlate with the share price, the correlation being higher for the former than for the latter. Furthermore, there is a

[504] Cf. Kennedy (2008), p. 196.

[505] Cf. Cahan et al. (2000), p. 1290 for similar application. In this analysis a tolerance value of 0.1 is applied which is comparable to a VIF score of 10. The application follows the use of a VIF cut-off rate of 10 applied among others by Baum (2006) and Kennedy (2008) and is established as a practical guideline. Reference is made to O'Brien (2007) for a critical review of a rule of thumb for the VIF. The author criticizes that researchers often eliminate variables from their sample to reduce collinearity and therefore fulfill the kind of random threshold of a VIF of 10, 20, 30 or even beyond that figure. Cf. StataCorp LP (2013), pp. 1892 –1859 for an overview of the interpretation of the VIF figure provided by Stata.

positive and significant correlation at p<0.01 with FCT and the share price of 0.06 as well as with OTH and the share price of 0.09 and a negative and significant correlation of ACT with the share price of -0.19.

*Table 5.4: Spearman correlation matrix price model*

| | $P/S_{it}$ | $BVE/S_{it}$ | $NI/S_{it}$ | $CI/S_{it}$ | $OCI/S_{it}$ | $FCT/S_{it}$ | $AFS/S_{it}$ | $CFH/S_{it}$ | $ACT/S_{it}$ | $REV/S_{it}$ | $ASS/S_{it}$ | $OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $P/S_{it}$ | 1.000 | | | | | | | | | | | |
| $BVE/S_{it}$ | **0.699*** | 1.000 | | | | | | | | | | |
| $NI/S_{it}$ | **0.696*** | **0.604*** | 1.000 | | | | | | | | | |
| $CI/S_{it}$ | **0.666*** | **0.547*** | **0.953*** | 1.000 | | | | | | | | |
| $OCI/S_{it}$ | -0.031 | **-0.129*** | **-0.053*** | **0.250*** | 1.000 | | | | | | | |
| $FCT/S_{it}$ | **0.059*** | -0.011 | -0.010 | **0.120*** | **0.694*** | 1.000 | | | | | | |
| $AFS/S_{it}$ | -0.029 | **-0.059*** | -0.023 | **0.168*** | **0.629*** | 0.039 | 1.000 | | | | | |
| $CFH/S_{it}$ | -0.016 | **-0.119*** | -0.032 | **0.076*** | **0.353*** | 0.040 | **0.054*** | 1.000 | | | | |
| $ACT/S_{it}$ | **-0.186*** | **-0.190*** | **-0.086*** | -0.035 | **0.158*** | **-0.094*** | -0.044 | -0.042 | 1.000 | | | |
| $REV/S_{it}$ | 0.035 | 0.028 | 0.035 | 0.044 | 0.032 | 0.004 | -0.011 | 0.020 | 0.034 | 1.000 | | |
| $ASS/S_{it}$ | -0.044 | **-0.069*** | **-0.061*** | -0.013 | **0.156*** | 0.035 | **0.085*** | **0.082*** | **0.072*** | -0.029 | 1.000 | |
| $OTH/S_{it}$ | **0.090*** | **0.092*** | **0.059*** | **0.069*** | 0.027 | 0.015 | 0.042 | -0.035 | 0.004 | -0.032 | 0.018 | 1.000 |

* correlation significant at p<0.01

## Descriptive Statistics Return Model

For the return model the summary statistics is illustrated in Table 5.5. The total sample size used to analyze the association between price changes and income measures amounts to 2,381 observations. The sample size for the return model is smaller compared to the price model because the former analyses price changes as opposed to price levels and, therefore, losing one year of observations. Contrary to the summary statistic for the price model, the mean and median for the dependent variable share return and the independent variables, changes of NI and CI are negative. The means for the changes in OCI on an aggregated level, for changes in FCT and changes in AFS are positive, whereas the other components of OCI are negative. Changes in ACT, changes in REV, changes in ASS, and changes in OTH, based on quartiles, at least 50% of the values are equal to zero; however, the values for minimum and maximum show that in some cases extreme values are possible.

*Table 5.5: Summary statistics return model*

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $RET/S_{it}$ | 2,381 | -0.283 | 9.714 | -53.760 | -3.033 | -0.045 | 3.210 | 35.144 |
| $\Delta NI/S_{it}$ | 2,381 | -0.157 | 1.892 | -13.077 | -0.418 | 0.003 | 0.320 | 9.204 |
| $\Delta CI/S_{it}$ | 2,381 | -0.134 | 2.263 | -17.852 | -0.655 | -0.024 | 0.465 | 13.418 |
| $\Delta OCI/S_{it}$ | 2,381 | 0.023 | 1.170 | -8.157 | -0.247 | -0.001 | 0.222 | 8.916 |
| $\Delta FCT/S_{it}$ | 2,381 | 0.033 | 0.683 | -4.635 | -0.095 | 0 | 0.104 | 4.889 |
| $\Delta AFS/S_{it}$ | 2,381 | 0.028 | 0.818 | -8.675 | -0.001 | 0 | 0.001 | 7.961 |
| $\Delta CFH/S_{it}$ | 2,381 | -0.003 | 0.409 | -5.559 | -0.039 | 0 | 0.027 | 5.935 |
| $\Delta ACT/S_{it}$ | 2,381 | -0.035 | 0.185 | -1.477 | 0 | 0 | 0 | 0.754 |
| $\Delta REV/S_{it}$ | 2,381 | 0.000 | 0.030 | -0.502 | 0 | 0 | 0 | 0.397 |
| $\Delta ASS/S_{it}$ | 2,381 | 0.000 | 0.046 | -0.432 | 0 | 0 | 0 | 0.380 |
| $\Delta OTH/S_{it}$ | 2,381 | 0.000 | 0.060 | -1.944 | 0 | 0 | 0 | 1.158 |

Table 5.6 shows the correlation matrix for the return model. The correlation coefficients lack multicollinearity. The only variable pair with a comparably high correlation coefficient of 0.72 at $p<0.1$ is the changes in NI and changes in CI. However, as these items are not jointly included in any of the return regressions this does not present a potential conflict.[506] Changes in NI, CI as well as OCI on an aggregated basis are all positive and correlate with returns significantly. Similarly, changes in FCT, changes in AFS, changes in CFH, and changes in ASS are positive and correlate with returns significantly at $p<0.01$.

*Table 5.6: Spearman correlation matrix return model*

| | $RET/S_{it}$ | $\Delta NI/S_{it}$ | $\Delta CI/S_{it}$ | $\Delta OCI/S_{it}$ | $\Delta FCT/S_{it}$ | $\Delta AFS/S_{it}$ | $\Delta CFH/S_{it}$ | $\Delta ACT/S_{it}$ | $\Delta REV/S_{it}$ | $\Delta ASS/S_{it}$ | $\Delta OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $RET/S_{it}$ | 1 | | | | | | | | | | |
| $\Delta NI/S_{it}$ | **0.289*** | 1 | | | | | | | | | |
| $\Delta CI/S_{it}$ | **0.396*** | **0.745*** | 1 | | | | | | | | |
| $\Delta OCI/S_{it}$ | **0.328*** | **0.075*** | **0.575*** | 1 | | | | | | | |
| $\Delta FCT/S_{it}$ | **0.227*** | **0.082*** | **0.387*** | **0.650*** | 1 | | | | | | |
| $\Delta AFS/S_{it}$ | **0.164*** | 0.013 | **0.237*** | **0.386*** | 0.023 | 1 | | | | | |
| $\Delta CFH/S_{it}$ | **0.227*** | 0.005 | **0.178*** | **0.366*** | **0.056*** | **0.066*** | 1 | | | | |
| $\Delta ACT/S_{it}$ | 0.013 | -0.005 | **0.093*** | **0.163*** | 0.025 | 0.010 | 0.049 | 1 | | | |
| $\Delta REV/S_{it}$ | -0.019 | -0.024 | -0.029 | -0.009 | 0.010 | -0.027 | -0.001 | -0.006 | 1 | | |
| $\Delta ASS/S_{it}$ | **0.096*** | 0.050 | **0.133*** | **0.198*** | **0.083*** | **0.134*** | 0.031 | 0.038 | -0.004 | 1 | |
| $\Delta OTH/S_{it}$ | -0.014 | 0.015 | 0.027 | 0.010 | -0.008 | 0.035 | -0.006 | -0.027 | 0.047 | 0.005 | 1 |

* correlation significant at $p<0.01$

[506] For the return model the highest VIF score observed is 1.2 which is clearly below the critical value of 10 and indicates a lack of multicollinearity for these observations

### Descriptive Statistics Abnormal Return Model

The summary statistics for the return model are illustrated in Table 5.7. The sample used for the abnormal return model amounts to 2,270 observations.[507] In line with the summary statistic for the return model, the mean and median for the dependent variables for the different definitions of abnormal return (ABRET) are negative for all three calculations. The changes in NI and changes in CI are negative and in line with the value of the different definitions of abnormal return. The means for the changes in OCI, the components for changes FCT, changes in AFS, and changes in OTH are positive, whereas the other components of OCI are negative.

*Table 5.7: Summary statistics abnormal return model*

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $ABRET\_CAPM_{it}$ | 2,270 | -0.009 | 0.251 | -0.646 | -0.173 | -0.026 | 0.143 | 0.860 |
| $ABRET\_Sector_{it}$ | 2,270 | -0.013 | 0.296 | -0.688 | -0.202 | -0.036 | 0.152 | 1.178 |
| $ABRET\_12_{it}$ | 2,270 | -0.091 | 0.427 | -0.903 | -0.385 | -0.120 | 0.142 | 1.555 |
| $\Delta NI/S_{it}$ | 2,270 | -0.136 | 1.862 | -13.077 | -0.390 | 0.007 | 0.328 | 9.204 |
| $\Delta CI/S_{it}$ | 2,270 | -0.126 | 2.248 | -17.852 | -0.620 | -0.020 | 0.470 | 13.418 |
| $\Delta OCI/S_{it}$ | 2,270 | 0.010 | 1.168 | -8.157 | -0.257 | -0.002 | 0.218 | 8.916 |
| $\Delta FCT/S_{it}$ | 2,270 | 0.026 | 0.695 | -4.635 | -0.101 | 0 | 0.107 | 4.889 |
| $\Delta AFS/S_{it}$ | 2,270 | 0.027 | 0.792 | -7.191 | -0.001 | 0 | 0.001 | 7.961 |
| $\Delta CFH/S_{it}$ | 2,270 | -0.007 | 0.424 | -5.559 | -0.042 | 0 | 0.026 | 5.935 |
| $\Delta ACT/S_{it}$ | 2,270 | -0.036 | 0.187 | -1.477 | 0 | 0 | 0 | 0.754 |
| $\Delta REV/S_{it}$ | 2,270 | 0.000 | 0.032 | -0.502 | 0 | 0 | 0 | 0.397 |
| $\Delta ASS/S_{it}$ | 2,270 | 0.000 | 0.047 | -0.432 | 0 | 0 | 0 | 0.380 |
| $\Delta OTH/S_{it}$ | 2,270 | 0.000 | 0.016 | -0.147 | 0 | 0 | 0 | 0.157 |

Based on the correlation matrix for the abnormal return model, illustrated in Table 5.8, the correlation between the different defined abnormal return variables is between 0.64 and 0.74 at $p<0.1$. This is expected but not problematic bacause the variables are not included in the same models. The same holds for the correlation between changes in NI and changes in CI with correlations coefficients of 0.74 repectively. The changes in NI, CI as well as OCI on an aggregated basis are all positive and correlate significantly with the different measures of abnormal returns. Likewise, changes in FCT and changes in AFS significantly correlate with the different abnormal return measures.

[507] Additional observations are lost compared to the return model based on the outlier deletion process on the 1% and 99% percentile for additional variables.

The same pattern can be observed for changes in CFH and changes in ASS. However, abnormal returns and sector returns do not correlate significantly. None of the coefficients indicates multicollinearity.[508]

*Table 5.8: Spearman correlation matrix abnormal return model*

| | AR_ CAPM | AR_ Sector | AR_ 12 | $\Delta NI/S_{it}$ | $\Delta CI/S_{it}$ | $\Delta OCI/S_{it}$ | $\Delta FCT/S_{it}$ | $\Delta AFS/S_{it}$ | $\Delta CFH/S_{it}$ | $\Delta ACT/S_{it}$ | $\Delta REV/S_{it}$ | $\Delta ASS/S_{it}$ | $\Delta OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AR_CAPM | 1 | | | | | | | | | | | | |
| AR_Sector | **0.741*** | 1 | | | | | | | | | | | |
| AR_12 | **0.718*** | **0.635*** | 1 | | | | | | | | | | |
| $\Delta NI/S_{it}$ | **0.324*** | **0.237*** | **0.261*** | 1 | | | | | | | | | |
| $\Delta CI/S_{it}$ | **0.306*** | **0.248*** | **0.385*** | **0.740*** | 1 | | | | | | | | |
| $\Delta OCI/S_{it}$ | **0.126*** | **0.123*** | **0.346*** | **0.068*** | **0.572*** | 1 | | | | | | | |
| $\Delta FCT/S_{it}$ | **0.072*** | **0.110*** | **0.224*** | **0.077*** | **0.388*** | **0.654*** | 1 | | | | | | |
| $\Delta AFS/S_{it}$ | **0.074*** | **0.056*** | **0.189*** | 0.014 | **0.234*** | **0.364*** | 0.015 | 1 | | | | | |
| $\Delta CFH/S_{it}$ | **0.094*** | 0.044 | **0.225*** | -0.003 | **0.173*** | **0.365*** | 0.051 | **0.063*** | 1 | | | | |
| $\Delta ACT/S_{it}$ | -0.047 | -0.036 | 0.0390 | -0.016 | **0.086*** | **0.161*** | 0.023 | 0.006 | 0.052 | 1 | | | |
| $\Delta REV/S_{it}$ | -0.035 | -0.002 | -0.0270 | -0.026 | -0.031 | -0.005 | 0.008 | -0.016 | 0.005 | -0.016 | 1 | | |
| $\Delta ASS/S_{it}$ | **0.056*** | 0.036 | **0.124*** | 0.050 | **0.137*** | **0.199*** | **0.077*** | **0.133*** | 0.037 | 0.041 | -0.005 | 1 | |
| $\Delta OTH/S_{it}$ | 0.017 | 0.018 | 0.0050 | 0.026 | 0.042 | 0.020 | -0.006 | 0.036 | 0.007 | -0.027 | 0.046 | 0.001 | 1 |

* correlation significant at p<0.01

## Descriptive Statistics Target Price Models

Based on the analysis examining the association between NI, CI and components of OCI and the different definitions of target prices, three summary statistics are illustrated in the following tables. In line with the theoretical foundation, the descriptive statistics for the target price models are closely linked to the illustration for the price model, return model and abnormal return model. The sample amounts to 2,639 observations for target price consensus model (TPC), to 2,238 for the target price revision model (TPR), and to 2,229 for the target price potential model (TPP).

[508] For the abnormal return model the highest VIF score observed is 1.2 which is clearly below the critical value of 10 and indicates that multicollinearity can be excluded from these observations.

*Table 5.9: Summary statistics target price models*

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $TPC_{it}$ | 2,639 | 24.798 | 24.775 | 0.713 | 6.950 | 16.500 | 35.000 | 165.500 |
| $BVE/S_{it}$ | 2,639 | 13.869 | 15.722 | 0.054 | 4.230 | 8.463 | 17.477 | 126.745 |
| $NI/S_{it}$ | 2,639 | 1.514 | 2.263 | -6.173 | 0.266 | 0.956 | 2.255 | 16.534 |
| $CI/S_{it}$ | 2,639 | 1.405 | 2.333 | -7.887 | 0.194 | 0.860 | 2.103 | 16.932 |
| $OCI/S_{it}$ | 2,639 | -0.111 | 0.706 | -4.472 | -0.229 | -0.015 | 0.077 | 2.732 |
| $FCT/S_{it}$ | 2,639 | -0.003 | 0.477 | -2.956 | -0.069 | 0 | 0.058 | 3.025 |
| $AFS/S_{it}$ | 2,639 | -0.030 | 0.419 | -3.618 | -0.001 | 0 | 0 | 2.602 |
| $CFH/S_{it}$ | 2,639 | -0.028 | 0.212 | -1.987 | -0.030 | 0 | 0.011 | 0.954 |
| $ACT/S_{it}$ | 2,639 | -0.047 | 0.181 | -1.545 | -0.001 | 0 | 0 | 0.416 |
| $REV/S_{it}$ | 2,639 | 0.001 | 0.016 | -0.150 | 0 | 0 | 0 | 0.257 |
| $ASS/S_{it}$ | 2,639 | -0.003 | 0.027 | -0.357 | 0 | 0 | 0 | 0.138 |
| $OTH/S_{it}$ | 2,639 | 0.000 | 0.008 | -0.058 | 0 | 0 | 0 | 0.104 |

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $TPR_{it}$ | 2,238 | -1.268 | 10.653 | -68.000 | -4.000 | -0.245 | 2.500 | 40.000 |
| $\Delta NI/S_{it}$ | 2,238 | -0.148 | 1.883 | -13.077 | -0.401 | 0.006 | 0.328 | 9.204 |
| $\Delta CI/S_{it}$ | 2,238 | -0.118 | 2.254 | -17.852 | -0.627 | -0.022 | 0.470 | 13.418 |
| $\Delta OCI/S_{it}$ | 2,238 | 0.030 | 1.166 | -8.157 | -0.245 | -0.001 | 0.225 | 8.916 |
| $\Delta FCT/S_{it}$ | 2,238 | 0.034 | 0.690 | -4.635 | -0.097 | 0 | 0.110 | 4.889 |
| $\Delta AFS/S_{it}$ | 2,238 | 0.033 | 0.793 | -7.191 | -0.001 | 0 | 0.001 | 7.961 |
| $\Delta CFH/S_{it}$ | 2,238 | -0.003 | 0.412 | -5.559 | -0.041 | 0 | 0.027 | 5.935 |
| $\Delta ACT/S_{it}$ | 2,238 | -0.034 | 0.180 | -1.477 | 0 | 0 | 0 | 0.735 |
| $\Delta REV/S_{it}$ | 2,238 | 0.000 | 0.032 | -0.502 | 0 | 0 | 0 | 0.397 |
| $\Delta ASS/S_{it}$ | 2,238 | 0.000 | 0.045 | -0.432 | 0 | 0 | 0 | 0.380 |
| $\Delta OTH/S_{it}$ | 2,238 | 0.000 | 0.016 | -0.147 | 0 | 0 | 0 | 0.157 |

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $TPP_{it}$ | 2,229 | 0.003 | 0.058 | -0.261 | -0.013 | 0.000 | 0.027 | 0.192 |
| $\Delta NI/S_{it}$ | 2,229 | -0.158 | 1.939 | -13.077 | -0.399 | 0.009 | 0.330 | 9.204 |
| $\Delta CI/S_{it}$ | 2,229 | -0.143 | 2.322 | -17.852 | -0.622 | -0.020 | 0.497 | 11.142 |
| $\Delta OCI/S_{it}$ | 2,229 | 0.015 | 1.184 | -8.157 | -0.249 | -0.002 | 0.225 | 8.916 |
| $\Delta FCT/S_{it}$ | 2,229 | 0.031 | 0.704 | -4.635 | -0.100 | 0 | 0.110 | 4.889 |
| $\Delta AFS/S_{it}$ | 2,229 | 0.027 | 0.794 | -7.191 | 0.000 | 0 | 0.001 | 7.961 |
| $\Delta CFH/S_{it}$ | 2,229 | -0.007 | 0.424 | -5.559 | -0.042 | 0 | 0.027 | 5.935 |
| $\Delta ACT/S_{it}$ | 2,229 | -0.036 | 0.184 | -1.477 | 0 | 0 | 0 | 0.735 |
| $\Delta REV/S_{it}$ | 2,229 | 0.000 | 0.032 | -0.502 | 0 | 0 | 0 | 0.397 |
| $\Delta ASS/S_{it}$ | 2,229 | -0.001 | 0.045 | -0.432 | 0 | 0 | 0 | 0.380 |
| $\Delta OTH/S_{it}$ | 2,229 | 0.000 | 0.017 | -0.147 | 0 | 0 | 0 | 0.157 |

The Spearman's rank correlation coefficients for the target price models are illustrated in Table 5.10.[509]

[509] For the target price models the highest VIF score observed is 1.8 for the TPC and 1.5 for TPR and TPP which is clearly below the critical value of 10 and indicates that multicollinearity can be excluded.

*Table 5.10: Spearman correlation matrix target price models*

| | $TPC_{it}$ | $BVE/S_{it}$ | $NI/S_{it}$ | $CI/S_{it}$ | $OCI/S_{it}$ | $FCT/S_{it}$ | $AFS/S_{it}$ | $CFH/S_{it}$ | $ACT/S_{it}$ | $REV/S_{it}$ | $ASS/S_{it}$ | $OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $TPC_{it}$ | 1 | | | | | | | | | | | |
| $BVE/S_{it}$ | **0.716*** | 1 | | | | | | | | | | |
| $NI/S_{it}$ | **0.728*** | **0.617*** | 1 | | | | | | | | | |
| $CI/S_{it}$ | **0.689*** | **0.562*** | **0.953*** | 1 | | | | | | | | |
| $OCI/S_{it}$ | **-0.059*** | **-0.124*** | **-0.057*** | **0.248*** | 1 | | | | | | | |
| $FCT/S_{it}$ | 0.032 | 0.000 | -0.004 | **0.207*** | **0.696*** | 1 | | | | | | |
| $AFS/S_{it}$ | -0.042 | **-0.060*** | -0.028 | **0.164*** | **0.634*** | **0.051*** | 1 | | | | | |
| $CFH/S_{it}$ | -0.034 | **-0.127*** | -0.042 | **0.066*** | **0.352*** | 0.046 | 0.049 | 1 | | | | |
| $ACT/S_{it}$ | **-0.177*** | **-0.193*** | **-0.092*** | -0.043 | **0.154*** | **-0.098*** | -0.045 | -0.045 | 1 | | | |
| $REV/S_{it}$ | 0.045 | 0.035 | 0.043 | **0.052*** | 0.032 | 0.004 | -0.011 | 0.020 | 0.035 | 1 | | |
| $ASS/S_{it}$ | -0.036 | **-0.052*** | **-0.052*** | -0.001 | **0.164*** | **0.058*** | **0.079*** | **0.072*** | **0.072*** | -0.029 | 1 | |
| $OTH/S_{it}$ | **0.091*** | **0.092*** | **0.062*** | **0.071*** | 0.026 | 0.013 | 0.043 | -0.034 | 0.004 | -0.032 | 0.018 | 1 |

* correlation significant at p<0.01

| | $TPR_{it}$ | $\Delta NI/S_{it}$ | $\Delta CI/S_{it}$ | $\Delta OCI/S_{it}$ | $\Delta FCT/S_{it}$ | $\Delta AFS/S_{it}$ | $\Delta CFH/S_{it}$ | $\Delta ACT/S_{it}$ | $\Delta REV/S_{it}$ | $\Delta ASS/S_{it}$ | $\Delta OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $TPR_{it}$ | 1 | | | | | | | | | | |
| $\Delta NI/S_{it}$ | **0.290*** | 1 | | | | | | | | | |
| $\Delta CI/S_{it}$ | **0.386*** | **0.741*** | 1 | | | | | | | | |
| $\Delta OCI/S_{it}$ | **0.311*** | **0.068*** | **0.573*** | 1 | | | | | | | |
| $\Delta FCT/S_{it}$ | **0.218*** | **0.075*** | **0.391*** | **0.655*** | 1 | | | | | | |
| $\Delta AFS/S_{it}$ | **0.141*** | 0.012 | **0.232*** | **0.382*** | 0.026 | 1 | | | | | |
| $\Delta CFH/S_{it}$ | **0.214*** | -0.010 | **0.164*** | **0.353*** | 0.042 | **0.059*** | 1 | | | | |
| $\Delta ACT/S_{it}$ | 0.024 | -0.019 | **0.082*** | **0.161*** | 0.022 | 0.015 | 0.041 | 1 | | | |
| $\Delta REV/S_{it}$ | -0.013 | -0.020 | -0.023 | 0.004 | 0.014 | -0.005 | 0.004 | -0.012 | 1 | | |
| $\Delta ASS/S_{it}$ | **0.104*** | 0.050 | **0.135*** | **0.207*** | **0.088*** | **0.127*** | 0.029 | 0.041 | -0.008 | 1 | |
| $\Delta OTH/S_{it}$ | 0.004 | 0.023 | 0.040 | 0.019 | -0.006 | 0.050 | -0.002 | -0.030 | 0.041 | 0.003 | 1 |

* correlation significant at p<0.01

| | $TPP_{it}$ | $\Delta NI/S_{it}$ | $\Delta CI/S_{it}$ | $\Delta OCI/S_{it}$ | $\Delta FCT/S_{it}$ | $\Delta AFS/S_{it}$ | $\Delta CFH/S_{it}$ | $\Delta ACT/S_{it}$ | $\Delta REV/S_{it}$ | $\Delta ASS/S_{it}$ | $\Delta OTH/S_{it}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $TPP_{it}$ | 1 | | | | | | | | | | |
| $\Delta NI/S_{it}$ | **0.168*** | 1 | | | | | | | | | |
| $\Delta CI/S_{it}$ | **0.166*** | **0.744*** | 1 | | | | | | | | |
| $\Delta OCI/S_{it}$ | **0.095*** | **0.074*** | **0.575*** | 1 | | | | | | | |
| $\Delta FCT/S_{it}$ | 0.041 | **0.076*** | **0.391*** | **0.654*** | 1 | | | | | | |
| $\Delta AFS/S_{it}$ | 0.050 | 0.016 | **0.236*** | **0.380*** | 0.022 | 1 | | | | | |
| $\Delta CFH/S_{it}$ | **0.010*** | -0.009 | **0.164*** | **0.357*** | 0.037 | **0.065*** | 1 | | | | |
| $\Delta ACT/S_{it}$ | -0.002 | -0.014 | **0.088*** | **0.163*** | 0.031 | 0.017 | 0.049 | 1 | | | |
| $\Delta REV/S_{it}$ | -0.040 | -0.023 | -0.020 | 0.005 | 0.008 | 0.003 | 0.007 | -0.003 | 1 | | |
| $\Delta ASS/S_{it}$ | 0.051 | 0.047 | **0.128*** | **0.202*** | **0.086*** | **0.130*** | 0.037 | 0.039 | 0.004 | 1 | |
| $\Delta OTH/S_{it}$ | -0.003 | 0.029 | 0.050 | 0.031 | -0.003 | 0.047 | 0.004 | -0.028 | 0.036 | 0.001 | 1 |

* correlation significant at p<0.01

## Descriptive Statistics Forecasting Models

The summary statistics shown in Table 5.11 provide an overview of the different variables used in the forecasting models based on Operating Cash Flows (referred to as OCF) and NI. After removing outliers in the 1st and the 99th percentile the sample size on the basis of OCF amounts to 2,343 observations and 2,353 observations on the basis of NI. The mean and median for the dependent variables current OCF and current NI as well as the independent variables lagged NI and CI are positive. The means for the lagged OCI components on an individual, as well as on an aggregated basis, are negative with the exemption of FCT, REV, and OTH. In line with the other models, OCI components all have a median of zero and most of the components amount to 0 in the 25% and the 75% quartiles, resulting from the infrequent reporting of those items.

*Table 5.11: Summary statistics for cash flow forecasting model*

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $OCF/S_{it}$ | 2,343 | 2.808 | 3.863 | -12.631 | 0.475 | 1.849 | 3.970 | 32.993 |
| $NI/S_{it-1}$ | 2,343 | 1.500 | 2.346 | -6.647 | 0.248 | 0.908 | 2.220 | 17.191 |
| $CI/S_{it-1}$ | 2,343 | 1.388 | 2.403 | -7.887 | 0.173 | 0.828 | 2.069 | 19.160 |
| $OCI/S_{it-1}$ | 2,343 | -0.113 | 0.720 | -5.663 | -0.204 | -0.010 | 0.082 | 2.732 |
| $FCT/S_{it-1}$ | 2,343 | 0.000 | 0.505 | -3.308 | -0.059 | 0 | 0.068 | 3.025 |
| $AFS/S_{it-1}$ | 2,343 | -0.050 | 0.394 | -4.079 | -0.002 | 0 | 0 | 1.920 |
| $CFH/S_{it-1}$ | 2,343 | -0.032 | 0.223 | -2.108 | -0.030 | 0 | 0.009 | 0.949 |
| $ACT/S_{it-1}$ | 2,343 | -0.029 | 0.141 | -1.176 | 0 | 0 | 0 | 0.465 |
| $REV/S_{it-1}$ | 2,343 | 0.000 | 0.015 | -0.150 | 0 | 0 | 0 | 0.240 |
| $ASS/S_{it-1}$ | 2,343 | -0.003 | 0.028 | -0.387 | 0 | 0 | 0 | 0.138 |
| $OTH/S_{it-1}$ | 2,343 | 0.000 | 0.007 | -0.063 | 0 | 0 | 0 | 0.104 |

| | n | Mean | SD | Min | 25% | Median | 75% | Max |
|---|---|---|---|---|---|---|---|---|
| $NI/S_{it}$ | 2,353 | 1.358 | 2.203 | -6.441 | 0.180 | 0.792 | 2.126 | 15.918 |
| $NI/S_{it-1}$ | 2,353 | 1.506 | 2.327 | -6.647 | 0.253 | 0.909 | 2.223 | 17.191 |
| $CI/S_{it-1}$ | 2,353 | 1.390 | 2.376 | -7.887 | 0.175 | 0.818 | 2.066 | 19.160 |
| $OCI/S_{it-1}$ | 2,353 | -0.118 | 0.730 | -5.663 | -0.211 | -0.011 | 0.082 | 2.732 |
| $FCT/S_{it-1}$ | 2,353 | 0.001 | 0.511 | -3.308 | -0.059 | 0 | 0.066 | 3.025 |
| $AFS/S_{it-1}$ | 2,353 | -0.056 | 0.410 | -4.061 | -0.002 | 0 | 0 | 1.920 |
| $CFH/S_{it-1}$ | 2,353 | -0.031 | 0.222 | -2.108 | -0.028 | 0 | 0.009 | 0.949 |
| $ACT/S_{it-1}$ | 2,353 | -0.029 | 0.142 | -1.176 | 0 | 0 | 0 | 0.465 |
| $REV/S_{it-1}$ | 2,353 | 0.000 | 0.015 | -0.151 | 0 | 0 | 0 | 0.240 |
| $ASS/S_{it-1}$ | 2,353 | -0.003 | 0.029 | -0.387 | 0 | 0 | 0 | 0.138 |
| $OTH/S_{it-1}$ | 2,353 | 0.000 | 0.007 | -0.063 | 0 | 0 | 0 | 0.104 |

The Spearman's rank correlation coefficients for the forecasting models are illustrated in Table 5.12. The correlation between the dependent variables, current OCF and current NI and the independent variables differ only marginally between models. Previous year's NI and CI on an aggregated basis correlates significantly with current OCF and NI, with the correlations coefficient of 0.63 and 0.54 as well as 0.71 and 0.68 respectively. Increases in lagged ACT predict decreases in current OCF and NI. Increases in OCI on an aggregated basis predict decreases in current OCF whereas increases in lagged FCT predict increases in NI. Only the correlation between the lagged CI and lagged NI might be problematic with a coefficient of 0.93. However, this was to be expected since NI is nested in CI. As those two variables are not jointly used in one model, multicollinearity can be excluded.[510]

[510] For the forecasting models the highest VIF score observed is 1.2 for the OCF and 1.1 for NI which is clearly below the critical value of 10 and indicates a lack of multicollinearity for these observations.

*Table 5.12: Spearman correlation matrix the forecasting models*

| | $OCF/S_{it}$ | $NI/S_{it-1}$ | $CI/S_{it-1}$ | $OCI/S_{it-1}$ | $FCT/S_{it-1}$ | $AFS/S_{it-1}$ | $CFH/S_{it-1}$ | $ACT/S_{it-1}$ | $REV/S_{it-1}$ | $ASS/S_{it-1}$ | $OTH/S_{it-1}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $OCF/S_{it}$ | 1 | | | | | | | | | | |
| $NI/S_{it-1}$ | **0.631*** | 1 | | | | | | | | | |
| $CI/S_{it-1}$ | **0.580*** | **0.926*** | 1 | | | | | | | | |
| $OCI/S_{it-1}$ | **-0.068*** | **-0.063*** | **0.199*** | 1 | | | | | | | |
| $FCT/S_{it-1}$ | -0.002 | -0.005 | **0.187*** | **0.677*** | 1 | | | | | | |
| $AFS/S_{it-1}$ | 0.004 | -0.014 | **0.108*** | **0.375*** | **0.072*** | 1 | | | | | |
| $CFH/S_{it-1}$ | -0.017 | -0.025 | **0.058*** | **0.359*** | 0.042 | 0.037 | 1 | | | | |
| $ACT/S_{it-1}$ | **-0.101*** | **-0.066*** | -0.043 | **0.095*** | **-0.116*** | 0.034 | 0.029 | 1 | | | |
| $REV/S_{it-1}$ | 0.016 | 0.017 | 0.019 | 0.031 | 0.002 | -0.036 | 0.027 | 0.030 | 1 | | |
| $ASS/S_{it-1}$ | -0.014 | -0.011 | 0.039 | **0.170*** | 0.044 | **0.116*** | **0.063*** | **0.061*** | -0.026 | 1 | |
| $OTH/S_{it-1}$ | 0.030 | 0.022 | 0.031 | 0.016 | 0.026 | -0.009 | 0.002 | 0.014 | -0.030 | 0.025 | 1 |

* pairwise correlations significant at the 10 percent level

| | $NI/S_{it}$ | $NI/S_{it-1}$ | $CI/S_{it-1}$ | $OCI/S_{it-1}$ | $FCT/S_{it-1}$ | $AFS/S_{it-1}$ | $CFH/S_{it-1}$ | $ACT/S_{it-1}$ | $REV/S_{it-1}$ | $ASS/S_{it-1}$ | $OTH/S_{it-1}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $NI/S_{it}$ | 1 | | | | | | | | | | |
| $NI/S_{it-1}$ | **0.708*** | 1 | | | | | | | | | |
| $CI/S_{it-1}$ | **0.683*** | **0.925*** | 1 | | | | | | | | |
| $OCI/S_{it-1}$ | 0.022 | **-0.068*** | **0.197*** | 1 | | | | | | | |
| $FCT/S_{it-1}$ | **0.083*** | -0.011 | **0.183*** | **0.675*** | 1 | | | | | | |
| $AFS/S_{it-1}$ | 0.040 | -0.019 | **0.107*** | **0.381*** | **0.072*** | 1 | | | | | |
| $CFH/S_{it-1}$ | -0.013 | -0.019 | **0.061*** | **0.350*** | 0.041 | 0.031 | 1 | | | | |
| $ACT/S_{it-1}$ | **-0.113*** | **-0.070*** | -0.048 | **0.090*** | **-0.118*** | 0.032 | 0.028 | 1 | | | |
| $REV/S_{it-1}$ | 0.017 | 0.017 | 0.019 | 0.031 | 0.000 | -0.036 | 0.024 | 0.025 | 1 | | |
| $ASS/S_{it-1}$ | 0.013 | -0.014 | 0.038 | **0.175*** | 0.045 | **0.120*** | **0.061*** | **0.057*** | -0.026 | 1 | |
| $OTH/S_{it-1}$ | 0.041 | 0.028 | 0.037 | 0.011 | 0.023 | -0.015 | 0.001 | 0.016 | -0.030 | 0.028 | 1 |

* pairwise correlations significant at the 10 percent level

After the illustration of the descriptive statistics the following subsections deal with the results for the regression analysis of the models specified under 4.2.

## 5.3 Results Regression Analyses

In line with the theoretical foundation the results are split in two main sections: the results from the association between market values and accounting numbers testing the *value-relevance* and the results from the regression analyzing the *forecasting ability* of current accounting numbers on the basis of lagged accounting numbers.

### The Value-Relevance Models

The value-relevance models analyze the association between share price, share return, abnormal share return, and target prices with NI, CI, and components of OCI.

Thereby it is tested how the association varies between the different definitions of income, implying a higher or lower value-relevance. In a first step the Hausman test indicates whether the random effects model or fixed effects model should be used. In a second step, the Breusch-Pagan test examines whether the use of pooled OLS regressions would be sufficient in the specific model. Even though the fixed effects are to be preferred for the value-relevance models, the results from the OLS regressions are explicitly shown for comparability with other studies and to illustrate the differences between the applied panel models. Chow tests examine if the implementation of IAS 1 (revised 2007) had an effect on the association between market values and accounting measures. Robustness tests control for negative earnings and the impact of the financial industry. Furthermore, the inclusion of company and country specific control variables as well as specific control variables for the Financial and Eurozone crisis verify the robustness of the results.

### The Forecasting Ability Models

The forecasting models analyze the association between current accounting numbers, namely OCF and NI with lagged NI and compare it to the association with lagged CI and lagged components of OCI. The Chow test examines for changes in the association with the implementation of IAS 1 (revised 2007) and the inclusion of control variables complies with the models used for the value-relevance. Accordingly, robustness tests are performed in line with the application for the value-relevance models.

Even though the fixed effects model is preferred to analyze the association between market values and accounting numbers it may not be the preferred model to forecast accounting numbers based on current accounting numbers. As this may seem counterintuitive the different underlying assumptions for the association model and the forecasting model are illustrated.

As previously outlined, the fixed effects regression removes the baseline valuations from the different companies. The differences across companies are based on numerous unobserved and unobservable variables and would lead to inaccurate results. Though, the elimination does not only remove those effects but also eliminates the part of NI, CI, and OCI that might help to explain differences between companies. This is a desired effect as causal chain and control for the interaction of NI, CI, and OCI is not possible with unobserved variables. Therefore, focusing on changes *within* companies and their correlation with changes in NI, CI, and OCI removes intractable effects and leads to better and more consistent results.

The downside of fixed effects regression is the fact that predicted values depend on the company-specific fixed effect that is not measurable. Instead the effect is estimated based on historical data making it inherently backward looking. In the application in this study the fixed effect is calculated on the basis of observations for the preceding 6 years. The observation period includes events such as the financial crisis and the Eurozone crisis which has led to large fluctuations in the underlying income measures. Consequently the fixed effects for the companies based on the data from the years 2007 to 2011 do not seem to be a good basis for forecasting the value for 2012.

For analyzing the association between the market values and accounting numbers for the value-relevance analysis fixed effects and NI, CI, and OCI effects were based on the same time period. When applying the fixed effects regression on the basis of the association regression, the fixed effect clearly removed company specific effects from the regression. However, the NI performs better in modeling differences in the valuation between companies for future periods than fixed effects, which are averaged over the years 2007-2011. This is based on the fact that future values for fixed effects cannot be measured and thus the prediction cannot include this “potential” effect in the regression. When, however, using the fixed effects for past periods the results are distorted.

After lining out the procedure different approaches used for the analysis the following sections present the actual results from the different regressions.

### 5.3.1 Results Price Regressions

***The results from the price model indicate that CI is more value-relevant than NI and particular component of OCI, namely FCT and CFH have been identified as being value-relevant and robust. The results imply that the implementation of IAS 1 (revised 2007) did have an effect on the value-relevance for CI and the components FCT and ACT of OCI.***

This section presents the results from the price regressions of the association of the NI, CI as well as the individual OCI components with the share price, illustrated in section 4.2.1, testing [H1]. The applied regressions were defined as follows:

$$P_{it}= \alpha_{0,1}+ \alpha_1 BVE/S_{it}+ \alpha_2 NI/S_{it}+\varepsilon_{it}+v_i \quad (1a)$$

$$P_{it}= \alpha_{0,2}+ \alpha_3 BVE/S_{it}+ \alpha_4 CI/S_{it}+\varepsilon_{it}+v_i \quad (1b)$$

$$P_{it}= \alpha_{0,3}+ \alpha_5 BVE/S_{it}+ \alpha_6 NI/S_{it}+ \alpha_7 OCI/S_{it}+\varepsilon_{it}+v_i \quad (1c)$$

$$P_{it}= \alpha_{0,4}+ \alpha_8 BVE/S_{it}+ \alpha_9 NI/S_{it}+\alpha_{10} FCT/S_{it}+\alpha_{11} AFS/S_{it}+\alpha_{12} CFH/S_{it} +\alpha_{13} ACT/S_{it}+\alpha_{14} REV/S_{it}+\alpha_{15} ASS/S_{it}+\alpha_{16} OTH/S_{it}+\varepsilon_{it}+v_i \quad (1d)$$

All variables are as defined in section 4.2.1.

In a first step the tests illustrated in section 4.4.2 are applied to figure out which panel regression model approximates the current data best. The Breusch-Pagan test compares the random effects model against the use of the pooled OLS. The Hausman test compares the use of the fixed effects model with the random effects model.[511] Based on this initial assessment, the results from the price regression based on the fixed effects model are illustrated in Table 5.13.

[511] The Breusch-Pagan test and the Hausman test carried out for the price model were also performed for the other models analyzing the association between market values and accounting numbers. The tests delivered the same results of preferring the fixed effects model based on the applied data.

In line with previous findings, the adjusted $R^2$ for the different models amounts to about 85%. This was expected since the regression was based on the BVE.[512] The coefficient for BVE is positive and highly significant at $p<0.01$ for all models. The coefficients for NI, CI, and OCI are also positive and highly significant at $p<0.01$ for all models where they are included.

The positive coefficient at $p<0.01$ for FCT is in line with the findings by Pinto (2005) and Höhn (2011) but contrary to the findings by Devalle and Magarini (2012) who find a significant negative coefficient for the association with share price.[513] The study by Goncharov and Hodgson (2011) on a comparable European sample did not observe significant results for this association.

Also increases in CFH can predict increases in share price at $p<0.01$. The positive and significant coefficient could be an indication for the fact that investors distinguish between effective and ineffective risk management based on cash flow hedges and price them accordingly. Other European studies by Goncharov and Hodgson (2011) and Devalle and Magarini (2012) do not find an association between CFH and the share price. Whereas, the study by Kanagaretnam et al. (2009) found a negative and weak association for CFH at $p<0.1$ for a Canadian sample, Deol (2013) finds a positive, though, also weak association at $p<0.1$ based on Canadian firms.

OTH and share price show a trend towards a positive association at $p<0.1$.[514] However, the high coefficient and high standard error indicate that the result is primarily driven by extreme observations and needs further examination.

The current lack of correlation between the remaining components of OCI are in line with Devalle and Magarini (2012) on ACT, with Goncharov and Hodgson (2011) on REV and with Höhn (2011) on ACT, and REV. The significance levels of the coefficients neither changes when incrementally adding the OCI components nor when adding them in a different order.[515]

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[512] Cf. Kanagaretnam et al. (2009), p. 359, Höhn (2011), p. 76, Deol (2013), p. 88.

[513] The differences in results in the study by Devalle and Magarini (2012) can possibly be explained by the inclusion of a large number of companies from the UK, as already pointed out in the literature review.

[514] The high coefficients on a relative basis indicate a comparably high sensitivity of the underlying variable.

[515] Cf. Goncharov and Hodgson (2011), p. 41 where the authors report that components of OCI are always positive and significant when added separately to NI. The tests have been performed for the other regressions as well and delivered qualitatively similar results.

Based on the selection criteria AIC and BIC as well as the adjusted $R^2$ it can be stated that models including CI (1b-1d) are preferred over models solely including NI (1a). Among the models including CI in any form, the model including the individual components of OCI (1d) is preferred over the model including CI (1b), whereas the inclusion of NI and OCI individually (1c) does not improve the model. The Vuong test confirms these findings at the $p<0.01$ significance level.

*Table 5.13: Price fixed effects regression*

| | **$P/S_{it}$ (share price around announcment date of results)** | | | |
|---|---|---|---|---|
| | (1a) | (1b) | (1c) | (1d) |
| Intercept | 8.187*** (0.836) | 8.934*** (0.832) | 8.946*** (0.833) | 9.046*** (0.830) |
| $BVE/S_{it}$ | **0.765*** ** (0.064) | **0.727*** ** (0.063) | **0.727*** ** (0.063) | **0.718*** ** (0.063) |
| $NI/S_{it}$ | **1.952*** ** (0.125) | | **1.938*** ** (0.124) | **1.942*** ** (0.123) |
| $CI/S_{it}$ | | **1.939*** ** (0.112) | | |
| $OCI/S_{it}$ | | | **1.962*** ** (0.269) | |
| $FCT/S_{it}$ | | | | **2.015*** ** (0.381) |
| $AFS/S_{it}$ | | | | 0.604 (0.470) |
| $CFH/S_{it}$ | | | | **6.233*** ** (0.897) |
| $ACT/S_{it}$ | | | | -0.048 (1.339) |
| $REV/S_{it}$ | | | | -15.040 (14.850) |
| $ASS/S_{it}$ | | | | 5.004 (7.715) |
| $OTH/S_{it}$ | | | | **44.772*** (26.610) |
| N | 2,744 | 2,744 | 2,744 | 2,744 |
| adj. R-sq | 0.844 | 0.848 | 0.848 | 0.850 |
| AIC | 19027.5 | 18962.9 | 18964.0 | 18931.3 |
| BIC | 19045.2 | 18980.6 | 18987.6 | 18990.4 |
| Vuong (F-Value) | | -4.1866*** | -4.1391*** | -4.5843*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

To examine if the implementation of IAS 1 (revised 2007) changed the association between CI and the components of OCI with the share price, Chow tests were performed (see Table 5.14), testing [H5]. The significant interaction for CI between the two periods shows that the implementation in the years 2007 and 2008 compared to the years 2009 to 2012 after the implementation of IAS 1 (revised 2007) had an impact on the association between the share price and CI. In connection with

components of OCI, it can be stated that these differences are primarily related to FCT and ACT with their significant interaction for the two time periods.[516]

*Table 5.14: Price regression – results from the Chow test*

| **Chow test $P/S_{it}$ (share price around announcment date of results)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CI/Sit | OCI/Sit | FCT/Sit | AFS/Sit | CFH/Sit | ACT/Sit | REV/Sit | ASS/Sit | OTH/Sit |
| Chow (F-Value) | **4.16**** | 1.82 | **7.17***** | 0.69 | 0.93 | **6.04**** | 0.15 | 0.59 | 0.36 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

For comparability with other studies closely linked to the empirical analysis in this study, e.g., by Ernstberger (2008), Kanagaretnam et al. (2009), or Goncharov and Hodgson (2011), the models are recalculated based on OLS regressions. The results based on the OLS regressions as well as the results based on the fixed effects regressions are contrasted in Table 5.15. The adjusted $R^2$ on the basis of the OLS regression ranges from 60.3% to 61.6% for the different models and between 84.3% and 84.8% on the basis of the fixed effects regression. A similar observation can be made on the basis of the selection criteria AIC and BIC which are considerably lower for the fixed effects regression compared to the OLS regression, clearly favoring the fixed effects regression confirming the findings from the Breusch-Pagan test.

In general both the OLS regressions and the fixed effects regressions produce similar coefficients for CI, NI, and OCI in models 1a to 1c and FCT, CFH, and OTH[517] in model 1d. Only ACT differs with a negative coefficient at p<0.01 for the OLS regression and non-significant for the fixed effects regression. This difference could partly be explained by the fact that for OLS regressions the coefficients incorporates

[516] Even though the results indicate that the impact of CI, primarily in the form of FCT and CFH, has changed significantly with the implementation of IAS 1 (revised 2007) the findings need to be interpreted with special care because of external effects, such as the financial crisis, which may have had a distorting effect.

[517] The significance level for the coefficient for OTH is significant at p<0.05. However, the marginal difference can be explained by the high coefficient in general and the corresponding high standard error. If a control variable is added which takes the value "one" if the value is different from zero and "zero" otherwise the significant results disappear.

information to explain differences across companies whereas the fixed effects regression already captures those differences with a specific fixed effect for each company. The results for ACT are in line with the findings by Deol (2013), but, contrary to Dhaliwal et al. (1999), Goncharov and Hodgson (2011) and Devalle and Magarini (2012).

Based on AIC and BIC a comparison of the models (1a-1d) for the OLS regression and fixed effects regression produces conflicting results. Whereas the fixed effects regression strongly favors the model including CI over the one including NI, the OLS regression yields non-significant results. The calculations based on the OLS and fixed effects regressions favor the models including all components of OCI (1d) over the models including OCI as a separate component (1c) over the aggregates model (1b) and over the model including NI (1a). The different results for the model preference between NI and CI based on the OLS regression and the fixed effects regression could be an indication for the deviating findings of a preference of NI over CI by the majority of the studies presented in Table 3.3.

*Table 5.15: Price regression – fixed effects regression vs. OLS regression*

| | **$P/S_{it}$ (share price around announcment date of results)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (1a) | (1b) | (1c) | (1d) | (1a) | (1b) | (1c) | (1d) |
| Intercept | 6.662*** | 6.868*** | 6.711*** | 6.591*** | 8.187*** | 8.934*** | 8.946*** | 9.046*** |
| | (0.355) | (0.356) | (0.354) | (0.351) | -0.836 | (0.832) | (0.833) | (0.830) |
| $BVE/S_{it}$ | **0.633*** ** | **0.689*** ** | **0.644*** ** | **0.621*** ** | **0.765*** ** | **0.727*** ** | **0.727*** ** | **0.718*** ** |
| | (0.022) | (0.021) | (0.022) | (0.022) | (0.064) | (0.063) | (0.063) | (0.063) |
| $NI/S_{it}$ | **4.204*** ** | | **4.185*** ** | **4.207*** ** | **1.952*** ** | | **1.938*** ** | **1.942*** ** |
| | (0.146) | | (0.146) | (0.145) | (0.125) | | (0.124) | (0.123) |
| $CI/S_{it}$ | | **3.822*** ** | | | | **1.939*** ** | | |
| | | (0.136) | | | | (0.112) | | |
| $OCI/S_{it}$ | | | **1.557*** ** | | | | **1.962*** ** | |
| | | | (0.377) | | | | (0.269) | |
| $FCT/S_{it}$ | | | | **2.744*** ** | | | | **2.015*** ** |
| | | | | (0.547) | | | | (0.381) |
| $AFS/S_{it}$ | | | | -0.184 | | | | 0.604 |
| | | | | (0.629) | | | | (0.470) |
| $CFH/S_{it}$ | | | | **4.616*** ** | | | | **6.233*** ** |
| | | | | (1.251) | | | | (0.897) |
| $ACT/S_{it}$ | | | | **-7.410*** ** | | | | -0.048 |
| | | | | (1.485) | | | | (1.339) |
| $REV/S_{it}$ | | | | 14.034 | | | | -15.040 |
| | | | | (16.587) | | | | (14.850) |
| $ASS/S_{it}$ | | | | 8.631 | | | | 5.004 |
| | | | | (9.721) | | | | (7.715) |
| $OTH/S_{it}$ | | | | **77.327** ** | | | | **44.772*** |
| | | | | (35.179) | | | | (26.611) |
| N | 2,744 | 2,744 | 2,744 | 2,744 | 2,744 | 2,744 | 2,744 | 2,744 |
| adj. R-sq | 0.606 | 0.603 | 0.608 | 0.616 | 0.844 | 0.848 | 0.848 | 0.850 |
| AIC | 22160.2 | 22184.3 | 22145.2 | 22095.8 | 19027.5 | 18962.9 | 18964.0 | 18931.3 |
| BIC | 22178.0 | 22202.1 | 22168.9 | 22154.9 | 19045.2 | 18980.6 | 18987.6 | 18990.4 |
| Vuong (F-Value) | | 0.9345 | -1.5448* | -3.1692*** | | -4.1866*** | -4.1391*** | -4.5843*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

## Robustness checks

As already indicated in the previous sections a thoroughly conducted robustness check is core for resilient results and deriving implications from the outcomes. To control if negative earnings have a biasing effect on the price regression through differential valuation of negative earnings impact, the terms DNegNI and DNegCI were added to

the regressions. The inclusion does not change the results qualitatively, implying that negative NI or negative CI do not affect the estimated price regression.

Previous studies failed to verify their inclusion of share prices for companies three months after the fiscal year-end. The current study argues that the failure of taking the exact announcement data can bias the results. Nevertheless, this study does not find significant differences in the outcomes for the price model when either using the share price three months after year-end or the average share price one day before and three days after the announcement date for the results. Concluding both figures are appropriate for the use in the price model and thus cannot account for deviations compared to previous results.

In the current analysis, the finance industry was not excluded from the initial sample, but, due to the different business model, the special financing structure, and the generally lower price to book value may have biased the results. However, as illustrated in Table 5.16, the exclusion of the financial industry from the sample does not produce significantly different results, which is in line with previously conducted studies.[518] As expected, the coefficient of BVE is noticeably higher,[519] but neither the correlation for NI, CI nor components of OCI are affected by the exclusion. When analyzing the financial industry on an individual basis, the significant level for the coefficients for BVE is lower compared to the model including the full sample, which is in line with expectations.

Moreover, CFH as a component of OCI is not associated with the share price for companies from the financial industry anymore. Remarkably, for the financial industry OTH turns out to be positive at $p<0.1$. The results show that the OTH position is only value-relevant for the financial industry such that reported gains under this component have a positive effect on the share price. The opposite holds for losses, indicating that investors need to pay special attention to this position when dealing with companies from the financial industry.

[518] Cf. Kanagaretnam et al. (2009), p. 354, where the authors state that the results were not different when including or excluding the financial industry. Similar findings have been made by Goncharov and Hodgson (2011), p. 55.

[519] Cf. Damodaran (2013), p. 4.

*Table 5.16: Price regression excluding financials and on individual basis*

| | **$P/S_{it}$ (share price around announcment date of results)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
| | (1a) | (1b) | (1c) | (1d) | (1a) | (1b) | (1c) | (1d) |
| Intercept | 7.062*** | 7.648*** | 7.685*** | 7.855*** | 11.52*** | 12.82*** | 12.72*** | 12.85*** |
| | (0.910) | (0.901) | (0.902) | (0.899) | (1.930) | (1.936) | (1.941) | (1.960) |
| BVE/Sit | **0.957*** ** | **0.922*** ** | **0.925*** ** | **0.902*** ** | **0.251** ** | **0.205** ** | **0.204*** | **0.201*** |
| | (0.0757) | (0.0745) | (0.0748) | (0.0755) | (0.104) | (0.104) | (0.104) | (0.104) |
| NI/Sit | **2.104*** ** | | **2.101*** ** | **2.170*** ** | **1.721*** ** | | **1.697*** ** | **1.700*** ** |
| | (0.154) | | (0.152) | (0.152) | (0.190) | | (0.188) | (0.193) |
| CI/Sit | | **2.139*** ** | | | | **1.641*** ** | | |
| | | (0.137) | | | | (0.169) | | |
| OCI/Sit | | | **2.337*** ** | | | | **1.374*** ** | |
| | | | (0.326) | | | | (0.420) | |
| FCT/Sit | | | | **1.735*** ** | | | | **2.914*** ** |
| | | | | (0.414) | | | | (0.958) |
| AFS/Sit | | | | 1.045 | | | | **0.927*** |
| | | | | (0.759) | | | | (0.546) |
| CFH/Sit | | | | **8.028*** ** | | | | 1.377 |
| | | | | (1.022) | | | | (1.769) |
| ACT/Sit | | | | -0.031 | | | | 8.356 |
| | | | | (1.397) | | | | (5.309) |
| REV/Sit | | | | -24.668 | | | | 18.064 |
| | | | | (17.833) | | | | (23.667) |
| ASS/Sit | | | | 1.097 | | | | 23.265 |
| | | | | (8.675) | | | | (15.554) |
| OTH/Sit | | | | 23.407 | | | | **93.852*** |
| | | | | (30.125) | | | | (52.223) |
| N | 2,252 | 2,252 | 2,252 | 2,252 | 492 | 492 | 492 | 492 |
| adj. R-sq | 0.836 | 0.841 | 0.841 | 0.843 | 0.891 | 0.894 | 0.894 | 0.895 |
| AIC | 15720.9 | 15659.9 | 15660.4 | 15623.1 | 3234.5 | 3221.4 | 3222.8 | 3221.5 |
| BIC | 15738.0 | 15677.0 | 15683.3 | 15680.2 | 3247.1 | 3234.0 | 3239.6 | 3263.5 |
| Vuong (F-Value) | | -4.534*** | -4.2011*** | -4.9062*** | | -1.3300* | -1.5229* | -1.4011* |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Moreover, several control variables have been added to the regressions that statistically control for possible erroneous relationships. The control variables include crisis variables, the yield of government bonds, variables for the GDP growth,

variables for leverage, and a variable for size indicated by total assets.[520] Table 5.17 illustrates the models including control variables (1a-CV to 1d-CV) and the model without control variables 1(d) for comparison.

In general, the inclusion of control variables does not qualitatively change the previously observed results. Even though the value for some coefficients changes considerably the predictive association remains unaltered for the previously identified value-relevant components.[521] As expected, the control variables for the financial crisis (DFINCrisis) and Eurozone crisis (DEURCrisis) have negative coefficients and are highly significant at $p<0.01$ for all models. This indicates that both crises had a negative effect on the share price; however, overall results did not change. Likewise, increasing government bond yield (YGOV) decreases the share price, indicating that higher interest rates have a negative impact on the share price. This outcome was expected since an increase in the government bond yield raises the interest rate for government and corporate bonds and thus making them more attractive for investors. Consequently, investors are likely to shift their investment focus from equities, in the form of shares, to government and corporate bonds which, therefore, impact the share price negatively.

An increase in the growth rate expectations of a country has a positive impact on the valuation of a company and consequently on the demand of the shares company and the share price, as illustrated by the positive coefficients for GDP growth (GDPG) at $p<0.01$. Larger companies tend to have higher share prices as implied by the positive coefficient for the log of total assets (lTA) at $p<0.01$ and in line with expectation. The control variable for leverage (LEV) is non-significant and indicates that the financing structure of the respective company does not have a significant impact on the regressions between the share price and income measures. Concluding it can be stated that the outcome of the tests confirms the robustness of the results. Even though the coefficient and the significance level of the control variables provide valuable information for the regression diagnostic, an interpretation of the values of the single coefficients could have limited explanatory power on its own.

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[520] A detailed overview of the control variables has been provided in section 4.3.4.

[521] The significance of the coefficient disappears when excluding the financial industry from the sample, which is an indicator for the fact that this component has primarily been influenced by observations from the financial industry.

*Table 5.17: Price regression including control variables*

| | $P/S_{it}$ (share price around announcment date of results) | | | | |
|---|---|---|---|---|---|
| | (1a-CV) | (1b-CV) | (1c-CV) | (1d-CV) | (1d) |
| Intercept | -7.174 (8.887) | -9.341 (8.825) | -9.293 (8.826) | -10.838 (8.854) | 9.046*** (0.830) |
| $BVE/S_{it}$ | **0.512***** (0.068) | **0.493***** (0.068) | **0.488***** (0.068) | **0.480***** (0.068) | **0.718***** (0.063) |
| $NI/S_{it}$ | **1.849***** (0.123) | | **1.825***** (0.122) | **1.829***** (0.122) | **1.942***** (0.123) |
| $CI/S_{it}$ | | **1.773***** (0.109) | | | |
| $OCI/S_{it}$ | | | **1.558***** (0.262) | | |
| $FCT/S_{it}$ | | | | **1.758***** (0.370) | **2.015***** (0.381) |
| $AFS/S_{it}$ | | | | 0.398 (0.458) | 0.604 (0.470) |
| $CFH/S_{it}$ | | | | **4.678***** (0.893) | **6.233***** (0.897) |
| $ACT/S_{it}$ | | | | 0.335 (1.292) | -0.0484 (1.339) |
| $REV/S_{it}$ | | | | -9.643 (14.28) | -15.04 (14.850) |
| $ASS/S_{it}$ | | | | 1.190 (7.412) | 5.004 (7.715) |
| $OTH/S_{it}$ | | | | **42.366*** (25.61) | **44.772*** (26.610) |
| DFINCrisis | **-7.537***** (0.517) | **-7.052***** (0.514) | **-7.101***** (0.518) | **-6.863***** (0.521) | |
| DEURCrisis | **-4.400***** (0.626) | **-4.428***** (0.621) | **-4.412***** (0.621) | **-4.368***** (0.624) | |
| YGOV | **-0.194***** (0.063) | **-0.169***** (0.063) | **-0.173***** (0.063) | **-0.166***** (0.063) | |
| GDPG | **0.840***** (0.069) | **0.713***** (0.070) | **0.767***** (0.072) | **0.752***** (0.072) | |
| LEV | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | |
| ITA | **2.764**** (1.088) | **3.050***** (1.080) | **3.046***** (1.080) | **3.224***** (1.084) | |
| N | 2,744 | 2,744 | 2,744 | 2,744 | 2,744 |
| adj. R-sq | 0.860 | 0.862 | 0.862 | 0.863 | 0.850 |
| AIC | 18546.5 | 18504.4 | 18504.9 | 18489.2 | 18931.3 |
| BIC | 18599.7 | 18557.5 | 18564.0 | 18583.7 | 18990.4 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

As previously indicated in the context of the OLS regression ACT require further investigation, not only because of the different coefficient compared to the OLS model. The inclusion of an interaction variable for ACT before and after the implementation of IAS 1 (revised 2007) inverts the results from the regression.[522] The result that increases in actuarial gains predict increases in the share price and actuarial

[522] For the years 2007 and 2008 the coefficient for ACT amounted to 8.754 and the coefficient for the years 2009 to 2012 amounted to -3.375, both coefficients being significant at p<0.01. When combing the coefficients over time the coefficient becomes positive and not significant as previously illustrated.

losses have negative effects on the share price seems plausible. However, as already illustrated in section 5.1 ACT are to some extent accumulated and are not recycled over time. As a result, a company may have continuously increasing actuarial losses, and these losses can be lower than expected by the investors. In addition, it could be possible that the publication under OCI is regarded as a positive signal to the market in the first place, even though the reported figures show losses on an absolute basis. These ambiguous results show that an examination of the changes of the OCI positions is necessary by the way of the return model.

### 5.3.2 Results Return Regressions

***The results from the return model indicate that CI is more value-relevant than NI and particular components of OCI, namely FCT, AFS, CFH, and to some extent ACT have been identified as being robustly value-relevant. The results imply that the implementation of IAS 1 (revised 2007) did have an effect on the value-relevance for the components FCT, AFS, and CFH of OCI.***

This section presents the results from the return regressions, testing the association of NI, CI as well as the individual OCI components with the cum-dividend return per share, which was illustrated in section 4.2.2, testing [H2]. The regressions were defined as follows:

$$RET_{it} = \beta_{0,1} + \beta_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad (2a)$$

$$RET_{it} = \beta_{0,2} + \beta_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad (2b)$$

$$RET_{it} = \beta_{0,3} + \beta_3(\Delta NI/S)_{it} + \beta_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad (2c)$$

$$RET_{it} = \beta_{0,4} + \beta_5(\Delta NI/S)_{it} + \beta_6(\Delta FCT/S)_{it} + \beta_7(\Delta AFS/S)_{it} + \beta_8(\Delta CFH/S)_{it} + \beta_9(\Delta ACT/S)_{it} + \beta_{10}(\Delta REV/S)_{it} + \beta_{11}(\Delta ASS/S)_{it} + \beta_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad (2d)$$

All variables are as defined in section 4.2.2.

In line with the price model, both Breusch-Pagan test and the Hausman test suggest to use a fixed effects regression to determine the association between the share return and the different income measures. The results for the return regressions are illustrated in Table 5.18. The adjusted $R^2$ ranges from 3.4% for model (2a) including NI to 14.5% for model (2d) including all components of OCI individually. The relatively low values for the adjusted $R^2$ is in line with comparable studies, for example, by Kanagaretnam et al. (2009), Höhn (2011), and Goncharov and Hodgson (2011).

The coefficients for changes in NI, CI, and OCI are all positive and highly significant at $p<0.01$, indicating that increasing changes in NI, CI, and OCI predict increases in share return. Likewise, increasing changes in FCT and CFH predict increases in share returns, which is in line with the results for the price regression. In addition, the increasing changes in AFS and ACT predict higher share returns. All mentioned coefficients are positive and significant at $p<0.01$.

The predictive power for FCT is, for example, in line with findings by Wang et al. (2006), Mitra and Hossain (2009), and Höhn (2011), though, in contrast to the findings by Louis (2003). These results imply that gains resulting from FCT are regarded as a positive sign by investors reflected by a positive reaction in share return, the opposite being true for losses from FCT. However, the predictive power by Louis (2003) would imply the contrary which is hardly imaginable from an economic perspective. In line with the results in this study, studies by Ernstberger (2008), Kanagaretnam et al. (2009), and Höhn (2011) find that an increase in share return predicts and increase in AFS. This was confirmed by Goncharov and Hodgson (2011) on the basis of a European sample. Studies examining the association between share returns and CFH by Ernstberger (2008) and Höhn (2011) do not find significant results for this OCI component. Kanagaretnam et al. (2009) even find that a decrease in CFH predicts an increase in share returns, on a sample from companies in Canada. However, a more recent study by Deol (2013) on Canadian companies finds a positive association which is in line with the result in this study. In addition, positive coefficients for ACT have so far only been observed for US samples in studies by Biddle and Choi (2006), and Mitra and Hossain (2009) whereas the studies by Ernstberger (2008), Höhn (2011), and Deol (2013) do not find significant results. The positive coefficients in this study imply that investors regard the information as value-relevant and price the information accordingly.

From a theoretical point, the positive associations for the changes in OCI components observed in this study seem to be more reasonable. The positive association between the return, in the form of a change in share price, and certain components of OCI is an indication for the fact that investors regard gains recognized under OCI as having a positive impact on the performance of the company and losses as having a negative impact respectively. The high significance level for the coefficient is an indicator for the value-relevance of the reported components for investors and the fact that the information is incorporated in their valuation.

Using the selection criteria AIC and BIC as well as the adjusted $R^2$ the models including CI (2b-2d) are clearly favored over the model exclusively including NI (2a) which is in line with the findings for the price model. Whereas, based on AIC and adjusted $R^2$ model 2d is preferred over the other models, on the basis of the BIC model 2c is favored. This can be explained by the different punishment criteria for the additional independent variables. In general, the Vuong test confirms the higher value-relevance of CI over NI; however, it does not favor the individual reporting of NI and OCI in model 2c, nor the individual reporting of the components of OCI in model 2d.

*Table 5.18: Return fixed effects regression*

| | **RET/$S_{it}$ (cum-dividend rawreturn per share)** | | | |
|---|---|---|---|---|
| | (2a) | (2b) | (2c) | (2d) |
| Intercept | -0.079 (0.196) | -0.065 (0.188) | -0.151 (0.186) | -0.052 (0.190) |
| Δ $NI/S_{it}$ | **1.306***** (0.117) | | **1.234***** (0.111) | **1.227***** (0.110) |
| Δ $CI/S_{it}$ | | **1.628***** (0.093) | | |
| Δ $OCI/S_{it}$ | | | **2.622***** (0.180) | |
| Δ $FCT/S_{it}$ | | | | **2.707***** (0.307) |
| Δ $AFS/S_{it}$ | | | | **1.998***** (0.257) |
| Δ $CFH/S_{it}$ | | | | **4.962***** (0.567) |
| Δ $ACT/S_{it}$ | | | | **4.848***** (1.236) |
| Δ $REV/S_{it}$ | | | | -1.021 (6.992) |
| Δ $ASS/S_{it}$ | | | | 0.169 (4.504) |
| Δ $OTH/S_{it}$ | | | | 1.206 (3.309) |
| N | 2,381 | 2,381 | 2,381 | 2,381 |
| adj. R-sq | 0.034 | 0.115 | 0.134 | 0.145 |
| AIC | 16889.4 | 16681.5 | 16630.2 | 16604.2 |
| BIC | 16901.0 | 16693.0 | 16647.5 | 16656.2 |
| Vuong (F-Value) | | -9.2104*** | -7.2477*** | -7.6123*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

In line with the application for the price model the introduction of IAS 1 (revised 2007) changed the association between the share return and different CI measures. The results from the Chow test indicate, that with the implementation of IAS 1 (revised 2007), the association between the share return and changes in CI has, though only weakly significant, changed (see Table 5.19). The significant interaction between the pre and post implementation period for changes in FCT at p<0.01 and changes in ACT and changes in CFH at p<0.05 supports the association for changes CI in general. These specific items changed with the explicit reporting of OCI components under IAS 1 (revised 2007).

*Table 5.19: Return regression – results from the Chow test*

| **Chow test RET/$S_{it}$ (cum-dividend raw stock return per share)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Δ CI/$S_{it}$ | Δ OCI/$S_{it}$ | Δ FCT/$S_{it}$ | Δ AFS/$S_{it}$ | Δ CFH/$S_{it}$ | Δ ACT/$S_{it}$ | Δ REV/$S_{it}$ | Δ ASS/$S_{it}$ | Δ OTH/$S_{it}$ |
| Chow (F-Value) | **3.64*** | 0.01 | **18.40***** | **6.62**** | **5.24**** | 1.63 | 1.03 | 1.31 | 0.06 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

In addition, as outlined in section 4.2.2, the return model is modified in a way such that it includes income measures in a non-linear form, using the inverse tangent. This modification controls if the previously examined association correlates with the persistence of income figures. Table 5.20 illustrates the modified models using the inverse tangent of the income measures (2a_arctan to 2d_arctan) and the model including all components of OCI without modifications (2d) for comparison. The findings show the models 2a to 2c are robust based on the inverse tangent modification.[523] For the model including all components of OCI on an individual basis (2d_arctan) the significance level for changes in ASS becomes weakly significant at p<0.1. As the model based on the inverse tangent puts more weight to values which are close to zero, the results for the coefficients ASS could indicate that they primarily effect the regression close to the center of the distribution. However, based on the absolute values of the coefficients and the corresponding standard errors, the change can be regarded as not relevant in this context.

Model comparisons based on the selection criteria AIC, BIC, and adjusted $R^2$ suggest that models including CI are superior over models using NI. This is in line with the results from the linear return regression and confirms the superior explanatory power of CI over NI. However, the result is contrary to the findings by Goncharov and Hodgson (2011), using a comparable sample, who show that the model including NI is to be preferred over the models including CI in any form.[524] The differences in the results might be explained by the lack of predictive power between the OCI components FCT and REV and the weak association for AFS shown in their study. In

[523] Cf. Goncharov and Hodgson (2011), p. 40, where the authors explicitly state that "a convergence was not achieved" when comparing the model including all available components of OCI.

[524] It should be noted that Goncharov and Hodgson (2011) in their study calculate the Z value by comparing the explanatory power of the modified models with the explanatory power of the base model based on NI (p. 42).

general, the Vuong test confirms the preference of models including CI in any form over models including only NI, slightly preferring the model including OCI on an aggregated basis (arctan 2c).

*Table 5.20: Arctan return fixed effects regression*

| | **Arctan RET/$S_{it}$ (cum-dividend raw stock return per share)** | | | | |
|---|---|---|---|---|---|
| | (2a_arctan) | (2b_arctan) | (2c_arctan) | (2d_arctan) | (2d) |
| Intercept | -375.2*** (88.39) | -355.0*** (86.24) | -380.3*** (85.46) | -370.3*** (86.69) | -0.0519 (0.190) |
| arctan (NI/Sit) | **955.4*** ** (149.5) | | **816.5*** ** (145.1) | **839.6*** ** (143.3) | **1.227*** ** (0.110) |
| arctan (CI/Sit) | | **1444.3*** ** (125.4) | | | |
| arctan (OCI/Sit) | | | **1933.0*** ** (170.2) | | |
| arctan (FCT/Sit) | | | | **1493.7*** ** (222.6) | **2.707*** ** (0.307) |
| arctan (AFS/Sit) | | | | **3062.2*** ** (290.6) | **1.998*** ** (0.257) |
| arctan (CFH/Sit) | | | | **1049.1*** ** (362.5) | **4.962*** ** (0.567) |
| arctan (ACT/Sit) | | | | **1942.6*** ** (670.6) | **4.848*** ** (1.236) |
| arctan (REV/Sit) | | | | -123.5 (3292.3) | -1.021 (6.992) |
| arctan (ASS/Sit) | | | | **3676.1*** (2106.8) | 0.169 (4.504) |
| arctan (OTH/Sit) | | | | 1909.4 (1944.1) | 1.206 (3.309) |
| N | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 |
| adj. R-sq | 0.106 | 0.147 | 0.164 | 0.188 | 0.145 |
| AIC | 45988.1 | 45874.4 | 45828.6 | 45763.3 | 16604.2 |
| BIC | 45999.6 | 45886.0 | 45845.9 | 45815.3 | 16656.2 |
| Vuong (F-Value) | | -5.8927*** | -5.9399*** | -5.7162*** | |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Similar to the price model the return models are rerun on pooled OLS regressions and compared with the findings from the fixed effects model. The results are illustrated in Table 5.21 and are principally similar. However, based on the OLS regression the changes in ACT do not affect the regression, whereas based on the fixed effects regression, increases in ACT predict higher share returns at p<0.01. The difference in the coefficient for ACT could be an indicator for the fact that this OCI component is used by the OLS regression to explain differences between companies, whereas this company specific effect is already incorporated by the fixed effects and could be an explanation for the different results. The model preference based on the selections

criteria AIC, BIC and adjusted $R^2$ are identical for the return model based on OLS regressions and fixed effects regressions. The same holds for the application of the Vuong test preferring model 2b validating previous findings.

*Table 5.21: Return regression – fixed effects regression vs. OLS regression*

| | **RET/$S_{it}$ (cum-dividend raw return per share)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (2a) | (2b) | (2c) | (2d) | (2a) | (2b) | (2c) | (2d) |
| Intercept | -0.0777 | -0.0813 | -0.135 | -0.160 | -0.0788 | -0.0652 | -0.151 | -0.0519 |
| | (0.193) | (0.187) | (0.186) | (0.189) | (0.196) | (0.188) | (0.186) | (0.190) |
| Δ NI/Sit | **1.313*** ** | | **1.260*** ** | **1.244*** ** | **1.306*** ** | | **1.234*** ** | **1.227*** ** |
| | (0.102) | | (0.0982) | (0.0983) | (0.117) | | (0.111) | (0.110) |
| Δ CI/Sit | | **1.508*** ** | | | | **1.628*** ** | | |
| | | (0.0824) | | | | (0.0933) | | |
| Δ OCI/Sit | | | **2.132*** ** | | | | **2.622*** ** | |
| | | | (0.159) | | | | (0.180) | |
| Δ FCT/Sit | | | | **2.237*** ** | | | | **2.707*** ** |
| | | | | (0.272) | | | | (0.307) |
| Δ AFS/Sit | | | | **1.658*** ** | | | | **1.998*** ** |
| | | | | (0.228) | | | | (0.257) |
| Δ CFH/Sit | | | | **3.720*** ** | | | | **4.962*** ** |
| | | | | (0.458) | | | | (0.567) |
| Δ ACT/Sit | | | | 1.141 | | | | **4.848*** ** |
| | | | | (1.006) | | | | (1.236) |
| Δ REV/Sit | | | | -10.275 | | | | -1.021 |
| | | | | (6.267) | | | | (6.992) |
| Δ ASS/Sit | | | | 1.565 | | | | 0.169 |
| | | | | (4.056) | | | | (4.504) |
| Δ OTH/Sit | | | | 0.547 | | | | 1.206 |
| | | | | (3.114) | | | | (3.309) |
| N | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 |
| adj. R-sq | 0.065 | 0.123 | 0.130 | 0.137 | 0.034 | 0.115 | 0.134 | 0.145 |
| AIC | 17425.6 | 17272.9 | 17253.8 | 17242.6 | 16889.4 | 16681.5 | 16630.2 | 16604.2 |
| BIC | 17437.2 | 17284.4 | 17271.2 | 17294.6 | 16901.0 | 16693.0 | 16647.5 | 16656.2 |
| Vuong (F-Value) | | -5.8300*** | -4.5936*** | -4.8391*** | | -9.2104*** | -7.2477*** | -7.6123*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

**Robustness checks**

The robustness checks for the return regression follow the same procedure as used for the price regression. In a first step it is examined if negative earnings biased the return regression. Likewise to the price regression, including the terms DNegNI and DNegCI does not change the results. This means that negative income measures do not impact the share return strongly and are hence not biasing the regression.

The potential shortcoming of distorting results on the basis of using the share price three months after fiscal year end instead of the announcement data to calculate the share return can also not be confirmed for the return regression.

The regression coefficients do not change when the financial industry is excluded from the analysis as illustrated in Table 5.22, indicating that including the financial industry in the return regression is reasonable.[525]

When explicitly examining the association between the share return and the different income measures for the financial industry only the significant levels for changes in CFH and ACT is altered to $p<0.05$ and $p<0.1$, respectively. This might indicate that these positions are less value-relevant for investors when dealing with companies from the financial industry, though, the changes in significance level could also have been influenced by the considerable change in the underlying sample size.

[525] Cf. Kanagaretnam et al. (2009), p. 354, Goncharov and Hodgson (2011), p. 55 for similar findings.

*Table 5.22: Return regression excluding financials and on individual basis*

| | **RET/$S_{it}$ (cum-dividend raw return per share)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
| | (2a) | (2b) | (2c) | (2d) | (2a) | (2b) | (2c) | (2d) |
| Intercept | -0.0104 | 0.0497 | -0.00490 | 0.0851 | -0.352 | -0.556 | -0.670* | -0.661* |
| | (0.224) | (0.215) | (0.212) | (0.218) | (0.395) | (0.361) | (0.366) | (0.366) |
| Δ NI/Sit | **1.175***** | | **1.210***** | **1.242***** | **1.606***** | | **1.372***** | **1.219***** |
| | (0.143) | | (0.136) | (0.137) | (0.184) | | (0.172) | (0.173) |
| Δ CI/Sit | | **1.646***** | | | | **1.594***** | | |
| | | (0.120) | | | | (0.131) | | |
| Δ OCI/Sit | | | **2.962***** | | | | **1.992***** | |
| | | | (0.232) | | | | (0.255) | |
| Δ FCT/Sit | | | | **2.348***** | | | | **5.380***** |
| | | | | (0.334) | | | | (0.820) |
| Δ AFS/Sit | | | | **2.633***** | | | | **1.687***** |
| | | | | (0.447) | | | | (0.272) |
| Δ CFH/Sit | | | | **5.566***** | | | | **2.824**** |
| | | | | (0.650) | | | | (1.138) |
| Δ ACT/Sit | | | | **4.418***** | | | | **7.840*** |
| | | | | (1.320) | | | | (4.039) |
| Δ REV/Sit | | | | -6.808 | | | | 13.474 |
| | | | | (8.287) | | | | (11.98) |
| Δ ASS/Sit | | | | -1.325 | | | | 5.418 |
| | | | | (5.394) | | | | (7.371) |
| Δ OTH/Sit | | | | 1.359 | | | | 1.417 |
| | | | | (4.474) | | | | (4.346) |
| N | 1,932 | 1,932 | 1,932 | 1,932 | 449 | 449 | 449 | 449 |
| adj. R-sq | 0.023 | 0.093 | 0.118 | 0.128 | 0.113 | 0.246 | 0.248 | 0.289 |
| AIC | 13820.0 | 13676.8 | 13622.7 | 13605.2 | 3045.8 | 2973.0 | 2972.4 | 2951.4 |
| BIC | 13831.1 | 13687.9 | 13639.4 | 13655.3 | 3054.1 | 2981.2 | 2984.7 | 2988.3 |
| Vuong (F-Value) | | -7.4210*** | -5.9804*** | -6.2349*** | | -6.1630*** | -4.6818*** | -5.1019*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

In line with the application for the price model, control variables have been included in the regressions. The control variables include crisis variables, variables for the yield of government bonds, variables for the GDP growth, variables for leverage and a variable for size indicated by total assets. Table 5.23 illustrated the return models including control variables (2a-CV to 2d-CV) and the model 2d without control variables for comparison.

In general, the inclusion of control variables does not qualitatively change the coefficients of the income measures. The only exemption is the coefficient for ACT turns out to be weakly significant at $p<0.1$. The coefficient for ACT is mainly influenced by the control variable for GDP growth. This could be explained by the fact that ACT are, at least partly, determined by the valuation of the underlying plan assets which are as such strongly influenced by the development of the GDP.

The increases in the control variables relating to the financial crisis (DFINCrisis) and the Eurozone crisis (DEURCrisis) have a negative impact on the share return, which is in line with expectations. The control variable for the financial crisis (DFINCrisis) is significant at $p<0.1$ for model 2b-CV and at $p<0.01$ for models 2c-CV and 2d-CV. Though, the control variable for the Eurozone crisis (DEURCrisis) is non-significant for any of the models. The Coefficients for GDP growth (GDPG) is positive and significant at $p<0.01$ and is as expected. All remaining coefficients are non-significant. Concluding it can be stated that the outcome confirms the robustness of the results.

*Table 5.23: Return regression including control variables*

| | **RET/$S_{it}$ (cum-dividend raw stock return per share)** | | | | |
|---|---|---|---|---|---|
| | (2a-CV) | (2b-CV) | (2c-CV) | (2d-CV) | (2d) |
| Intercept | -8.462 (10.650) | -9.649 (10.370) | -8.553 (10.300) | -8.310 (10.340) | -0.0519 (0.190) |
| Δ NI/$S_{it}$ | **0.856***** (0.101) | | **0.813***** (0.098) | **0.812***** (0.099) | **1.227***** (0.110) |
| Δ CI/$S_{it}$ | | **1.088***** (0.083) | | | |
| Δ OCI/$S_{it}$ | | | **1.818***** (0.164) | | |
| Δ FCT/$S_{it}$ | | | | **1.952***** (0.276) | **2.707***** (0.307) |
| Δ AFS/$S_{it}$ | | | | **1.591***** (0.228) | **1.998***** (0.257) |
| Δ CFH/$S_{it}$ | | | | **2.715***** (0.507) | **4.962***** (0.567) |
| Δ ACT/$S_{it}$ | | | | **1.800*** (1.087) | **4.848***** (1.236) |
| Δ REV/$S_{it}$ | | | | -0.974 (6.085) | -1.021 (6.992) |
| Δ ASS/$S_{it}$ | | | | -2.244 (3.933) | 0.169 (4.504) |
| Δ OTH/$S_{it}$ | | | | 1.812 (2.902) | 1.206 (3.309) |
| DFINCrisis | -0.411 (0.493) | **-0.783*** (0.476) | **-1.339***** (0.484) | **-1.380***** (0.486) | |
| DEURCrisis | -0.142 (0.713) | -0.302 (0.694) | -0.531 (0.691) | -0.590 (0.692) | |
| YGOV | 0.090 (0.060) | 0.076 (0.059) | 0.066 (0.058) | 0.066 (0.058) | |
| GDPG | **1.855***** (0.072) | **1.706***** (0.071) | **1.640***** (0.072) | **1.620***** (0.073) | |
| LEV | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | |
| ITA | 1.103 (1.243) | 1.259 (1.211) | 1.156 (1.203) | 1.130 (1.207) | |
| N | 2,381 | 2,381 | 2,381 | 2,381 | 2,381 |
| adj. R-sq | 0.216 | 0.268 | 0.279 | 0.286 | 0.145 |
| AIC | 16244.7 | 16082.3 | 16048.5 | 16029.0 | 16604.2 |
| BIC | 16290.8 | 16128.4 | 16100.4 | 16115.5 | 16656.2 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

In contrast to the measurement perspective applied in the price model which primarily focuses on the relevance and reliability of accounting information, the information perspective applied in the return model analyzes if the accounting information provided in the form of OCI is useful for investors. This implies that the information on FCT and CFH is regarded as value-relevant and reliable based on the price model. In addition to the other two OCI components also AFS and ACT represent unexpected information to the market indicated by the return regression.

### 5.3.3 Results Abnormal Return Regressions

***The results from the abnormal return models based on CAPM and Sector Returns indicate that CI is more value-relevant than NI. The components of OCI, namely FCT and to some extent AFS are robust and value-relevant in this context. The results imply that the implementation of IAS 1 (revised 2007) did affect the value-relevance for the component FCT of OCI.***

Not only the association of absolute cum dividend returns and income measures are of interest for this study but also the association of relative returns compared to a benchmark with different income measures, represented by abnormal returns. In this section the results from the abnormal return regressions are illustrated examining the association of the NI, CI as well as the individual OCI components with the abnormal return, testing [H2]. The calculation of abnormal returns is based on three different benchmarks to provide robust results and to provide results that are comparable with other studies conducted in this research area so far. Based on the illustration in section 4.2.3 regressions were defined as follows:

$$ABRET_{it} = \delta_{0,1} + \delta_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad (3a)$$

$$ABRET_{it} = \delta_{0,2} + \delta_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad (3b)$$

$$ABRET_{it} = \delta_{0,3} + \delta_3(\Delta NI/S)_{it} + \delta_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad (3c)$$

$$ABRET_{it} = \delta_{0,4} + \delta_5(\Delta NI/S)_{it} + \delta_6(\Delta FCT/S)_{it} + \delta_7(\Delta AFS/S)_{it} + \delta_8(\Delta CFH/S)_{it} + \delta_9(\Delta ACT/S)_{it} + \delta_{10}(\Delta REV/S)_{it} + \delta_{11}(\Delta ASS/S)_{it} + \delta_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad (3d)$$

All variables are as defined in section 4.2.3.

The results based on the fixed effects regression[526] with the (i) abnormal returns based on the CAPM, (ii) abnormal returns based on the sector benchmark, and (iii) abnormal

[526] The initially performed Breusch-Pagan and the Hausman tests confirm the application of fixed effects regression to determine the association between the abnormal returns and the different income measures.

returns based on a fixed expected return, as dependent variables, are illustrated in Table 5.24. Increases in NI, CI, and OCI components on an aggregated basis predict increases in the different calculated abnormal returns at $p<0.01$.

For the regression including the individual components of OCI (3d), increases in FCT and CFH predict higher abnormal returns for all different abnormal return measures at $p<0.01$ to $p<0.1$ significance levels. Higher AFS also seem to increase abnormal returns based on CAPM and on a fixed expected return but not for the sector returns. Abnormal returns based on the 12% expected fixed correlate positively with ACT at $p<0.01$. However, these results need further examination. The comparison of the adjusted $R^2$ for the models using different abnormal return definitions demonstrates that, in particular, the model with abnormal returns based on a fixed expected return has an adjusted $R^2$ which is close to zero for model 3a and comparable very low for the other models, giving this model limited explanatory power.[527] Those results are hardly surprising, because even though the theoretical motivation of using a fixed average return on equity of 12% is comprehensible, the mathematical inclusion of a "fixed term" in the regression is somehow problematic. By subtracting the actual returns from a fixed expected return the regression based on resulting abnormal return is solely shifted. The resulting coefficients is, therefore, more comparable to the return model, though, with distorted coefficients. As a consequence of these findings the application of the abnormal returns based on a fixed expected return is dismissed for the further examination in this study.

A comparison between models 3a and 3b, based on the CAPM abnormal returns, applying the selection criteria adjusted $R^2$, AIC, and BIC provides a clear preference for the model including CI over NI. The performed Vuong test confirms this finding. Based on AIC and BIC model 3b, including CI on a consolidated basis, is slightly preferred over the others, whereas, the model comparison based on the adjusted $R^2$ and the Vuong test marginally prefers model 3c, including NI and OCI separately, over the other models.

In line with the results for the abnormal returns calculated on the CAPM also on the basis of the sector abnormal returns the previously applied selection criteria indicate a

[527] The calculation was repeated with different discount rates for a robustness check, explicitly 4%, 8%, 16% and 20% and showed similar results for the coefficients of the independent variables. Cf. Barth et al. (1999), p. 42 and Dechow et al. (1999), p. 14 for a similar application. The $R^2$ being close to zero implies certain misspecifications in the model design for the model including NI.

clear preference of model including CI over NI. The adjusted $R^2$ for the sector abnormal returns ranges from 8.0% to 9.5% which is clearly below the levels based on the abnormal returns based on the CAPM ranging from 29.7% to 30.7%. This indicates that company specific information, which is included in the CAPM calculation, has an impact on the association of abnormal returns and the components of OCI. An aggregation of the effects on sector level seems to dilute the information value of the income measures. Based on these observation the remaining of this section focuses on the abnormal returns based on the CAPM providing brief reference to the results based on the sector abnormal returns.

Concluding it can be stated that CI, either on a consolidated basis or when reported separately as NI and OCI, is clearly more value-relevant than NI on an individual basis.

*Table 5.24: Abnormal return fixed effects regression*

| | **ABRET_CAPM$_{it}$** | | | | **ABRET_Sector$_{it}$** | | | | **ABRET_12$_{it}$** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (3a) | (3b) | (3c) | (3d) | (3a) | (3b) | (3c) | (3d) | (3a) | (3b) | (3c) | (3d) |
| Intercept | -0.005 | -0.006 | -0.006 | -0.005 | -0.010* | -0.010* | -0.010* | -0.010 | -0.086*** | -0.084*** | -0.087*** | -0.081*** |
| | (0.004) | (0.004) | (0.004) | (0.005) | (0.006) | (0.006) | (0.006) | (0.006) | (0.009) | (0.009) | (0.009) | (0.009) |
| Δ NI/Sit | **0.025*** ** | | **0.025*** ** | **0.025*** ** | **0.019*** ** | | **0.019*** ** | **0.018*** ** | **0.036*** ** | | **0.033*** ** | **0.033*** ** |
| | (0.003) | | (0.003) | (0.003) | (0.004) | | (0.004) | (0.004) | (0.006) | | (0.006) | (0.006) |
| Δ CI/Sit | | **0.023*** ** | | | | **0.022*** ** | | | | **0.057*** ** | | |
| | | (0.002) | | | | (0.003) | | | | (0.005) | | |
| Δ OCI/Sit | | | **0.021*** ** | | | | **0.030*** ** | | | | **0.113*** ** | |
| | | | (0.004) | | | | (0.00566) | | | | (0.008) | |
| Δ FCT/Sit | | | | **0.019*** ** | | | | **0.045*** ** | | | | **0.105*** ** |
| | | | | (0.007) | | | | (0.009) | | | | (0.014) |
| Δ AFS/Sit | | | | **0.017*** ** | | | | 0.014 | | | | **0.085*** ** |
| | | | | (0.006) | | | | (0.009) | | | | (0.013) |
| Δ CFH/Sit | | | | **0.031** ** | | | | **0.035*** | | | | **0.212*** ** |
| | | | | (0.013) | | | | (0.018) | | | | (0.027) |
| Δ ACT/Sit | | | | 0.040 | | | | 0.048 | | | | **0.258*** ** |
| | | | | (0.029) | | | | (0.039) | | | | (0.057) |
| Δ REV/Sit | | | | -0.175 | | | | -0.186 | | | | 0.089 |
| | | | | (0.157) | | | | (0.211) | | | | (0.314) |
| Δ ASS/Sit | | | | 0.076 | | | | 0.054 | | | | 0.307 |
| | | | | (0.105) | | | | (0.141) | | | | (0.210) |
| Δ OTH/Sit | | | | **0.536*** | | | | 0.342 | | | | 0.148 |
| | | | | (0.300) | | | | (0.404) | | | | (0.600) |
| N | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 |
| adj. R-sq | 0.297 | 0.305 | 0.306 | 0.306 | 0.080 | 0.093 | 0.094 | 0.095 | 0.000 | 0.002 | 0.028 | 0.040 |
| AIC | -1234.8 | -1263.6 | -1263.6 | -1259.7 | 121.3 | 89.01 | 86.56 | 88.50 | 2126.1 | 1983.9 | 1906.9 | 1884.5 |
| BIC | -1223.3 | -1252.1 | -1246.4 | -1208.2 | 132.7 | 100.5 | 103.7 | 140.0 | 2137.5 | 1995.4 | 1924.1 | 1936.0 |
| Vuong (F-Value) | | -3.9949*** | -4.6458*** | -4.0086*** | | -4.6114*** | -3.7161*** | -3.5977*** | | -11.4914*** | -11.0913*** | -10.9223*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Also for the abnormal return models it is examined if the introduction of IAS 1 (revised 2007) had an impact on the association between the abnormal returns and the different illustrated CI figures. The results from a Chow test, illustrated in Table 5.25, show that the association between CI and abnormal returns based on the CAPM changed before and after the introduction of IAS 1 (revised 2007; report Stats). The difference in changes in OCI before and after the explicit of OCI components was primarily driven by the change in the OCI component FCT.[528] The results imply that the explicit reporting of FCT under IAS 1 (revised 2007) changed the regression significantly between this OCI component and abnormal return.

*Table 5.25: Abnormal return (CAPM) - results from the Chow test*

| **Chow test ABRET_CAPM$_{it}$ (Abnormal return based on CAPM)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ CI/S$_{it}$ | $\Delta$ OCI/S$_{it}$ | $\Delta$ FCT/S$_{it}$ | $\Delta$ AFS/S$_{it}$ | $\Delta$ CFH/S$_{it}$ | $\Delta$ ACT/S$_{it}$ | $\Delta$ REV/S$_{it}$ | $\Delta$ ASS/S$_{it}$ | $\Delta$ OTH/S$_{it}$ |
| Chow (F-Value) | **9.38*** ** | **3.22*** | **6.13**** | 0.20 | 0.14 | 0.00 | 0.51 | 0.33 | 0.67 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

Furthermore, it is examined if OLS regressions and fixed effects regressions produce different results for the abnormal return model. A comparison of the results for the abnormal returns calculated on the basis of the CAPM is shown in Table 5.26. Both regression models produce qualitatively similar results.

The model selection criteria AIC, BIC and adjusted $R^2$ based on OLS regressions indicate similar preferences as indicated for the fixed effects regression, favoring models including CI in any form over models including solely NI. Moreover, the models including the components of OCI individually are not favored over models including the components on an aggregated basis. These findings are confirmed by the Vuong test.

[528] The Chow test based on sector abnormal returns indicates that the coefficients for CI and OCI are weakly significant for a comparison of the periods before and after the implementation, even if, none of the components of the OCI indicates a significant change.

*Table 5.26: Abnormal return (CAPM) – fixed effects regression vs. OLS regression*

| | **ABRET_CAPM$_{it}$** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (3a) | (3b) | (3c) | (3d) | (3a) | (3b) | (3c) | (3d) |
| Intercept | -0.005 | -0.006 | -0.005 | -0.007 | -0.005 | -0.006 | -0.006 | -0.005 |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.004) | (0.004) | (0.004) | (0.005) |
| Δ NI/Sit | **0.029**** | | **0.028***** | **0.028***** | **0.025***** | | **0.025***** | **0.025***** |
| | (0.003) | | (0.003) | (0.003) | (0.003) | | (0.003) | (0.003) |
| Δ CI/Sit | | **0.025***** | | | | **0.023***** | | |
| | | (0.002) | | | | (0.002) | | |
| Δ OCI/Sit | | | **0.018***** | | | | **0.021***** | |
| | | | (0.004) | | | | (0.004) | |
| Δ FCT/Sit | | | | **0.015**** | | | | **0.019***** |
| | | | | (0.007) | | | | (0.007) |
| Δ AFS/Sit | | | | **0.019***** | | | | **0.017***** |
| | | | | (0.007) | | | | (0.006) |
| Δ CFH/Sit | | | | **0.025**** | | | | **0.031**** |
| | | | | (0.012) | | | | (0.013) |
| Δ ACT/Sit | | | | -0.042 | | | | 0.040 |
| | | | | (0.028) | | | | (0.029) |
| Δ REV/Sit | | | | -0.187 | | | | -0.175 |
| | | | | (0.166) | | | | (0.157) |
| Δ ASS/Sit | | | | 0.046 | | | | 0.076 |
| | | | | (0.111) | | | | (0.105) |
| Δ OTH/Sit | | | | 0.258 | | | | **0.536*** |
| | | | | (0.322) | | | | (0.300) |
| N | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 |
| adj. R-sq | 0.045 | 0.050 | 0.051 | 0.052 | 0.297 | 0.305 | 0.306 | 0.306 |
| AIC | 71.14 | 59.83 | 57.09 | 61.85 | -1234.8 | -1263.6 | -1263.6 | -1259.7 |
| BIC | 82.60 | 71.28 | 74.28 | 113.4 | -1223.3 | -1252.1 | -1246.4 | -1208.2 |
| Vuong (F-Value) | | -1.2320* | -2.3873*** | -2.0659*** | | -3.9949*** | -4.6458*** | -4.0086*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

## Robustness checks

The robustness checks for the abnormal return regressions are in line with the checks used for the return regression. The including of the variables DNegNI and DNegCI tests if negative earnings may have distorted the abnormal return regression. Results show that that negative income measures do not have a distorting impact on the abnormal return.

In line with the findings for the price and return regressions the potential deficiency of using share prices three months after fiscal year does not change the coefficients.

As illustrated in Table 5.27, excluding the financial industry from the sample in general does not substantially change the results of the abnormal return regression. However, with the exclusion of the financial industry AFS does not predict changes in abnormal returns based on the CAPM anymore. In contrast, when only including companies from the financial industry increases in AFS predict higher abnormal returns based on the CAPM at $p<0.01$.[529] Combining the findings for the two subsamples, it can be concluded that the inclusion of the financial industry is the main driver of the significant results for the association of AFS and abnormal returns based on CAPM. The coefficients for NI, CI, and OCI as well as for FCT and CFH remain unaltered. The further robustness checks are performed on the basis of the full sample for the highest possible generalizability; however, implications are also provided for the robustness of the results based on the sample excluding the financial industry and the results for companies from the financial industry.

[529] The results on the basis of the sector abnormal returns provide qualitatively similar results.

*Table 5.27: Abnormal return regression excluding financials and on individual basis*

| | **ABRET_CAPM$_{it}$** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
| | (3a) | (3b) | (3c) | (3d) | (3a) | (3b) | (3c) | (3d) |
| Intercept | 0.010* | 0.010** | 0.010** | 0.011** | -0.075*** | -0.076*** | -0.079*** | -0.078*** |
| | (0.005) | (0.005) | (0.005) | (0.005) | (0.009) | (0.009) | (0.009) | (0.009) |
| Δ NI/Sit | **0.030*** ** | | **0.030*** ** | **0.030*** ** | **0.014*** ** | | **0.010** ** | **0.010** ** |
| | (0.003) | | (0.003) | (0.003) | (0.004) | | (0.004) | (0.005) |
| Δ CI/Sit | | **0.027*** ** | | | | **0.016*** ** | | |
| | | (0.003) | | | | (0.003) | | |
| Δ OCI/Sit | | | **0.020*** ** | | | | **0.026*** ** | |
| | | | (0.005) | | | | (0.007) | |
| Δ FCT/Sit | | | | **0.019** ** | | | | 0.012 |
| | | | | (0.007) | | | | (0.024) |
| Δ AFS/Sit | | | | 0.009 | | | | **0.025*** ** |
| | | | | (0.010) | | | | (0.007) |
| Δ CFH/Sit | | | | **0.035** ** | | | | 0.051 |
| | | | | (0.015) | | | | (0.031) |
| Δ ACT/Sit | | | | 0.038 | | | | 0.120 |
| | | | | (0.030) | | | | (0.123) |
| Δ REV/Sit | | | | -0.206 | | | | 0.015 |
| | | | | (0.181) | | | | (0.315) |
| Δ ASS/Sit | | | | 0.020 | | | | 0.221 |
| | | | | (0.123) | | | | (0.187) |
| Δ OTH/Sit | | | | 0.457 | | | | 0.390 |
| | | | | (0.389) | | | | (0.459) |
| N | 1,863 | 1,863 | 1,863 | 1,863 | 407 | 407 | 407 | 407 |
| adj. R-sq | 0.283 | 0.288 | 0.290 | 0.289 | 0.326 | 0.352 | 0.357 | 0.351 |
| AIC | -922.7 | -936.2 | -939.4 | -934.8 | -335.8 | -351.9 | -354.7 | -347.3 |
| BIC | -911.6 | -925.1 | -922.8 | -885.1 | -327.8 | -343.9 | -342.6 | -311.3 |
| Vuong (F-Value) | | -1.8737** | -3.3042*** | -2.6291*** | | -4.8115*** | -4.1730*** | -2.9727*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Following the procedure from the price and return model, control variables have been included in the abnormal return regression to capture factors that may have biased the regression. The results are illustrated in Table 5.28, whereas the models 3a-CV to 3d-CV include control variables and model 3d shows the results without control variables for comparison. By including these control variables, a trend towards weaker associations between the income components and abnormal returns can be observed.

The significance level for the changes in AFS drops from p<.01 to p<0.1 and the coefficient for changes in CFH turns out to be non-significant previously being significant at the p<.05. The findings show that the control variables moderate the relationship between the abnormal returns and the components of OCI. Especially the variable for GDP growth and the government bond yield serve as mediator variable and significantly influence the regression.

Increases in the control variables for the financial crisis (DFINCrisis) predict decreases in the abnormal returns at p<0.01, though, non-significant for the Eurozone crisis (DFINCrisis). As expected, higher government bond yields (YGOV) seem to decrease abnormal returns at p<0.01, while GDP growth (GDPG) seems to increase abnormal returns at p<0.01. In contrast to the price model, larger companies have smaller abnormal returns than smaller companies at p<0.5 and p<0.1 for the different models. This could be explained by the fact that larger companies have a larger impact on the development of the comparable market averages and, therefore, have smaller abnormal returns. Leverage (LEV) does not seem to affect the abnormal returns. In general it can be concluded the tests confirm the robustness of the results.

*Table 5.28: Abnormal return regression (CAPM) including control variables*

| | **ABRET_CAPM$_{it}$ (Abnormal return based on CAPM)** | | | | |
|---|---|---|---|---|---|
| | (3a-CV) | (3b-CV) | (3c-CV) | (3d-CV) | (3d) |
| Intercept | 0.665** (0.283) | 0.626** (0.283) | 0.627** (0.282) | 0.623** (0.283) | -0.005 (0.005) |
| Δ NI/S$_{it}$ | **0.024*** (0.003) | | **0.023*** (0.003) | **0.023*** (0.003) | **0.025*** (0.003) |
| Δ CI/S$_{it}$ | | **0.021*** (0.002) | | | |
| Δ OCI/S$_{it}$ | | | **0.016*** (0.004) | | |
| Δ FCT/S$_{it}$ | | | | **0.020*** (0.007) | **0.019*** (0.007) |
| Δ AFS/S$_{it}$ | | | | **0.012*** (0.006) | **0.017*** (0.006) |
| Δ CFH/S$_{it}$ | | | | 0.015 (0.013) | **0.031**** (0.013) |
| Δ ACT/S$_{it}$ | | | | 0.034 (0.028) | 0.040 (0.029) |
| Δ REV/S$_{it}$ | | | | -0.184 (0.153) | -0.175 (0.157) |
| Δ ASS/S$_{it}$ | | | | 0.057 (0.102) | 0.076 (0.105) |
| Δ OTH/S$_{it}$ | | | | **0.547*** (0.293) | **0.536*** (0.300) |
| DFINCrisis | **-0.089***** (0.015) | **-0.088***** (0.015) | **-0.087***** (0.015) | **-0.088***** (0.015) | |
| DEURCrisis | 0.026 (0.019) | 0.024 (0.019) | 0.025 (0.019) | 0.023 (0.019) | |
| YGOV | **-0.014***** (0.002) | **-0.014***** (0.002) | **-0.014***** (0.002) | **-0.014***** (0.002) | |
| GDPG | **0.020***** (0.002) | **0.018***** (0.002) | **0.019***** (0.002) | **0.019***** (0.002) | |
| LEV | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | |
| ITA | **-0.069**** (0.033) | **-0.065**** (0.033) | **-0.065**** (0.033) | **-0.064*** (0.033) | |
| N | 2,270 | 2,270 | 2,270 | 2,270 | 2,270 |
| adj. R-sq | 0.342 | 0.346 | 0.347 | 0.347 | 0.306 |
| AIC | -1367.2 | -1383.6 | -1384.8 | -1380.6 | -1259.7 |
| BIC | -1321.5 | -1337.8 | -1333.3 | -1294.8 | -1208.2 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

### 5.3.4 Results Target Price Regressions

The importance of analysts' forecasts in general and of target prices in particular for the investor community was highlighted in section 4.2.4. This section shows the results for the regressions on NI, CI, and components of OCI and the (i) target price consensus (TPC), (ii) target prices revision (TPR), and (iii) target price potential (TPP) , testing [H3].

### 5.3.4.1 Results Target Price Consensus Regressions

***The results from the target price consensus model indicate that CI is more value-relevant than NI. The components of OCI, namely CFH and to some extent ACT are robust and value-relevant in this context. The results imply that the implementation of IAS 1 (revised 2007) did affect the value-relevance for the components FCT and ACT of OCI.***

This section illustrates the results from the regression testing the association between target price consensus (TPC) and NI, CI as well as the components of OCI. Closely linked to the application for the price model, the following regressions are applied to examine a potential association:

$$TPC_{it}= \mu_{0,1}+ \mu_1 BVE/S_{it}+ \mu_2 NI/S_{it}+\varepsilon_{it}+v_i \quad (4a\_TPC)$$

$$TPC_{it}= \mu_{0,2}+ \mu_3 BVE/S_{it}+ \mu_4 CI/S_{it}+\varepsilon_{it}+v_i \quad (4b\_TPC)$$

$$TPC_{it}= \mu_{0,3}+ \mu_5 BVE/S_{it}+ \mu_6 NI/S_{it}+ \mu_7 OCI/S_{it}+\varepsilon_{it}+v_i \quad (4c\_TPC)$$

$$TPC_{it}= \mu_{0,4}+ \mu_8 BVE/S_{it}+ \mu_9 NI/S_{it}+\mu_{10} FCT/S_{it}+\mu_{11} AFS/S_{it}+\mu_{12} CFH/S_{it} +\mu_{13} ACT/S_{it}+\mu_{14} REV/S_{it}+\mu_{15} ASS/S_{it}+\mu_{16} OTH/S_{it}+\varepsilon_{it}+v_i \quad (4d\_TPC)$$

All variables are as defined in section 4.2.4.

The results based on the fixed effects[530] regressions examining the association of the target price consensus with different income measures are illustrated in Table 5.29. The adjusted $R^2$ for the different models amounts to about 85% which is in line with the observation for the price model and is primarily driven by the inclusion of the BVE in the regression. Increases in BVE predict increases in the target price consensus for all models at $p<0.01$. Also increases in NI, in CI, and in OCI predict higher target price consensus at $p<0.01$ which is in line with the findings for the price model. Likewise

[530] The initially performed Breusch-Pagan and the Hausman tests confirm the application of fixed effects regression for the regression of the target price consensus and the different income measures.

positive values in CFH and ACT predict higher target price consensus at $p<0.01$ and FCT and OTH seem to impact the target price consensus positively at $p<0.1$. The significance of the components implies that analysts regard those positions as value-relevant and include them in their valuation. These findings are slightly different from the results from the price regression where the coefficients for FCT and CFH were found to be positive and significant at $p<0.01$. The initially observed differences between the findings of the two models could be an indication for the fact that analysts do not regard FCT as being value-relevant for their valuations. However, for analysts, ACT seems to be value-relevant and therefore is included in their projections for the target price. The differences between the price model and the target price consensus model are further illustrated in the summary section of results.

On the basis of the selection criteria AIC, BIC, adjusted $R^2$ as well as based on the Voung test the models including CI in any form (4b_TPC to 4d_TPC) are favored over the model solely including NI (4a_TPC) which is an indicator for a higher value-relevance of CI compared to NI. Whereas the preference of the model including CI on a consolidated basis (4b_TPC) over the model solely including NI (4a_TPC) is only marginal, the preference becomes more significant for the models including NI and OCI (4c_TPC) and even further based on the basis of including all components of OCI (4d_TPC). Based on all selection criteria the latter model (4d_TPC) is preferred over the other models.

*Table 5.29: Target price consensus fixed effects regression*

| | $TPC_{it}$ (target price consensus) | | | |
|---|---|---|---|---|
| | (4a_TPC) | (4b_TPC) | (4c_TPC) | (4d_TPC) |
| Intercept | 11.497*** (0.996) | 12.304*** (1.002) | 12.072*** (1.001) | 11.998*** (0.996) |
| $BVE/S_{it}$ | **0.677*** (0.074) | **0.663*** (0.075) | **0.647*** (0.074) | **0.675*** (0.075) |
| $NI/S_{it}$ | **2.589*** (0.141) | | **2.585*** (0.141) | **2.543*** (0.140) |
| $CI/S_{it}$ | | **2.356*** (0.128) | | |
| $OCI/S_{it}$ | | | **1.305*** (0.305) | |
| $FCT/S_{it}$ | | | | **0.759*** (0.437) |
| $AFS/S_{it}$ | | | | 0.120 (0.528) |
| $CFH/S_{it}$ | | | | **6.653*** (1.017) |
| $ACT/S_{it}$ | | | | **3.974*** (1.520) |
| $REV/S_{it}$ | | | | -18.972 (16.586) |
| $ASS/S_{it}$ | | | | 11.717 (8.771) |
| $OTH/S_{it}$ | | | | **57.967*** (29.747) |
| N | 2,639 | 2,639 | 2,639 | 2,639 |
| adj. R-sq | 0.851 | 0.851 | 0.852 | 0.855 |
| AIC | 18836.7 | 18832.3 | 18816.0 | 18773.8 |
| BIC | 18854.4 | 18849.9 | 18839.5 | 18832.6 |
| Vuong (F-Value) | | -0.2448 | -2.2167** | -3.1766*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

In line with the application for the previous models, the Chow test indicates that the associations of CI and OCI with the target price consensus changed significantly between the years before and after the implementation of IAS 1 (revised 2007) illustrated in Table 5.30. The findings demonstrate that this change was primarily driven by the OCI components FCT and ACT for which increases predict higher target price consensus at p<0.01. A possible explanation for this finding could be that analysts have changed their view of considering FCT and ACT in their valuation with the explicit reporting of these values. This change in the valuation view could have been influenced by the fact that the prominent presentation raised more attention to those items and by the fact that the explicit reporting has improved the usefulness of processing the information into the valuation.

*Table 5.30: Target price consensus regression – results from the Chow test*

| **Chow test $TPC_{it}$ (target price consensus)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CI/Sit | OCI/Sit | FCT/Sit | AFS/Sit | CFH/Sit | ACT/Sit | REV/Sit | ASS/Sit | OTH/Sit |
| Chow (F-Value) | **4.00**** | **8.33***** | **20.56***** | 1.40 | 0.39 | **7.14***** | 0.09 | 0.42 | 1.22 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

As outlined for the previously illustrated models the target price consensus regression is recalculated on the basis of pooled OLS regressions and the findings are compared with the results from the fixed effects regression. The results are illustrated in Table 5.31. The coefficients for CI and NI are similar for both models, whereas the OLS regression shows a trend towards a weaker association between consolidated OCI and target price consensus. This difference is based on the components of OCI and needs further consideration. Whereas the coefficients for FCT and CFH are similar, the predictive value for ACT inverts. While increases in ACT predict decreases in the target price consensus in OLS regression at p<0.01, increases in ACT in the fixed effects regression predict higher target price consensus at p<0.01. This result demonstrates that there are potentially unobservable companies specific effects that have significance impact on the association between ACT and the target price consensus. Whereas this effect is captured by the company specific term in the fixed effects model the pooled OLS does not specifically consider this effect, therefore, biasing the regression. Even though direction of association differs between the OLS regression and the fixed effects regression, both models confirm the high value-relevance of the component of OCI. Hence, previous conflicting results across studies may be due to the different regressions models used in the analyses.

A comparison based on the model selections AIC, BIC, and adjusted $R^2$ for the OLS regression and fixed effects regression produces conflicting results. In line with the findings for the price model, the OLS regression favors the model including NI (4a_TPC) over the model including CI (4b_TPC) whereas the preference based on the OLS model is the opposite illustrated in Table 5.31. The performed Vuong test confirms the preference of the model including all components of OCI (4d_TPC) over the model including solely NI (4a_TPC) on the basis of all applied model selection criteria for the fixed effects and OLS regression.

*Table 5.31: Target price consensus – fixed effects regression vs. OLS regression*

| | **$TPC_{it}$ (target price consensus)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (4a_TPC) | (4b_TPC) | (4c_TPC) | (4d_TPC) | (4a_TPC) | (4b_TPC) | (4c_TPC) | (4d_TPC) |
| Intercept | 7.723*** | 8.043*** | 7.749*** | 7.658*** | 11.49*** | 12.30*** | 12.07*** | 11.99*** |
| | (0.386) | (0.392) | (0.386) | (0.385) | (0.996) | (1.002) | (1.001) | (0.996) |
| $BVE/S_{it}$ | **0.680*** ** | **0.758*** ** | **0.684*** ** | **0.667*** ** | **0.677*** ** | **0.663*** ** | **0.647*** ** | **0.675*** ** |
| | (0.0232) | (0.0225) | (0.0234) | (0.0238) | (0.0744) | (0.0745) | (0.0744) | (0.0748) |
| $NI/S_{it}$ | **5.056*** ** | | **5.048*** ** | **5.058*** ** | **2.589*** ** | | **2.585*** ** | **2.543*** ** |
| | (0.161) | | (0.161) | (0.161) | (0.141) | | (0.141) | (0.140) |
| $CI/S_{it}$ | | **4.443*** ** | | | | **2.356*** ** | | |
| | | (0.151) | | | | (0.128) | | |
| $OCI/S_{it}$ | | | **0.730*** | | | | **1.305*** ** | |
| | | | (0.411) | | | | (0.305) | |
| $FCT/S_{it}$ | | | | **1.410** ** | | | | **0.759*** |
| | | | | (0.604) | | | | (0.437) |
| $AFS/S_{it}$ | | | | -0.645 | | | | 0.120 |
| | | | | (0.687) | | | | (0.528) |
| $CFH/S_{it}$ | | | | **4.170*** ** | | | | **6.653*** ** |
| | | | | (1.367) | | | | (1.017) |
| $ACT/S_{it}$ | | | | **-6.860*** ** | | | | **3.974*** ** |
| | | | | (1.627) | | | | (1.520) |
| $REV/S_{it}$ | | | | 18.165 | | | | -18.972 |
| | | | | (17.971) | | | | (16.586) |
| $ASS/S_{it}$ | | | | 9.345 | | | | 11.717 |
| | | | | (10.646) | | | | (8.771) |
| $OTH/S_{it}$ | | | | **83.334** ** | | | | **57.967*** |
| | | | | (38.221) | | | | (29.747) |
| N | 2,639 | 2,639 | 2,639 | 2,639 | 2,639 | 2,639 | 2,639 | 2,639 |
| adj. R-sq | 0.645 | 0.633 | 0.645 | 0.650 | 0.851 | 0.851 | 0.852 | 0.855 |
| AIC | 21702.6 | 21791.5 | 21701.4 | 21673.5 | 18836.7 | 18832.3 | 18816.0 | 18773.8 |
| BIC | 21720.2 | 21809.2 | 21724.9 | 21718.3 | 18854.4 | 18849.9 | 18839.5 | 18832.6 |
| Vuong (F-Value) | | 3.0287 | -0.4784 | -2.1495** | | -0.2448 | -2.2167** | -3.1766*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

**Robustness checks**

To test whether negative earnings may have distorted the regression, the terms DNegNI and DNegCI were added to the regression.[531] The inclusion does not qualitatively change the coefficients. The only difference is the change of the significance level for FCT from $p<0.1$ to $p<0.05$. In general, the outcome implies that negative NI or negative CI do not bias the regression for the target price consensus. As already briefly illustrated in previous sections failing to use the exact announcement dates for the determination of the target prices does not distort the results of the target price consensus model.

Moreover, the regression is rerun by firstly excluding companies from the financial industry and secondly by solely including companies from the financial industry. The results presented in Table 5.32 show that even when companies from the financial industry are excluded regression coefficients remain identical to the full sample.[532] When analyzing the association between the target price consensus and the different income measures on the basis of financial companies the predictive value remains at $p<0.01$ for NI, CI, OCI, and at $p<0.1$ for FCT. CFH and ACT do not predict changes in the target price consensus. The predictive value of BVE for the target price consensus is lower for the financial industry which in line with the findings for the price model. The results imply that analysts include CFH, ACT, and to a certain extent FCT in their valuation when dealing with non-financial companies; however, this finding cannot be confirmed on the sample for the financial industry. To provide the highest possible generalizability, the further analysis is based on the full sample.

[531] Cf. Das (1998), pp. 37–46. The author finds that analysts' projections are less accurate for loss making companies compared to profit making companies.

[532] The only exemption being OTH which turns out not to be significant previously being weakly significant at $p<0.1$.

*Table 5.32: Target price consensus excluding financials and on individual basis*

| | **$TPC_{it}$ (target price consensus)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
| | (4a_TPC) | (4b_TPC) | (4c_TPC) | (4d_TPC) | (4a_TPC) | (4b_TPC) | (4c_TPC) | (4d_TPC) |
| Intercept | 10.405*** | 11.041*** | 10.937*** | 10.925*** | 11.431*** | 12.959*** | 12.724*** | 12.763*** |
| | (1.045) | (1.042) | (1.041) | (1.037) | (2.172) | (2.201) | (2.213) | (2.246) |
| $BVE/S_{it}$ | **0.831*** ** | **0.821*** ** | **0.803*** ** | **0.823*** ** | **0.296*** ** | **0.242** ** | **0.244** ** | **0.246** ** |
| | (0.086) | (0.085) | (0.086) | (0.086) | (0.111) | (0.112) | (0.112) | (0.113) |
| $NI/S_{it}$ | **2.912*** ** | | **2.915*** ** | **2.940*** ** | **1.564*** ** | | **1.556*** ** | **1.551*** ** |
| | (0.171) | | (0.169) | (0.169) | (0.191) | | (0.189) | (0.196) |
| $CI/S_{it}$ | | **2.734*** ** | | | | **1.478*** ** | | |
| | | (0.154) | | | | (0.172) | | |
| $OCI/S_{it}$ | | | **1.931*** ** | | | | **1.089** ** | |
| | | | (0.361) | | | | (0.428) | |
| $FCT/S_{it}$ | | | | **0.818*** | | | | **1.855*** |
| | | | | (0.458) | | | | (1.059) |
| $AFS/S_{it}$ | | | | 0.916 | | | | 0.837 |
| | | | | (0.828) | | | | (0.554) |
| $CFH/S_{it}$ | | | | **8.419*** ** | | | | 1.325 |
| | | | | (1.129) | | | | (1.823) |
| $ACT/S_{it}$ | | | | **4.090*** ** | | | | 7.529 |
| | | | | (1.551) | | | | (5.314) |
| $REV/S_{it}$ | | | | -31.002 | | | | 18.947 |
| | | | | (19.419) | | | | (23.784) |
| $ASS/S_{it}$ | | | | 7.782 | | | | 23.592 |
| | | | | (9.497) | | | | (16.893) |
| $OTH/S_{it}$ | | | | 32.201 | | | | 85.454 |
| | | | | (32.878) | | | | (52.519) |
| N | 2,182 | 2,182 | 2,182 | 2,182 | 457 | 457 | 457 | 457 |
| adj. R-sq | 0.848 | 0.850 | 0.850 | 0.854 | 0.874 | 0.871 | 0.874 | 0.874 |
| AIC | 15582.2 | 15555.1 | 15549.1 | 15504.7 | 3216.6 | 3228.1 | 3218.4 | 3220.3 |
| BIC | 15599.3 | 15572.2 | 15571.9 | 15561.5 | 3229.0 | 3240.4 | 3234.9 | 3261.6 |
| Vuong (F-Value) | | -1.5857* | -2.8456*** | -3.7539*** | | 1.5319 | 1.310 | -0.1449 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

As part of the robustness check the regressions are rerun by including control variables in line with the application for the price model. In order to control for specific effects relating to analyst recommendations two additional control variables dealing with the target prices were included in the regression. The number of analysts providing target prices differs across companies and may have a disturbing effect on the findings. To

control for this potential effect a variable, representing the number of analysts providing target prices (NumAnalyst), was included. Moreover, the target price might have been affected by liquidity of the share represented by the trading volume for a particular company. Consequently, a variable controlling for the trading volume of the share (TradVol) was included in the regression.

The regressions including the control variables produce qualitatively similar results as illustrated in Table 5.33. Whereas the significance level remains highly significant at $p<0.01$ for the coefficients for NI, CI, OCI, and CFH, the significance level for the coefficients for FCT and OTH become non-significant previously being weakly significant at $p<0.1$ and decreases from the $p<0.01$ to $p<0.05$ for the coefficient for ACT.

In line with expectations increases in the control variables for the financial crisis (DFINCrisis) and the Eurozone crisis (DEURCrisis) seem to decrease target price consensus at $p<0.01$, while increases in GDP growth (GDPG) predict increases target price at $p<0.01$. Moreover it seems that the target price revisions are comparably higher for companies whose shares are traded in higher volumes (TradVol) around the announcement date of results at $p<0.01$. All other variables were not relevant for the regression.

*Table 5.33: Target price consensus fixed effects regression including control variables*

| | **$TPC_{it}$ (target price consensus)** | | | | |
|---|---|---|---|---|---|
| | 4a_TPC-CV) | (4b_TPC-CV) | (4c_TPC-CV) | (4d_TPC-CV) | (4d_TPC) |
| Intercept | 17.330 (10.834) | 12.934 (10.820) | 14.087 (10.813) | 11.209 (10.828) | 11.998*** (0.996) |
| $BVE/S_{it}$ | **0.528***** (0.084) | **0.521***** (0.084) | **0.503***** (0.084) | **0.516***** (0.084) | **0.675***** (0.075) |
| $NI/S_{it}$ | **2.237***** (0.140) | | **2.218***** (0.140) | **2.201***** (0.139) | **2.543***** (0.140) |
| $CI/S_{it}$ | | **2.042***** (0.125) | | | |
| $OCI/S_{it}$ | | | **1.281***** (0.299) | | |
| $FCT/S_{it}$ | | | | 0.657 (0.450) | **0.759*** (0.437) |
| $AFS/S_{it}$ | | | | 0.328 (0.518) | 0.120 (0.528) |
| $CFH/S_{it}$ | | | | **5.301***** (1.014) | **6.653***** (1.017) |
| $ACT/S_{it}$ | | | | **2.924**** (1.474) | **3.974***** (1.520) |
| $REV/S_{it}$ | | | | -14.896 (15.975) | -18.972 (16.586) |
| $ASS/S_{it}$ | | | | 11.902 (8.448) | 11.717 (8.771) |
| $OTH/S_{it}$ | | | | 48.620 (29.090) | **57.967*** (29.747) |
| DFINCrisis | **-5.803***** (0.592) | **-5.241***** (0.592) | **-5.443***** (0.596) | **-5.143***** (0.598) | |
| DEURCrisis | **-4.731***** (0.723) | **-4.678***** (0.721) | **-4.680***** (0.720) | **-4.477***** (0.722) | |
| YGOV | -0.0147 (0.073) | 0.00286 (0.073) | -0.00508 (0.073) | -0.00576 (0.073) | |
| GDPG | **0.398***** (0.105) | **0.439***** (0.104) | **0.421***** (0.105) | **0.422***** (0.104) | |
| LEV | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | |
| ITA | -0.195 (1.364) | 0.453 (1.363) | 0.279 (1.363) | 0.571 (1.363) | |
| NumAnalyst | 0.018 (0.075) | -0.031 (0.075) | -0.009 (0.075) | 0.009 (0.075) | |
| TradVol | **0.025***** (0.003) | **0.026***** (0.003) | **0.025***** (0.003) | **0.025***** (0.003) | |
| N | 2,639 | 2,639 | 2,639 | 2,639 | 2,639 |
| adj. R-sq | 0.865 | 0.866 | 0.866 | 0.867 | 0.855 |
| AIC | 18314.6 | 18301.4 | 18293.7 | 18271.5 | 18773.8 |
| BIC | 18379.1 | 18365.9 | 18364.1 | 18377.0 | 18832.6 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

### 5.3.4.2 Results Target Price Revision Regressions

***The results from the target price revision model indicate that CI is more value-relevant than NI. The components of OCI, namely FCT, AFS, CFH, and ACT are robust and value-relevant in this context. The results imply that the implementation of IAS 1 (revised 2007) did affect value-relevance for the OCI components FCT, AFS, CFH, and ACT.***

In this section the results from the regression testing the association between target price revisions (TPR) and changes in NI, CI as well as the components of OCI are illustrated. Closely linked to the application for the return model, regressions were defined as follows:

$$TPR_{it}= \sigma_{0,1}+ \sigma_1(\Delta NI/S)_{it}+\varepsilon_{it}+v_i \quad (4a\_TPR)$$

$$TPR_{it}= \sigma_{0,2}+ \sigma_2(\Delta CI/S)_{it}+\varepsilon_{it}+v_i \quad (4b\_TPR)$$

$$TPR_{it}= \sigma_{0,3}+ \sigma_3(\Delta NI/S)_{it}+ \sigma_4(\Delta OCI/S)_{it}+\varepsilon_{it}+v_i \quad (4c\_TPR)$$

$$TPR_{it}= \sigma_{0,4}+ \sigma_5(\Delta NI/S)_{it}+\sigma_6(\Delta FCT/S)_{it}+\sigma_7(\Delta AFS/S)_{it}+\sigma_8(\Delta CFH/S)_{it} \quad (4d\_TPR)$$
$$+\sigma_9(\Delta ACT/S)_{it}+\sigma_{10}(\Delta REV/S)_{it}+\sigma_{11}(\Delta ASS/S)_{it}+\sigma_{12}(\Delta OTH/S)_{it}+\varepsilon_{it}+v_i$$

All variables are as defined in section 4.2.4.

The results from fixed effects regressions[533] are illustrated in Table 5.34. The adjusted $R^2$ ranges from 7.2% for model 4a_TPR including NI to 16.6% for model 4d_TPR including all components of OCI on an individual basis and are comparable to the findings of the return model. Increases in NI, CI, and OCI predict increases in target price revisions at $p<0.01$. Likewise, increases in FCT, AFS, CFH, and ACT seem to increase the target price revisions at $p<0.01$. Overall analysts seem to incorporate the information on CI and particular OCI components in their target price revisions. When

[533] The initially performed Breusch-Pagan and the Hausman tests confirm the application of fixed effects regression to determine the association between the target price revisions and the different income measures.

comparing the results from the target price revisions with the results from the return model it can be stated that the findings for target price revisions are in general in line with the findings for the return model with the exception of changes in ACT. The difference in significance level for changes in ACT at $p<0.01$ compared to $p<0.1$ for the return model indicates that, even though influenced by the development of the share price, analysts additionally seem to incorporate ACT in their valuations, which emphasizes the value-relevance of this OCI component for analysts.

The positive correlation between changes in FCT and target price revisions is in line with the findings by Goncharov and Hodgson (2011). However, in contrast to the current study, the authors did not find significant results for the correlation with AFS and a positive correlation for REV. They did not include the additional components of OCI namely changes in CFH, ACT, and OTH.

A model comparison based on the selection criteria AIC, BIC, adjusted $R^2$, and the Vuong shows that the models 4b_TPR to 4d_TPR, including CI in any form, are favored over model 4a_TPR including solely NI. Though, the preference among the models including CI slightly differs across the selection criteria. On the basis of AIC, BIC, and adjusted $R^2$ model 4d_TPR is preferred over the other models, whereas the Vuong test favors model 4b_TPR.

*Table 5.34: Target price revision fixed effects regression*

| | **$TPR_{it}$ (target price revision)** | | | |
|---|---|---|---|---|
| | (4a_TPR) | (4b_TPR) | (4c_TPR) | (4d_TPR) |
| Intercept | -1.083*** (0.218) | -1.083*** (0.210) | -1.174*** (0.208) | -1.091*** (0.212) |
| Δ $NI/S_{it}$ | **1.256*** ** (0.132) | | **1.153*** ** (0.126) | **1.164*** ** (0.126) |
| Δ $CI/S_{it}$ | | **1.564*** ** (0.105) | | |
| Δ $OCI/S_{it}$ | | | **2.569*** ** (0.203) | |
| Δ $FCT/S_{it}$ | | | | **2.888*** ** (0.336) |
| Δ $AFS/S_{it}$ | | | | **1.609*** ** (0.298) |
| Δ $CFH/S_{it}$ | | | | **5.421*** ** (0.632) |
| Δ $ACT/S_{it}$ | | | | **4.180*** ** (1.415) |
| Δ $REV/S_{it}$ | | | | -0.573 (7.281) |
| Δ $ASS/S_{it}$ | | | | -2.853 (5.171) |
| Δ $OTH/S_{it}$ | | | | 13.035 (13.820) |
| N | 2,238 | 2,238 | 2,238 | 2,238 |
| adj. R-sq | 0.072 | 0.135 | 0.151 | 0.166 |
| AIC | 16187.4 | 16031.2 | 15989.4 | 15954.2 |
| BIC | 16198.9 | 16042.6 | 16006.5 | 16005.6 |
| Vuong (F-Value) | | -8.5854*** | -6.9837*** | -6.9996*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

The Chow test illustrated in Table 5.35 indicates that the associations between the target price revisions and the different CI measures changed significantly between the years before and after the implementation of IAS 1 (revised 2007). Especially the changes for the OCI components FCT and CFH at p<0.01 and ACT at p<0.05 seem to be relevant.

*Table 5.35: Target price revisions regression – results from the Chow test*

| | **Chow test $TPR_{it}$ (target price revision)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Δ $CI/S_{it}$ | Δ $OCI/S_{it}$ | Δ $FCT/S_{it}$ | Δ $AFS/S_{it}$ | Δ $CFH/S_{it}$ | Δ $ACT/S_{it}$ | Δ $REV/S_{it}$ | Δ $ASS/S_{it}$ | Δ $OTH/S_{it}$ |
| Chow (F-Value) | **11.56*** ** | 0.19 | **25.00*** ** | **3.31*** | **20.50*** ** | **5.33*** ** | 0.55 | 0.05 | 0.28 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01

As previously illustrated for the other models the regression based on target price revision is recalculated on the basis of pooled OLS regressions to compare the findings with the results from the fixed effects model. The results of the comparison are illustrated in Table 5.36. The two regressions produce qualitatively similar results for the coefficients changes in CI, NI, and OCI. Similar results can also be observed for coefficients for changes in FCT, AFS, and CFH. However, changes in ACT is non-significant in the pooled OLS regression anymore previously being significant at $p<0.01$ on the basis of the fixed effects model.

Comparing the different models on the basis of the OLS regression applying the AIC, BIC, and adjusted $R^2$ criterion as well as the Vuong test delivers similar results compared to the fixed effects regression.[534]

[534] The only marginally difference is that based on the OLS regressions the model 4c_TPR is preferred over model 4d_TPR using the selection criteria BIC whereas the opposite is true for the fixed effects regression.

*Table 5.36: Target price revision – fixed effects regression vs. OLS regression*

| | **$TPR_{it}$ (target price revision)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (4a_TPR) | (4b_TPR) | (4c_TPR) | (4d_TPR) | (4a_TPR) | (4b_TPR) | (4c_TPR) | (4d_TPR) |
| Intercept | -1.059*** | -1.085*** | -1.127*** | -1.128*** | -1.083*** | -1.083*** | -1.174*** | -1.091*** |
| | (0.219) | (0.213) | (0.213) | (0.216) | (0.218) | (0.210) | (0.208) | (0.212) |
| Δ NI/Sit | **1.415*** ** | | **1.364*** ** | **1.347*** ** | **1.256*** ** | | **1.153*** ** | **1.164*** ** |
| | (0.116) | | (0.113) | (0.113) | (0.132) | | (0.126) | (0.126) |
| Δ CI/Sit | | **1.552*** ** | | | | **1.564*** ** | | |
| | | (0.0944) | | | | (0.105) | | |
| Δ OCI/Sit | | | **2.030*** ** | | | | **2.569*** ** | |
| | | | (0.182) | | | | (0.203) | |
| Δ FCT/Sit | | | | **2.419*** ** | | | | **2.888*** ** |
| | | | | (0.308) | | | | (0.336) |
| Δ AFS/Sit | | | | **1.186*** ** | | | | **1.609*** ** |
| | | | | (0.269) | | | | (0.298) |
| Δ CFH/Sit | | | | **3.906*** ** | | | | **5.421*** ** |
| | | | | (0.517) | | | | (0.632) |
| Δ ACT/Sit | | | | 1.506 | | | | **4.180*** ** |
| | | | | (1.181) | | | | (1.415) |
| Δ REV/Sit | | | | -9.537 | | | | -0.573 |
| | | | | (6.782) | | | | (7.281) |
| Δ ASS/Sit | | | | 0.816 | | | | -2.853 |
| | | | | (4.788) | | | | (5.171) |
| Δ OTH/Sit | | | | -1.510 | | | | 13.035 |
| | | | | (12.93) | | | | (13.820) |
| N | 2,238 | 2,238 | 2,238 | 2,238 | 2,238 | 2,238 | 2,238 | 2,238 |
| adj. R-sq | 0.062 | 0.107 | 0.111 | 0.120 | 0.072 | 0.135 | 0.151 | 0.166 |
| AIC | 16799.0 | 16688.4 | 16680.2 | 16663.1 | 16187.4 | 16031.2 | 15989.4 | 15954.2 |
| BIC | 16810.4 | 16699.8 | 16697.3 | 16714.5 | 16198.9 | 16042.6 | 16006.5 | 16005.6 |
| Vuong (F-Value) | | -4.0427*** | -3.3234*** | -3.5132*** | | -8.5854*** | -6.9837*** | -6.9996*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

## Robustness checks

Negative earnings do not seem to affect the revision of the target price. The inclusion of DNegNI and DNegCI in the regression does not change the parameters. Also for the target price revision model it cannot be confirmed that using the exact announcement dates for the determination of the target prices affects the target price revision.

Furthermore, to test if the financial industry affects the target price revision companies were first excluded from and the model and secondly solely included. Table 5.37

illustrates the results and shows that the exclusion of the financial industry, in general, does not change the outcome of the regression. On the basis of financial companies findings are in line with the results from the full sample, though, the coefficient for changes in ACT is non-significant anymore previously being significant at $p<0.01$. The finding shows that analysts do not tend to include the information on ACT when dealing with companies from the financial industry.

Concluding this analysis implies that FCT, AFS, CFH, and ACT have a value-relevant effect on the target price revisions by analysts. Based on the financial industry ACT is not relevant.

*Table 5.37: Target price revision regression excluding financials and on individual basis*

| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
|---|---|---|---|---|---|---|---|---|
| | (4a_TPR) | (4b_TPR) | (4c_TPR) | (4d_TPR) | (4a_TPR) | (4b_TPR) | (4c_TPR) | (4d_TPR) |
| Intercept | -0.973*** | -0.924*** | -0.982*** | -0.915*** | -1.582*** | -1.792*** | -1.944*** | -2.032*** |
| | (0.248) | (0.240) | (0.237) | (0.243) | (0.429) | (0.399) | (0.404) | (0.399) |
| Δ NI/Sit | **1.200*** ** | | **1.198*** ** | **1.238*** ** | **1.389*** ** | | **1.134*** ** | **0.919*** ** |
| | (0.162) | | (0.155) | (0.156) | (0.200) | | (0.190) | (0.191) |
| Δ CI/Sit | | **1.652*** ** | | | | **1.399*** ** | | |
| | | (0.135) | | | | (0.143) | | |
| Δ OCI/Sit | | | **2.926*** ** | | | | **1.909*** ** | |
| | | | (0.259) | | | | (0.282) | |
| Δ FCT/Sit | | | | **2.608*** ** | | | | **6.115*** ** |
| | | | | (0.362) | | | | (0.995) |
| Δ AFS/Sit | | | | **1.912*** ** | | | | **1.461*** ** |
| | | | | (0.524) | | | | (0.300) |
| Δ CFH/Sit | | | | **5.766*** ** | | | | **4.594*** ** |
| | | | | (0.722) | | | | (1.264) |
| Δ ACT/Sit | | | | **3.891*** ** | | | | 5.677 |
| | | | | (1.507) | | | | (5.024) |
| Δ REV/Sit | | | | -4.858 | | | | 20.710 |
| | | | | (8.515) | | | | (12.984) |
| Δ ASS/Sit | | | | -4.141 | | | | 4.835 |
| | | | | (5.978) | | | | (9.285) |
| Δ OTH/Sit | | | | 24.123 | | | | -15.234 |
| | | | | (18.378) | | | | (18.557) |
| N | 1,839 | 1,839 | 1,839 | 1,839 | 399 | 399 | 399 | 399 |
| adj. R-sq | 0.054 | 0.112 | 0.132 | 0.143 | 0.192 | 0.290 | 0.299 | 0.348 |
| AIC | 13432.4 | 13317.2 | 13276.7 | 13256.9 | 2723.7 | 2672.0 | 2667.8 | 2642.6 |
| BIC | 13443.5 | 13328.2 | 13293.3 | 13306.5 | 2731.6 | 2679.9 | 2679.7 | 2678.5 |
| Vuong (F-Value) | | -7.0594*** | -5.9041*** | -6.0991*** | | -5.4272*** | -4.1551*** | -4.7255*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

The robustness check also confirms the previous finding of the target price consensus model illustrated in Table 5.38. All parameter for the control variables remain identical. As expected, the coefficients for the control variables for the financial crisis (DFINCrisis) and the Eurozone crisis (DEURCrisis) are negative at p<0.01. The positive coefficient for GDP growth (GDPG) at p<0.01 is also in line with expectations. The coefficients for government bond yields (YGOV) and size (lTA) are negative at p<0.01 which is in line with the other models and in line with expectations.

The positive coefficients at $p<0.01$ for the trading volume (TradVol) confirm the finding from the target price consensus models that the target price revisions are comparably higher for companies of which shares are traded in relatively higher volumes around the announcement date. This observation is supported by the positive coefficients at $p<0.01$ for the number of analysts covering the company (NumAnalyst) indicating that target price revisions are higher for companies who are followed by more analysts. The coefficient for leverage did not prove to be significantly associated with the target price revisions.

*Table 5.38: Target price revision fixed effects regression including control variables*

| | **$TPR_{it}$ (target price revision)** | | | | |
|---|---|---|---|---|---|
| | (4a_TPR-CV) | (4b_TPR-CV) | (4c_TPR-CV) | (4d_TPR-CV) | (4d_TPR) |
| Intercept | 44.353*** (13.260) | 39.680*** (12.880) | 38.968*** (12.770) | 36.454*** (12.700) | -1.091*** (0.212) |
| $NI/S_{it}$ | **1.042*** (0.120) | | **0.915*** (0.116) | **0.908*** (0.116) | **1.164*** (0.126) |
| $CI/S_{it}$ | | **1.294*** (0.096) | | | |
| $OCI/S_{it}$ | | | **2.237*** (0.191) | | |
| $FCT/S_{it}$ | | | | **3.120*** (0.308) | **2.888*** (0.336) |
| $AFS/S_{it}$ | | | | **1.232*** (0.275) | **1.609*** (0.298) |
| $CFH/S_{it}$ | | | | **3.459*** (0.590) | **5.421*** (0.632) |
| $ACT/S_{it}$ | | | | **3.535*** (1.279) | **4.180*** (1.415) |
| $REV/S_{it}$ | | | | -3.899 (6.584) | -0.573 (7.281) |
| $ASS/S_{it}$ | | | | -5.173 (4.674) | -2.853 (5.171) |
| $OTH/S_{it}$ | | | | 17.27 (12.520) | 13.037 (13.823) |
| DFINCrisis | **-10.785*** (0.672) | **-10.530*** (0.651) | **-10.779*** (0.647) | **-10.871*** (0.645) | |
| DEURCrisis | **-3.429*** (0.853) | **-3.426*** (0.827) | **-3.590*** (0.820) | **-3.867*** (0.816) | |
| YGOV | **-0.300*** (0.078) | **-0.279*** (0.076) | **-0.269*** (0.075) | **-0.269*** (0.074) | |
| GDPG | **1.950*** (0.091) | **1.790*** (0.091) | **1.717*** (0.092) | **1.695*** (0.092) | |
| LEV | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | 0.000 (0.001) | |
| ITA | **-5.386*** (1.584) | **-4.781*** (1.539) | **-4.609*** (1.525) | **-4.253*** (1.517) | |
| NumAnalyst | **0.305*** (0.091) | **0.269*** (0.089) | **0.229*** (0.088) | **0.210** (0.088) | |
| TradVol | **0.017*** (0.005) | **0.017*** (0.005) | **0.018*** (0.005) | **0.017*** (0.005) | |
| N | 2,238 | 2,238 | 2,238 | 2,238 | 2,238 |
| adj. R-sq | 0.251 | 0.294 | 0.307 | 0.319 | 0.166 |
| AIC | 15509.6 | 15378.8 | 15338.3 | 15306.6 | 15954.2 |
| BIC | 15566.6 | 15435.8 | 15401.0 | 15403.5 | 16005.6 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

### 5.3.4.3 Results Target Price Potential Regressions

***The results from the target price potential model indicate that CI is more value-relevant than NI. The components of OCI, namely ACT and to some extent FCT are robust and value-relevant in this context. The results imply that the implementation of IAS 1 (revised 2007) did affect the value-relevance for the components AFS, ACT, and OTH of OCI.***

This section presents the results from the regression testing the association between target price potential (TPP) and NI, CI as well as the components of OCI. The target price potential is calculated by subtracting the current share price from the target price consensus presenting the possible upside or downside potential for the share price. Closely linked to the application for the model on target price revisions, the following regressions are applied to examine a potential association:

$$TPP_{it} = Ø_{0,1} + Ø_1(\Delta NI/S)_{it} + \varepsilon_{it} + v_i \quad (4a\_TPP)$$

$$TPP_{it} = Ø_{0,2} + Ø_2(\Delta CI/S)_{it} + \varepsilon_{it} + v_i \quad (4b\_TPP)$$

$$TPP_{it} = Ø_{0,3} + Ø_3(\Delta NI/S)_{it} + Ø_4(\Delta OCI/S)_{it} + \varepsilon_{it} + v_i \quad (4c\_TPP)$$

$$TPP_{it} = Ø_{0,4} + Ø_5(\Delta NI/S)_{it} + Ø_6(\Delta FCT/S)_{it} + Ø_7(\Delta AFS/S)_{it} + Ø_8(\Delta CFH/S)_{it} + Ø_9(\Delta ACT/S)_{it} + Ø_{10}(\Delta REV/S)_{it} + Ø_{11}(\Delta ASS/S)_{it} + Ø_{12}(\Delta OTH/S)_{it} + \varepsilon_{it} + v_i \quad (4d\_TPP)$$

All variables are as defined in section 4.2.4.

The results from the fixed effects[535] regression are illustrated in Table 5.39. In line with the findings for the other models increases in NI, CI, and OCI predict increases in the target price potential at $p<0.01$. Analyzing the components of OCI on an individual basis yields positive coefficients for changes in AFS and ACT at $p<0.01$. The positive association implies that AFS and ACT have an impact on the target price potential

[535] The initially performed Breusch-Pagan and the Hausman tests confirm the application of fixed effects regression to determine the association between the target price potential and the different income measures.

which goes beyond the information already provided by the share price. The coefficients for changes in FCT and AFS are positive but only weakly significant at $p<0.1$.

A comparison of the different models based on the selection criteria AIC, BIC, and adjusted $R^2$ leads to the general conclusion that the models including CI either on an aggregated or individual basis are preferred over the model solely including NI. A comparison between the models 4b_TPP to 4d_TPP provides different preference based on the selection criteria. Whereas based on adjusted $R^2$ and AIC the model including the components of OCI (4d_TPP) is preferred over the others, the BIC favors the model including CI on a consolidated basis (4b_TPP). The latter finding is also confirmed by the results from the Vuong test.[536] The results based on the BIC and from the Vuong test imply that all the relevant information on the OCI components is already included in the aggregated CI figure.

[536] The differences in the results can be explained by the fact that the adjusted $R^2$ values for the different models are close to each other and by the fact that the selection criteria penalize differently for additional independent variables included in the model.

*Table 5.39: Target price potential fixed effects regression*

| | **$TPP_{it}$ (target price potential)** | | | |
|---|---|---|---|---|
| | (4a_TPP) | (4b_TPP) | (4c_TPP) | (4d_TPP) |
| Intercept | 0.003*** (0.001) | 0.003*** (0.001) | 0.003*** (0.001) | 0.004*** (0.001) |
| $\Delta$ $NI/S_{it}$ | **0.003*** ** (0.001) | | **0.003*** ** (0.001) | **0.003*** ** (0.001) |
| $\Delta$ $CI/S_{it}$ | | **0.003*** ** (0.001) | | |
| $\Delta$ $OCI/S_{it}$ | | | **0.005*** ** (0.001) | |
| $\Delta$ $FCT/S_{it}$ | | | | **0.003*** (0.002) |
| $\Delta$ $AFS/S_{it}$ | | | | **0.003*** (0.002) |
| $\Delta$ $CFH/S_{it}$ | | | | **0.010*** ** (0.004) |
| $\Delta$ $ACT/S_{it}$ | | | | **0.025*** ** (0.008) |
| $\Delta$ $REV/S_{it}$ | | | | -0.005 (0.042) |
| $\Delta$ $ASS/S_{it}$ | | | | 0.039 (0.030) |
| $\Delta$ $OTH/S_{it}$ | | | | 0.009 (0.080) |
| N | 2,229 | 2,229 | 2,229 | 2,229 |
| adj. R-sq | 0.031 | 0.039 | 0.040 | 0.043 |
| AIC | -7068.2 | -7085.2 | -7087.8 | -7090.0 |
| BIC | -7056.7 | -7073.7 | -7070.7 | -7038.6 |
| Vuong (F-Value) | | -3.3215*** | -2.8197*** | -2.7777*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

The results from the Chow test testing if the association between the target price potential and the different CI measures has changed before and after the implementation of IAS 1 (revised 2007) are illustrated in Table 5.40. The associations have significantly changed between the years before and after the implementation of IAS 1 (revised 2007). The changes for the consolidated OCI and the components ACT and OTH are significant at $p<0.05$ and for CI and AFS at $p<0.1$.

*Table 5.40: Target price potential regression – results from the Chow test*

| Chow test TPPit (target price potential) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\Delta$ CI/$S_{it}$ | $\Delta$ OCI/$S_{it}$ | $\Delta$ FCT/$S_{it}$ | $\Delta$ AFS/$S_{it}$ | $\Delta$ CFH/$S_{it}$ | $\Delta$ ACT/$S_{it}$ | $\Delta$ REV/$S_{it}$ | $\Delta$ ASS/$S_{it}$ | $\Delta$ OTH/$S_{it}$ |
| Chow (F-Value) | **3.52*** | **5.33**** | 2.62 | **3.66*** | 1.19 | **4.01**** | 0.29 | 0.78 | **5.23**** |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

Moreover, in line with the application for the other models the regressions have been recalculated on the basis of pooled OLS regressions. The comparison of the findings from the OLS regression and the fixed effects regression is shown in Table 5.41Table 5.40. The coefficients for changes CI, NI, and OCI are similar. However, while increases in AFS in the OLS regression predict increases in target price potential at $p<0.05$, this association is only weakly existing in the fixed effects regression at $p<0.1$. Instead increases in ACT predict increases in target price potential at $p<0.01$ in the fixed effects regression but only weakly in the pooled OLS at $p<0.1$. When considering the absolute values of the coefficients in relation to the corresponding standard errors for the coefficient for changes in AFS, it becomes obvious that the differences are very marginal and can be neglected. However, the differences in the coefficient for ACT based on the OLS regression and the fixed effects regression are more relevant. The differences can maybe be explained by a potential company specific effect which is captured by the fixed effects regression and not for the OLS regression. This affect may have a larger impact on the association which has already been identified for the model on target price consensus. The coefficients for the remaining components of OCI are non-significant.

Comparing the models based on the selection criteria AIC, BIC, and adjusted $R^2$ confirms the preference of the models including CI over the model including solely NI. Moreover, the model preference previously outlined for the fixed effects model is confirmed based on the different selection criteria in the OLS regression.

*Table 5.41: Target price potential – fixed effects regression vs. OLS regression*

| | **$TPP_{it}$ (target price potential)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS | | | | Fixed effects | | | |
| | (4a_TPP) | (4b_TPP) | (4c_TPP) | (4d_TPP) | (4a_TPP) | (4b_TPP) | (4c_TPP) | (4d_TPP) |
| Intercept | 0.003*** | 0.003*** | 0.003*** | 0.004*** | 0.003*** | 0.003*** | 0.003*** | 0.004*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Δ NI/Sit | **0.003*** ** | | **0.003*** ** | **0.003*** ** | **0.003*** ** | | **0.003*** ** | **0.003*** ** |
| | (0.001) | | (0.001) | (0.001) | (0.001) | | (0.001) | (0.001) |
| Δ CI/Sit | | **0.003*** ** | | | | **0.003*** ** | | |
| | | (0.001) | | | | (0.001) | | |
| Δ OCI/Sit | | | **0.004*** ** | | | | **0.005*** ** | |
| | | | (0.001) | | | | (0.00112) | |
| Δ FCT/Sit | | | | **0.003*** | | | | **0.003*** |
| | | | | (0.002) | | | | (0.002) |
| Δ AFS/Sit | | | | **0.003*** * | | | | **0.003*** |
| | | | | (0.002) | | | | (0.002) |
| Δ CFH/Sit | | | | **0.008*** ** | | | | **0.010*** ** |
| | | | | (0.003) | | | | (0.004) |
| Δ ACT/Sit | | | | **0.012*** | | | | **0.025*** ** |
| | | | | (0.007) | | | | (0.008) |
| Δ REV/Sit | | | | -0.006 | | | | -0.005 |
| | | | | (0.039) | | | | (0.042) |
| Δ ASS/Sit | | | | 0.033 | | | | 0.039 |
| | | | | (0.027) | | | | (0.030) |
| Δ OTH/Sit | | | | -0.038 | | | | 0.009 |
| | | | | (0.074) | | | | (0.080) |
| N | 2,229 | 2,229 | 2,229 | 2,229 | 2,229 | 2,229 | 2,229 | 2,229 |
| adj. R-sq | 0.033 | 0.039 | 0.040 | 0.041 | 0.031 | 0.039 | 0.040 | 0.043 |
| AIC | -6434.3 | -6447.6 | -6447.6 | -6440.9 | -7068.2 | -7085.2 | -7087.8 | -7090.0 |
| BIC | -6422.9 | -6436.2 | -6430.4 | -6389.5 | -7056.7 | -7073.7 | -7070.7 | -7038.6 |
| Vuong (F-Value) | | -1.9163** | -1.7542** | -1.3559* | | -3.3215*** | -2.8197*** | -2.7777*** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

## Robustness checks

In line with the application for the previous models tests have been performed to control for the robustness of the results. Initially it is tested if negative earnings may have biased the regression by adding the terms DNegNI and DNegCI to the regression. The inclusion of the dummy variables does not change the parameters. The only exemption is the predictive value of FCT which is non-significant anymore previously being weakly significant at p<0.1. It can be concluded that negative income measures

do not bias the regression including the target prices potential as the dependent variable.

To test if the inclusion of companies from the financial industry in the initial sample biased the results the regressions are rerun by firstly excluding companies from the financial industry and secondly by solely including companies from the financial industry.

The results illustrated in Table 5.42 show that the already weak significance level of $p<0.1$ for the coefficients for changes in FCT and AFS is lost after the exclusion of the financial industry. The positive sign and the $p<0.01$ significance level are confirmed for the coefficients CFH and ACT based on the full sample as well as for the sample excluding the financial industry. On the basis of the sample exclusively from the financial industry almost all coefficients are non-significant, the only exemptions being CI at $p<0.05$ and to a minor extent ASS becoming weakly significant at $p<0.1$.

Concluding it is confirmed that NI, CI, and the OCI components CFH and ACT provide value-relevant information for the prediction of the target prices by analysts in addition to the information provided by the share price. The association on the basis of the financial industry is negligible.

*Table 5.42: Target price potential regression excluding financials and on individual basis*

| | **$TPP_{it}$ (target price portential)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fixed effects (excl. financal industry) | | | | Fixed effects (financal industry) | | | |
| | (4a_TPP) | (4b_TPP) | (4c_TPP) | (4d_TPP) | (4a_TPP) | (4b_TPP) | (4c_TPP) | (4d_TPP) |
| Intercept | 0.005*** | 0.005*** | 0.005*** | 0.006*** | -0.004 | -0.004 | -0.005 | -0.004 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.003) | (0.003) | (0.003) | (0.003) |
| Δ NI/Sit | **0.003*** ** | | **0.003*** ** | **0.003*** ** | 0.00197 | | 0.00156 | 0.00117 |
| | (0.001) | | (0.001) | (0.001) | (0.001) | | (0.001) | (0.002) |
| Δ CI/Sit | | **0.004*** ** | | | | **0.002** ** | | |
| | | (0.001) | | | | (0.001) | | |
| Δ OCI/Sit | | | **0.005*** ** | | | | 0.003 | |
| | | | (0.001) | | | | (0.002) | |
| Δ FCT/Sit | | | | 0.003 | | | | 0.005 |
| | | | | (0.002) | | | | (0.008) |
| Δ AFS/Sit | | | | 0.004 | | | | 0.00273 |
| | | | | (0.003) | | | | (0.002) |
| Δ CFH/Sit | | | | **0.012*** ** | | | | 0.00287 |
| | | | | (0.004) | | | | (0.010) |
| Δ ACT/Sit | | | | **0.024*** ** | | | | 0.0388 |
| | | | | (0.008) | | | | (0.039) |
| Δ REV/Sit | | | | -0.009 | | | | 0.0407 |
| | | | | (0.047) | | | | (0.100) |
| Δ ASS/Sit | | | | 0.018 | | | | **0.138** * |
| | | | | (0.033) | | | | (0.074) |
| Δ OTH/Sit | | | | 0.061 | | | | -0.149 |
| | | | | (0.101) | | | | (0.144) |
| N | 1832 | 1832 | 1832 | 1832 | 397 | 397 | 397 | 397 |
| adj. R-sq | 0.031 | 0.039 | 0.041 | 0.043 | 0.011 | 0.018 | 0.016 | 0.013 |
| AIC | -5824.0 | -5839.0 | -5841.6 | -5842.7 | -1241.0 | -1243.9 | -1242.6 | -1237.6 |
| BIC | -5813.0 | -5828.0 | -5825.1 | -5793.1 | -1233.0 | -1235.9 | -1230.6 | -1201.8 |
| Vuong (F-Value) | | -3.0355*** | -2.6794*** | -2.4633*** | | -1.5797* | -0.7867 | -0.2244 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

As part of the robustness check the regressions are rerun by including control variables in line with the application for the target price consensus model. The results from the regression analyses including the control variables are illustrated in Table 5.43. The inclusion of the control variables does not change the coefficients for NI, CI, and OCI at p<0.01.

The sign for the coefficients for the components of OCI does not change with the inclusion of the addition variables; however, the significance level of the coefficients is marginally altered. The significance level for FCT increases from $p<0.1$ to $p<0.05$. The previously weak significance level at $p<0.1$ for AFS disappears completely with the inclusion of the control variables. The significance level for CFH drops from $p<0.01$ to $p<0.05$. The different effects could possibly be explained by the fact that the strength of the effect has been occluded by the control variables and is uncovered by the inclusion of the moderating variables.

As expected, increases in the control variables for the financial crisis (DFINCrisis) predict decreases in the target price potential at $p<0.01$. Similarly GDP growth (GDPG) remains a strong predictor for changes in target price potential at $p<0.01$. The coefficient for the government bond yield (YGOV) implies that higher interest rates have a negative impact on the target price potential at $p<0.01$. In line with the observation for the target price revision model larger company sizes predict smaller a target price potential at $p<0.01$. The coefficients for the remaining control variables did not prove to be significantly associated with the target price potential.

*Table 5.43: Target price potential fixed effects regression including control variables*

| | **$TPP_{it}$ (target price potential)** | | | | |
|---|---|---|---|---|---|
| | (4a_TPP-CV) | (4b_TPP-CV) | (4c_TPP-CV) | (4d_TPP-CV) | (4d_TPP) |
| Intercept | 0.245*** (0.076) | 0.238*** (0.076) | 0.236*** (0.076) | 0.227*** (0.076) | 0.004*** (0.001) |
| $NI/S_{it}$ | **0.002**** (0.001) | | **0.002**** (0.001) | **0.001**** (0.001) | **0.003***** (0.001) |
| $CI/S_{it}$ | | **0.002***** (0.001) | | | |
| $OCI/S_{it}$ | | | **0.003***** (0.001) | | |
| $FCT/S_{it}$ | | | | **0.003*** (0.002) | **0.003*** (0.002) |
| $AFS/S_{it}$ | | | | 0.001 (0.002) | **0.003*** (0.002) |
| $CFH/S_{it}$ | | | | 0.002 (0.003) | **0.010***** (0.004) |
| $ACT/S_{it}$ | | | | **0.021***** (0.007) | **0.025***** (0.008) |
| $REV/S_{it}$ | | | | -0.013 (0.040) | -0.005 (0.042) |
| $ASS/S_{it}$ | | | | 0.025 (0.028) | 0.039 (0.030) |
| $OTH/S_{it}$ | | | | 0.030 (0.075) | 0.009 (0.080) |
| DFINCrisis | **-0.048***** (0.004) | **-0.048***** (0.004) | **-0.048***** (0.004) | **-0.048***** (0.004) | |
| DEURCrisis | -0.003 (0.005) | -0.003 (0.005) | -0.003 (0.005) | -0.003 (0.005) | |
| YGOV | **-0.002***** (0.000) | **-0.002***** (0.000) | **-0.002***** (0.000) | **-0.002***** (0.000) | |
| GDPG | **0.006***** (0.001) | **0.006***** (0.001) | **0.006***** (0.001) | **0.006***** (0.001) | |
| LEV | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | |
| ITA | **-0.027***** (0.009) | **-0.026***** (0.009) | **-0.026***** (0.009) | **-0.025***** (0.009) | |
| NumAnalyst | 0.001 (0.001) | 0.001 (0.001) | 0.001 (0.001) | 0.001 (0.001) | |
| TradVol | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | |
| N | 2,229 | 2,229 | 2,229 | 2,229 | 2,229 |
| adj. R-sq | 0.152 | 0.155 | 0.155 | 0.156 | 0.088 |
| AIC | -7271.5 | -7278.7 | -7279.6 | -7278.4 | -7090.0 |
| BIC | -7214.5 | -7221.8 | -7217.0 | -7181.6 | -7038.6 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

### 5.3.5 Results Forecasting Models

As illustrated in section 4.2.5, addressees of financial statements are not only interested in the potential association of income measures and market data, but also in the forecasting ability of accounting information. In addition to the analysis of the association between current market values and income measures, this section illustrates the results from the forecasting model examining the association between current and future income measures. In a first step the association between current OCF and lagged NI, CI, and components of OCI is analyzed. In a second step the association between current NI and those lagged income measures is examined, testing [H4].

As already covered in section 5.3 the application of the fixed effects regressions for the forecasting models in the context of this study is not appropriate. Consequently the forecasting models in this section are based on OLS regressions.

#### 5.3.5.1 Forecasting Operating Cash Flows Regressions

***The results from the forecasting model of OCF do not provide clear evidence that CI has additional forecasting ability compared to NI. The components of OCI, namely FCT, AFS and to some extent ACT have been identified as being robustly value-relevant in this context. The results imply that the implementation of IAS 1 (revised 2007) did have an effect on the forecasting ability for the components AFS, CFH, ACT and ASS of OCI.***

To test the association between current OCF and lagged NI, CI, and components of OCI and, therefore, the forecasting ability of OCF, the following regression models have been applied:

$$OCF/S_{it} = \vartheta_{0,1} + \vartheta_1 NI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5a\_OCF)}$$

$$OCF/S_{it} = \vartheta_{0,2} + \vartheta_2 CI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5b\_OCF)}$$

$$OCF/S_{it} = \vartheta_{0,3} + \vartheta_3 NI/S_{i(t-1)} + \vartheta_4 OCI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad \text{(5c\_OCF)}$$

$$OCF/S_{it} = \vartheta_{0,4} + \vartheta_5 NI/S_{i(t-1)} + \vartheta_6 FCT/S_{i(t-1)} + \vartheta_7 AFS/S_{i(t-1)} + \vartheta_8 CFH/S_{i(t-1)} \quad \text{(5d\_OCF)}$$
$$+ \vartheta_9 ACT/S_{i(t-1)} + \vartheta_{10} REV/S_{i(t-1)} + \vartheta_{11} ASS/S_{i(t-1)} + \vartheta_{12} OTH/S_{i(t-1)} + \varepsilon_{it} + v_i$$

All variables are as defined in section 4.2.5

Results from the OCF forecasting model based on OLS regressions are illustrated in Table 5.44. Increases in lagged NI and lagged CI predict increases in OCF at $p<0.01$, indicating that the income measures are primary drivers of the forecasting ability of OCF.[537] Furthermore, the coefficient for lagged OCI is negative at $p<0.01$ which could be an indication for the reverting nature of the components of OCI over time. The findings for the individual lagged components of OCI (5d_OCF) indicate that not all components are equally associated with OCF.

The negative association between lagged AFS and OCF at $p<0.01$ could be an indication for the fact that unrealized gains on available-for-sale financial assets transform into negative OCF figure in the following year through realization via profit or loss. However, AFS are frequently reported for companies in the financial industry and could have influenced the results. Consequently, this position needs further examination. Similarly, increases in lagged ACT are predictive for decreases in OFC at $p<0.01$. The reverse relation could be an indication for the fact that the reporting of actuarial losses under OCI are regarded as a positive sign from the investor base as the information is explicitly provided and reducing uncertainty. Another possible explanation could be the fact that ACT are closely linked to the development of the underlying plan assets and consequently, also depend on the development of the stock exchanges. The economic downturn in the observation period may have had a decisive

[537] A recalculation of the association between OCF and the two-years lagged income measures produced positive and highly significant results for NI and CI at $p<0.01$ and negative significant results for the coefficient for ACT at $p<0.05$. All other coefficients are non-significant on the basis of the 1,876 observations. The finding may be an indicator for the fact that the current income measures are, in general, a better basis to predict future OCF then one year lagged income measures.

impact on the association and the valuations of the companies have not fully recovered from the crisis troughs. The concept of not recycling this position reinforces this effect, supported by the negative correlation. The coefficient for CFH is negative and only weakly significant at $p<0.1$. Especially, the changes in OCI on a consolidated basis as well as AFS and ACT, all at $p<0.01$, show that OCI and its components are forecasting relevant which is in contrast to the concept by Ohlson (1999) indicating that OCI is transitory in nature and forecasting irrelevant.

Moreover, the model selection criteria AIC, BIC, adjusted $R^2$ and the Voung are applied to test if the models including CI in any form (5b_OCF to 5d_OCF) are favored over the model solely including NI (5a_TPC). The findings do not provide a clear preference of the models including CI over the models solely including NI. Also the Vuong test does not deliver significant results that would support a preference of CI over NI, implying that the model including NI is as good as the models including OCI in any form. Even though the results for the coefficients for some of the components of OCI are significant, they do not seem to significantly improve the forecasting power for future OCF.

*Table 5.44: Cash flow forecasting OLS regression*

| | **$OCF/S_{it}$ (Operating Cash Flows)** | | | |
|---|---|---|---|---|
| | (5a_OCF) | (5b_OCF) | (5c_OCF) | (5d_OCF) |
| Intercept | 1.638*** (0.0834) | 1.839*** (0.0830) | 1.612*** (0.0836) | 1.574*** (0.0846) |
| $NI/S_{it-1}$ | **0.780*** ** (0.0300) | | **0.773*** ** (0.0300) | **0.770*** ** (0.0301) |
| $CI/S_{it-1}$ | | **0.698*** ** (0.0299) | | |
| $OCI/S_{it-1}$ | | | **-0.328*** ** (0.0976) | |
| $FCT/S_{it-1}$ | | | | -0.101 (0.141) |
| $AFS/S_{it-1}$ | | | | **-0.534*** ** (0.179) |
| $CFH/S_{it-1}$ | | | | **-0.607*** (0.317) |
| $ACT/S_{it-1}$ | | | | **-1.500*** ** (0.505) |
| $REV/S_{it-1}$ | | | | -3.871 (4.776) |
| $ASS/S_{it-1}$ | | | | 1.984 (2.517) |
| $OTH/S_{it-1}$ | | | | -6.819 (9.534) |
| N | 2,343 | 2,343 | 2,343 | 2,343 |
| adj. R-sq | 0.224 | 0.188 | 0.228 | 0.230 |
| AIC | 12388.9 | 12495.6 | 12379.6 | 12379.2 |
| BIC | 12400.4 | 12507.1 | 12396.9 | 12431.0 |
| Vuong (F-Value) | | 3.6590 | -0.8499 | -1.0474 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

By the use of a Chow test it is examined if the requirement of the explicit reporting of OCI components under of IAS 1 (revised 2007) had an effect on the predictability of OCF based on the different income measures. The results from the Chow test are illustrated in Table 5.45 and show that the associations of lagged OCI with the current OCF have significantly changed between the years before and after the implementation of IAS 1 (revised 2007). Moreover, the findings demonstrate that this change was primarily driven by the OCI components AFS, CFH, ACT, and ASS, with AFS being highly significant at $p<0.01$ and the other components being significant at $p<0.05$.

*Table 5.45: Cash flow forecasting – results from the Chow test*

| Chow test forecasting OCF/$S_{it}$ (Operating Cash Flows) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $CI/S_{it-1}$ | $OCI/S_{it-1}$ | $FCT/S_{it-1}$ | $AFS/S_{it-1}$ | $CFH/S_{it-1}$ | $ACT/S_{it-1}$ | $REV/S_{it-1}$ | $ASS/S_{it-1}$ | $OTH/S_{it-1}$ |
| Chow (F-Value) | 1.47 | **11.9*** ** | 1.02 | **37.85*** ** | **4.48** ** | **5.85** ** | 0.01 | **5.31** ** | 0.25 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

## Robustness checks

In a first step it is examined if negative earnings may have distorted the OCF forecasting regression. The inclusion of the terms DNegNI and DNegCI only very slightly changes the results. The coefficient for FCT previously being non-significant becomes weakly significant at p<0.1 and coefficient for CFH becomes non-significant beforehand being weakly significant at p<0.1. However, the minor changes in the coefficients can be neglected and could be the result from the inclusion of the two control variables. Consequently it can be stated that negative income measures do not have a stronger effect on the OCF forecasting regression than positive income measures and are not distorting the estimation of the regression.

When the regression is rerun without companies from the financial industry the results do not change. A comparison of the results is illustrated in Table 5.46. The coefficients for CFH slightly changes and becomes significant at p<0.05 previously being weakly significant at p<0.1, whereas all other coefficients remain unchanged. The adjusted $R^2$ increases significantly with the exclusion of the financial industry, from between 18.8% and 23.0% to between 31.3% and 37.9% for the different models. Based on the adjusted $R^2$, AIC and the Vuong test the model including the individual components of OCI is now preferred over the model including solely NI at p<0.05. This is an indicator for the fact that the inclusion of the financial industry may have distorted the forecasting power. When rerunning the regression solely for companies from the financial industry the coefficient for OCI becomes non-significant, indicating that the inclusion of OCI does not necessarily increases the forecasting power of OCF.

The model selection criteria as well as the generally lower adjusted $R^2$ confirm this finding. Moreover, the coefficient for ACT and ASS changes to positive at p<0.05 for the financial industry. In conclusion it can be stated that the financial industry does

have a significant impact on the association between previous years' NI and CI with current years' OCF. This finding is not surprising as the calculation of OCF for financial institutions significantly differs from the calculation for the other industries in the sample.[538]

[538] Cf. Mulford and Comiskey (2009), pp. 4–6. Even though OCF are viewed as one of the most important financial measures for non-financial companies this is not true for financial companies. Looking at financial institutions investors tend to focus on financial ratios and regulatory measures, e.g. net interest margins and core tier one capital ratios, rather than OCF. In an interview by Johnson (2009) in the context of the publication of the previous mentioned article, Dr. Charles W. Mulford was quoted saying that "Right now, operating cash flow for a bank is basically meaningless."

*Table 5.46: Cash flow forecasting regression excluding financials and on individual basis*

| | **$OCF/S_{it}$ (Operating Cash Flows)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS (excl. financal industry) | | | | Pooled OLS (financal industry) | | | |
| | (5a_OCF) | (5b_OCF) | (5c_OCF) | (5d_OCF) | (5a_OCF) | (5b_OCF) | (5c_OCF) | (5d_OCF) |
| Intercept | 1.464*** | 1.655*** | 1.454*** | 1.405*** | 2.106*** | 2.316*** | 2.028*** | 2.238*** |
| | (0.070) | (0.071) | (0.069) | (0.070) | (0.326) | (0.317) | (0.338) | (0.344) |
| $NI/S_{it-1}$ | **0.875*** ** | | 0.865*** | 0.854*** | **0.535*** ** | | **0.534*** ** | **0.516*** ** |
| | (0.026) | | (0.026) | (0.026) | (0.101) | | (0.101) | (0.101) |
| $CI/S_{it-1}$ | | **0.792*** ** | | | | **0.469*** ** | | |
| | | (0.027) | | | | (0.098) | | |
| $OCI/S_{it-1}$ | | | **-0.302*** ** | | | | -0.307 | |
| | | | (0.084) | | | | (0.342) | |
| $FCT/S_{it-1}$ | | | | -0.140 | | | | 0.0267 |
| | | | | (0.108) | | | | (0.843) |
| $AFS/S_{it-1}$ | | | | **-0.406** ** | | | | -0.664 |
| | | | | (0.192) | | | | (0.444) |
| $CFH/S_{it-1}$ | | | | **-0.553** ** | | | | -0.165 |
| | | | | (0.271) | | | | (1.147) |
| $ACT/S_{it-1}$ | | | | **-1.900*** ** | | | | **9.338** ** |
| | | | | (0.383) | | | | (3.927) |
| $REV/S_{it-1}$ | | | | -0.651 | | | | -5.866 |
| | | | | (4.700) | | | | (12.883) |
| $ASS/S_{it-1}$ | | | | -0.759 | | | | **28.66** ** |
| | | | | (2.009) | | | | (11.770) |
| $OTH/S_{it-1}$ | | | | 4.616 | | | | -47.308 |
| | | | | (7.857) | | | | (38.647) |
| N | 1,934 | 1,934 | 1,934 | 1,934 | 409 | 409 | 409 | 409 |
| adj. R-sq | 0.370 | 0.313 | 0.374 | 0.379 | 0.063 | 0.051 | 0.062 | 0.078 |
| AIC | 9046.9 | 9212.2 | 9036.0 | 9024.4 | 2628.0 | 2632.8 | 2629.2 | 2628.0 |
| BIC | 9058.0 | 9223.4 | 9052.7 | 9074.5 | 2636.1 | 2640.9 | 2641.3 | 2664.1 |
| Vuong (F-Value) | | 4.1729 | -0.9106 | -1.6676** | | 1.0298 | 0.0694 | -0.7435 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Furthermore, the regressions are rerun by including additional variables in the regression to control for effects that may have a distorting impact on the previously stated findings. The control variables are in line with the application for the price regressions, but, have been adapted to correspond to the lagged character of the

independent variables.[539] The results are illustrated in Table 5.47 and show that the inclusion of the control variables has a noticeable effect on the results from the regressions. The predictive power for NI, CI, and OCI remain unaltered. The same holds true for the coefficient for AFS confirming the robustness of the finding. However, the coefficient for ACT previously being highly significant at $p<0.01$ becomes only weakly significant at $p<0.1$ after the inclusion of the control variables. Alike the significance level for CFH becomes non-significant previously being weakly significant at $p<0.1$. Moreover, the coefficient for FCT is significant at $p<0.05$ previously being non-significant without the inclusion of the control variables. The difference in the significance level shows that especially the size of the company represented by the logarithm of total assets had a significant impact on the forecasting ability.

The coefficients of the control variables are in general in line with expectations. The coefficients for the control variables relating to the financial crisis (DFINCrisis) and the Eurozone crisis (DEURCrisis) are negative at $p<0.01$. As already pointed out the size of the company (lTA) has a significant impact on the forecasting ability at $p<0.01$. The coefficients for the control variable as a proxy for the financing structure (LEV) indicate that a higher leverage has a negative impact on future OCF. The coefficients for government bonds (YGOV) and GDP growth (GDPG) are non-significant implying that those effects do not have a significant impact on the forecasting of OCF based on the different income measures.

Concluding it can be stated that based on the robustness checks the coefficient for AFS at $p<0.01$ and FCT at $p<0.05$ as well as to a minor extent ACT at $p<0.01$ have a negative impact on the forecasting power of OCF.

[539] The control variables have been calculated based on lagged values to be comparable with the lagged independent variables used in the analyses for the forecasting models.

*Table 5.47: Cash flow forecasting regression including control variables*

| | **OCF/$S_{it}$ (Operating Cash Flows)** | | | | |
|---|---|---|---|---|---|
| | (5a_OCF-CV) | (5b_OCF-CV) | (5c_OCF-CV) | (5d_OCF-CV) | (5d_OCF) |
| Intercept | 0.441 (0.365) | 0.415 (0.374) | 0.511 (0.364) | 0.528 (0.366) | 1.574*** (0.085) |
| $NI/S_{it-1}$ | **0.757*** ** (0.031) | | **0.745*** ** (0.031) | **0.746*** ** (0.031) | **0.770*** ** (0.030) |
| $CI/S_{it-1}$ | | **0.672*** ** (0.031) | | | |
| $OCI/S_{it-1}$ | | | **-0.424*** ** (0.101) | | |
| $FCT/S_{it-1}$ | | | | **-0.355** ** (0.147) | -0.101 (0.141) |
| $AFS/S_{it-1}$ | | | | **-0.507*** ** (0.180) | **-0.534*** ** (0.179) |
| $CFH/S_{it-1}$ | | | | -0.490 (0.323) | **-0.607*** (0.317) |
| $ACT/S_{it-1}$ | | | | **-0.867*** (0.508) | **-1.500*** ** (0.505) |
| $REV/S_{it-1}$ | | | | -2.774 (4.723) | -3.871 (4.776) |
| $ASS/S_{it-1}$ | | | | 2.601 (2.488) | 1.984 (2.517) |
| $OTH/S_{it-1}$ | | | | -6.766 (9.413) | -6.819 (9.534) |
| DFINCrisis | **-0.859*** ** (0.197) | **-0.640*** ** (0.201) | **-0.967*** ** (0.198) | **-0.912*** ** (0.208) | |
| DEURCrisis | **-0.627*** ** (0.188) | **-0.625*** ** (0.193) | **-0.672*** ** (0.188) | **-0.652*** ** (0.189) | |
| YGOV | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | |
| GDPG | 0.007 (0.029) | -0.038 (0.030) | 0.037 (0.030) | 0.035 (0.030) | |
| LEV | **-0.039** (0.019) | **-0.055*** ** (0.019) | -0.031 (0.019) | **-0.031*** (0.019) | |
| ITA | **0.217*** ** (0.042) | **0.246*** ** (0.043) | **0.208*** ** (0.042) | **0.203*** ** (0.042) | |
| N | 2,343 | 2,343 | 2,343 | 2,343 | 2,343 |
| adj. R-sq | 0.248 | 0.212 | 0.253 | 0.252 | 0.230 |
| AIC | 12125.6 | 12233.3 | 12110.0 | 12118.6 | 12379.2 |
| BIC | 12171.5 | 12279.3 | 12161.7 | 12204.7 | 12431.0 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

### 5.3.5.2 Forecasting Net Income Regressions

***The results from the forecasting model for NI indicate that lagged NI is a better predictor of current NI than CI. On the basis of positive NI none of the OCI components is found to increase the forecasting ability compared to solely considering NI. However, when including also negative earnings the components of OCI, namely CFH and ACT have been identified as being robustly improving the forecasting ability in this context. The results imply that the implementation of IAS 1 (revised 2007) did have an effect on the forecasting ability for FCT, though, the result being only marginally significant.***

In addition the forecasting ability of NI on the basis of lagged NI, CI, and OCI components is tested in this study. The following regression models have been applied to examine a potential association between current NI and lagged income measures:

$$NI/S_{it} = \varphi_{0,1} + \varphi_1 NI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5a\_NI)$$

$$NI/S_{it} = \varphi_{0,2} + \varphi_2 CI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5b\_NI)$$

$$NI/S_{it} = \varphi_{0,3} + \varphi_3 NI/S_{i(t-1)} + \varphi_4 OCI/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5c\_NI)$$

$$NI/S_{it} = \varphi_{0,4} + \varphi_5 NI/S_{i(t-1)} + \varphi_6 FCT/S_{i(t-1)} + \varphi_7 AFS/S_{i(t-1)} + \varphi_8 CFH/S_{i(t-1)} + \varphi_9 ACT/S_{i(t-1)} + \varphi_{10} REV/S_{i(t-1)} + \varphi_{11} ASS/S_{i(t-1)} + \varphi_{12} OTH/S_{i(t-1)} + \varepsilon_{it} + v_i \quad (5d\_NI)$$

All variables are as defined in section 4.2.5

The results based on OLS regressions are illustrated in Table 5.48. The adjusted $R^2$ ranges from 36.4% for model 5b_NI including lagged NI to 39.3% for model 5d_NI including all lagged components of OCI. The coefficients for lagged NI, lagged CI, and lagged OCI are positive at $p<0.01$. The coefficients for the individual lagged components of OCI are highly significant at $p<0.01$ for FCT, CFH and ACT. The positive coefficient for FCT implies that current gains in FCT have a positive effect on future NI which can be explained by the recycling of the accumulated component of

OCI via the profit or loss in the following periods. The reverse relation between CFH and future NI at $p<0.01$ seems counterintuitive as one would expect gains for the current period to transform into profits in the following periods through recycling. However, as this position is predominantly relevant for financial institutions the association needs further examination. Moreover, the financial crisis may have had a significant impact on the reporting of this component and needs further assessment by the inclusion of control variables. In line with the results for the forecasting model for OCF the coefficient for ACT is negative at $p<0.01$.

Moreover, the model selection criteria AIC, BIC, adjusted $R^2$ and the Voung are applied to test if the models including CI in any form (5b_NI to 5d_NI) are favored over the model solely including NI (5a_NI). The findings do not provide a clear preference of the models including CI over the models solely including NI. Also the Vuong test does not deliver significant results that would support a preference of CI over NI, implying that the model including NI is as good as the models including OCI on a consolidated basis. However, the model including the components of OCI on an individual basis (5d_NI) seems to significantly improve the forecasting power for future NI.

*Table 5.48: Net Income forecasting OLS regression*

| | **$NI/S_{it}$ (current period Net Income)** | | | |
|---|---|---|---|---|
| | (5a_NI) | (5b_NI) | (5c_NI) | (5d_NI) |
| Intercept | 0.475*** (0.0425) | 0.580*** (0.0420) | 0.486*** (0.0426) | 0.448*** (0.0428) |
| $NI/S_{it-1}$ | **0.586*** ** (0.0153) | | **0.590*** ** (0.0154) | **0.581*** ** (0.0154) |
| $CI/S_{it-1}$ | | **0.559*** ** (0.0152) | | |
| $OCI/S_{it-1}$ | | | **0.141*** ** (0.0490) | |
| $FCT/S_{it-1}$ | | | | **0.320*** ** (0.0703) |
| $AFS/S_{it-1}$ | | | | 0.124 (0.0869) |
| $CFH/S_{it-1}$ | | | | **-0.429*** ** (0.161) |
| $ACT/S_{it-1}$ | | | | **-0.797*** ** (0.253) |
| $REV/S_{it-1}$ | | | | 0.762 (2.365) |
| $ASS/S_{it-1}$ | | | | -0.978 (1.258) |
| $OTH/S_{it-1}$ | | | | 6.845 (4.797) |
| N | 2,353 | 2,353 | 2,353 | 2,353 |
| adj. R-sq | 0.383 | 0.364 | 0.385 | 0.393 |
| AIC | 9260.4 | 9331.6 | 9254.0 | 9227.3 |
| BIC | 9271.9 | 9343.1 | 9271.3 | 9279.1 |
| Vuong (F-Value) | | 1.7925 | -0.7630 | -1.8908** |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

The results from the Chow test, examining if the requirement of the explicit reporting of OCI components under of IAS 1 (revised 2007) had an effect on the predictability of NI, are illustrated in Table 5.49. The results show that the associations of lagged CI and lagged consolidated OCI with the current NI have significantly changed between the years before and after the implementation of IAS 1 (revised 2007). The results indicate that the changes in lagged OCI were primarily driven by the component of FCT being significant at p<0.1.

*Table 5.49: Forecasting Net Income – results from the Chow test*

| **Chow test forecasting $NI/S_{it}$ (current period Net Income)** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $CI/S_{it-1}$ | $OCI/S_{it-1}$ | $FCT/S_{it-1}$ | $AFS/S_{it-1}$ | $CFH/S_{it-1}$ | $ACT/S_{it-1}$ | $REV/S_{it-1}$ | $ASS/S_{it-1}$ | $OTH/S_{it-1}$ |
| Chow (F-Value) | **11.10*** ** | **4.84** ** | **3.26*** | 2.22 | 0.64 | 1.42 | 0.58 | 1.08 | 0.85 |
| Statistical significance: * p<0.10, ** p<0.05, *** p<0.01 | | | | | | | | | |

## Robustness checks

To control if negative earnings may have had a distorting effect on the regression the term DNegNI[540] has been added to the regressions. The results are explicitly illustrated in Table 5.50, because the inclusion of the terms for negative income significantly changes the results. With the inclusion of the control variable for negative NI the adjusted $R^2$ increases to 92.0% for all the models. None of the components of OCI is significant, implying that lagged OCI components do not increase the predicting power for current positive NI. The results show that based on the different model selection criteria lagged NI is the best predictor of current NI and that the inclusion of OCI in any form does not improve the forecasting ability. The results from the complete sample lead to the conclusion that certain components of lagged OCI increase the forecasting ability for current NI when not controlling for negative NI. However, this forecasting ability disappears if only positive income figures are considered indicating the persistence of positive NI figures.

[540] On the basis of the forecasting model for NI only the control variable for DNegNI has been included in the regression instead of DNegCI for the model including CI. This approach has been taken, because NI is nested in CI and the inclusion of a component relating to lagged CI may have distorted the results due to the direct correlation with the dependent variable NI.

*Table 5.50: Net Income forecasting OLS regression controlling for negative Net Income*

| | **$NI/S_{it}$ (current period Net Income)** | | | |
|---|---|---|---|---|
| | (5a_NI-NEG) | (5b_NI-NEG) | (5c_NI-NEG) | (5d_NI-NEG) |
| Intercept | -0.253*** (0.016) | -0.060** (0.027) | -0.250*** (0.017) | -0.248*** (0.017) |
| $NI/S_{it-1}$ | **-0.026*** ** (0.007) | | **-0.024*** ** (0.007) | **-0.024*** ** (0.007) |
| DNegNI | **1.084*** ** (0.009) | **1.076*** ** (0.008) | **1.083*** ** (0.009) | **1.084*** ** (0.009) |
| $CI/S_{it-1}$ | | **-0.016** ** (0.007) | | |
| $OCI/S_{it-1}$ | | | **0.039** ** (0.018) | |
| $FCT/S_{it-1}$ | | | | 0.026 (0.026) |
| $AFS/S_{it-1}$ | | | | 0.051 (0.032) |
| $CFH/S_{it-1}$ | | | | 0.045 (0.059) |
| $ACT/S_{it-1}$ | | | | 0.115 (0.092) |
| $REV/S_{it-1}$ | | | | 0.051 (0.861) |
| $ASS/S_{it-1}$ | | | | 0.073 (0.458) |
| $OTH/S_{it-1}$ | | | | -1.161 (1.748) |
| N | 2,353 | 2,353 | 2,353 | 2,353 |
| adj. R-sq | 0.920 | 0.919 | 0.920 | 0.920 |
| AIC | 4467.4 | 4474.1 | 4464.6 | 4475.0 |
| BIC | 4484.7 | 4491.4 | 4487.7 | 4532.7 |
| Vuong (F-Value) | | 1.2727 | -0.7661 | 0.0967 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

Moreover, the regressions are rerun excluding companies from the financial industry. The results presented in Table 5.51 illustrate that the coefficients for NI, CI, OCI, FCT, and ACT are qualitatively unchanged. However, CFH loses its predictive power when excluding the financial industry and the coefficient for AFS becomes an important variable for the regression at p<0.01, previously being non-significant. The results from the regressions solely considering companies from the financial industry show that CFH has influenced the findings for the full sample at p<0.01. Moreover, AFS has canceled out the positive and significant results based on the full sample. The findings indicate that the inclusion of the financial industry in the full sample did have a significant effect on the results.

*Table 5.51: Net Income forecasting regression excluding financials and individual basis*

| | **Net Income /$S_{it}$ (current period Net Income)** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Pooled OLS (excl. financal industry) | | | | Pooled OLS (financal industry) | | | |
| | (5a_NI) | (5b_NI) | (5c_NI) | (5d_NI) | (5a_NI) | (5b_NI) | (5c_NI) | (5d_NI) |
| Intercept | 0.452*** | 0.529*** | 0.458*** | 0.431*** | 0.390*** | 0.571*** | 0.362*** | 0.282** |
| | (0.046) | (0.045) | (0.046) | (0.046) | (0.109) | (0.108) | (0.112) | (0.109) |
| $NI/S_{it-1}$ | **0.643*** ** | | **0.651*** ** | **0.646*** ** | **0.447*** ** | | **0.446*** ** | **0.432*** ** |
| | (0.017) | | (0.017) | (0.017) | (0.033) | | (0.033) | (0.032) |
| $CI/S_{it-1}$ | | **0.625*** ** | | | | **0.403*** ** | | |
| | | (0.017) | | | | (0.033) | | |
| $OCI/S_{it-1}$ | | | **0.229*** ** | | | | -0.103 | |
| | | | (0.056) | | | | (0.106) | |
| $FCT/S_{it-1}$ | | | | **0.233*** ** | | | | **0.968*** ** |
| | | | | (0.071) | | | | (0.237) |
| $AFS/S_{it-1}$ | | | | **0.470*** ** | | | | **-0.305** ** |
| | | | | (0.133) | | | | (0.129) |
| $CFH/S_{it-1}$ | | | | 0.121 | | | | **-1.802*** ** |
| | | | | (0.178) | | | | (0.365) |
| $ACT/S_{it-1}$ | | | | **-0.731*** ** | | | | -1.544 |
| | | | | (0.250) | | | | (1.043) |
| $REV/S_{it-1}$ | | | | 2.391 | | | | 0.194 |
| | | | | (3.067) | | | | (3.942) |
| $ASS/S_{it-1}$ | | | | -1.243 | | | | 1.405 |
| | | | | (1.312) | | | | (3.490) |
| $OTH/S_{it-1}$ | | | | 3.762 | | | | 15.690 |
| | | | | (5.128) | | | | (12.138) |
| N | 1926 | 1926 | 1926 | 1926 | 427 | 427 | 427 | 427 |
| adj. R-sq | 0.418 | 0.406 | 0.423 | 0.428 | 0.300 | 0.259 | 0.300 | 0.368 |
| AIC | 7368.4 | 7407.0 | 7353.5 | 7343.5 | 1814.4 | 1838.3 | 1815.4 | 1777.4 |
| BIC | 7379.6 | 7418.1 | 7370.2 | 7393.5 | 1822.5 | 1846.4 | 1827.6 | 1813.9 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

In line with the application for the forecasting model for OCF control variables have been added to the regressions to capture factors that may have had an impact on the association. The inclusion of control variables does non-significantly change the results that have been observed without the inclusion. However, the coefficient for FCT becomes non-significant previously being highly significant at p<0.01.

In line with expectations, the coefficients for the control variable capturing the financial crisis (DFINCrisis) and for the Eurozone (DEURCrisis) crisis remain

significant at p<0.01 and p<0.1 respectively. The coefficients for the control variable GDP growth (GDPG) are positive and significant at p<0.01. Table 5.52 illustrates the models including control variables (4a_NI-CV to 4d_NI-CV) and the model without control variables (4d_NI) for comparison.

The outcome in general confirms the robustness of the results; however, the findings from this section also show that a differentiated view needs to be taken when dealing with the forecasting ability of NI and is covered in the discussion of the results section.

*Table 5.52: Net Income forecasting regression including control variables*

| | **$NI/S_{it}$ (current period Net Income)** | | | | |
|---|---|---|---|---|---|
| | (5a_NI-CV) | (5b_NI-CV) | (5c_NI-CV) | (5d_NI-CV) | (5d_NI) |
| Intercept | 0.550*** (0.183) | 0.481** (0.189) | 0.552*** (0.184) | 0.539*** (0.184) | 0.448*** (0.043) |
| $NI/S_{it-1}$ | **0.576*** (0.016) | | **0.575*** (0.016) | **0.568*** (0.016) | **0.581*** (0.015) |
| $CI/S_{it-1}$ | | **0.540*** (0.016) | | | |
| $OCI/S_{it-1}$ | | | -0.010 (0.051) | | |
| $FCT/S_{it-1}$ | | | | 0.099 (0.074) | **0.320*** (0.070) |
| $AFS/S_{it-1}$ | | | | 0.059 (0.088) | 0.124 (0.087) |
| $CFH/S_{it-1}$ | | | | **-0.564*** (0.164) | **-0.429*** (0.161) |
| $ACT/S_{it-1}$ | | | | **-0.566**** (0.255) | **-0.797*** (0.253) |
| $REV/S_{it-1}$ | | | | 1.188 (2.347) | 0.762 (2.365) |
| $ASS/S_{it-1}$ | | | | -0.963 (1.248) | -0.978 (1.258) |
| $OTH/S_{it-1}$ | | | | 7.266 (4.752) | 6.845 (4.797) |
| DFINCrisis | **-0.636*** (0.100) | **-0.468*** (0.103) | **-0.639*** (0.101) | **-0.515*** (0.106) | |
| DEURCrisis | **-0.196**** (0.096) | **-0.177** (0.098) | **-0.197**** (0.096) | **-0.161** (0.096) | |
| YGOV | 0.001 (0.010) | -0.011 (0.010) | 0.001 (0.010) | 0.002 (0.010) | |
| GDPG | **0.101*** (0.015) | **0.064*** (0.015) | **0.102*** (0.015) | **0.105*** (0.015) | |
| LEV | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | |
| ITA | 0.027 (0.021) | **0.048**** (0.021) | 0.027 (0.021) | 0.020 (0.021) | |
| N | 2,353 | 2,353 | 2,353 | 2,353 | 2,353 |
| adj. R-sq | 0.412 | 0.380 | 0.412 | 0.416 | 0.393 |
| AIC | 9039.9 | 9164.8 | 9041.9 | 9031.0 | 9227.3 |
| BIC | 9085.9 | 9210.8 | 9093.6 | 9117.2 | 9279.1 |

Statistical significance: * p<0.10, ** p<0.05, *** p<0.01
Standard errors in parentheses

## 5.4 Summary of Results

This study provides empirical evidence on value-relevance of different income measures by analyzing the association between NI and CI with market data. It is examined how well CI and the components of OCI are reflecting the economic situation of the company compared to NI. Furthermore, this study provides empirical evidence for the forecasting ability of current OCF and NI based on preceding NI and CI figures. The summary of the results presented in this section provides an overview of the findings based on the hypotheses developed in the theoretical part of this study.

The price model has been applied to test the [H1] and to establish if the information provided by CI in addition to NI provides a better approximation for the share prices implying a higher value-relevance. The results indicate that CI is more value-relevant than NI and particular component of OCI, namely FCT and CFH have been identified as being value-relevant and robust.[541]

The corresponding models have been applied in addition to test the [H2] and to establish if the information provided by CI in addition to NI provides a better approximation for the share return and abnormal share return. The results indicate that CI is more value-relevant than NI and particular component of OCI, namely FCT and AFS for both models and in addition CFH and ACT for the return model have been identified as being value-relevant and robust.[542]

Based on the price and return models the target price models have been developed to test [H3] if analysts incorporate the information on CI in their valuations. The results indicate that analysts use the current share price as an indicator for the target price; however, all target price models are in addition being driven by ACT. Moreover, the target price consensus and the target price potential are driven by CFH. Whereas, FCT had a strong impact on the share price, this association cannot be confirmed by the target price consensus models and only partially by the target price potential models. The results for the target price revisions are quantitatively similar to the results from the return model. The higher value-relevance of either CI or OCI compared to NI can be confirmed for all target price models.[543]

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[541] Reference is made to section 5.3.1 for detailed results.

[542] Reference is made to sections 5.3.2 and 5.3.2 for detailed results.

[543] Reference is made to section 5.3.4 for detailed results.

In addition to the value-relevance of the information provided by OCI, it has been examined if the forecasting ability of current CI is a superior predictor of future OCF and future NI compared with NI testing [H4]. The results indicate that lagged NI is a better predictor of current NI than CI. On the basis of positive NI none of the OCI components is found to increase the forecasting ability compared with solely considering NI. However, when including also negative earnings the components of OCI, namely CFH and ACT have been identified as being robust and improving the forecasting ability. Based on OCF no clear evidence can be provided that CI increases the forecasting ability compared to NI. The components of OCI, namely FCT, AFS, and to a minor extent ACT have been identified as being robustly increasing the forecasting ability.[544]

Chow tests have been performed for each model to test [H5] if the associations of CI and the components of OCI with the previously examined market and accounting numbers have increased relatively to NI since the implementation of IAS 1 (revised 2007). The results indicate that the value-relevance as well as the forecasting ability of CI and components of OCI has significantly changed with the implementation of the explicit reporting of OCI. In particular certain components of OCI, namely FCT and ACT and to a minor extent also AFS and CFH have been identified as having significantly changed with the implementation. However, the results need to be carefully considered because external effects may have distorted the findings.[545] The results from the value-relevance and forecasting ability regressions are summarized in Table 5.53.

[544] Reference is made to section 5.3.5 for detailed results.

[545] Reference is made to the results from the Voung tests in sections 5.3.1 to 5.3.5 for detailed results.

*Table 5.53: Summary of results from value-relevance and forecasting models*

| | Value-relevance models | | | | | | Forecasting models | |
|---|---|---|---|---|---|---|---|---|
| | Price model | Return model | Abnormal return model | Target price models | | | Operating Cash Flows | Net Income |
| | | | | Target price consensus | Target price revision | Target price potential | | |
| NI | + + | + + | + + | + + | + + | + + | + + | + + |
| CI | + + | + + | + + | + + | + + | + + | + + | + + |
| OCI | + + | + + | + + | + + | + + | + + | - - | + + |
| BVE | + + | | | + + | | | | |
| FCT | + + | + + | + + | 0 | + + | + | - - | 0 |
| AFS | 0 | + + | + | 0 | + + | 0 | - - | 0 |
| CFH | + + | + + | 0 | + + | + + | 0 | 0 | - - |
| ACT | 0 | + | 0 | + + | + + | + + | - | - - |
| REV | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ASS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OTH | + | 0 | + | 0 | 0 | 0 | 0 | 0 |
| DFINCrisis | - - | - - | - - | - - | - - | - - | - - | - - |
| DEURCrisis | - - | 0 | 0 | - - | - - | 0 | - - | - |
| YGOV | - - | 0 | - - | 0 | - - | - - | 0 | 0 |
| GDPG | + + | + + | + + | + + | + + | + + | 0 | + + |
| LEV | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 |
| ITA | + + | 0 | - - | 0 | - - | - - | + + | 0 |
| NumAnalyst | | | | 0 | + + | 0 | | |
| TradVol | | | | + + | + + | 0 | | |

+ + (high) statistical significant positve association (1% / 5%),
+ weak statistical significant positve association (10%),
- - (high) statistical significant negative association (1% / 5%),
- weak statistical significant negative association (10%),
0 no statistical significant impact
no value - not included in the model

The results show that not only the theoretical foundation differs significantly between the models examining the value-relevance and forecasting ability but also the outcomes from the empirical analysis itself. Based on the value-relevance models, and in line with expectations, all coefficients for the income components are positive if they proof to be significant. Contrariwise for the models testing the forecasting ability, the coefficients for the components of OCI turn out to be negative if they are identified as being significant. This fact can possibly be explained by the reverting nature of OCI. The coefficients for REV and ASS are non-significant for any of the models and

OTH is only weakly significant at $p<0.1$ for the price model and the abnormal return model. This is an indicator for low or even non existing value-relevance and forecasting ability of those components.

The coefficients for the control variables are negative and highly significant for all models which on the one hand emphasize the importance of the inclusion of crisis variables in the regression analysis and on the other hand provide robust results also for economically turbulent times. The control variable for government bond yields is negative or non-significant for all models, which is in line with expectations and confirms the intuition that higher interest rates have a negative effect on the performance of the company. Moreover, the results imply that the country of registration of the companies has a significant impact on their financing costs. Contrariwise, but in line with expectations, the coefficient for GDP growth is positive and significant for all models providing evidence that the general economic sentiment in the country of domicile has a significant impact on the performance. The leverage of the companies in the sample does not have a significant impact on the results from the value-relevance and forecasting models. The coefficients for the variables controlling for size show mixed results across the different models in terms of sign, however, mostly significant results. The results indicate that the size of the company does have a significant effect on the association with the share price. Depending on the model this effect can be either positive or negative. For the models including analysts' target prices the inclusion of control variables for the number of analysts covering the company and the trading volume around the announcement date of results either have a positive or non-significant coefficient. The findings for the number of analysts and the trading volume indicate that those factors tend to have a positive effect on the target price consensus and changes in target prices. This fact indicates that the "awareness" of the investor base relating to the analyst coverage does have an impact on the target price consensus provided by analysts.

Based on all models analyzing the association between market values and accounting numbers the fixed effects model needs to be preferred over the random effects model and the pooled OLS model. This fact indicates that the use of the models in this study significantly differs from the approaches in previous studies. The comparison of the models using pooled OLS regressions and fixed effects models shows that, in general,

the two models generate similar results.[546] Consequently the differences in the results cannot be explained by the use of the different regression models.

To check if negative earnings may have had a distorting effect on the regressions analyzing the value-relevance and forecasting ability, control terms for negative NI and negative CI have been added to the regressions. The findings indicate that the negative earnings do not have a significant distorting effect on the results from the regressions. The only exemption being that the forecasting model for NI for which the results significantly changed with the inclusion of the control variable for negative earnings. For this forecasting model all coefficients for components of OCI, partially having been significant without the inclusion of the control variable, become non-significant. The coefficient for NI, excluding negative NI, takes a value close to one supporting the argument that current NI is the best predictor of future NI.

The inclusion of the financial industry has not significantly changed the results based on the value-relevance models. However, when applied for the forecasting models the results based on the sample including and excluding the financial industry significantly differ. Especially when considering the forecasting model based on OCF this difference becomes apparent. This difference in the forecasting ability for OCF can be explained by the different composition of OCF for companies from the financial industry compared to other industries and implies that a differentiated view needs to be taken in this respect. The inclusion of the financial industry in the forecasting model for NI does non-significantly change the results. The finding confirms that especially noncash expenses and changes in working capital are the primary drivers in the difference in the cash flow statement for financial institutions.

When setting up the framework for the empirical analysis the generalization of using the share prices for companies three months after the fiscal year-end, as utilized by several previous studies, has been identified as a potential shortcoming. This study argues that not taking the exact announcement data may distort the results from the analysis. However, this study does not find significant differences in the outcomes for the different value-relevance and forecasting models when either using the share price three months after year-end or the average share price one day before and three days

[546] The only significant difference between the fixed effects regressions and the pooled OLS regressions can be observed with respect to the target price consensus model, where the coefficient for ACT is negative and highly significant based on the pooled OLS model but positive and highly significant based on the fixed effects model.

after the announcement date for the results. Concluding, both figures are appropriate for the use in the context of value-relevance and forecasting models. The differences in results between the studies carried out so far and the results in this study cannot be explained by the use of generalized announcement dates.

# 6 Implications from the Study

## 6.1 Discussion of the Results

The empirical analysis in this study was motivated by the occurrence of mixed results in the studies carried out so far and by the fact that explicit reported data on OCI components for companies reporting following IFRS has only been available since the implementation of IAS 1 (revised 2007). This study provides evidence that OCI does provide value-relevant information for investors based on a sample from the Eurozone and that the implementation of IAS 1 (revised 2007) has changed the value-relevance of OCI components.

By the use of commonly applied approaches such as the price model, return model, and the abnormal return model this study shows that CI is more associated with market values compared to NI, implying higher value-relevance of CI.[547] In particular the components FCT, AFS, and CFH prove to provide value-relevant information in this context. The components for ACT, REV, ASS, and OTH are not statistically significant or only weakly significant for certain models. The results of higher value-relevance of CI compared to NI is contrary to the findings in recent European studies by Goncharov and Hodgson (2011), Devalle and Magarini (2012), and Mechelli and Cimini (2014). Though, the differences of the results can be explained by the use of data before the implementation of IAS 1 (revised 2007) in the studies by Goncharov and Hodgson (2011) and Devalle and Magarini (2012) and by the use of consolidated OCI figures from Datastream in the study Mechelli and Cimini (2014). However, the findings by other international studies, for example by Kanagaretnam et al. (2009), Kubota et al. (2011), and Deol (2013) confirm the results of this study.

In addition, this study focuses on the value-relevance of CI and OCI components for research analysts.[548] It transfers the commonly used share price based approaches from other studies to the target prices provided by research analysts. The results confirm that CI is more value-relevant than NI and, in addition to the OCI components being identified as positive and significant for the price and return models, the coefficients for ACT prove to be significant and positive associated with target prices and target

[547] Reference is made to sections 5.3.1 to 5.3.2 for detailed results.

[548] Reference is made to section 5.3.4 for detailed results.

price changes. This finding is an indication for the fact that analysts, in addition to the information on the current share price, incorporate the information about ACT in their valuation and is in line with the findings by Choi and Zang (2006). The coefficients for the remaining components of OCI are non-significant implying that they are not included in the valuation by analysts. These findings are contrasting the results by Goncharov and Hodgson (2011) who find significant and positive coefficients for REV for a European sample. However, the use of "as-if" data from Datastream before the implementation of IAS 1 (revised 2007) is a possible explanation for the differences in the results compared to the findings in this study.

Furthermore, the association between current NI and NI / CI from the previous period has been tested to analyze the forecasting ability of different income measures.[549] This study provides evidence that current CI and components of OCI are not better predictors of future OCF and future NI compared to current NI. The coefficients for the components of current OCI, namely FCT and AFS are highly significant and negatively associated with future OCF confirming the transitory nature of the components in the future. Similarly, the coefficients for CFH and ACT are negative and highly significant associated with future NI. The conflicting findings of positive and highly significant results for the components FCT, AFS, and REV in the paper by Goncharov and Hodgson (2011) can be explained by the fact that the authors analyzed the OCI components on a consolidated basis, combined with lagged NI. Consequently, the explanatory power of the single OCI components is diluted and primarily the inclusion of NI drives the association. The positive and significant coefficients for NI and CI in their study are confirmed by the findings in this study.

Based on the Conceptual Framework for Financial Reporting by the IASB (2010a), financial information is regarded as value-relevant if it fulfills the fundamental characteristics of being relevant and that it faithfully represents the fact it claims to represent. As previously illustrated the faithfully representation of accounting information is achieved by the obligation to preparing the financial information following accepted accounting standards and by the assurance provided by an independent auditor. The findings in the empirical part of this study show that the information provided in the form of OCI influences the decision making of users of financial statements and confirms that the information published under OCI is

[549] Reference is made to section 5.3.5 for detailed results.

value-relevant for investors. Moreover, the results show that analysts do include the information on OCI in their valuations when estimating the target price. However, the predictive value of OCI can only partially be confirmed in this study.

The findings in this study illustrate that not only the absolute values for CI are important for investors but especially the composition of the components of OCI. Even though the framework for the application of OCI has changed over time and is still in the process of being finalized, investors tend to use the information provided by the components of OCI. As already shown in the quantitative overview in Table 5.1 the reporting of OCI components varies significantly in terms of publication by the companies in the sample. The OCI component FCT on average is reported for 84% of the observations, for CFH on average for 74%, for AFS on average for 50%, and for ACT on average for 35% of the observations. The other components are reported more irregularly for the companies in the sample and amount on average to 20% for ASS, 6% for REV and to 14% for OTH of the observations. In this context not only the absolute values of the OCI components are of particular importance but especially the relative values on the basis of NI and Total Common Equity (referred to as EQ).

Figure 6.1 illustrates the means for absolute OCI components relative to absolute NI with and without zero-counts. The illustration shows that certain components of OCI, even though only irregularly reported, can have if reported, a major impact on the results. For example the values for absolute REV on average amount to 128% (compared to 8% including zero-counts) of absolute NI when eliminating zero-counts, indicating that this position can have a significant effect on the results when reported. But also the other components of OCI which have not been identified as being value-relevant in the analysis, such as ASS (4% vs. 19%) and OTH (1% vs. 6%), can have an effect on NI which is several times higher if excluding the zero-counts. The results indicate that extreme values may have a significant impact on the results of the company and that an examination solely based on means can have a diluting effect.

*Figure 6.1: Mean of absolute OCI components relative to absolute NI*

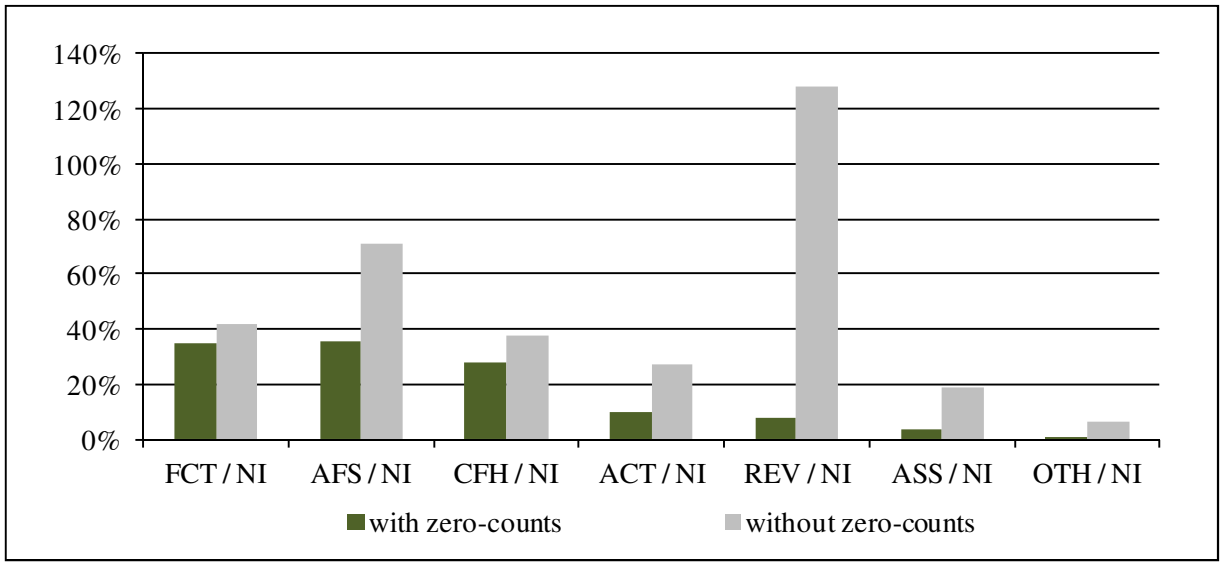
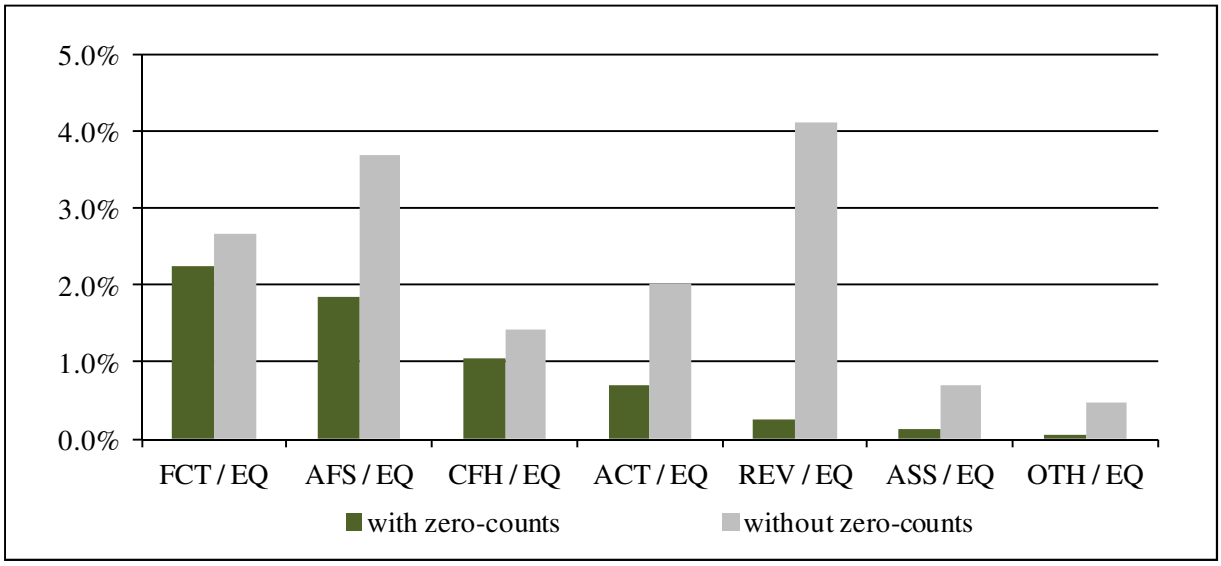



Figure 6.2 illustrates the means for absolute OCI components relative to EQ with and without zero-counts to demonstrate the impact that components of OCI can have relative to the equity position of a company. The illustration supports the conclusion from Figure 6.1, that certain components of OCI, even though only irregularly reported, can have a significant impact on the equity position of a company. The values for absolute REV amount on average to 0.2% relative to EQ with zero-counts, however, to 4.2% when excluding zero-counts. Similar results can be observed for ASS (0.1% vs. 0.7%) and OTH (0.1% vs. 0.5%). The illustration shows that OCI components can, if reported, significantly impact the equity position of the respective company.

*Figure 6.2: Mean of absolute OCI components relative to Total Equity*




The results from the empirical analysis have shown that certain components of OCI, namely FCT, AFS, CFH, and ACT prove to be value-relevant when analyzing the association between market values and accounting numbers. Significant, though negative results, are found for the same components of OCI also for the forecasting model. However, in connection with the less regular reported components of OCI it is particularly important to individually examine those items and to take a relative view, especially in relation to NI and EQ. Those items can have a significant impact on the current and future earnings as well as on the equity of a company. In conclusion it can be stated that the analysis of CI and NI on a consolidated basis provides an initial indication on the importance of consolidated OCI for a particular company. This assessment should only be viewed as a starting point for further analysis. As previously shown, the components of OCI, namely FCT, AFS, CFH, and ACT need further examination because of their significant association with share prices, share returns, target prices, and forecasting ability. However, also the other components of OCI need further examination especially when they prove to be relatively high important for the observation.

## 6.2 Practical Guideline for Dealing with Other Comprehensive Income

But what do these results mean for the users of financial statements and how can they make use of the findings? This section aims at providing a brief overview of how users of financial statements may approach the different components of OCI.[550]

**Foreign currency translation adjustments (FCT)** are closely linked to the operations of the company and can either arise from the accounting for foreign currency translations or from translating financial statements in foreign currencies into the presentation currency.[551] Consequently this component of OCI is primarily driven by the development of the foreign exchange rate between the presentation currency and the currencies from financial statements of foreign operations. In addition, this position is especially important for companies where the production facilities are based in countries which have a different currency compared to the major selling market. As FCT are reported on a consolidated basis it is not possible to differentiate between the sources of the currency translation adjustment. In general the relative importance of FCT in relation to NI or EQ can be viewed as an indicator for the potential impact on the volatility of the CI over time. Moreover, FCT can also be viewed as an indicator for the competitive situation the company is operating in. If the difference between revenues and costs in currencies, other than the presentation currency, is comparably high then the company is likely to profit from higher FCT going forward and vice versa. In this analysis results from net investments in foreign operations have been combined with FCT as the treatment of the two components is comparable. As a practical guideline for further analyses this approach is advised to be followed.

**Gains and losses on available-for-sale financial assets (AFS)** imply that assets, without a specific trading incentive, have changed in value based on the basis of a fair value assessment.[552] The corresponding gains and losses should be regarded as

[550] As already pointed out in the empirical analysis of this study, the components of OCI should be viewed net of tax for comparability reasons.

[551] Reference is made to section 2.2.1 for the theoretical foundation.

[552] Reference is made to section 2.2.2 for the theoretical foundation

one-time effects and should be treated like other financial results in the income statement. The fact that those gains and losses can be realized via recycling at the discretion of the management supports the argument to treat this component in line with the items from the profit or loss to eliminate potential earnings management. This position indicates if a company has significant holdings of financial assets on their balance sheet that are classified as available-for-sale and provides information on the aggregated value changes of such holdings since the last assessment.

**Gains and losses on cash flow hedges (CFH)** result from the effective portion of a cash flow hedge and can be viewed as an indicator of well documented and successful risk management.[553] Especially when comparing CFH on a relative basis to NI with comparable companies it becomes obvious to what extent the company performs an effective cash flow hedging. When comparing the position with comparable companies the gains and losses should be treated as one-time effects and in line with other financial results in the income statement. It may provide an indication on the risk associated with future cash flows if putting the effective portion of the hedge recognized in OCI in relation to the ineffective portion of the hedge recognized in profit or loss. Moreover, the observation over time could provide an indication for increasing costs.

**Actuarial gains and losses on defined benefit plans (ACT)** are one-time effects that are primarily driven by the development of plan assets, the prevailing interest rates and the actuarial assumptions about the underlying workforce.[554] As shown in the empirical analysis the development of ACT is closely linked to the development of GDP growth and the changes in values for the corresponding assets. ACT are an important component of OCI as it is an indication for future pension payments that have to be made by the company. Especially the development over time provides an indication of the relative importance of the position for the company and helps the estimation of such future obligations. Due to the reporting choices that were prevailing in the observation period companies could decide if they wanted to apply the faster

[553] Reference is made to section 2.2.3 for the theoretical foundation.

[554] Reference is made to section 2.2.4 for the theoretical foundation.

recognition, the corridor method, or the direct recognition of which only the latter affects OCI. However, since 1 January, 2013 only the direct recognition is allowed, thereby making the information on ACT more comparable across companies.

**Changes in revaluation surplus of tangible and intangible assets (REV)** should be regarded as a one-time effect as the changes in value are directly linked to the currently observed market values following the fair value concept.[555] The position consists of changes from revaluation surplus from tangible and intangible assets if the fair value of an asset exceeds the cost of the asset less depreciation. A positive revaluation surplus indicates that the asset has gained value based on comparable market values and could be disposed at a higher value. A negative revaluation surplus indicates that the value of an asset that previous experienced revaluation surpluses has reverted over time. Due to the corresponding reporting choices the information value of this position is limited and leaves the company room for maneuver.[556] The fact that this position is the least reported component of OCI in the sample, with on average only about 6% of the observations, underlines that the reporting choice is only used sporadically. However, if a company decides to report this position, the relative importance, especially compared to EQ, needs to be examined. The development over time is of particular importance for this component. In this context special attention should be paid to companies from the financial industry where REV has proven to have a significant effect for the companies in the sample. In case of disposal the revaluation surpluses are offset from accumulated OCI to retained earnings without profit or loss effect.

**Share of Other Comprehensive Income of investments in associates (ASS)** includes all components of OCI of investments in associates in consolidated form. An explicit interpretation of the position is only possible when analyzing the annual reports of the individual investments in associates.[557] As shown in the empirical analysis this component could not be proven to be value-relevant or improving the

[555] Reference is made to section 2.2.5 for the theoretical foundation.

[556] Companies in economic difficulties may choose to report revaluation surpluses to strengthen the equity position of the company.

[557] Reference is made to section 2.2.6 for the theoretical foundation.

forecasting ability. However, when the position is significant, in terms of relative importance to NI and EQ, then financial statement of the major associates should be examined to establish the source of the original OCI component.

**Other not further specified items (OTH)** are items that are included under OCI and for which no further explanation of the positions is provided in the notes of the financial statement.[558] As illustrated in the results section OTH is only weakly significant for the value-relevance models and the impact is primarily driven by companies from the financial industry. Consequently, the significance of this position should be examined relative to NI and to EQ. Special attention should be paid to financial institutions where this position tends to have a more significant effect. If the position tends to have a significant affect then the sources of the component need further investigation otherwise the item should be ignored.

## 6.3 Possible Limitations and Future Research

The motivation of this study has been based on several shortcomings that have been identified in previous studies; however, also this study has some limitations that are briefly illustrated. The limitations identified in this study are primarily related to the availability of specific data during the observation period.

One limitation of the study is the relatively small observation period due to the mandatory application of IAS 1 (revised 2007) only in 2009. Repeating the analysis at a later stage when more reporting years will be available, and ideally with the accessibility of high quality and machine readable data, the study may yield more resilient results.

The sample period from 2007 - 2012 includes a period of economic decline following the financial crisis, the subsequent recovery phase and also the ongoing sovereign debt crisis which could bias the results and could lead to a misinterpretation of the findings. Almost all components of OCI have directly or indirectly been influenced by the crisis. It could be argued that the results from the empirical analysis had been influenced by the financial crisis even though the analysis has controlled for those effects by

[558] Reference is made to section 2.2.7 for the theoretical foundation.

including control variables. An analysis with more available reporting years, especially including non-crisis and recovery years, could verify those results.

Even though the results indicate that the impact of CI, primarily in the form of FCT and CFH, has significantly changed with the implementation of IAS 1 (revised 2007) the findings should be interpreted with special care because external effects, such as the financial crisis and the Eurozone crisis, may have had a distorting effect. The fact that those crises fall into the implementation phase of the explicit CI reporting may have distorted the findings. There are potentially other effects such as conservative investment decisions in crisis that may have influenced the results. However, the results for the years including economic crises can also be viewed as a validation of the robustness of results.

This thesis was not able to further investigate the reclassification adjustments that are only mandatorily reported for financial years starting July 1, 2012. Future research could make use of the then available data and analyze if the information provided on the reclassifications adjustment includes value-relevant information or increases the forecasting ability.

Moreover, the IASB introduced the explicit presentation of OCI items that will never be recycled to profit or loss separately in contrast to those that may be recycled to profit or loss. The IASB thinks that this will make financial statements more comprehensible, and that it will give users a better understanding of the effect that OCI items may have on an entity's financial performance. The differentiation between items that will never be recycled to profit or loss and those that may be recycled to profit or loss is required by preparers of financial statements since 2012. Future research could have a closer look at those values and analyze the value-relevance of a separate publication.

A general issue with the analysis of CI data still remains the reporting choices that companies have or had, e.g., regarding ACT,[559] which could bias and limit the explanatory power of results. The implementation of updated standards, e.g., IAS 19 (revised 2011) eliminating the reporting choices for the recognition of ACT and only

[559] Actuarial gains and losses can be reported by using the corridor method (cf. IAS 19.92), the faster method (cf. IAS 19.95) and the SoRIE (Statement of Recognized Income and Expense) method, of which only the latter yields recognition in OCI. For reporting periods beginning on or after 1 January, 2013 the reporting choices are eliminated for actuarial gains and losses and only allows the direct recognition in OCI pursuant to IAS 19 (2011).

allowing a consistent direct recognition, may have an effect on the value-relevance studies carried out so far. Future research could examine if the omission of the reporting choice had an effect on the value-relevance and forecasting ability of those OCI components.

## 6.4 Conclusion and Outlook

The purpose of this study has been to examine the value-relevance and forecasting ability of CI and components of OCI compared to NI. Furthermore, it has been examined if the explicit reporting of OCI based on IAS 1 (revised 2007) has provided incremental information value for investors beyond NI. The purpose of the study has been to establish if the implementation of OCI has primarily been driven by the convergence project between the IASB and the FASB or if the value-relevance and forecasting ability could be confirmed by empirical evidence.

This study has provided empirical evidence on the value-relevance and forecasting ability of OCI. Based on hand collected data for a sample of 559 companies from the Eurozone between 2007 and 2012 and by the use of price models, return models, and target price models the general value-relevance of OCI in connection with market values has been confirmed. This study establishes that CI is more value-relevant than NI and shows that certain components of OCI, namely FCT, AFS, and CFH proof to be value-relevant and robust for the price and return models. In addition, ACT proof to be value-relevant based on the target price models, implying that analysts incorporate the information on OCI in their valuations. The forecasting ability of OCI components could only marginally be established, which can be explained by the reverting nature of those components. Though, FCT and AFS proof to be forecasting relevant for future OCF as well as CFH and ACT for future NI.

The main aim of the standard setters is to achieve cohesive, consistent and understandable financial information for the addressees. The ultimate goal of the IASB and the FASB remains having a homogeneous, comprehensive, and consistent worldwide accepted accounting standard. As part of this goal the reporting of CI has evolved and still develops over time and has often been viewed as a “moving target”. In this context, there is still no consistent principle for the diverging treatment of items recognized in profit or loss and in CI under the different accounting standards.

Another major issue with respect to the different treatment of IFRS and US GAAP remains the concept of recycling. Whereas, US GAAP follows a strict concept of recycling all items recognized under OCI, IFRS follows a more differentiated approach of not recycling all items via profit or loss. In the context of recycling the discussion paper published by the IASB (2013b) states under principle 3: "… an item that has previously been recognized in OCI should be reclassified (recycled) to profit or loss when, and only when, the reclassification results in relevant information." Consequently, the items that will not be reclassified to profit or loss under IFRS, namely ACT and REV, do not provide relevant information based on the principle provided by the IASB. However, based on the findings in this study it is questionable if the statement of ACT does not provide relevant information. Especially for research analysts the publication of information on ACT has proven to provide value-relevant information. In addition, for the forecasting models ACT have been identified as being forecasting relevant. Based on those findings the standard setter may reconsider the recycling of this OCI component going forward.

This study has shown that it is particularly important for users of financial statements to not only consider NI but also to incorporate the reported information on OCI in the decision making. The information provided under OCI has been identified as providing value-relevant information and should be used as such by investors. Moreover, the direct recognition of certain OCI items in equity and the non-recycling via profit or loss makes those items invisible when only considering NI. It is important that users understand the general concept of OCI to be able to detect position that may have a significant impact on the current and future financial position of a particular company. This becomes even more important when users of financial statements base their decisions on summarizations such as NI rather than analyzing the complete financial reports.

The developments in connection with the reporting of OCI in the last years can be regarded as a step into the right direction. Especially the ongoing convergence efforts of international standards and the elimination of reporting choices have helped to increase the comparability of financial statements, in particular of CI and the components of OCI. With the ongoing developments there is a general tendency that the values of reported OCI items will increase further in the years to follow and as a consequence also the importance of considering OCI position in the decision making process of investors will increase.

However, even though the developments in the recent years can be regarded as positive, several issues remain unsolved. Especially the different recognition of particular OCI items and the concept of recycling in general on an international level need further convergence efforts. The results from this study may help to convince standard setters to consider these desirable developments in the future.

# Appendix

# A1: Overview of the "Narrow Approach" and "Broad Approach"[560]

| Category | Definition | Recycling | Example |
|---|---|---|---|
| **Mismatched remeasurement** | Represents the effects of a linked set of assets, liabilities or past or planned transactions so incompletely that it provides little relevant information about the return the entity has made on its economic resources in the period.<br><br>IASB determines when linkage is sufficient to warrant recognition in Other Comprehensive Income. | All<br><br>When linked item(s) are recognized in profit or loss | Remeasurement of a hedging instrument in a cash flow hedge.<br><br>Accumulated gain or loss recognized in Other Comprehensive Income is recycled (reclassified to profit or loss) when the effect of the hedged item is recognized in profit or loss. |
| **Bridging item** | A disaggregated component of an item of income or expense<br><br>Represents the difference between a measure used to determine profit or loss and a measure used in the statement of financial position.<br><br>IASB determines when two different measures should be used in the primary financial statements.<br><br>Profit or loss must reflect meaningful, understandable and clearly describable measure. | All<br><br>Automatic result of measure recognized in profit or loss | Financial assets measured at fair value through Other Comprehensive Income (under the proposals in the IFRS 9 2012 ED)<br><br>Accumulated gain or loss recognized in Other Comprehensive Income is recycled on disposal or impairment as a consequence of reflecting amortized cost in profit or loss. |
| **Transitory remeasurement** | An item of income or expense that:<br>• will be realised/settled over the long-term<br>• is likely to reverse or significantly change<br>• if separately recognized in Other Comprehensive Income, in whole or in part, enhances the relevance and understandability of profit or loss | Some<br><br>If the IASB determines that recycling provides relevant information | Remeasurement of a defined benefit pension liability/asset).<br><br>Accumulated gain or loss recognized in Other Comprehensive Income (reclassified to profit or loss) is not recycled. No operational and meaningful method of recycling can be determined. |

[560] Taken from the Staff Paper: Conceptual framework profit or loss and comprehensive income, September 23, 2013 by the IASB (2013d). The staff paper is based on the IASB discussion paper DP/2013/1 "A Review of the Conceptual Framework for Financial Reporting".

# A2: Example of the One-Statement and Two-Statement Approach[561]

[561] The examples have been adopted from the IFRS Taxonomy 2011 published by the IFRS Foundation. Available at http://www.ifrs.org [accessed 15/04/2013]

Presentation of profit or loss and Other Comprehensive Income in **one statement** and the classification of expenses within profit or loss by function

| Statement of comprehensive income | | |
|---|---|---|
| (in thousand Euro) | | |
| | **20X7** | **20X6** |
| **Revenue** | 390,000 | 355,000 |
| Cost of sales | -238,000 | -219,500 |
| Gross profit | 152,000 | 135,500 |
| Other income | 20,667 | 11,300 |
| Distribution costs | -9,000 | -8,700 |
| Administrative expenses | -20,000 | -21,000 |
| Other expenses | -2,100 | -1,200 |
| Finance costs | -15,000 | -18,000 |
| Share of profit of associates[(a)] | 35,100 | 30,100 |
| **Profit before tax** | 161,667 | 128,000 |
| Income tax expense | -40,417 | -32,000 |
| **Profit for the year from continuing operations** | 121,250 | 96,000 |
| Loss for the year from discontinued operations | – | -30,500 |
| **PROFIT FOR THE YEAR** | 121,250 | 65,500 |
| **Other comprehensive income:** | | |
| **Items that will not be reclassified to profit or loss:** | | |
| Gains on property revaluation | 933 | 3,367 |
| Investments in equity instruments | -24,000 | 26,667 |
| Remeasurements of defined benefit pension plans | -667 | 1,333 |
| Share of gain (loss) on property revaluation of associates[(c)] | 400 | -700 |
| Income tax relating to items that will not be reclassified[(d)] | 5,834 | -7,667 |
| | -17,500 | 23,000 |
| **Items that may be reclassified subsequently to profit or loss:** | | |
| Exchange differences on translating foreign operations[(b)] | 5,334 | 10,667 |
| Cash flow hedges[(b)] | -667 | -4,000 |
| Income tax relating to items that may be reclassified[(d)] | -1,167 | -1,667 |
| | 3,500 | 5,000 |
| **Other comprehensive income for the year, net of tax** | -14,000 | 28,000 |
| **TOTAL COMPREHENSIVE INCOME FOR THE YEAR** | 107,250 | 93,500 |

(a) This means the share of associates' profit attributable to owners of the associates, ie it is after tax and non-controlling interests in the associates.

(b) This illustrates the aggregated presentation, with disclosure of the current year gain or loss and reclassification adjustment presented in the notes. Alternatively, a gross presentation can be used.

(c) This means the share of associates' other comprehensive income attributable to owners of the associates, ie it is after tax and non-controlling interests in the associates.

(d) The income tax relating to each component of other comprehensive income is disclosed in the notes.

Presentation of profit or loss and Other Comprehensive Income in **two statements** and the classification of expenses within profit or loss by function

| **Income statement** | | | |
|---|---|---|---|
| **(illustrating the presentation of comprehensive income in two statements and classification of expenses within** | | | |
| (in thousand Euro) | | | |
| | | **20X7** | **20X6** |
| **Revenue** | | 390,000 | 355,000 |
| Other income | | 20,667 | 11,300 |
| Changes in inventories of finished goods and work in progress | | -115,100 | -107,900 |
| Work performed by the entity and capitalised | | 16,000 | 15,000 |
| Raw material and consumables used | | -96,000 | -92,000 |
| Employee benefits expense | | -45,000 | -43,000 |
| Depreciation and amortisation expense | | -19,000 | -17,000 |
| Impairment of property, plant and equipment | | -4,000 | – |
| Other expenses | | -6,000 | -5,500 |
| Finance costs | | -15,000 | -18,000 |
| Share of profit of associates[(e)] | | 35,100 | 30,100 |
| **Profit before tax** | | 161,667 | 128,000 |
| Income tax expense | | -40,417 | -32,000 |
| **Profit for the year from continuing operations** | | 121,250 | 96,000 |
| Loss for the year from discontinued operations | | – | -30,500 |
| **PROFIT FOR THE YEAR** | | 121,250 | 65,500 |
| Profit attributable to: | | | |
| | Owners of the parent | 97,000 | 52,400 |
| | Non-controlling interests | 24,250 | 13,100 |
| | | 121,250 | 65,500 |
| Earnings per share (in currency units): | | | |
| | Basic and diluted | 0.46 | 0.3 |

(e) This means the share of associates' profit attributable to owners of the associates, ie it is after tax and non-controlling interests in the associates.

## Statement of comprehensive income

**(illustrating the presentation of comprehensive income in two statements)**

(in thousands of currency units)

| | 20X7 | 20X6 |
|---|---|---|
| **Profit for the year** | 121,250 | 65,500 |
| **Other comprehensive income:** | | |
| **Items that will not be reclassified to profit or loss:** | | |
| Gains on property revaluation | 933 | 3,367 |
| Investments in equity instruments | -24,000 | 26,667 |
| Remeasurements of defined benefit pension plans | -667 | 1,333 |
| Share of gain (loss) on property revaluation of associates[(f)] | 400 | -700 |
| Income tax relating to items that will not be reclassified[(g)] | 5,834 | -7,667 |
| | -17,500 | 23,000 |
| **Items that may be reclassified subsequently to profit or loss:** | | |
| Exchange differences on translating foreign operations | 5,334 | 10,667 |
| Cash flow hedges | -667 | -4,000 |
| Income tax relating to items that may be reclassified[(g)] | -1,167 | -1,667 |
| | 3,500 | 5,000 |
| **Other comprehensive income for the year, net of tax** | -14,000 | 28,000 |
| **TOTAL COMPREHENSIVE INCOME FOR THE YEAR** | 107,250 | 93,500 |
| Total comprehensive income attributable to: | | |
| Owners of the parent | 85,800 | 74,800 |
| Non-controlling interests | 21,450 | 18,700 |
| | 107,250 | 93,500 |

(f) This means the share of associates' other comprehensive income attributable to owners of the associates, ie it is after tax and non-controlling interests in the associates.

(g) The income tax relating to each component of other comprehensive income is disclosed in the notes.

# A3: Overview GICS (Global Industry Classification Standard)[562]

| Sector Number | Sector | Industry |
|---|---|---|
| 10 | **Energy** | Energy Equipment & Services<br>Oil, Gas & Consumable Fuels |
| 15 | **Materials** | Chemicals<br>Construction Materials<br>Containers & Packaging<br>Metals & Mining<br>Paper & Forest Products |
| 20 | **Industrials** | Aerospace & Defense<br>Building Products<br>Construction & Engineering<br>Electrical Equipment<br>Industrial Conglomerates<br>Machinery<br>Trading Companies & Distributors<br>Commercial Services & Supplies<br>Professional Services<br>Air Freight & Logistics<br>Airlines<br>Marine<br>Road & Rail<br>Transportation Infrastructure |
| 25 | **Consumer Discretionary** | Auto Components<br>Automobiles<br>Household Durables<br>Leisure Equipment & Products<br>Textiles, Apparel & Luxury Goods<br>Hotels, Restaurants & Leisure<br>Diversified Consumer Services<br>Media<br>Distributors<br>Internet & Catalog Retail<br>Multiline Retail<br>Specialty Retail |
| 30 | **Consumer Staples** | Food & Staples Retailing<br>Beverages<br>Food Products<br>Tobacco<br>Household Products<br>Personal Products |

[562] The Global Industry Classification Standard is published on the webpage of Standard & Poor's. Available at: http://www.standardandpoors.com [accessed 12/07/2013].

| Sector Number | Sector | Industry |
|---|---|---|
| 35 | **Health Care** | Health Care Equipment & Supplies<br>Health Care Providers & Services<br>Health Care Technology<br>Biotechnology<br>Pharmaceuticals<br>Life Sciences Tools & Services |
| 40 | **Financials** | Commercial Banks<br>Thrifts & Mortgage Finance<br>Diversified Financial Services<br>Consumer Finance<br>Capital Markets<br>Insurance<br>Real Estate -- Discontinued effective 04/28/2006<br>Real Estate Investment Trusts (REITs)<br>Real Estate Management & Development |
| 45 | **Information Technology** | Internet Software & Services<br>IT Services<br>Software<br>Communications Equipment<br>Computers & Peripherals<br>Electronic Equipment, Instruments & Components<br>Office Electronics<br>Semiconductor Equipment & Products --<br>Discontinued effective 04/30/2003.<br>Semiconductors & Semiconductor Equipment |
| 50 | **Telecommunication Services** | Diversified Telecommunication Services<br>Wireless Telecommunication Services |
| 55 | **Utilities** | Electric Utilities<br>Gas Utilities<br>Multi-Utilities<br>Water Utilities<br>Independent Power Producers & Energy Traders |

# A4: List of Companies Used in the Analysis

A2A SpA
Aalberts Industries NV
Aareal Bank AG
Abengoa SA
Abertis Infraestructuras SA
Acciona SA
Accor SA
ACEA SpA
Acerinox SA
Ackermans & van Haaren NV
ACS SA
Adidas AG
Aedifica SA
Aegean Airlines SA
Aegon NV
Aer Lingus Group PLC
Aeroports de Paris SA
AGFA-Gevaert NV
Agrana Beteiligungs AG
Ahlstrom Oyj
Air Berlin PLC
Air Liquide SA
Airbus Group NV
Aixtron SE
Akzo Nobel NV
ALBIOMA SA
Alcatel-Lucent SA
Allianz SE
Allied Irish Banks PLC
Alma Media Oyj
Alpha Bank AE
Alstom SA
Alten SA
Altran Technologies SA
Amer Sports Oyj
Amplifon SpA
Andritz AG
Ansaldo STS SpA
Arcadis NV
Areva SA
Arkema SA
Arnoldo Mondadori Editore SpA
Arseus NV
Assicurazioni Generali SpA
Astaldi SpA
ASTM SpA
AT & S AG
Athens Stock Exchange SA
Athens Water Supply SA
Atlantia SpA
AtoS SE
Atresmedia Corporación SA
Attica Bank
Aurubis AG
Autogrill SpA
AXA SA
Axel Springer SE
Azimut Holding SpA
Banca Carige SpA
Banca Generali SpA
Banca Monte dei Paschi SpA
Banca Popolare dell Etruria SC
Banca Popolare dell'Emilia SC
Banca Popolare di Milano Scarl
Banca Popolare di Sondrio Scarl
Banco BPI SA
Banco Comercial Portugues SA
Banco de Sabadell SA
Banco di Desio SpA
Banco Espirito Santo SA
Banco Popolare SC
Banco Popular Espanol SA
Banco Santander SA
Bank of Ireland PLC
Bankinter SA
Barco NV
BASF SE
Bayer AG
Bayerische Motoren Werke AG
BayWa AG
BBVA SA
Beiersdorf AG
Belgacom SA
Beneteau SA
Beni Stabili SpA
Bilfinger SE
BinckBank NV
BioMerieux SA
BNP Paribas SA
Bollore SA
Bolsas y Mercados Espanoles SA
Bourbon SA
Bouygues SA
Brederode SA
Brembo SpA
Brisa – Autoestradas de Portugal SA
Bureau Veritas SA
Buzzi Unicem SpA
C&C Group PLC
CA Immobilien Anlagen AG
CAF SA
CaixaBank SA
Caltagirone Editore SpA
Cap Gemini SA
Cargotec Oyj
Carrefour SA
Casino Guichard Perrachon SA
Celesio AG
Cementos Portland Valderrivas SA
Christian Dior SA
Cie d'Entreprises CFE SA
Cie Maritime Belge SA
Ciments Francais SA
Cimpor Cimentos de Portugal SA
CIR SpA
Citycon Oyj
Club Mediterranee SA
CNP Assurances SA
Coca-Cola Hellenic Bottling SA
Cofide SpA
Colruyt SA
Comdirect Bank AG
Commerzbank AG

Compagnie de St-Gobain SA
Confinimmo SA
Continental AG
Conwert Immobilien Invest SE
Corbion NV
Corio NV
Corp Financiera Alba SA
Cramo Oyj
Credit Agricole SA
Credito Bergamasco SpA
Credito Emiliano SpA
Credito Valtellinese SpA
CRH PLC
CTS Eventim AG
Daimler AG
Danieli SpA
Danone SA
Dassault Systemes SA
Davide Campari-Milano SpA
DCC PLC
De' Longhi SpA
DeA Capital SpA
Delhaize Group SA
Deoleo SA
Deutsche Bank AG
Deutsche Boerse AG
Deutsche Euroshop AG
Deutsche Lufthansa AG
Deutsche Post AG
Deutsche Postbank AG
Deutsche Telekom AG
Deutsche Wohnen AG
Dexia SA
DiaSorin SpA
D'ieteren NV
DMG MORI SEIKI AG
Douglas Holding AG
E.ON SE
Ebro Foods SA
EDP - Energias de Portugal SA
EDP Renovaveis SA
Eiffage SA
Electricite de France SA
Elia System Operator SA
Elisa Oyj
Ellaktor SA
ElringKlinger AG
Elval- Hellenic Aluminium SA
Enagas SA
EnBW AG
Endesa SA
Enel SpA
Eni SpA
Eramet SA
ERG SpA
Erste Group Bank AG
Essilor International SA
Établissements Maurel Prom SA
Euler Hermes SA
Eurazeo SA
Eurobank Ergasias SA
Eurobank Properties SA
Eurocommercial Properties NV
Eurofins Scientific SE
Eutelsat Communications SA
EVN AG
EVS Broadcast Equipment SA
Exact Holding NV
Exor SpA
Faes Farma SA
Faurecia SA
FBD Holdings PLC
FCC SA
Ferrovial SA
Fiat SpA
Fielmann AG
Fimalac SA
Financiere de Tubize SA
Finmeccanica SpA
Finnlines Oyj
Finsoe SpA
Fiskars Oyj Abp
Flughafen Wien AG
Folli Follie SA
Fonciere Des Regions SA
Fortum Oyj
Fourlis Holdings SA
Fraport AG
Frigoglass SA
Fuchs Petrolub SE
Fugro NV
GAGFAH SA
Galapagos NV
Galp Energia SGPS SA
Gamesa Corp. Tecnologica SA
Gas Natural SDG SA
GDF Suez SA
GEA Group AG
Gecina SA
GEK Terna SA
Gemalto NV
Gemina SpA
Generale de Sante SA
Generali Deutschland AG
Geox SpA
Gerresheimer AG
GFI Informatique SA
GFK SE
Gimv NV
Glanbia PLC
Grafton Group PLC
Grifols SA
Groupe Bruxelles Lambert SA
Groupe Eurotunnel SA
Groupe Steria SCA
Grupo Catalana Occidente SA
Grupo Ezentis SA
Gruppo Editoriale L'Espresso SpA
GTECH SpA
Hamburger Hafen und Logistik AG
Hannover Rueck SE
Havas SA
HeidelbergCement AG
Heidelberger Druckmaschinen AG
Heineken NV
Hellenic Petroleum SA
Henex SA
Henkel AG & Co KGaA
Hera SpA
Hermes International SCA
Hochtief AG
Hugo Boss AG

Huhtamaki Oyj
Hygeia SA
Iaso SA
Iberdrola SA
ICADE SA
Imerys SA
Immofinanz AG
Indesit Co SpA
Inditex SA
Indra Sistemas SA
Infineon Technologies AG
ING Groep NV
Ingenico SA
Intercell AG
Interpump Group SpA
Intesa Sanpaolo SpA
Intracom Holdings SA
Intralot SA
Ipsen SA
IPSOS SA
Italcementi SpA
Italmobiliare SpA
IVG Immobilien AG
JCDecaux SA
Jenoptik AG
Jeronimo Martins SGPS SA
JUMBO SA
K+S AG
Kapsch TrafficCom AG
KBC Groep NV
Kemira Oyj
Kering SA
Kerry Group PLC
Kesko Oyj
Kinepolis Group NV
Kingspan Group PLC
Klepierre SA
Kloeckner & Co SE
Kone Oyj
Konecranes Oyj
Koninklijke Ahold NV
Koninklijke BAM Groep NV
Koninklijke DSM NV
Koninklijke KPN NV
Koninklijke Philips NV
Koninklijke Vopak NV
Koninklijke Wessanen NV
Kontron AG
Krones AG
Lafarge SA
Lagardere SCA
Lamda Development SA
Lampsa Hotel Co
LANXESS AG
Lassila & Tikanoja Oyj
Legrand SA
Lemminkainen Oyj
Lenzing AG
Leoni AG
Linde AG
Logwin AG
L'Oreal SA
Luxottica Group SpA
LVMH SA
MAN SE
Mapfre SA
Marfin Investment SA
MARR SpA
Martinsa-Fadesa SA
Mayr Melnhof Karton AG
Mediaset Espana Comunicacion SA
Mediaset SpA
Mediobanca SpA
Mediolanum SpA
Medion AG
Mediq BV
Melexis NV
Melia Hotels International SA
Mercialys SA
Merck KGaA
Metka SA
Metro AG
Metropole Television SA
Metrovacesa SA
Metsa Board Oyj
Metso Oyj
Michelin SCPA
Milano Assicurazioni SPA
MLP AG
Mobistar SA
Motor Oil Corinth Refineries SA
MTU Aero Engines AG
Munich Re AG
Mytilineos Holdings SA
National Bank of Greece SA
Natixis SA
Neopost SA
Neste Oil Oyj
Nexans SA
Nexity SA
NH Hoteles SA
NicOx SA
Nokia Oyj
Nokian Renkaat Oyj
Nordex SE
NRJ Group SA
Nutreco NV
NV Bekaert SA
Nyrstar NV
Oberbank AG
Obrascon Huarte Lain SA
Oesterreichische Post AG
Olvi Oyj
OMV AG
OPAP SA
Orange SA
Ordina NV
Oriola-KD Oyj
Orion Oyj
Orpea SA
OTE Group SA
Outokumpu Oyj
Outotec Oyj
Paddy Power PLC
Parmalat SpA
Pernod Ricard SA
Peugeot SA
Pfeiffer Vacuum Technology AG
Piaggio & C SpA
Piraeus Bank SA
Piraeus Port Authority SA
Pirelli & C. SpA

PKC Group Oyj
Plastika Kritis SA
Pohjola Bank PLC
Portucel SA
Portugal Telecom SGPS SA
PostNL NV
Poyry Oyj
Praktiker AG
Prelios SpA
Promotora de Informaciones SA
Prosegur Cia de Seguridad SA
ProSiebenSat.1 Media AG
Prysmian SpA
Public Power Corp SA
Publicis Groupe SA
Puma SE
Raiffeisen Bank International AG
Raisio PLC
Rallye SA
Ramirent Oyj
Randstad Holding NV
Rational AG
Rautaruukki Oyj
RCS MediaGroup SpA
Recordati SpA
Red Electrica Corp SA
Reed Elsevier NV
Remy Cointreau SA
Renault SA
Repsol SA
Rexel SA
Rheinmetall AG
RHI AG
Rhoen Klinikum AG
Royal Boskalis Westminster NV
Royal Imtech NV
RTL Group SA
Rubis SCA
RWE AG
Ryanair Holdings PLC
S IMMO AG
S&B Minerals SA
Sacyr SA
Safilo Group SpA
Safran SA
Saft Groupe SA
Saipem SpA
Salini Impregilo SpA
Salzgitter AG
Sampo Oyj
Sanofi SA
Sanoma Oyj
SAP AG
Sarantis SA
Saras SpA
Schneider Electric SA
Schoeller-Bleckmann AG
SCOR SE
SEB SA
Semapa SGPS SA
Semperit AG
Sequana SA
SES SA
SGL Carbon SE
SIAS SpA
Sidenor Steel Products SA
Siemens AG
SILIC SA
Singulus Technologies AG
Sipef SA
Sky Deutschland AG
Sligro Food Group NV
SMA Solar Technology AG
Smurfit Kappa Group PLC
Snam SpA
SNS REAAL NV
Societa Cattolica SC
Societe BIC SA
Societe Generale SA
Societe Television Francaise SA
Sodexo SA
Sofina SA
Software AG
Soitec SA
Solarworld AG
Solocal Group SA
Solvac SA
Solvay SA
Sonae SA
Sorin SpA
Sponda Oyj
Stada Arzneimittel AG
Stockmann OYJ Abp
Stora Enso Oyj
Strabag SE
Suedzucker AG
Suez Environnement SA
Symrise AG
Talvivaara Mining PLC
Technicolor SA
Technip SA
Tecnicas Reunidas SA
Telecom Italia SpA
Telefonica SA
Telegraaf Media Groep NV
Telekom Austria AG
Telenet Group Holding NV
Teleperformance SA
Terex Solutions AG
Terna Energy SA
Terna SpA
Tessenderlo Chemie NV
Thales SA
Thessaloniki Water SA
ThromboGenics NV
ThyssenKrupp AG
Tieto Oyj
Titan Cement Co SA
Tod's SpA
Tognum AG
TomTom NV
Total SA
Trevi Finanziaria Industriale SpA
TUI AG
UBISOFT SA
UCB SA
Umicore SA
Unibail-Rodamco SE
UniCredit SpA
Unilever NV
Unione di Banche Italiane SCpA
UnipolSai SpA

UNIQA Insurance Group AG
United Internet AG
UPM-Kymmene Oyj
Uponor Oyj
USG People NV
Vacon PLC
Vaisala Oyj
Valeo SA
Vallourec SA
Van Lanschot NV
Vastned Retail NV
Veolia Environnement SA
Verbund AG
Vicat SA
Vienna Insurance Group AG
Vinci SA
Viohalco SA
Virbac SA
Viscofan SA
Vivendi SA
Vocento SA
Voestalpine AG
Volkswagen AG
Vossloh AG
Wacker Chemie AG
Warehouses De Pauw SCA
Wartsila Oyj Abp
Wendel SA
Wereldhave NV
Wienerberger AG
Wincor Nixdorf AG
Wirecard AG
Wolters Kluwer NV
YIT Oyj
Yoox SpA
Zardoya Otis SA
Zeltia SA
Zodiac Aerospace SA
Zon Optimus SGPS SA
Zumtobel AG

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# Curriculum Vitae

Robert Günther, born May 7, 1983, in Cologne, Germany.

## Education

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| 2011 - 2014 | **University of St. Gallen (HSG)**<br>Doctoral Student |
| 2012 | **Haas School of Business, University of California, Berkeley**<br>Summer School |
| 2005 - 2007 | **HHL - Leipzig Graduate School of Management**<br>Graduate Studies in Business Administration and Management |
| 2006 | **ITESM / EGADE, Campus Ciudad de Mexico, Mexico City**<br>Exchange Semester in the MBA Program |
| 2003 - 2005 | **University of Bayreuth**<br>Undergraduate Studies in Business Administration |

## Professional Experience

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| 2011 - 2014 | **University of St. Gallen (HSG)**<br>Research Associate |
| 2007 - 2011 | **UniCredit Bank, Munich / London**<br>Capital Markets |