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Author(s)	D. Wirtz
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Firms' adoption of the International Financial Reporting Standards (IFRS) has been increasing worldwide. Even the U.S. Securities and Exchange Commission is considering direct incorporation of IFRS into the U.S. financial reporting regime in the foreseeable future. With the adoption of IFRS, reports of managers' fair value estimates of a firm's assets in financial statements became more pervasive than under local generally accepted accounting principles (GAAPs) and is likely to become increasingly important over the coming years. However, managers' fair value estimates are subject to measurement errors that might reduce the faithful representation of accounting numbers. Using publicly available managers' fair value estimates of cash generating units and investment properties, this empirical study analyzes the usefulness to investors of these estimates. The analysis is based on two standards of the International Accounting Standards Board (IASB): International Accounting Standard (IAS) 36 "*Impairment of Assets*" and International Accounting Standard (IAS) 40 "*Investment Property*."

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Dieter Wirtz

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Co-promotor:	Prof. Dr. V.R. O'Connell

Overige Leden:	Prof. Dr. B.G.D. O'Dwyer
	Prof. Dr. W. Rees
	Dr. D. Veenman

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Contents

1 Introduction

1.1 Research motivation

1.1.1 Worldwide prominence of IFRS

The International Financial Reporting Standards (IFRS) set by the International Accounting Standards Board (IASB) have gained global importance over the last few years due to accounting regulation harmonization and the transparency requirements of capital markets (Schipper 2005). In 2005 publicly traded firms adopted IFRS in more than 100 countries, including countries of the European Union (EU) (Ball 2006). The Council of the EU adopted IFRS in June 2002. The adoption requires firms listed on EU stock exchanges to prepare consolidated financial statements in accordance with IFRS. These firms must have adopted IFRS no later than in the fiscal year starting in 2005 or if they reported financial statements under U.S. General Accepted Accounting Principles (GAAP), in 2007.[1] As a result, about 7,000 European firms are affected by the adoption of IFRS (Hoogendoorn 2006).

The IASB aims to promulgate one set of high-quality, globally accepted standards to enhance the comparability of operating performance across firms (IASB 2010). Thus, the IASB has been encouraging the U.S. Securities and Exchange Commission (SEC) to permit U.S. issuers of securities to apply IFRS instead of the U.S. GAAP issued by the U.S. Financial Accounting Standards Board (FASB). A first milestone was achieved in 2007 when the SEC removed the reconciliation requirements to U.S. GAAP for cross-listed firms that apply IFRS and are listed in the

[1] EU member states could allow listed firms that were additionally listed outside the EU to prepare their financial statements in accordance with U.S. GAAP until 2007 (Schipper 2005).

Unites States (IASB 2007). Accordingly, IFRS and U.S. GAAP coexist in the U.S. capital market.

Improving the quality of IFRS and U.S. GAAP are aims of the joint IASB–FASB projects. The joint projects intend to align IFRS and U.S. GAAP to form a single unit of global standards (Schipper 2005; Kothari et al. 2010). The SEC supports the convergence process and is considering direct incorporation of IFRS into the U.S. financial reporting regime (SEC 2010).

1.1.2 Fair value estimates

With the adoption of IFRS, fair value reporting became more pervasive than under local GAAPs and is likely to become increasingly important over the coming years (Schipper 2005; Ball 2006; Barth 2006; Cairns 2006). The U.S. FASB has also moved toward fair value accounting in the last decades but restricts upward adjustments to assets' fair value to financial instruments only (Hitz 2007). The U.S. FASB has addressed concern about the faithful representation of fair value estimates of nonquoted assets that are based on managers' judgments (Barth 1994; Barth and Landsman 1995; Cotter and Zimmer 2003).[2]

The fair value hierarchy of the U.S. FASB and the IASB reflects the degree of managers' judgments in a descending order. Specifically, fair value measures, according to the Statement of Financial Accounting Standards (SFAS) 157 "*Fair Value Measurements*" and IFRS 13 "*Fair Value Measurement*," are classified using a three-level hierarchy that

[2] In September 2010, the IASB and U.S. FASB completed their joint project on the objectives and qualitative characteristics of financial reporting incorporated in the financial frameworks of IFRS and U.S. GAAP. Within this project, the U.S. FASB and IASB substituted the term "faithful representation" for "reliability," as they expect the former to capture more clearly than the latter the intended meaning that accounting information represents what it purports to represent (FASB 2010).

depends on the availability of market data. Level one refers to quoted prices in active markets (marked-to-market). Level two prices are based on input components that are observable for other similar assets. Level three is based on inputs that cannot be observed in markets (marked-to-model) (FASB 2006; IASB 2011). Accordingly, the IASB and U.S. FASB categorize estimates of fair values into level two and level three of the fair value hierarchy.

Levels two and three fair values have caused much debate in recent years (Schipper 2005; Hitz 2007; Lapointe-Antunes et al. 2009) due to their potential misuse by managers, which has been observed in a number of accounting scandals (e.g., in the Enron scandal, see also Watts 2003). Thus, opponents of fair value accounting argue that managers can opportunistically use discretion when reporting operating income (e.g., Holthausen and Watts 2001; Watts 2003; Ramanna 2008; Kothari et al. 2010; Ramanna and Watts 2012). Notwithstanding this argument, fair value based estimates are less arbitrary and relatively more precise in portraying the economic picture of assets than historical cost measurements (Dietrich et al. 2001; Barth 2006; Herrmann et al. 2006).

In summary, assets and operating income based on IFRS are influenced increasingly by managers' estimates of fair values. Use of fair value estimates in a firm's financial statements represents a new measurement paradigm by replacing cost and transaction based accounting by market value and event based accounting (Herrmann et al. 2006; Penman 2007). In this dissertation, I conduct three standalone analyses of the usefulness to investors (and thus also to other financial statement users) of managers' fair value estimates of firm assets.

First, I model the requirements of International Accounting Standard (IAS) 36 "*Impairment of Assets*" and analyze whether a firm's reporting environment affects managers' use of discretion inherent in the requirements. Specifically, I examine which discretionary IAS 36 requirements are used opportunistically by managers in a weak reporting environment and whether a stringent reporting environment encourages managers to use discretion prudently in estimating IAS 36 fair values.

Second, I examine whether fair values reported under IAS 36 is informative to investors when reported in the absence of managers' exploitation of discretion inherent in the impairment guidelines. Finally, I investigate whether fair values reported under IAS 40 "*Investment Property*" summarize information that is used by investors to value a firm's equity base to a higher extent than historical cost accounting that includes impairments.

Before presenting in more detail the three standalone analyses in subsection 1.2, I outline the motivation to conduct these analyses in subsections 1.1.3 (IAS 36) and 1.1.4 (IAS 40).

1.1.3 IAS 36 *"Impairment of Assets"*

Under IFRS, firms are allowed or required to estimate levels two and three fair values for property, plant, and equipment, intangible assets, and investment properties. Whereas managers have the option to report fair values above historical cost (unrealized gains) for these assets in financial statements, they are required to report fair values when these assets are impaired. An impairment loss is to be reported in a firm's financial statements when the book value of an asset is not recoverable (i.e., the book value is above the fair value). In this case impairment charges—the difference between the old and "new" book values (where the new book value is the current fair value)—are to be taken to the income statement (IASB 2003a, 2003b, 2004a, 2008).

Asset impairment charges and other items (e.g., restructuring charges) became more prevalent in the last decades of the 1900s (Elliott and Hanna 1996). The abolishment of amortization of goodwill and other intangible assets with indefinite lifetimes in 2004 by the IASB, and the global financial crisis of 2008–2009 further increased the influence of asset impairment losses in a firm's income statements.[3] Consequently, it is worthwhile to analyze the usefulness of IFRS asset impairments, as they are an important income statement component.

Impairments of tangible fixed assets (i.e., property, plant, and equipment, and investment property) and intangible fixed assets (i.e., goodwill and other intangibles, such as patents, software, and trademarks) are covered under IAS 36. IAS 36 requires an impairment test at least once a year for intangible assets with an indefinite life (e.g., goodwill) and for all tangible and intangible assets when indicators signal that they are impaired. An impairment test compares the book value with the recoverable amount, which is the higher of an asset's fair value less cost to sell and its value in use. The value in use of an asset (or asset group) is estimated by discounting projected future net cash flows. As cash flows on individual assets are not easily identified, tangible and intangible assets are evaluated within cash generating units (CGUs); a CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB 2004a).

[3] Before March 2004, IAS 38 "*Intangible Assets*" viewed goodwill and other intangible assets as having a useful life. Thus, they were to be amortized. According to IFRS 3 "*Business Combinations*," goodwill acquired in a business combination has now an indefinitely useful life. Other intangible assets need to be analyzed to determine whether they generate unlimited periods of cash flows. In connection with IFRS 3 and IAS 38, IAS 36 requires an impairment test at least once a year for intangible assets with an indefinite life, but they are not subject to systematic amortization (IASB 2004a, 2004b, 2008).

The value in use of CGUs—predominantly applied by firms (see e.g., Beumer 2006; Heintges and Herre 2007; Carlin et al. 2010; Carlin and Finch 2011)—is based on level three fair values. That is, managers need to define CGUs, project future net cash flows from CGUs, and estimate discount rates that reflect the risk of the CGUs. Thus, there is substantial discretion in estimating the values in use of CGUs.

Managers can exploit discretion such that reports of impairment charges are avoided, resulting in an overstatement of assets in financial statements (e.g., Li et al. 2011; Li and Sloan 2011; Ramanna and Watts 2012). It has been suggested that an overstatement of assets can be curbed by a stringent reporting environment (Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Kim et al. 2003). In chapter 2 of this dissertation, I provide evidence that a stringent reporting environment restricts a manager's tendency to overstate a firm's asset base by encouraging the manager either to adjust the asset base frequently or to report large impairment losses. Specifically, after modeling the guidelines of IAS 36, I find that in a weak reporting environment managers tend to identify CGUs opportunistically to mask impaired assets, and in a stringent reporting environment managers are induced to use discretion prudently to avoid the overstatement of assets.

Prior research finds that impairment losses in general provide little information about a firm's expected future operating performance (e.g., Strong and Meyer 1987; Elliott and Shaw 1988; Francis et al. 1996; Bartov et al. 1998; Hirschey and Richardson 2002, 2003; Bens et al. 2011). The low informativeness of impairment charges can be attributable to managers' opportunistic use of discretion (Watts 2003; Ramanna 2008; Ramanna and Watts 2012). In chapter 3, I provide evidence that impairment charges estimated in the absence of managers' opportunistic behavior reduce only in part investors' uncertainty about a firm's asset quality (value) when investors are not well informed by analysts. When investors are well informed by analysts, my results imply that the information content of nonopportunistic impairment losses is completely anticipated. I argue that managers provide little or no new information to investors to reduce a firm's costs, which can be in the interest of investors, as explained in more detail below. Thus, not only managers' opportunistic behavior—that is likely of interest to managers only—can reduce the informativeness of impairment losses (as suggested by prior literature), but also managers' cost considerations.

1.1.4 IAS 40 "*Investment Property*"

Upward adjustments of property, plant, and equipment (IAS 16 "*Property, Plant and Equipment*"), intangible assets (IAS 38 "*Intangible Assets*"), and investment properties (IAS 40) can be reported in financial statements under IFRS (fair value option) (IASB 2003a, 2003b, 2008). However, applying the revaluation (fair value) model for property, plant, and equipment, and actively traded intangibles is not common in practice (Christensen and Nikolaev 2009; Cairns et al. 2011). In particular, the requirements of IAS 38 that fair values of intangibles must be backed by market values are not easily satisfied due to the uniqueness of intangibles. Upward adjustments, however, are frequently observed in financial statements for investment properties (Christensen and Nikolaev 2009; Cairns et al. 2011), one of the largest asset classes (including own-occupied properties) in the world (Muller et al. 2011).[4]

[4] IAS 40 defines investment properties as properties that are held and used for rental income and/or capital appreciation. While IAS 40 provides a fair value option, fair values are to be disclosed for investment properties when the historical cost model is applied. This is not required for property, plant, and equipment, and intangibles. Under the historical cost model, investment properties are to be depreciated and IAS 36 impairment charges are to be reported

U.S. GAAP requires firms to apply the historical cost model for investment properties (PWC 2009). Thus, in theory and practice the accounting treatment of investment properties differs between firms that report under IFRS and firms that report under U.S. GAAP.

Under the U.S. GAAP historical cost model, a firm must report impairment losses (fair value decrements) for investment properties in accordance with SFAS 144 "*Accounting for the Impairment or Disposal of Long-Lived Assets*." The guidelines of SFAS 144 for properties held and used are similar to those of IAS 36. A major difference exists in the definition of impaired assets. Whereas IAS 36 requires an impairment loss to be reported when discounted future net cash flows are below the book value, SFAS 144 impairment losses are triggered based on an analysis of nondiscounted future net cash flows. Yet, SFAS 144 impairment losses reported for held for sale investment properties are triggered by discounted future net cash flows (IASB 2004a; FASB 2001b).

In summary, the U.S. FASB requires firms to report fair value decrements of investment properties in financial statements through impairment charges to avoid overstating assets but forbids firms to report fair value increments (unrealized gains). That is, fair values of investment properties are estimated by managers based on their judgment and hence are subject to estimation errors (levels two and three fair values) that decreases their faithful representation (Fields et al. 1998; Danbolt and Rees 2008). Yet, if U.S. listed firms adopt IFRS in the foreseeable future, they will report presumably fair value increments for investment properties in financial statements.

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in a firm's financial statements when the property is impaired (IASB 2003a, 2003b, 2004a, 2008).

In chapter 4, I provide evidence that the concern of the U.S. FASB that levels two and three fair value appreciations are insufficiently faithfully represented to be capable of being decision useful (relevant) to investors is not justified. Fair value appreciations of investment properties reported by real estate firms in financial statements on average are more value relevant to investors than historical cost income.[5] I also find that around the severe real estate crisis (2007–2009), unrealized losses are not more useful in explaining market fluctuations than impairments. Since in good times book values of investment properties are adjusted upward under the fair value model, the findings might imply that managers are reluctant to report large unrealized losses in bad times, decreasing the value relevance of unrealized losses over impairments. I argue that this compensates for the fact that in contrast to impairments, unrealized losses are likely reported immediately with the economic downward trend of the investment properties in a real estate firm's financial statements and estimated in a routine fashion, as explained in more detail below.

1.2 Research summary including objectives and contributions

1.2.1 General overview

In this dissertation, I conduct three standalone capital market based analyses of the usefulness to investors of managers' fair value estimates.[6] My methodology to conduct the three studies is based on positive accounting research. I use a quantitative approach to carry out my research. Thus, in all

[5] Value relevance of fair value estimates suggests that they explain share prices and/or share price returns and hence are capable of being decision useful (relevant) to investors. When fair values are sufficiently faithfully represented, they should be value relevant to investors (e.g., Barth et al. 2001).

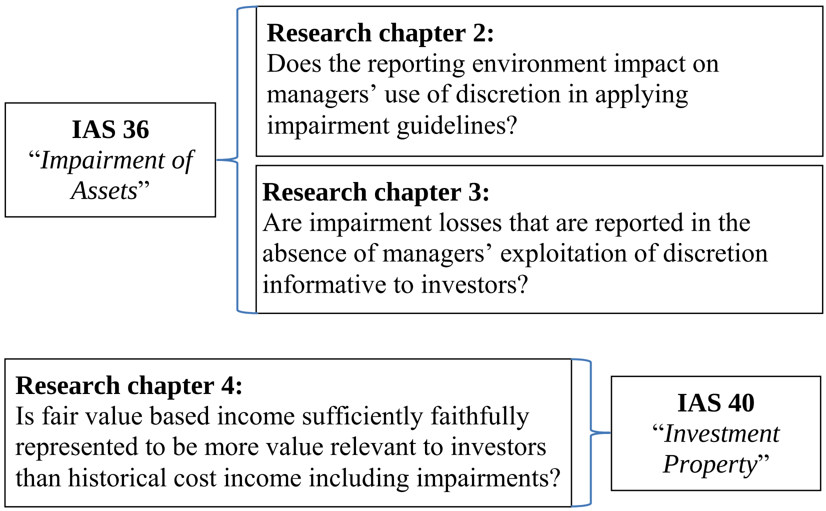
[6] Capital market research is any study that analyzes the usefulness of accounting information (including fair values) to security market participants who are the major focus of my studies.

three studies, I develop hypotheses and relate them to econometric regressions that test the hypotheses.

The first two studies outlined in chapters 2–3 are conducted in a European setting and cover a post-IFRS period from 2006 to 2010. I use a large sample of European countries to test drivers and the informativeness of IAS 36 impairments reported for CGUs in financial reports. This supplements prior studies that either focused on U.S. GAAP (e.g., Francis et al. 1996; Riedl 2004; Boone and Raman 2007; Bens et al. 2011; Muller et al. 2012) or reported evidence from a single asset (e.g., IAS 36 goodwill impairments: Knauer and Wöhrmann 2012) or a single country (Australia: Cotter et al. 1998; Vanza et al. 2011). The third study, presented in chapter 4, focuses on U.S. real estate firms—applying the historical cost model—and U.K. real estate firms—using the fair value model for investment properties—and a time period from 2005 to 2011. To my knowledge, this is the first study to apply a sample of U.S. GAAP historical cost income and IFRS fair value based income reported by common law countries for investment properties to test their relative usefulness in explaining market fluctuations.

Figure 1.1 provides an overview of the dissertation by exhibiting the three research questions that are addressed in chapters 2–4. The first two research questions are linked to IAS 36 and represent the first two empirical studies (chapters 2–3 of the dissertation). The third research question is based on IAS 40 and represents the third study (chapter 4 of the dissertation).

Figure 1.1: Research questions of the dissertation



Specifically, in chapter 2, I examine the impact of the reporting environment on managers' use of discretion in defining CGUs and estimating the value in use of the defined CGUs. The research objectives of chapter 2 are to analyze whether managers are motivated to use discretion inherent in IAS 36 opportunistically (nonopportunistically) and aggressively (prudently) in a weak (stringent) reporting environment. By using discretion opportunistically and aggressively, information about impaired assets is likely not provided to investors in a timely manner and assets are overstated. This is not aligned to the intended purpose of IAS 36 which is to avoid an overstatement of assets.

Prior studies indicate that discretional asset impairments are aligned to economic factors, but also to managers' desire to avoid reporting impairment losses (bad news) in financial statements (e.g., Francis et al.

1996; Cotter et al. 1998; Riedl 2004; Beatty and Weber 2006; Boone and Raman 2007; Vanza et al. 2011; Li et al. 2011; Li and Sloan 2011; Ramanna and Watts 2012). My research in chapter 2 supplements that literature by providing further evidence on managers' use of discretion in impairment reporting.

By modeling the IAS 36 impairment guidelines, I am able to analyze which guidelines are opportunistically used by managers in a weak reporting environment. In addition, by controlling for the IAS 36 impairment guidelines, I am able to examine whether discretion is used prudently in a stringent reporting environment.

An impact of the reporting environment on managers' use of discretion in estimating impairments reduces the comparability of operating performance across firms and time periods. Increasing the comparability of firms' operating performance is one of the IASB's major goals (IASB 2010). Thus, this research should be of interest to the research community, standard setters, accountants, and users of financial statements.

In chapter 3, I analyze the informativeness of impairment charges of CGUs that are reported nonopportunistically in a firm's financial statements. The research objective of chapter 3 is to examine whether IAS 36 impairment charges estimated in the absence of managers' exploitation of discretion reduce information asymmetry between managers and investors.

Contemporaneous research finds that managers tend to exploit the discretion inherent in impairment guidelines by estimating the value of assets opportunistically when issuing financial statements (e.g., Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004; Beatty and Weber 2006). As a result, impairment charges often provide little information to investors (Watts 2003; Ramanna 2008; Ramanna and Watts 2012). It is, however, not well understood whether factors other than managers' opportunistic behavior affect the informativeness of impairment losses to investors.

When managers nonopportunistically report expectations about a firm's future earnings, private information about the quality of assets should be released in a timely manner. Yet, the provision of timely and qualitative information about impaired assets engenders costs to a firm (through the direct cost of impairment tests and the disclosure of proprietary information) that is ultimately borne by investors. Thus, the low informativeness of impairment losses might not be attributable only to managers' opportunistic behavior, but can also reflect managers' cost considerations. Whereas managers' opportunistic behavior is detrimental to investors, managers' cost considerations can benefit investors. Thus, reducing the informativeness of impairment losses might be aligned to investors' interest when at the same time a firm's costs are reduced.

This analysis aims to determine whether the informativeness of impairment charges is reduced by managers' cost considerations. This is the first research (to my knowledge) that includes managers' cost considerations in producing and disseminating information about a firm's asset quality to investors, thus, the findings should interest the research community, standard setters, accountants, and users of financial statements.

In chapter 4, I compare the value relevance of the historical cost model that requires firms to report fair values of investment properties when impaired (downward adjustments only) and the fair value model that allows upward adjustments (unrealized gains) and downward adjustments (unrealized losses) to the fair value of investment properties. The research objective of chapter 4 is to analyze whether fair value based income for investment properties is sufficiently faithfully represented to be capable of being more decision useful (relevant) to investors than historical cost income including impairment charges. To compare the usefulness of both models, I apply a value relevance study. Value relevance of accounting data implies that the data summarize information, regardless of the source, that is used by investors in valuing a firm's net assets (e.g., Barth et al. 2001). This concept is to some extent aligned to the concept of relevance defined by the U.S. FASB and IASB. According to the definition of the U.S. FASB and IASB, an accounting amount is relevant if it is sufficiently faithfully represented to be "capable" of being decision useful (relevant) to investors (FASB 2010; see also Sloan 1999; Barth et al. 2001; Herrmann et al. 2006). As the U.S. FASB and IASB work together toward greater convergence between their accounting requirements and their accounting models for investment properties differ markedly, the results of this study might be of particular interest to the standard setters.

In summary, the focus of the dissertation is to analyze the usefulness to investors of managers' fair value estimates that are based on two standards of the IASB: IAS 36 and IAS 40. In subsections 1.2.2–1.2.4, I describe the three studies presented in chapters 2–4 in more detail.

1.2.2 Overview of research presented in chapter 2

In chapter 2, I model the IAS 36 requirements. Whereas prior studies relate impairment charges to economic returns and asset (or equity) risk (Francis et al. 1996; Riedl 2004; Boone and Raman 2007; Cotter et al. 1998; Vanza et al. 2011), I propose and validate comprehensive determinants that should drive impairment losses systematically with respect to IAS 36 requirements. Subsequently, I examine whether after controlling for IAS 36 requirements, a stringent reporting environment curbs managers' overstatement of assets. The stringent reporting environment is captured by three groups: (i) strict country-level enforcement systems, (ii) periods of intense scrutiny over a firm's financial reporting, and (iii) firm-specific determinants that increase the quality of accounting data.

A stringent reporting environment should encourage managers to use discretion in identifying CGUs, projecting CGUs' future net cash flows, and estimating CGUs' discount rates systematically and/or prudently. That is, in a stringent reporting environment a firm's financial reporting is carefully scrutinized by, for instance, regulators, analysts, and/or auditors. Accordingly, an overstatement of a firm's asset base is likely to be identified, possibly increasing managers' and firms' risk of litigation; thus, managers tend to understate rather than overstate assets to avoid litigation (see e.g., Ball et al. 2000; Ball et al. 2003; Kim et al. 2003). Therefore, I expect that managers are more likely to report impairment charges in a firm's financial statements in a stringent reporting environment than in a weak reporting environment. I use a probit regression to test my hypothesis. Results of the probit regression should show that all three groups that capture a stringent reporting environment increase the occurrence of impairment reports.

Subsequently, I analyze whether managers are encouraged by a stringent reporting environment to apply IAS 36 requirements systematically (second analysis in chapter 2) and/or prudently (third analysis in chapter 2) to avoid overstating assets. The second analysis will reveal which element(s) of the value in use approach set forth in IAS 36 are used opportunistically by managers in a weak reporting environment to mask impaired assets. Based on descriptive results, prior literature suggests that some managers opportunistically define CGUs and/or aggressively use low discount rates for CGUs to mask impaired assets (Finch 2006; Ramanna 2008; Carlin and Finch 2009; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011; Ramanna and Watts 2012). I do not predict which element(s) of the discretionary requirements are exploited by managers in a weak reporting environment. I expect, however, that managers report impairment charges more systematically in a stringent reporting environment than in a weak reporting environment to avoid an overstatement of a firm's asset base that is likely to be detected in a stringent reporting environment.

The third analysis will reveal whether a stringent reporting environment encourages managers to release bad news about a firm's asset quality earlier rather than later (or not at all). In a stringent reporting environment managers should be motivated to estimate impairment losses prudently because the estimation of level three fair values for CGUs is more an art than a science and is subject to error (see also Hoogendoorn 2006; Petersen and Plenborg 2010) that might cause a firm's asset base to be overstated. An overstatement of assets can increase firms' and managers' risk of litigation, particularly in a stringent reporting environment (see e.g., Ball et al. 2000; Ball et al. 2003; Kim et al. 2003). To reduce risk of litigation in a stringent reporting environment, I expect that managers apply IAS 36 requirements prudently, which can lead to an understatement of assets.

To find evidence for my second and third hypotheses, I construct an index that captures an increasingly stringent reporting environment (i.e., I add determinants that are summarized in the three groups that facilitate stringent reporting environments). Next, I interact this index with the determinants of impairments that capture the IAS 36 requirements. The interacting variables test whether the stringency of the reporting environment affects manager's exploitation of the element(s) of the IAS 36 requirements. The results of the probit regression should show that the occurrence of impairment charges is systematically aligned to IAS 36 guidelines in an increasing fashion to the stringency of the reporting environment. This part of research adds to our knowledge of whether a stringent reporting environment induces managers to apply IAS 36 requirements systematically to avoid an overstatement of assets and which part of the IAS 36 requirements are used opportunistically by managers in a weak reporting environment.

Using the constructed index on a standalone basis tests whether a stringent reporting environment induces managers to define more rather than fewer CGUs and estimate lower rather than larger values in use of the identified CGUs to avoid overstating assets. Accordingly, the results of the probit regression should show that the occurrence of impairment charges increases as the stringency of the reporting environment increases. This part adds to our knowledge of whether a stringent reporting environment induces managers to apply IAS 36 requirements prudently to avoid an overstatement of assets.

Finally, I examine in chapter 2 whether a stringent reporting environment impacts the magnitude of impairment charges. The move to a more stringent reporting environment might induce managers to report large impairment charges to account for previously unaccounted economic losses. In contrast, a steady stringent reporting environment can result in reporting small amounts of impairment charges in a firm's financial statements, which would indicate that the asset base is frequently adjusted. I leave as an open empirical question in which direction determinants that capture a stringent reporting environment affect the magnitude of impairment losses.

Using impairers only and applying an ordinary least squares (OLS) regression, I expect the magnitude of impairment charges is affected by determinants that facilitate stringent reporting environments. The final analysis of chapter 2 helps to identify how stringent reporting environments influence the magnitude of (nonzero) impairment charges and curb managers' tendencies to overstate the asset base.

1.2.3 Overview of research presented in chapter 3

Prior studies analyzed the informativeness of impairment losses as reported (e.g., Strong and Meyer 1987; Elliott and Shaw 1988; Francis et al. 1996; Bartov et al. 1998; Hirschey and Richardson 2002, 2003; Bens et al. 2011). Yet, the informativeness of nonopportunistic impairment losses is not well understood. I propose a method to identify nonopportunistic impairments.[7] By identifying nonopportunistic impairment losses, I am able to shed light on whether factors other than managers' exploitation of discretion affect the (decision) useful of asset impairments to investors.

Besides exploiting the discretion inherent in IAS 36 requirements, managers may consider direct and indirect costs of producing and disseminating information about a firm's asset quality (value) to investors. Impairment tests are costly to implement. To reduce the direct costs, managers might conduct impairment tests for all CGUs during the year end external audit and internal budgeting process (see also Elliott and Shaw 1988; Zucca and Campbell 1992). As a result, nonopportunistic impairment charges are reported at the fiscal year end, irrespective of the time of year that economic losses trigger asset impairments.

The disclosure of sensitive data to competitors in financial statements imposes indirect (proprietary) costs to a firm. To reduce these proprietary costs, managers might reduce the quality of disclosures

[7] Impairment charges are defined as nonopportunistic when the following three conditions are satisfied: impairment losses are (1) reported along with fiscal year negative returns (proxy for economic losses), (2) reported by a firm that operates at least two CGUs if the firm's market-to-book ratio (MtB) before impairments is above 1 at the fiscal year end (this condition is relaxed if the MtB before impairments is equal to or below 1), and (3) approved by large auditors.

(information quality) about impaired assets (see also e.g., Petersen and Plenborg 2010; Carlin and Finch 2011). In summary, the reduction of direct costs and indirect costs maintains a firm's fiscal year earnings (benefiting the investor) but delays the provision and reduces the quality of information about impaired assets (depriving the investor).

To analyze the timeliness and the quality of information provided by nonopportunistic impairments, I use high and low analyst coverage environments. In a high analyst coverage environment investors are well informed in a timely manner about a firm's asset quality (Bens et al. 2011; Muller et al. 2012; see also Brennan et al. 1993). That is, analysts act as intermediaries between firms and investors by processing market, industry, and firm data and disseminating the processed data to investors (Lang and Lundholm 1996; Barker 1998; Piotroski and Roulstone 2004). Thus, in a high analyst coverage environment the information content of nonopportunistic impairment losses should be anticipated during the fiscal year when the losses are reported with a delay at the end of the fiscal year (Bens et al. 2011; Muller et al. 2012). Consequently, the use of a high analyst coverage environment enables me to provide evidence on whether nonopportunistic impairments charges are reported in a firm's financial statements in a timely manner.

In a low analyst coverage environment investors are not well informed by analysts about a firm's asset quality. That is, available market, industry, and firm data that indicate an impairment of assets are not thoroughly processed by analysts. Accordingly, when nonopportunistic impairments are reported with a delay in a firm's annual financial statements, investors' uncertainty about a firm's asset quality should increase during the fiscal year in a low analyst coverage environment.

In a low analyst coverage environment investors' uncertainty should decline through reports of nonopportunistic impairment charges, even when they are reported in a nontimely manner at the fiscal year end. That is, investors tend to focus on managers' reports of impaired assets when the analyst coverage environment is low (see Botosan 1997).

The use of a low analyst coverage environment enables me to provide insight into the information quality of impairment charges released by managers in financial statements. I expect that in a low analyst coverage environment investors' uncertainty increases during the fiscal year (as discussed previously). If fiscal year end reports of nonopportunistic impairments only partially eliminate the uncertainty, this indicates that the information quality of the nonopportunistic impairments is low.

To test these hypotheses, I use an OLS regression that relates the bid-ask spread capturing the construct of information asymmetry to nonopportunistic impairment losses reported in low and high analyst coverage environments. A decline of the bid-ask spread indicates that investors' uncertainty about a firm's asset quality decreases. Accordingly, such a decline should be observed in a high analyst coverage environment before nonopportunistic impairment losses are reported in a firm's financial statements and in a low analyst coverage environment through reports of impairments. An increase of the bid-ask spread signaling an increase of investors' uncertainty about a firm's asset quality should be found before nonopportunistic impairments are reported in a firm's financial statements and throughout the reporting year of accounting data in a low analyst coverage environment.

This study generates knowledge about whether managers trade-off the benefit of providing timely and qualitative information about impaired assets for the benefit of cost reductions derived from delaying and reducing the quality of the information. My research supplements prior studies (e.g., Strong and Meyer 1987; Elliott and Shaw 1988; Francis et al. 1996; Bartov et al. 1998; Hirschey and Richardson 2002, 2003; Bens et al. 2011; Watts 2003; Ramanna 2008; Ramanna and Watts 2012) by examining whether besides managers' opportunistic behavior, managers' cost considerations—that might be in the interest of investors—reduce the informativeness of impairment losses.

1.2.4 Overview of research presented in chapter 4

In chapter 4, I use U.S. and U.K. real estate firms that are highly invested in investment properties to test my hypotheses. While U.S. real estate firms apply the historical cost model under U.S. GAAP to report the financial status of investment properties, U.K. real estate firms use the fair value model under IFRS. By comparing the value relevance of the fair value model with the historical cost model for investment properties, I assess the relative value relevance of impairment losses versus unrealized losses, which is not well understood.

I follow prior literature that suggests that the fair values of investment properties reported in financial statements are at least vaguely representative of the economic values of the investment properties whereas the historical costs of these properties are to a high extent arbitrary (see Dietrich et al. 2001; Barth 2006; Herrmann et al. 2006). Accordingly, I predict that fair value increments for investment properties are sufficiently faithfully represented in financial statements and are thus more value relevant to investors than historical cost income.

When fair value increments are represented sufficiently faithfully to be value relevant, the usefulness of unrealized losses in explaining market fluctuations should be higher than the usefulness of impairment losses.

Under historical cost accounting, fair value increments are not recognized. Thus, before an impairment loss is triggered in a downward trend of an investment property's value, unrecognized fair value increments of the investment property need to be absorbed. As a result, even in severe real estate crises, it is possible that impairments are either not triggered for all investment properties that suffer economic losses or that the reported impairment charges do not fully capture the economic losses of the impaired properties. In addition, impairment tests are likely to be conducted in a nonroutine fashion for which the valuation process still needs to be established and audited (Goncharov et al. 2013). In contrast, under the fair value model, fair value increments of an investment property are recognized. Thus, unrealized losses are reported immediately with the downward trend of the investment property's value in a real estate firm's financial statements and possibly estimated in a routine fashion. Accordingly, I expect that unrealized losses are capable of being more decision useful (relevant) to investors than impairment charges. Taken together, I predict that fair value increments and fair value decrements reported for investment properties are more useful in explaining market fluctuations than historical cost income including impairment losses.

To test my hypotheses, I use hand collected impairment and fair value data on investment properties. Based on the data, I apply value relevance regressions. That is, I relate share prices and share price returns to impairments (and deprecation) or unrealized gains and unrealized losses. I then compare the explanatory power (adj. R^2s) of the value relevance regressions for each of five subsamples: (1) historical cost income excluding impairments, (2) historical cost income including impairments, (3) fair value based income related to unrealized gains, (4) fair value based income related to unrealized losses, and (5) fair value based income related to both unrealized gains and unrealized losses. Comparing the explanatory power across the five subsamples enables me to infer the relative value relevance of historical cost income including impairments versus fair value based income.

Specifically, the research platform enables me to provide evidence on whether unrealized gains are sufficiently faithfully represented to sustain their value relevance to investors over historical cost income. In addition, I am able to analyze whether unrealized losses convey more value relevant information to investors than impairments, and whether fair value based income is of higher value relevance than historical cost income.

To my knowledge, this is the first analysis that contrasts the value relevance of SFAS 144 impairment charges with IAS 40 unrealized gains and IAS 40 unrealized losses on investment properties. In addition, whereas I analyze the relative usefulness of the U.S. GAAP historical cost model versus the IAS 40 fair value model in explaining market fluctuations, previous research examined the usefulness of (i) voluntarily disclosed fair values in a setting in which assets additionally are depreciated and written-off (Fields et al. 1998) and (ii) mandatorily reported fair values in the pre-IFRS period in which no other property adjustments (i.e., depreciation, impairments, and unrealized gains/losses) are taken to the income statement (Danbolt and Rees 2008).

1.3 Structure of the remainder of the PhD dissertation

In chapter 5, I present a summary and the conclusions of the dissertation. The dissertation closes with a Dutch summary of the dissertation.

2 Impact of the reporting environment on managers' use of discretion in applying impairment guidelines

Abstract

This chapter examines how the reporting environment shapes the asset impairments reported in financial statements. Specifically, I model the requirements of IAS 36 to examine how the reporting environment impacts managers' use of discretion in applying the requirements. Estimates of IAS 36 impairments of assets are subject to managers' use of discretion in terms of identifying cash generating units, projecting future net cash flows, and estimating discount rates. Using a sample of European firms over the post-IFRS period, I find that in a stringent reporting environment managers report more likely IAS 36 impairment losses than managers in a weak reporting environment. This indicates that in a stringent reporting environment managers avoid an overstatement of assets. To avoid an overstatement of assets, I find that in a stringent reporting environment managers report impairment charges more systematically—with respect to IAS 36 requirements—than managers in a weak reporting environment. Specifically, I find that a stringent reporting environment restricts the opportunistic identification of cash generating units to mask impaired assets. In addition, I provide evidence that a stringent reporting environment induces managers to apply IAS 36 requirements prudently to avoid the overstatement of assets. Furthermore, I find that a stringent reporting environment can encourage managers to report large amounts of impairments in financial statements, indicating that assets are adjusted for economic losses previously unaccounted for and possibly understated. I find also that a stringent reporting environment can induce managers to report small amounts of impairment charges, implying that assets are frequently adjusted. Overall, the results provide evidence that managers' various uses of discretion reduce the comparability of financial statements across firms and time periods.

2.1 Introduction

Prior literature suggests that while asset impairments are associated with economic losses, managers tend to exploit the discretion inherent in impairment guidelines by estimating the value of assets opportunistically when issuing financial statements (e.g., Francis et al. 1996; Riedl 2004; Boone and Raman 2007; Cotter et al. 1998; Vanza et al. 2011). As a consequence, asset impairments are often avoided, resulting in overstated assets (e.g., Li et al. 2011; Li and Sloan 2011; Ramanna and Watts 2012). In this study, I identify comprehensive determinants of impairment losses that capture the requirements of IAS 36 "*Impairment of Assets*" and examine how the reporting environment affects managers' use of discretion in reporting losses in financial statements.

IAS 36 "*Impairment of Assets*" requires firms to report losses of tangible or intangible assets when discounted projected future net cash flows—that is, the value in use—of a cash generating unit (CGU) are lower than the book value of the CGU.[8] Thus, IAS 36 provides substantial discretion in terms of identifying CGUs and in projecting future net cash flows and estimating discount rates of the identified CGUs.

Previous studies have proposed that the opportunistic use of discretion in identifying CGUs and estimating discount rates leads to the avoidance of reporting impairment charges in financial statements (Finch 2006; Carlin and Finch 2009; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011). A stringent reporting environment can mitigate managers' exploitation of discretion (see e.g., Leuz et al. 2003; Leuz 2010). That is, in a stringent reporting environment a firm's financial

[8] A CGU represents the smallest identifiable group of tangible and intangible assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB 2004a).

reporting is carefully scrutinized. Thus, an overstatement of a firm's asset base is likely to be identified, possibly increasing the risk of litigation for managers and firms. To reduce risk of litigation, managers might understate rather than overstate the asset base (Ball et al. 2000; Ball et al. 2003; Kim et al. 2003) so that bad news about a firm's asset quality is released at an early stage of the decline in value of the firm's asset base. This might maintain investors' trust and confidence in a firm's financial reporting.[9] Accordingly, I predict that a stringent reporting environment encourages managers to apply IAS 36 requirements more systematically and prudently than a weak reporting environment so that an overstatement of assets is avoided.[10]

In examining the impact of the reporting environment on managers' application of IAS 36 requirements, I supplement prior literature in four ways. First, I examine determinants of IAS 36 impairment charges for a large sample of European countries, whereas prior studies either focused on U.S. GAAP (Francis et al. 1996; Riedl 2004; Boone and Raman 2007) or reported evidence from a single country (Australia: Cotter et al. 1998; Vanza et al. 2011). Second, whereas prior studies relate impairment charges to economic returns and asset (or equity) risk (Francis et al. 1996; Riedl 2004; Boone and Raman 2007; Cotter et al. 1998; Vanza et al. 2011), I propose and validate comprehensive determinants that should drive

[9] When managers overstate a firm's asset base and the overstatement is detected, investors' trust and confidence in the firm's financial reporting declines. As a result, managers and firms might experience adverse effects because of the negative publicity, and the risk of litigation possibly increases.

[10] IAS 36 requirements are applied systematically when impairments are driven by the determinants that capture the requirements. This would indicate that managers do not exploit the discretion inherent in IAS 36 requirements to avoid reporting impairment charges in financial statements. IAS 36 requirements are applied prudently when more rather than fewer CGUs are defined and lower rather than larger values in use of the defined CGUs are estimated. Defining CGUs and estimating the value in use of the defined CGUs are more an art than a science. Thus, estimates of the value in use of CGUs are prone to unintentional errors that might cause a firm's asset base to be overstated. To reduce the likelihood of an overstatement of assets, managers can define and estimate the value in use of CGUs prudently.

impairment losses systematically with respect to IAS 36 requirements. Third, my research design allows me to examine the effect of determinants that capture a stringent reporting environment on managers' use of discretion in estimating the asset base. I ask whether a stringent reporting environment induces managers to apply IAS 36 requirements systematically and/or prudently to avoid an overstatement of assets. Fourth, my analysis helps to identify how stringent reporting environments influence the magnitude of (nonzero) impairment charges. A stringent reporting environment might induce managers to report large amounts of impairments, reflecting previously unrecognized economic losses, or small amounts of impairments, possibly indicating a regular adjustment of assets.

To analyze how the reporting environment affects managers' use of discretion in applying impairment guidelines, I need to control for IAS 36 requirements. Thus, I start my analysis by identifying comprehensive determinants of impairments that capture the value in use approach set forth in IAS 36. The determinants capture projected future net cash flows, the discount rate, and the comparison of the derived values in use of identified CGUs with their book values. Using a sample of 20 European countries and 13,549 firm-year observations over the post-IFRS period from 2006 to 2010, I find that, on average, managers report impairment losses in financial statements systematically with respect to IAS 36 requirements.

I next turn to the effect of the reporting environment on reports of impairment losses. I start by analyzing whether a variation in scrutiny over a firm's financial reporting has an impact on the occurrence of impairments. To conduct my analysis, I identify determinants that captures a stringent reporting environment. The determinants are decomposed into three groups: (i) country-level enforcement systems, (ii) periods of intense scrutiny over a firm's financial reporting, and (iii) firm-specific determinants. Turning to the first group: The rule of law proxies for differences in legal enforcement between countries (Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Kaufmann et al. 2007). Focusing on the second group: The global financial crisis of 2008–2009 intensified the attention paid by regulators to a firm's financial reporting (Stokes and Webster 2010) and might have raised the level of such scrutiny for the foreseeable future. Similarly, a high intensity of industry impairments might capture the attention of, for instance, investors. Finally, firm-specific determinants that influence the quality of accounting data incorporate the work of analysts who question firms' accounting policies (e.g., Lang and Lundholm 1996; Barker 1998) and the work of large auditors who provide high-quality audits (e.g., Francis and Krishnan 1999; Kim et al. 2003).

Using a probit regression, and after controlling for IAS 36 requirements, I find that each determinant that captures a stringent reporting environment is related to a higher occurrence of impairment losses. The findings suggest that a stringent reporting environment curbs managers' use of discretion in overstating the asset base.

Next, I test whether the avoidance of an overstatement of assets is linked to applying IAS 36 requirements systematically and/or prudently. To conduct this analysis, I adjust the probit regression and construct an index that captures an increasingly stringent reporting environment. Next, I interact this index with the determinants of impairments that capture IAS 36 requirements. The interacting variables test whether impairments are more systematically reported in a stringent reporting environment than in a weak reporting environment. The findings suggest that managers opportunistically define CGUs to mask impaired assets in a weak reporting environment, a practice that leads to an overstatement of assets. I find no difference in managers' opportunistic or nonopportunistic behavior in projecting future net cash flows and estimating discount rates between the stringent reporting environment and weak reporting environment. Using the constructed index on a standalone basis tests whether a stringent reporting environment induces managers to define more rather than fewer CGUs and estimate lower rather than larger values in use of the identified CGUs to avoid overstating assets. I find that in a stringent reporting environment managers apply IAS 36 requirements more prudently than managers in a weak reporting environment, presumably to decrease risk of litigation that would likely increase when assets are overstated.

Finally, I analyze the influence of a stringent reporting environment on the magnitude of (nonzero) impairment charges to provide further evidence on how the overstatement of assets is avoided. Using an OLS regression and impairers only (4,426 firm-year observations), and after controlling for IAS 36 requirements, I find that a high country-level enforcement system encourages managers to report large impairment charges. This indicates that the amount of impairment charges is estimated prudently, which can result in an understatement of assets, to avoid litigation. Similarly, I find that firms reported large amounts of impairment charges during and after the global financial crisis (2008–2009) and when most industry peers reported impairments in financial statements. This implies that a period of intense scrutiny over a firm's financial reporting induces managers to account for previous economic losses that have not been accounted for. Finally, I find that analysts and, in particular, large auditors encourage managers to report small and possibly frequent impairment losses in financial statements.

In summary, the findings imply that a stringent reporting environment encourages managers to apply IAS 36 requirements more systematically and prudently than a weak reporting environment so that an overstatement of the asset base is avoided. In addition, I provide some evidence that the overstatement of assets is avoided by inducing managers to report accumulated economic losses, to adjust the asset base frequently, and possibly to understate assets.

The remainder of this paper is organized as follows. In section 2.2, I provide background information and develop the hypotheses. In section 2.3, I model the requirements of IAS 36 and extend the model to incorporate the effect of the reporting environment. In section 2.4, I describe sample selection and descriptive statistics. The empirical results are outlined in section 2.5. In section 2.6, I report the results of additional sensitivity analyses. In section 2.7, a summary, conclusions, and limitations of this study are presented.

2.2 Background information and hypotheses development

2.2.1 Accounting for IAS 36 asset impairments

IAS 36 provides impairment guidelines for tangible and intangible assets. Tangible assets (e.g., property, plant, and equipment) and intangible assets (e.g., goodwill and patents) are impaired when the book value of the asset is not recoverable. A book value of an asset is not recoverable when the economic value (i.e., recoverable amount) of the asset decreases below the book value.

Specifically, IAS 36 requires calculation of the recoverable amount of an asset; that is, the higher of an asset's fair value less costs to sell and its value in use. The value in use requires the firm to project and discount future net cash flows of individual assets or group of assets. The discount rate (risk-adjusted rate) can be decomposed into the market risk-free rate and (asset) risk premium. The market risk-free rate and the (asset) risk premium reflect the time value of money and uncertainty of future net cash flows (asset risk), respectively (IASB 2004a).

Projected net cash flows—to be estimated when using the value in use approach—on individual assets are not easily identified (see Mackenzie et al. 2011, 326; Baltazar et al. 2012, 1378). When future net cash flows on individual assets are not identifiable, IAS 36 prescribes to estimate the recoverable amount of a CGU. A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB 2004a). Because the CGU's fair value (less costs to sell)—based on an offer by another firm, market value, or value of the trade of a comparable CGU—is often not available (Beumer 2006; Heintges and Herre 2007; Petersen and Plenborg 2010; Carlin et al. 2010; Carlin and Finch 2011), firms usually apply the value in use approach to measure the recoverable amount of a CGU. For example, survey results suggest that German and Danish firms mainly utilize the value in use approach (Beumer 2006; Heintges and Herre 2007; Petersen and Plenborg 2010). Also impairment testing in Hong Kong and Australia tends to be based on the value in use approach (Carlin et al. 2010; Carlin and Finch 2011).

Relating the recoverable amount to the value in use of a CGU (and not to the higher of the fair value less costs to sell and the value in use) is not a breach of IAS 36 requirements. IAS 36 prescribes that if the fair value is not determinable, the value in use is the recoverable amount of the CGU (IASB 2004a).

To test for the occurrence of asset impairments, the value in use is compared to the book value of the CGU. An impairment test is to be conducted once a year for intangible assets with an indefinite economic life (e.g., goodwill) and for all intangible assets and tangible assets any time indicators signal that assets are impaired.[11] An impairment of the CGU is to be reported in a firm's financial statements when the value in use is below the book value (IASB 2004a). Thus, impairment losses are reported once the unrecognized economic value of a CGU (i.e., the positive difference between the value in use and the book value of a CGU) is absorbed.

After the impairment loss is determined, the amount is first allocated to goodwill. When the book value of goodwill is zero, the remainder of the impairment loss is allocated proportionally to the other (individual) assets of the CGU. However, the book value of the individual assets cannot be reduced below its fair value less costs to sell (if determinable) or zero (IASB 2004a). While the fair value of a CGU is generally not determinable, the fair value might be determinable for individual assets of a CGU. When determinable, the fair value less costs to sell of an individual asset is used as a benchmark, which corresponds with IAS 36 requirements. That is, the book value of an individual asset is not reduced below the higher of its value in use (derived from the value in use of the CGU to which the individual asset belongs) or its fair value less costs to sell. If the impairment loss of a CGU allocated to its individual assets would in part reduce the asset's book value below its fair value less costs to sell, that part is proportionally allocated across the other assets (IASB 2004a). As firms tend to estimate impairment losses for CGUs, and the allocation of estimated impairment charges to individual assets is possibly arbitrary, I combine a firm's impairment charges reported in the financial statements for its individual intangible and tangible assets in a particular year.

[11] Indicators are grouped into external and internal sources of information. External indications are, for instance, a significant not expected market value decline of assets or a significant adverse effect on a firm's assets due to technological, market, economic, or legal environment development. Internal indicators are, for instance, obsolescence, physical damage of an asset, or plans to discontinue or restructure the operation to which an asset belongs (IASB 2004a).

In summary, IAS 36 impairments are estimated based on managers' use of discretion, which materializes in defining CGUs, projecting future net cash flows, and estimating discount rates. Managers can exploit the use of discretion so that assets are overstated.

2.2.2 Related literature

The literature on impairments finds some evidence that discretionary impairment losses (not specific to IAS 36) signal the trend of future operating performance (Rees et al. 1996; Godfrey and Koh 2009; Stokes and Webster 2010; Chalmers et al. 2011). Most of the studies, however, suggest that managers use discretion opportunistically (Strong and Meyer 1987; Zucca and Campbell 1992; Francis et al. 1996; Cotter et al. 1998; Laeven and Majnoni 2003; Riedl 2004; Beatty and Weber 2006; Boone and Raman 2007; Ramanna 2008; Zhang 2008; Vanza et al. 2011; Ramanna and Watts 2012). In addition, managers tend to withhold bad news, hoping that positive future events will make the disclosure of the bad news obsolete (Kothari et al. 2009). As a consequence, managers are inclined to avoid reporting impairment losses in financial statements; this practice leads to an overstatement of the asset base (Henning et al. 2004; Beatty and Weber 2006; Hayn and Hughes 2006; Chen et al. 2008; Hamberg et al. 2011; Li et al. 2011; Li and Sloan 2011; Jarva 2012; Ramanna and Watts 2012).

The question of whether write-downs are related to managers' opportunistic behavior and/or a deterioration of firms' economic environments is analyzed in a U.S. setting by Francis et al. (1996), Riedl (2004), and Boone and Raman (2007) and in an Australian setting by Cotter et al. (1998) and Vanza et al. (2011). By applying a pre-SFAS 121 sample, Francis et al. (1996) show that operating and market performance, but also opportunistic behavior, are drivers of impairment charges.[12] The cause of reporting write-offs for long-lived assets before and after SFAS 121 is analyzed by Riedl (2004). Riedl documents a lower association with economic factors and operating performance variables and a higher association with opportunistic behavior variables in post-SFAS 121 accounting practices. By applying a post-SFAS 121 sample 1996–2001, Boone and Raman (2007) show that SFAS 121 impairment charges—reported in financial statements by oil and gas firms—are triggered by economic losses and linked to managers' opportunistic use of discretion.

Some studies supplement the extensive body of U.S. GAAP-based research with research on the treatment of IFRS related impairments in Australia (Cotter et al. 1998; Vanza et al. 2011). Cotter et al. (1998) analyze determinants of asset impairment charges in 82 Australian firms before IFRS adoption. The authors find that write-downs reported in income statements are positively associated with firms' growth opportunities and firms' ability to absorb write-offs and are negatively related to good operating performance. In addition, their findings suggest that managers' opportunistic behavior impacts impairment loss reporting. Vanza et al. (2011) examine a sample of Australian firms in the post-IFRS adoption period. The authors find that both market performance and managers' opportunistic behavior impact IAS 36 impairments. Overall, prior studies suggest that impairment charges are not only driven by firms' impairment guidelines or firms' economic circumstances, but also by managers'

[12] SFAS No. 121 "*Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of*" became effective for fiscal years beginning after December 15, 1995. Impairment tests for intangible assets with an indefinite life were carved out of SFAS 121 and incorporated in the new standard SFAS 142 "*Goodwill and Other Intangible Assets*" for fiscal years beginning after December 15, 2001 (FASB 1995; FASB 2001a).

exploitation of the discretion inherent in the guidelines (see also Watts 2003).

2.2.3 Hypotheses development

Firms' reporting environments can affect managers' exploitive use of discretion by curbing managers' overstatement of assets in financial statements (Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Kim et al. 2003). Thus, I surmise that firms' reporting environments affect the likelihood of IAS 36 impairment losses after controlling for IAS 36 requirements.

In a stringent reporting environment a firm's financial reporting is closely scrutinized, increasing the likelihood that an overstatement of assets is detected. An overstatement of assets can reduce investors' trust and confidence in a firm's financial reporting and will presumably increase managers' and firms' risk of litigation (see Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Leuz 2010; Kim et al. 2003). Thus, a stringent reporting environment might induce managers to apply the requirements of IAS 36 strictly and/or prudently to avoid overstating the asset base. As a result, I predict that each determinant that is described in section 2.3.2 and indicates a stringent reporting environment should increase the occurrence of IAS 36 impairment losses and hence prevent an overstatement of the asset base. Hypothesis 2.1 is outlined below:

Hypothesis 2.1: Firms that issue financial statements in a stringent reporting environment are more likely to report impairments to avoid an overstatement of assets than firms that issue financial statements in a weak reporting environment.

Managers can avoid an overstatement of assets by following IAS 36 requirements more systematically and/or prudently. Turning to the systematic application of IAS 36 requirements: In a stringent reporting environment managers should be less likely to overstate the asset base by exploiting specific IAS 36 requirements than managers in a weak reporting environment. I next inquire which requirements of IAS 36 might be exploited by managers to overstate assets.

Prior studies argue that reporting opportunism is particularly evident where CGUs are defined (Ramanna 2008; Ramanna and Watts 2012; Finch 2006; Carlin et al. 2010; Petersen and Plenborg 2010). Some studies suggest that some managers allocate goodwill opportunistically to CGUs that have large unrecognized economic values so that future goodwill impairments can be avoided (Ramanna 2008; Ramanna and Watts 2012). In a similar vein, some managers might opportunistically mask impaired assets by establishing fewer CGUs than required to offset poorly performing assets with unrecognized economic values (Finch 2006; Carlin et al. 2010; Petersen and Plenborg 2010). Consequently, discretion in defining CGUs can be exploited so that impairments are opportunistically avoided.

Besides exploiting CGUs to avoid reporting impairments in financial statements, discretional interpretations of other IAS 36 requirements are likely to be abused to prevent impairment reporting. Prior literature suggests that some managers aggressively use low discount rates for CGUs (Carlin and Finch 2009; Carlin et al. 2010; Carlin and Finch 2011). Low discount rates increase the value in use (projected discounted future net cash flows) of CGUs so that asset impairments can be opportunistically avoided. Furthermore, projected future net cash flows might be upwardly adjusted to increase the value in use of CGUs and to prevent asset impairments.

I make no predictions about which IAS 36 requirements are exploited opportunistically in a weak reporting environment. In addition, I do not discriminate among determinants that capture a stringent reporting environment, which justifies a separate study. Accordingly, I predict that as the stringency of the reporting environment increases, managers will be increasingly encouraged to apply IAS 36 requirements systematically. Hypothesis 2.2 is outlined below:

Hypothesis 2.2: The stricter the reporting environment, the more likely it is that impairments are reported systematically in financial statements (i.e., in accordance with the elements of the value in use approach set forth in IAS 36) so that an opportunistic overstatement of assets is avoided.

Furthermore, I predict that in a stringent reporting environment managers define and estimate the value in use of CGUs prudently. That is, managers define more rather than fewer CGUs and estimate lower rather than larger values in use of the defined CGUs. Defining CGUs and estimating the value in use of the defined CGUs are more an art than a science. Thus, estimates of values in use of CGUs are prone to unintentional errors (see also Hoogendoorn 2006; Petersen and Plenborg 2010) so that a firm's asset base can be overstated. An overstatement of assets presumably increases managers' and firms' risk of litigation, in particular, when firms issue financial statements in a stringent reporting environment in which a firm's financial reporting is carefully scrutinized. Accordingly, to reduce risk of litigation, managers might be even encouraged to understate earnings/assets (see also Ball et al. 2000; Ball et al. 2003; Kim et al. 2003). Hypothesis 2.3 is outlined below:

Hypothesis 2.3: The stricter the reporting environment, the more likely it is that impairments are reported prudently in financial statements (i.e., that managers use the discretion inherent in IAS 36 requirements prudently) so that an overstatement of assets is avoided.

Hypothesis 2.1 predicts that the occurrence of impairments is higher when firms operate in a stringent reporting environment than when firms operate in a weak reporting environment, so that an overstatement of assets is more likely to be avoided in a stringent reporting environment than in a weak reporting environment. Hypotheses 2.2 and 2.3 predict that hypothesis 2.1 is true because managers apply IAS 36 requirements more systematically and prudently in a stringent reporting environment than in weak reporting environment. I next inquire whether a stringent reporting environment influences the magnitude of (nonzero) impairment charges to provide further evidence on how an overstatement of assets is avoided (in such an environment).

Managers can report large and small amounts of impairment charges in financial statements. The move to a more stringent reporting environment can lead to large amounts of impairment charges to account for previously unaccounted economic losses so that assets are not overstated any longer. Alternatively, a steady stringent reporting environment can lead to reporting frequent asset impairment charges. In this case, economic losses are less likely accumulated so that assets are generally not overstated, resulting in small impairment charges. Thus, I expect that each determinant that indicates a stringent reporting environment (see section 2.3.2) affects in some way the magnitude of impairment charges but I make no prediction about the sign of the relationship. Hypothesis 2.4 is outlined below:

Hypothesis 2.4: To avoid an overstatement of assets in a stringent reporting environment, managers report large amounts of impairment charges in financial statements to recognize accumulated economic losses, or small amounts of impairment losses to adjust assets frequently.

2.3 Model specification

2.3.1 Modeling the requirements of IAS 36

To test my hypotheses, I define my test models in two steps. In this section, I identify comprehensive determinants of impairment losses that reflect the elements of the value in use approach set forth in IAS 36. These determinants are used as control variables and will reveal whether impairments are on average reported in financial statements by European firms in accordance with IAS 36 requirements. Specifically, I will reveal whether the determinants affect the likelihood (occurrence) and magnitude of IAS 36 impairment charges in a predicable manner. In section 2.3.2, the models are extended and adjusted for determinants that capture a stringent reporting environment to test hypotheses 2.1 to 2.4.

The value in use approach set forth in IAS 36 requires firms to first identify CGUs, then project future net cash flows, and estimate discount rates for each CGU, then compare the derived value in use of each identified CGU with its book value. Starting with projected future net cash flows, I use dividend adjusted share price returns of firm (j) in fiscal year (t) ($Return_{jt}$) to proxy for the change in projected future net cash flows (i.e., the economic performance of all CGUs).[13] $Return_{jt}$ reflects both systematic

[13] Using share price returns as a proxy for economic performance is based on the assumption that individual countries' stock markets incorporate information immediately based on the efficiency hypothesis. Some of the sample countries have lower liquidity than others. This

(market) and unsystematic (idiosyncratic) economic performance of a firm. Assuming an efficient market, $Return_{jt}$ captures changes in a firm's environment as well as a firm's strategic and operating decisions instantaneously by adjusting the firm's projected future net cash flows (see Basu 1997; Ball et al. 2000; Ball et al. 2003). Accordingly, I expect that the lower $Return_{jt}$ is, the more likely it is that the projected future net cash flows of a CGU are downwardly adjusted. Thus, a lower $Return_{jt}$ should increase the occurrence and the amount of impairment charges (see e.g., Elliott and Shaw 1988; Francis et al. 1996; Alciatore et al. 2000; Hirschey and Richardson 2002, 2003; Riedl 2004).[14] Yet, impairment losses might affect share price returns. To circumvent this concern, I measure $Return_{jt}$ over a firm's fiscal year and assume that impairment charges are predominantly reported in the fourth quarter (Elliott and Shaw 1988; Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004; Heintges and Herre 2007; Spear and Taylor 2011; Muller et al. 2012).[15]

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might produce noise in share price returns in these countries. In defense of my proxy, by aggregating countries and using a one year period of raw returns, the noise should be negligible.

[14] A firm's economic loss results in adjusting discounted projected future net cash flows downward, which can trigger an asset impairment (see chapter 3). However, a firm can operate several CGUs, one of which might be impaired while the others are performing well. Thus, everything else being equal, a firm with a low economic performance (even positive) is more likely to report impairments and to report impairments with larger amounts in financial statements than a firm with a high economic performance. In addition, to be consistent with the standard, I do not use market-adjusted returns. Using market-adjusted returns would test whether the change in idiosyncratic projected future net cash flows affect reports of impairment charges. An idiosyncratic change in projected future net cash flows is just a part of the total projected future net cash flow movements and might bias the inference of my tests. For instance, during the global financial crisis of 2008–2009, market returns were negative but market-adjusted returns of some firms were positive and might have in part compensated the market downturn. Thus, while market-adjusted returns of these firms increased, the likelihood of reporting impairment charges should have increased during the crisis.

[15] Using dividend adjusted share price returns of firm (*j*)—measured from the end of the third (fourth) month following the end of fiscal year (*t-1*) to the end of the third (fourth) month following the end of fiscal year (*t*)—keep results essentially the same except that returns are systematically related to impairment charges in a stringent reporting environment but not in a weak reporting environment. This might indicate that in a weak reporting environment managers opportunistically adjust future net cash flows to avoid reports of impairment charges

The discount rate is proxied by the absolute value of the beta factor (*Beta*). *Beta* is used predominately (as a starting point) by European and Australian firms to measure the discount rate of CGUs (e.g., Heintges and Herre 2007; Petersen and Plenborg 2010; Carlin and Finch 2009). *Beta* reflects a firm's equity risk, which is related to a firm's asset risk.[16] Riskier assets are more susceptible to a higher variation in projected future net cash flows. Accordingly, a higher *Beta* should increase the likelihood and magnitude of asset write-downs. $Beta_{jt}$ of firm (j) is calculated for the end of fiscal year (t) by using 36 monthly firm returns from (t-3) to (t-0) that need to be reported in sequence. Returns are adjusted for dividends. Market returns are proxied by summing weighted monthly returns of all noninsurance, nonfinancial, and nonreal estate firms that apply IFRS according to the sampling requirements set out in Table 2.1 (sample selection criteria) and described below (section 2.4) but before sample reductions. The weights are based on firms' market capitalizations by multiplying common shares outstanding and the monthly share price. I use absolute betas since whether negatively or positively related to market returns, a firm's equity (or asset) risk should increase as $Beta_{jt}$ increases.[17]

I use three determinants of IAS 36 impairments that capture the comparison of the derived values in use of identified CGUs with their book values. First, I use the natural logarithm (to account for nonlinearity) of the

in financial statements. Accordingly, these results are more strongly aligned to hypothesis 2.2 than results obtained from using fiscal year returns.

[16] While the equity beta is the levered beta that takes on both operating risk and financial risk, the asset beta is the unlevered beta that takes on the operating risk only (Damodaran 2001, 204).

[17] Share price returns also incorporate a firm's equity risk (see chapter 3). However, the main influence on returns is expected to be at a change in projected future net cash flows. The Pearson correlation matrix outlined in Appendix 2.2 signals a positive correlation between $Return_{jt}$ and $Beta_{jt}$. In addition, I do not capture market risk-free rates since those rates basically do not vary cross-sectionally in a European setting within the sample period, which is before the European crisis. They vary over time; however, the time span of this study is too small to obtain sufficient variations.

market-to-book ratio (i.e., the values in use over the book values of all CGUs) of firm (*j*) before impairments at the end of fiscal year (*t*) (MtB_{jt}). Second, I use the number of CGUs of firm (*j*) at the end of fiscal year (*t*) ($\#CGU_{jt}$). $\#CGU_{jt}$ is estimated by the number of a firm's operating regions and products, which should reflect the number of the firm's operating segments according to IFRS 8 "*Operating segments*" at the fiscal year end.[18] A CGU cannot be larger than an operating segment (IASB 2004a). Consequently, $\#CGU_{jt}$ should capture a firm's minimum required number of CGUs. Finally, I use a binary variable that takes the value of one if firm (*j*) impairs intangible and/or tangible assets in fiscal year (*t-1*) and zero otherwise ($BinaryLagIL_{jt-1}$).

Turning to MtB_{jt}: Firms with large unrecognized economic values have relatively few assets in place that can be written off (Pae et al. 2005; Beatty and Weber 2006; Roychowdhury and Watts 2007; Ramanna 2008; Sunder et al. 2011; Ramanna and Watts 2012). Accordingly, Godfrey and Koh (2009) find in a U.S. setting and Stokes and Webster (2010) and Chalmers et al. (2011) find in an Australian setting that firms with large unrecognized economic gains, in particular when audited by Big 4 auditors, are less likely to report goodwill impairments in financial statements and report smaller goodwill impairment charges. As a result, I expect a larger MtB_{jt} to reduce the likelihood and magnitude of impairments.

Focusing on $\#CGU_{jt}$: I predict that the more CGUs a firm has defined, the more likely it is that at least one of these CGUs is impaired. That is, at least one CGU does not contain unrecognized economic values

[18] A firm's segment reporting is provided in Datastream, which is aligned to IAS 14 "*Segment Reporting*." IAS 14 is superseded by IFRS 8 for periods beginning January 2009. However, the sample is spread over 2006 to 2010. Thus, the period incorporates the change from IAS 14 to IFRS 8. Yet, the difference between IAS 14 and IFRS 8 is to some extent marginal (IASB 2006; Alfredson et al. 2007, 754–785).

and performs poorly. In addition, I expect that firms that identify more CGUs should report larger amounts of impairment charges in financial statements than firms that identify fewer CGUs. That is, as long as the performances of the CGUs are not highly correlated, firms that identify more CGUs tend to report impairment charges of higher frequency.

Concentrating on $BinaryLagIL_{jt-1}$: Firms that reported a write-off in the immediate previous period signal that at least one CGU was impaired. Since at least one CGU did not have unrecognized economic values, I predict a higher likelihood of impairment losses being reported in the current period if a firm reported a write-off in the previous period compared to a firm that did not report impairment charges in the immediate previous period. I predict that the magnitude of impairment losses will be lower for a firm that released a write-off in the previous period, as the manager would presumably adjust CGUs on an on-going basis.

I analyze the impact of IAS 36 requirements on the likelihood of impairments by decomposing the sample into the occurrence and nonoccurrence of impairments. Thus, the dependent variable $BinaryIL_{jt}$ is a binary (dichotomous) variable that takes the value of one if firm (*j*) impairs intangible and/or tangible assets in fiscal year (*t*) and zero if firm (*j*) does not impair assets in fiscal year (*t*). Using a binary variable requires the use of the following probit regression (see e.g., Beatty and Weber 2006).

$$BinaryIL_{jt} = \alpha_0 + \alpha_1 Return_{jt} + \alpha_2 Beta_{jt} + \alpha_3 MtB_{jt} + \alpha_4 \#CGU_{jt} + \alpha_5 BinaryLagIL_{jt-1} + \varepsilon_{jt}. \tag{2.1}$$

The probit regression incorporates the control variables that capture the elements of the value in use approach and enables me to analyze whether the elements affect the likelihood (occurrence) of IAS 36 impairment losses systematically. In subsection 2.3.2, the probit regression is extended and adjusted for determinants that capture a stringent reporting environment to test hypotheses 2.1 to 2.3.[19] Variable definitions and data sources are reported in Appendix 2.1.

I predict that the coefficients on $Return_{jt}$ and MtB_{jt} are negative and the coefficients on $Beta_{jt}$, $\#CGU_{jt}$, and *BinaryLagILjt-1* are positive. That is, higher economic performance ($Return_{jt}$) and larger economic values to book values of net assets (MtB_{jt}) decrease the likelihood of impairment losses ($BinaryIL_{jt}$), while a higher equity risk ($Beta_{jt}$), a greater number of CGUs ($\#CGU_{jt}$), and write-offs reported in the immediate previous period ($BinaryLagIL_{jt-1}$) increase the likelihood of impairments. Thus, the occurrence of impairment losses would be on average systematically related to the elements of the value in use approach.

I use an ordinary least squares (OLS) regression and a sample of firms reporting impairment charges (i.e., impairers) to analyze the impact of IAS 36 requirements on the magnitude of (nonzero) impairment charges. Since I use only impairers, no zero values are included in the dependent (continuous) variable $ILTA_{jt}$. $ILTA_{jt}$ represents the amount of impairments of tangible and/or intangible assets in fiscal year (t) deflated by total assets at the end of fiscal year (t-1) of firm (j).[20] Thus, for instance, a Tobit specification would not be appropriate as applied in Riedl (2004) and Beatty and Weber (2006).[21]

[19] The results are essentially unchanged when a logistic regression is applied, which is also valid for the tests of hypotheses 2.1 to 2.3.

[20] Research tends to deflate impairment charges of fixed assets by lagged total assets (see e.g., Cotter et al. 1998; Riedl 2004; Vanza et al. 2011).

[21] By analyzing U.S. GAAP-based impairments, Riedl (2004) and Beatty and Weber (2006) incorporate zero values into their regression model (dependent variable). They assume that asset write-ups are censored to zero values since under U.S. GAAP, asset write-ups are not

$$ILTA_{jt} = \xi_0 + \xi_1 Retrun_{jt} + \xi_2 Beta_{jt} + \xi_3 MtB_{jt} + \xi_4 \#CGU_{jt} + \xi_5 BinaryLagIL_{jt-1} + \varepsilon_{jt}. \tag{2.2}$$

The OLS regression incorporates the same control variables that are used in the probit regression model 2.1 (see also Appendix 2.1). The control variables are applied to analyze whether the elements of the value in use approach affect the amount of IAS 36 impairment losses systematically. The OLS regression is extended for determinants that capture a stringent reporting environment in subsection 2.3.2 to test hypothesis 2.4.

I predict a positive coefficient on $Beta_{jt}$ and negative coefficients on the other explanatory variables. Thus, a higher equity risk ($Beta_{jt}$) triggers larger impairment charges while higher economic returns ($Return_{jt}$), larger economic values to book values of net assets (MtB_{jt}), a greater number of CGUs ($\#CGU_{jt}$), and prewrite-offs ($BinaryLagIL_{jt-1}$) predict a smaller magnitude of IAS 36 impairment charges.[22] Accordingly, the amount of impairment losses would be on average systematically related to the elements of the value in use approach.

2.3.2 Modeling the effect of the reporting environment

Determinants of impairments that capture a stringent reporting environment are grouped into country-level enforcement systems, periods of intense scrutiny over a firm's financial reporting, and firm-specific determinants. Periods of intense scrutiny consist of time periods during and after the

allowed to be reported in financial statements (FASB 1995; FASB 2001a; FASB 2001b; Riedl 2004). Using a censored data set requires, for instance, applying a Tobit regression.

[22] I use $BinaryLagIL_{jt-1}$ (and not a continuous variable) since I expect that the amount of current impairment losses is affected by the occurrence and not by the amount of past impairment charges (see section 2.3.1).

global financial crisis (2008–2009), and when there is a high intensity of industry impairments. Firm-specific determinants comprise the number analysts following the firm and the audit quality of the firm. Each determinant signals that a firm's financial reporting is carefully scrutinized, which should curb managers' overstatement of assets. Thus, I expect that as each of the following determinants reflects a stringent reporting environment, it will increase the occurrence of reports of IAS 36 impairments, which would be consistent with hypothesis 2.1.

Turning to country-level enforcement systems: Differences in countries' securities regulations that mandate and enforce disclosures might cause differences in accounting practices (Leuz et al. 2003; Leuz 2010; Barth et al. 2012). To protect investors against expropriation by insiders, common law countries (countries with legal systems of English origin) have developed a higher level of security (overall) for investors and market operators than code law countries (La Porta et al. 1997, 1998). Consequently, in countries with stringent legal enforcement systems managers understate rather than overstate the asset base (Ball et al. 2000; Ball et al. 2003). The legal enforcement system of a country is proxied by the "*rule of law*" measure of the country in the year 2006, drawn from Kaufmann et al. (2007). The binary variable $Rule_{j2006}$ is equal to unity if firm (j) operates in a country in which the "*rule of law*" measure is above the median of 1.675 and zero otherwise. A value of above 1.675 represents a stringent rule of law and a value of below 1.675 represents a weak rule of law.[23]

[23] Rule of law measures the extent to which agents have confidence in and abide by the rules of society, the police, and the courts. The quality of contract enforcement and the likelihood of crime and violence also reflect a country's rule of law (Kaufmann et al. 2007).

Focusing on periods of intense scrutiny over a firm's financial reporting: Given the high economic losses that occurred during the global financial crisis (2008–2009), firms, managers, and auditors were potentially under the extreme scrutiny of regulators (Stokes and Webster 2010). Consequently, firms, managers, and auditors' exposure to legal liability presumably increased during the crisis, which, in turn, should have induced managers to avoid overstating the asset base. The binary variable FC_j is unity if the fiscal year of firm (j) ends in August 2008 to July 2009 and zero otherwise.

The rationale for taking this time period is that the financial crisis swept over to the equity markets of nonfinancial firms about May 2008, however, a sharp decline in the equity market occurred in September to October 2008 and the decline eventually ended about February 2009 (Bartram and Bodnar 2009). The sharp decline in the equity market came with various failures and mergers of financial firms which reached the world media in September 2008.[24] While research defined 2008 (e.g., Stokes and Webster 2010) or 2009 (e.g., Vanza et al. 2011) as the year of the global financial crisis, I expect that scrutiny over a firm's financial reporting by regulators increased with the sharp equity drop. Thus, I start with August 2008, which also allows for the preparation time of the financial report that lags the fiscal year end in general.[25]

[24] In September, 2008, it was announced that Fannie Mae and Freddie Mac became nationalized and Fortis became seminationalized to stabilize the financial system, Lehman Brothers went bankrupt, the bank of America announced a takeover of Merrill Lynch, the American International Group (AIG) was bailed out by the Federal Reserve, and further bail-out schemes were announced in the following weeks all over the world.

[25] Instead of using the time period from August 2008 to July 2009 to capture the global financial crisis, I apply as a robustness test the period from 2008 to 2009 for the crisis. The results are essentially unchanged. Yet, I find that after the crisis (2010) the occurrence of impairments did not increase relatively to the period before the crisis. The results might indicate that during 2008–2009, firms estimated the value of CGUs pessimistically to avoid litigation, decreasing the likelihood of impairments in the following fiscal year 2010.

Since economic losses were high, the global financial crisis might have set a new era of responsibility and burden on firms, managers, and auditors, resulting in continued high scrutiny over a firm's financial reporting. This should curb overstatements of assets for the time period subsequent to the global financial crisis of 2008–2009. The binary variable $AfterFC_j$ is equal to unity if the fiscal year of firm (j) ends after July 2009 and zero otherwise.

The intensity of industry impairments is also predicted to curb overstatements of the asset base. For instance, Citicorp's announcement of loan loss reserves (LLR) of about $3 million in 1987 caused a chain reaction in other banks to anticipate loan losses by essentially reporting accumulated economic losses all at once (Musumeci and Sinkey 1990). A high correlation between industry impairments and firm impairments reflects the fact that firms in the same industry have similar cash flow characteristics (see e.g., Musumeci and Sinkey 1990; Fenn and Cole 1994; Docking et al. 1997).[26]

Hirschey and Richardson (2002, 2003) suggest that goodwill impairments are firm-specific events. Francis et al. (1996) provide some evidence of a negative relation between goodwill impairments and the

[26] Findings in the contagion effect literature indicate that the market relates information provided by one firm to other firms when the cash flow characteristics are similar. For instance, Musumeci and Sinkey (1990) and Docking et al. (1997) suggest that the share prices of banks is adjusted only when loan loss reserves are reported by another bank with a similar asset structure. Similarly, Fenn and Cole (1994) find that shareholders' wealth in other insurance companies declined the more the asset compositions were related to the asset impairments of First Executive and Travelers. Unrelated literature on impairments, for instance, conducted by Aharony and Swary (1983), also show a contagion effect when firms have similar asset risk. They find that the failure of Franklin National Bank caused by heavy foreign exchange losses led to a significantly negative abnormal performance of various solvent banks. Some of those banks had comparable problems with foreign exchange transactions during the same period, which might be interpreted as investors' reactions to a common type of unfavorable earnings implications (Aharony and Swary 1983).

intensity of industry write-offs but a positive relation for inventory and restructuring charges.

I expect that a high intensity of industry impairments curbs managers' use of IAS 36 discretion in overstating the asset base. My prediction is rationalized in two ways. First, if a firm did not write-off in coherence with the industry, scrutiny over the firm's financial reporting would presumably increase by, for instance, auditors and investors. To avoid this and prevent an overstatement of assets, managers of the firm likely report impairment losses in financial statements. Second, since peer firms report impairment losses, financial reporting of the other firms operating in the same industry is likely carefully scrutinized by auditors and the auditors might encourage managers to adjust the asset base.

The intensity of industry impairments ($Ind\#IL_{jt}$) represents the proportion of the number of IAS 36 write-down observations to the total number of observations of firms that are in the same industry (SIC code 1) as firm (*j*). Observations are included when the fiscal year ends up to 11 months before the end of fiscal year (*t*) of firm (*j*). The specified time frame allows for industry (peer firm) impairments to be reported during the fiscal year of the analyzed firm. The proportion is calculated by excluding the analyzed firm and using firms applying IFRS according to the sampling requirements set out in Table 2.1 (sample selection criteria) and described below (section 2.4) but before sample reductions. I require that at least five total observations are available within the industry and time frame to increase the validity of the measure.

Turning to firm-specific factors: Analysts act as intermediaries between firms and investors by processing available data including information provided in the annual reports that is subsequently disseminated to investors (Lang and Lundholm 1996; Barker 1998; Piotroski and

Roulstone 2004). In addition, the more analysts compete with each other, the more available data are processed and the higher is a firm's transparency (see Brennan and Subrahmanyam 1995). High scrutiny and extensive analyses potentially encourage managers to avoid overstating the asset base. $AnFol_{jt}$ represents the natural logarithm (to account for nonlinearity) of 1 + the number of analysts following firm (*j*) at the end of fiscal year (*t*).

Previous research finds a relation between the size of auditors and audit quality (Palmrose 1988; Teoh and Wong 1993; Francis and Krishnan 1999; Kim et al. 2003; Lennox and Pittman 2010). Because large auditing firms get more media attention than small auditing firms, and because a financial scandal damages the reputation of a firm's auditors, large auditing firms require firms to use discretionary accruals prudently (Kim et al. 2003). In addition, large auditing firms have more expertise than small auditing firms and can afford sophisticated technology to detect opportunistic behavior (Francis and Krishnan 1999; Kim et al. 2003). Thus, large auditors should encourage managers to avoid overstating the asset base. To capture audit quality, the binary variable $Big4_{jt}$ is equal to unity if firm (*j*) is audited by a big four auditing firm (Ernst & Young, PWC, Deloitte & Touche, or KPMG) at the end of fiscal year (*t*) and zero otherwise. The variable definitions and data sources are reported in Appendix 2.1.[27]

To test hypothesis 2.1, I extend the probit regression (model 2.1) as follows:

[27] I assume that write-offs are reported in the fourth quarter based on Elliott and Shaw (1988), Zucca and Campbell (1992), Francis et al. (1996), Riedl (2004), Heintges and Herre (2007), Spear and Taylor (2011), and Muller et al. (2012). Consequently, the variables are all related to the fiscal year end.

$$\begin{aligned} \textit{BinaryIL}_{jt} = \;& \alpha_0 + \\ \text{IAS 36 requirements} \;& \left\{ \begin{array}{l} \alpha_1 \textit{Return}_{jt} + \alpha_2 \textit{Beta}_{jt} + \alpha_3 \textit{MtB}_{jt} + \\ \alpha_4 \#\text{CGU}_{jt} + \alpha_5 \textit{BinaryLagIL}_{jt-1} \end{array} \right. \\ \text{Reporting environment} \;& \left\{ \alpha_6 X_{jt} + \right. \\ & \varepsilon_{jt}, \end{aligned} \tag{2.3}$$

where X_{jt} stands for $Rule_{j2006}$, FC_j, $AfterFC_j$, $Ind\#IL_{jt}$, $AnFol_{jt}$, and $Big4_{jt}$.[28] Hypothesis 2.1 predicts that the coefficients on all variables that capture a stringent reporting environment (X_{jt}) are positive. Thus, stringent country-level enforcement systems, periods of intense scrutiny over a firm's financial reporting, and firm-specific factors increase the likelihood of reporting impairment charges.[29]

To test hypotheses 2.2 and 2.3, I adjust the probit regression (model 2.3) as follows:

$$\begin{aligned} \textit{BinaryIL}_{jt} = \;& \beta_0 + \beta_1 \textit{Enforce}_{jt} + \beta_2 \textit{Return}_{jt} + \beta_3 \textit{Return}_{jt} {*} \textit{Enforce}_{jt} + \\ & \beta_4 \textit{Beta}_{jt} + \beta_5 \textit{Beta}_{jt} {*} \textit{Enforce}_{jt} + \beta_6 \textit{MtB}_{jt} + \\ & \beta_7 \textit{MtB}_{jt} {*} \textit{Enforce}_{jt} + \beta_8 \#\textit{CGU}_{jt} + \beta_9 \#\textit{CGU}_{jt} {*} \textit{Enforce}_{jt} + \\ & \beta_{10} \textit{BinaryLagIL}_{jt-1} + \beta_{11} \textit{BinaryLagIL}_{jt-1} {*} \textit{Enforce}_{jt} + \varepsilon_{jt}. \end{aligned} \tag{2.4}$$

[28] I do not control for year and country fixed effects on reports of impairment charges since I include in the models binary variables that capture the strictness of the country-level enforcement systems ($Rule_{j2006}$) and time periods during the crisis (FC_j) and after the crisis ($AfterFC_j$). Thus, I avoid over-control for country and time periods (see Woolridge 2009, 203–205).

[29] I do not discriminate among determinants that capture a stringent reporting environment. Accordingly, I analyze the sign and do not examine the magnitude of the coefficients.

Again, since I analyze the likelihood (occurrence and nonoccurrence) of an IAS 36 impairment loss with the binary variable $BinaryIL_{jt}$, I apply a probit regression. For hypotheses 2.2 and 2.3, I built up an index (*Enforce*) that captures the quality of the reporting environment in an increasing fashion. $Enforce_{jt}$ is measured by adding all determinants—that capture a stringent reporting environment—for firm (*j*) in fiscal year (*t*).[30] For nonbinary variables (determinants) $Ind\#IL_{jt}$ and $AnFol_{jt}$, I calculate the median and create a binary variable equal to unity if the number of the variable (determinant) is above the median and zero otherwise.[31] All binary variables (0 or 1) are added. Next, I add 1 to the index and take the natural logarithm to account for nonlinearity (i.e., the stringency of the reporting environment increases marginally). Subsequently, I interact $Enforce_{jt}$ with factors related to IAS 36 requirements.

Hypothesis 2.2 predicts that the coefficient(s) (at least one) on $Return_{jt}*Enforce_{jt}$ and/or $MtB_{jt}*Enforce_{jt}$ are negative and/or the coefficient(s) on $\#CGU_{jt}*Enforce_{jt}$ and/or $Beta_{jt}*Enforce_{jt}$ are positive. That is, a stringent reporting environment restricts managers from adjusting

[30] I do not discriminate among determinants that capture a stringent reporting environment in testing hypotheses 2.1 to 2.3. The purpose of hypothesis 2.1 is to test whether all identified determinants capture a stringent reporting environment in which managers' overstatement of the asset base is restricted. The purpose of hypotheses 2.3 and 2.4 is to test whether a stringent reporting environment influences managers' systematic and/or prudent impairment loss reporting to avoid an overstatement of assets without analyzing the influence of each determinant, which justifies a separate study. Thus, I include in the index $Enforce_{jt}$ those determinants that are positively related to the occurrence of impairments (model 2.3). As predicted by hypothesis 2.1, I find that all determinants increase the occurrence of impairments (see results outlined in Table 2.5). Accordingly, all determinants are included in $Enforce_{jt}$.

[31] I convert the continuous variables to dichotomous variables so that each determinant has the same scale unit. Thus, I do not differentiate among determinants and assume that all determinants equally capture a stringent reporting environment. Leaving $Ind\#IL_{jt}$ and $AnFol_{jt}$ as continuous variables would violate my assumptions and be difficult to justify. For instance, it is difficult to justify why five analysts following a firm capture to a higher degree a stringent reporting environment than a strict country-level enforcement system. Using the mean instead of the median to convert the two continuous variables to binary variables gives essentially the same results.

projected future net cash flows upward ($Return_{jt}*Enforce_{jt}$), adjusting discount rates downward ($Beta_{jt}*Enforce_{jt}$), and/or defining CGUs opportunistically ($MtB_{jt}*Enforce_{jt}$ and $\#CGU_{jt}*Enforce_{jt}$).

If firms opportunistically define CGUs to prevent asset impairments in a weak reporting environment, I would expect that the coefficients on $MtB_{jt}*Enforce_{jt}$ and $\#CGU_{jt}*Enforce_{jt}$ are affected as described in the previous paragraph. That is, firms that exploit IAS 36 rules about CGUs to mask impaired assets are less likely to report write-downs in financial statements when the difference in the economic value and the book value of net assets (MtB_{jt}) is decreasing and the diversification level proxying for the minimum number of required CGUs ($\#CGU_{jt}$) is increasing.

The coefficient on $BinaryLagIL_{jt-1}*Enforce_{jt}$ should be insignificantly different from zero. CGUs that were impaired in the immediate previous period did not have unrecognized economic values; thus, these CGUs can essentially not be defined opportunistically in the current period. Accordingly, the coefficient on $BinaryLagIL_{jt-1}$ should be significantly positive. Overall, the results would imply that a stringent reporting environment prevents overstating the asset base by curbing managers' exploitation of the elements of the value in use approach set forth in IAS 36 and encourages managers to report impairment losses systematically.

Interacting $Enforce_{jt}$ with the variables that capture the requirements of IAS 36 provides insight into whether an increasingly stringent reporting environment encourages managers to apply IAS 36 requirements systematically (hypothesis 2.2). The coefficient on $Enforce_{jt}$ tests whether an increasingly stringent reporting environment induces managers to apply IAS 36 requirements prudently (hypothesis 2.3). Hypothesis 2.3 predicts that the coefficient on $Enforce_{jt}$ is positive. Accordingly, managers reporting in a stringent reporting environment define more CGUs and estimate lower values in use of the defined CGUs than managers issuing financial statements in a weak reporting environment.

To test hypothesis 2.4, I extend the OLS regression (model 2.2) as follows:

$$
\begin{aligned}
ILTA_{jt} = \; & \xi_0 + \\
\text{IAS 36 requirements} \; & \left\{ \begin{array}{l} \xi_1 Return_{jt} + \xi_2 Beta_{jt} + \xi_3 MtB_{jt} + \\ \xi_4 \#\mathrm{CGU}_{jt} + \xi_5 BinaryLagIL_{jt-1} \end{array} \right. \\
\text{Reporting environment} \; & \left\{ \; \xi_6 X_{jt} + \right. \\
& \varepsilon_{jt},
\end{aligned}
\tag{2.5}
$$

The dependent (continuous) variable is the same as for the OLS regression (model 2.2) and the explanatory variables are the same as for the probit regression (model 2.3; see also Appendix 2.1). Hypothesis 2.4 predicts that the coefficients on all variables that capture a stringent reporting environment (X_{jt}) are significantly different from zero. I leave the sign as an open empirical question. A positive coefficient on X_{jt} indicates that a stringent reporting environment increases the magnitude of impairment charges. This would suggest that managers are encouraged to report accumulated economic losses. A negative coefficient on X_{jt} indicates that a stringent reporting environment encourages managers to report small amounts of impairment losses in financial statements. The negative coefficient on X_{jt} in connection with a positive relation to the likelihood of write-offs ($BinaryIL_{jt}$) provides some evidence that a stringent reporting environment induces managers to adjust the asset base frequently, resulting in small amounts of impairment charges ($ILTA_{jt}$).

2.4 Sample and descriptive statistics

The sample selection criteria are reported in Table 2.1. Firm-year observations over the post-IFRS adoption period 2006 to 2010 are obtained from 20 European countries. To avoid distortion, I drop the first year of firms' IFRS reporting. Distortion might arise due to the use of lag accounting data in my test so that they would be based on local GAAP, application of IFRS the first time, and use of the adoption guidelines set forth in IFRS 1 "*First-time Adoption of International Financial Reporting Standards.*" [32] This leads to an initial sample of 22,364 firm-year observations. The initial sample is based on firms that apply IFRS continuously after adoption and have applied IFRS at least since 2009 to assure a two year period.

I exclude insurance, financial, and real estate firms (SIC codes 6000 to 6799) because they are subject to special regulations, and adjustments of their primary asset base is captured in other IFRS standards. Furthermore, I remove firms with one occurrence of a book value of equity equal to or below zero. Those firms are potentially in severe distress. This might induce investors to speculate on acquisitions and turnarounds, irrespectively of reported accounting data. Thus, including those firms increases noise and leads to less representative results.

[32] According to my IFRS selection procedure, earlier IFRS adopters could have been incorporated for the end of fiscal year 2005. Yet, to have a consistent starting point and allow for the accounting change of intangible assets from March 2004 onward, I exclude 2005 data for those firms. Before March 2004, IAS 38 "*Intangible Assets*" viewed goodwill and other intangible assets as having a useful life. Thus, they were to be amortized. According to IFRS 3 "*Business Combinations*," goodwill acquired in a business combination has now an indefinitely useful life. Other intangible assets need to be analyzed to determine whether they generate unlimited periods of cash flows. In connection with IFRS 3 and IAS 38, IAS 36 requires an impairment test at least once a year for intangible assets with an indefinite life, but they are not subject to systematic amortization (IASB 2004a, 2004b, 2008).

Table 2.1: Sample selection criteria

	Deletion	Cumulative # of observations after deletions
Initial IFRS sample of firms that apply IFRS continuously after adoption and at least since 2009		22,364
Exclusion of insurance, financial, and real estate firms (SIC codes 6000 to 6799)	4,455	17,909
Book value of equity is equal to or below zero	929	16,980
Missing data	2,843	14,137
Outlier reduction - 0.5% obs. at the top and bottom of independent regression variables except for $\#CGU_{jt}$, $Ind\#IL_{jt}$, $AnFol_{jt}$, and binary variables - 0.5% obs. at the top of $AnFol_{jt}$ - Impairment loss is greater than one year lagged book value of equity	588	13,549
Final sample, 2006–2010	# of unique firms	# of observations
	3,708	13,549

The starting point of data selection is the sample of European firms that apply IFRS continuously after adoption and at least since 2009 on Datastream. For a description of the variables see Appendix 2.1.

After dropping observations of missing data of the regression variables, I allow for outliers by deleting 0.5 percent of observations that are at the top and bottom of the independent regression variable values (see Jarva 2009); 0.5 percent of observations are dropped at the top of $AnFol_{jt}$ only because that variable has quite a few observations with a value of zero.[33] Due to less variability, $\#CGU_{jt}$ and $Ind\#IL_{jt}$ are not trimmed. Finally, to allow for outliers of impairment losses, I remove observations where the amount of impairment losses is larger than the lagged book value of equity. In summary, the final sample consists of 3,708 firms and 13,549 firm-year observations from 20 countries over 2006–2010.

Of these firm year-observations, 4,426 are IAS 36 impairment loss observations that are collected from Datastream. However, Datastream frequently provides no impairment losses for tangible and intangible assets (i.e., NA). By dropping the whole firm-year observation when the value of an impairment loss for a tangible or intangible asset is not provided, the sample would be reduced from 13,549 to 629 firm-year observations (4,426 to 503 IAS 36 impairment loss observations) after the sample selection criteria are applied. To include nonprovided impairment charges, I adjust them to zero values. Consequently, I assume the firm did not report an impairment loss for the particular tangible or intangible asset in the financial statements. This approach is consistent with that in prior literature (Ramanna and Watts 2012).

[33] The results are essentially unchanged when the data are truncated at a 2.0 percent level (see Lee 2011). Yet, the results are weaker with respect to hypotheses 2.2 and 2.4. While the coefficient on $\#CGU_{jt}*Enforce_{jt}$ is still significantly positive, the coefficient on $MtB_{jt}*Enforce_{jt}$ is insignificantly negative (model 2.4). However, this still implies that IAS 36 requirements are more systematically applied in a stringent reporting environment than in a weak reporting environment (hypothesis 2.2). In addition, the coefficients on FC_j and $Ind\#IL_{jt}$ are insignificantly positive when $ILTA_{jt}$ is employed as a dependent variable (model 2.5). The coefficient on FC_j is, however, significantly positive when it is applied on a standalone basis in model 2.5 (see also column 3 of Table 2.7 below). The Variance Inflation Factors (VIFs) are all well below 2, indicating that no mulitcollinearity issues are present (see also Anderson et al. 2009, 578; Woolridge 2009, 99). The other determinants that capture a stringent reporting environment affect the amount of impairment charges in the same way as outlined in Table 2.7, confirming hypothesis 2.4. Winsorizing the data at 0.5 and 2.0 percent levels lead to similar results. The findings are even stronger with respect to hypothesis 2.2. The coefficient on $Return_{jt}*Enforce_{jt}$ is negative (model 2.4), indicating that projected future net cash flow changes are more systematically aligned to reports of impairment losses in a stringent reporting environment than in a weak reporting environment. Overall, the results of the additional sensitivity tests confirm hypotheses 2.1 to 2.4.

Table 2.2: Sample composition

Panel A. Sorted by country and county-level enforcement system

Country/ county-level enforcement system	# of firms	# of firms BinaryIL	% of firms BinaryIL	# of obs.	# of obs. BinaryIL	% of obs. BinaryIL
	(1)	(2)	(3)	(4)	(5)	(6)
Stringent enforcement system						
Austria	59	44	74.6	223	105	47.1
Denmark	92	53	57.6	363	127	35.0
Finland	108	67	62.0	489	170	34.8
Germany	440	278	63.2	1,742	681	39.1
Luxembourg	18	11	61.1	72	27	37.5
Netherlands	101	69	68.3	419	173	41.3
Norway	130	76	58.5	443	166	37.5
Sweden	281	121	43.1	1,028	251	24.4
Switzerland	120	85	70.8	522	241	46.2
United Kingdom	1,038	482	46.4	2,957	888	30.0
Total/Average	2,387	1,286	53.9	8,258	2,829	34.3

Table 2.2: Continued

Weak enforcement system						
Belgium	84	45	53.6	340	120	35.3
Czech Republic	13	5	38.5	44	10	22.7
France	413	232	56.2	1,730	562	32.5
Greece	215	57	26.5	979	91	9.3
Hungary	25	10	40.0	96	23	24.0
Ireland	45	23	51.1	138	47	34.1
Italy	190	130	68.4	745	353	47.4
Poland	207	109	52.7	686	194	28.3
Portugal	35	15	42.9	144	42	29.2
Spain	94	63	67.0	389	155	39.8
Total/Average	1,321	689	52.2	5,291	1,597	30.2
Total/Average of both system	3,708	1,975	53.3	13,549	4,426	32.7

Table 2.2: Continued

Panel B. Sorted by time period

Time period	# of firms	# of firms BinaryIL	% of firms BinaryIL	# of obs.	# of obs. BinaryIL	% of obs. BinaryIL
	(1)	(2)	(3)	(4)	(5)	(6)
BeforeFC	2,522	934	37.0	4,601	1,329	28.9
FC	3,001	1,041	34.7	3,001	1,041	34.7
AfterFC	3,594	1,498	41.7	5,947	2,056	34.6
Total/ Average				13,549	4,426	32.7

For a description of the variables see Appendix 2.1.

Table 2.2 exhibits the sample decomposition of the occurrence of IAS 36 impairment losses (*$BinaryIL_{jt}$*) sorted by country and country-level enforcement system (Panel A) and time period (Panel B). *$BinaryIL_{jt}$* is applied as the dependent variable of my regression analyses.

In Table 2.2, column 3 of Panel A reports that the percentage of firms in the sample that reported an impairment loss at least once is equal to 53.9 in a stringent country-level enforcement system and 52.2 in a weak country-level enforcement system. In relation to total observations in the respective setting, 34.3 percent of impairments were reported in a stringent and 30.2 percent of impairments were reported in a weak country-enforcement system (column 6).

In Table 2.2, column 3 of Panel B reports that relatively fewer firms reported impairment losses during the global financial crisis of 2008–2009 (FC) (34.7 percent) than before the crisis (37.0 percent) and after the crisis (41.7 percent). Yet, relatively more write-offs were reported during the crisis (34.7 percent) and after the crisis (34.6 percent) than before the crisis (28.9 percent) (column 6). Consequently, descriptive statistics indicate that the frequency of IAS 36 write-offs was higher in a stringent country-level enforcement system and during and after the global financial crisis.

Table 2.3 exhibits descriptive statistics of variables applied in the regression analyses. I analyze the relation of these variables to the likelihood of impairment losses (*$BinaryIL_{jt}$*) and to the magnitude of impairment losses to total lagged assets (*$ILTA_{jt}$*). The variables are grouped in two categories: IAS 36 requirements and the reporting environment. Within the categories the sample is split into impairment loss (BinaryIL) and nonimpairment loss (NonBinaryIL) observations.

Table 2.3: Statistics of regression variables for impairment loss and nonimpairment loss samples

Category	Variable	# of obs.	Mean	Percentile 25%	Percentile 50% Median	Percentile 75%	Standard deviation
		(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable							
	$ILTA_{jt}$	4,426	0.0208	0.0012	0.0042	0.0157	0.0507
IAS 36 requirements							
BinaryIL sample							
	$Return_{jt}$	4,426	0.0692	-0.3187	0.0195	0.3453	0.5595
	$Beta_{jt}$	4,426	1.0299	0.6133	0.9688	1.3827	0.5678
	MtB_{jt}	4,426	0.1016	-0.4079	0.0915	0.6421	0.7983
	$\#CGU_{jt}$	4,426	8.1679	6.0000	8.0000	10.0000	3.5957
	$BinaryLagIL_{jt-1}$	4,426	0.6367	0.0000	1.0000	1.0000	0.4810
NonBinaryIL sample							
	$Return_{jt}$	9,123	0.1116	-0.2761	0.0400	0.3681	0.5800
	$Beta_{jt}$	9,123	0.9150	0.5119	0.8525	1.2376	0.5471
	MtB_{jt}	9,123	0.1916	-0.3843	0.1766	0.7472	0.8535
	$\#CGU_{jt}$	9,123	6.2942	4.0000	6.0000	8.0000	3.2885
	$BinaryLagIL_{jt-1}$	9,123	0.1632	0.0000	0.0000	0.0000	0.3696

Table 2.3: Continued

Reporting environment						
BinaryIL sample						
$Rule_{j2006}$	4,426	0.6392	0.0000	1.0000	1.0000	0.4803
$BeforeFC_j$	4,426	0.3003	0.0000	0.0000	1.0000	0.4584
FC_j	4,426	0.2352	0.0000	0.0000	0.0000	0.4242
$AfterFC_j$	4,426	0.4645	0.0000	0.0000	1.0000	0.4988
$Ind\#IL_{jt}$	4,426	0.3362	0.2676	0.3333	0.4063	0.0981
$AnFol_{jt}$	4,426	1.6801	0.6932	1.7918	2.6391	1.1202
$Big4_{jt}$	4,426	0.8039	1.0000	1.0000	1.0000	0.3971
NonBinaryIL sample						
$Rule_{j2006}$	9,123	0.5951	0.0000	1.0000	1.0000	0.4909
$BeforeFC_j$	9,123	0.3587	0.0000	0.0000	1.0000	0.4796
FC_j	9,123	0.2148	0.0000	0.0000	0.0000	0.4107
$AfterFC_j$	9,123	0.4265	0.0000	0.0000	1.0000	0.4946
$Ind\#IL_{jt}$	9,123	0.3103	0.2385	0.2990	0.3721	0.0968
$AnFol_{jt}$	9,123	1.0126	0.0000	0.6931	1.7918	1.0048
$Big4_{jt}$	9,123	0.6301	0.0000	1.0000	1.0000	0.4828

For a description of variables see Appendix 2.1.

Columns 2 and 4 of Table 2.3 document that the mean and median values of $Return_{jt}$ and MtB_{jt} are lower and the mean and median values of $Beta_{jt}$, $\#CGU_{jt}$, and $BinaryLagIL_{jt-1}$ are higher for the impairment loss sample than for the nonimpairment loss sample. The results indicate that lower returns and market-to-book ratios and higher equity risk (equity betas), a greater number of CGUs, and past reports of impairment losses are linked to the occurrence of impairments. Furthermore, the mean values of $Rule_{j2006}$, FC_j, $AfterFC_j$, $Ind\#IL_{jt}$, $AnFol_{jt}$, and $Big4_{jt}$ are higher for the impairment loss sample than for the nonimpairment loss sample. This indicates that in a stringent reporting environment the frequency of write-offs is higher than in a weak reporting environment.

Table 2.4 exhibits mean differences of variables applied in the regression analyses of the relation between these variables and the likelihood of impairment losses ($BinaryIL_{jt}$) and the magnitude of impairment losses to total lagged assets ($ILTA_{jt}$). Mean differences between variables in the impairment loss sample and the nonimpairment loss sample are reported. The variables are grouped in two categories: IAS 36 requirements and the reporting environment.

Columns 5 and 6 of Table 2.4 show that the mean differences reported in Table 2.3 are significant. The preliminary results of the univariate tests are consistent with the view that a stringent reporting environment encourages managers to report impairment charges in financial statements.

Table 2.4: Univariate analysis of regression variables for impairment loss and nonimpairment loss samples

		BinaryIL sample		NonBinaryIL sample		Delta	
Category	Variable	# of obs.	Mean	# of obs.	Mean	Mean	p-value
		(1)	(2)	(3)	(4)	(5)=(2)-(4)	(6)
IAS 36 requirements							
	$Return_{jt}$	4,426	0.0692	9,123	0.1116	-0.0424	0.0001
	$Beta_{jt}$	4,426	1.0299	9,123	0.9150	0.1149	0,0000
	MtB_{jt}	4,426	0.1016	9,123	0.1916	-0.0900	0.0000
	$\#CGU_{jt}$	4,426	8.1679	9,123	6.2942	1.8737	0,0000
	$BinaryLagIL_{jt-1}$	4,426	0.6367	9,123	0.1632	0.4735	0.0000
Reporting environment							
	$Rule_{j2006}$	4,426	0.6392	9,123	0.5951	0.0441	0.0000
	$BeforeFC_j$	4,426	0.3003	9,123	0.3587	-0.0584	0.0000
	FC_j	4,426	0.2352	9,123	0.2148	0.0204	0.0074
	$AfterFC_j$	4,426	0.4645	9,123	0.4265	0.0380	0.0000
	$Ind\#IL_{jt}$	4,426	0.3362	9,123	0.3103	0.0259	0.0000
	$AnFol_{jt}$	4,426	1.6801	9,123	1.0126	0.6675	0.0000
	$Big4_{jt}$	4,426	0.8039	9,123	0.6301	0.1738	0.0000

For a description of the variables see Appendix 2.1.

The univariate tests, however, should be interpreted carefully because I do not control for the requirements of IAS 36 including the firms' economic circumstances. For instance, the Pearson correlation matrix tabulated in Appendix 2.2 shows an expected negative correlation between $Return_{jt}$ and FC_j. On average, firm performance was worse during the global financial crisis (2008–2009) than before the crisis. Accordingly, a firm's negative economic performance and not the stringent reporting environment during the crisis might have increased the occurrence of impairments. Consequently, before any conclusions can be drawn with respect to the effect of a stringent reporting environment on the occurrence of impairments, I need to control for determinants related to IAS 36 requirements.

2.5 Empirical results

Table 2.5 exhibits the probit regression analysis for testing hypothesis 2.1 that predicts that each determinant that reflects a stringent reporting environment increases the occurrence (likelihood) of impairments—captured by the dependent (binary) variable $BinaryIL_{jt}$—so that assets are not overstated. Thus, all coefficients on the variables within the category "reporting environment" should be positive. Determinants (variables) that capture the elements of the value in use approach (category: "IAS 36 requirements") are applied to show that in a European setting the occurrence of IAS 36 impairments is on average systematically related to IAS 36 requirements. Subsequently, the determinants are used as control variables in testing hypothesis 2.1.

Table 2.5: Influence of determinants that capture a stringent reporting environment on the occurrence of IAS 36 impairment losses

Category	Variable	Sign	IAS 36 requirements	$Rule_{j2006}$	FC_j/ $AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	Full
			(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Intercept	?	-1.485***	-1.535***	-1.567***	-1.827***	-1.502***	-1.609***	-1.918***
			(42.050)	(39.226)	(41.117)	(33.747)	(42.181)	(41.818)	(31.744)
IAS 36 requirements									
	$Return_{jt}$	-	-0.166***	-0.163***	-0.147***	-0.168***	-0.137***	-0.161***	-0.127***
			(7.093)	(6.968)	(5.478)	(7.185)	(5.704)	(6.780)	(4.589)
	$Beta_{jt}$	+	0.131***	0.131***	0.115***	0.126***	0.074***	0.128***	0.058**
			(5.843)	(5.852)	(4.999)	(5.568)	(3.171)	(5.640)	(2.386)
	MtB_{jt}	-	-0.075***	-0.087***	-0.078***	-0.071***	-0.154***	-0.096***	-0.169***
			(4.637)	(5.252)	(4.794)	(4.400)	(8.956)	(5.881)	(9.460)
	$\#CGU_{jt}$	+	0.066***	0.066***	0.067***	0.065***	0.040***	0.057***	0.038***
			(17.572)	(17.524)	(17.662)	(17.330)	(9.792)	(14.998)	(9.280)
	$BinaryLagIL_{jt-1}$	+	1.263***	1.259***	1.263***	1.249***	1.200***	1.242***	1.181***
			(42.064)	(41.813)	(41.882)	(41.589)	(40.028)	(41.295)	(39.048)

Table 2.5: Continued

Reporting environment								
$Rule_{j2006}$	+		0.088***					0.081***
			(3.163)					(2.867)
FC_j	+			0.152***				0.126***
				(4.277)				(3.382)
$AfterFC_j$	+			0.130***				0.129***
				(4.963)				(4.382)
$Ind\#IL_{jt}$	+				1.112***			0.755***
					(8.528)			(5.301)
$AnFol_{jt}$	+					0.222***		0.199***
						(15.483)		(13.043)
$Big4_{jt}$	+						0.279***	0.146***
							(9.339)	(4.558)
# of obs.		13549	13549	13549	13549	13549	13549	13549
Pseudo R2		0.205	0.205	0.206	0.209	0.221	0.210	0.227
Percent classified correctly		77.25	77.05	77.14	77.22	77.39	77.44	77.42

Table 2.5: Continued

Table 2.5 reports the results of the probit regression to test hypothesis 2.1 that predicts that each determinant that captures a stringent reporting environment increases the occurrence of impairments. The dependent variable $BinaryIL_{jt}$ separates the sample into occurrence and nonoccurrence of IAS 36 impairments. $BinaryIL_{jt}$ takes the value of one if firm (*j*) reports IAS 36 impairment losses in fiscal year (*t*) and zero otherwise. IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Determinants that capture IAS 36 requirements are used to show that impairment losses are on average reported systematically in a European setting. Subsequently, they are used as control variables in testing hypothesis 2.1. For a description of the variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Focusing on the determinants (variables) related to IAS 36 requirements: Column 1 of Table 2.5 shows that the coefficients on all variables have the predicted signs and are strongly significantly related to $BinaryIL_{jt}$. The findings imply that firms that perform worse ($Return_{jt}$) and bear higher equity risk ($Beta_{jt}$) are more likely to write off assets. Furthermore, the results suggest that firms having a higher economic value to the book value of net assets (MtB_{jt}) are less likely to write-down. In addition, the greater the number of CGUs ($\#CGU_{jt}$)—estimated by firms' diversification levels—the more likely it is that impairment losses are reported in financial statements.[34] Finally, the findings suggest that firms having reported impairment charges in financial statements in the immediate previous period ($BinaryLagIL_{jt-1}$) are more likely to report impairment charges in the current period than firms that did not write-off CGUs in the immediate previous period.[35] Taken together, the empirical results imply that the occurrence of impairments is on average systematically aligned to IAS 36 requirements.

After incorporating the variables (determinants) related to IAS 36 requirements, I include into the regression the variables that capture a stringent reporting environment one by one in columns 2–6 of Table 2.5 and include them all at once in column 7 of Table 2.5. Consequently, I am able to analyze the incremental standalone effect of these variables on $BinaryIL_{jt}$.

[34] The results are consistent with Beatty and Weber (2006), where a negative relationship between the likelihood of goodwill impairments and single business unit firms is reported. My findings are inconsistent with Vanza et al. (2011), where no relation between the likelihood of IAS 36 impairment losses and the number of CGUs is indicated. However, the sample differed from mine in that the authors studied Australian firms that are expected to report impairment charges in financial statements.

[35] Findings are consistent with Zucca and Campbell (1992), Elliott and Hanna (1996), and Francis et al. (1996). Those studies find a positive correlation between previous and current write-offs. Yet, those studies use a U.S. sample in a time period in which no specific write-off standard was in place for long-term assets (pre-SFAS 121 sample).

Columns 2–7 of Table 2.5 report that the coefficients on all these variables are positive to $BinaryIL_{jt}$ as predicted. Evidence is provided that each determinant that captures a stringent reporting environment increases the occurrence of impairments. Consequently, the findings imply that such an environment restricts managers' use of discretion in overstating the asset base, which confirms hypothesis 2.1. [36] These findings especially supplement the results in Vanza et al. (2011). The authors expect that investors' high uncertainty of a firm's asset quality (value) motivates managers to report impairment losses to reduce that uncertainty. Yet, the authors find that investors' uncertainty of the quality of impairers' assets is on average lower than investors' uncertainty of the quality of nonimpairers' assets. My results imply that managers are motivated to write-off assets in a stringent reporting environment.

Table 2.6 exhibits the probit regression analysis for testing hypotheses 2.2 and 2.3. Hypothesis 2.2 predicts that an increasingly stringent reporting environment encourages managers to report impairment losses in financial statements more systematically. Thus, I expect that at least one coefficient on the variables (determinants) related to IAS 36 requirements is more systematically aligned to the occurrence of impairments ($BinaryIL_{jt}$) when the variables are interacted with $Enforce_{jt}$. Hypothesis 2.3 predicts that an increasingly stringent reporting environment induces managers to define CGUs and estimate the value in use of CGUs more prudently. This is captured by $Enforce_{jt}$ (standalone basis). The coefficient on $Enforce_{jt}$ should be positive, indicating that the more stringent

[36] During and, in particular, after the global financial crisis of 2008–2009, the intensity of industry write-offs was high (see Appendix 2.2: Pearson correlation matrix). Yet, column 7 documents that the coefficients on all variables that capture the periods of intense scrutiny over a firm's financial reporting are positive. Thus, after controlling for the periods during the crisis (FC_j) and after the crisis ($AfterFC_j$), a high intensity of industry impairments ($Ind\#IL_{jt}$) triggers impairment charges of peer firms.

the reporting environment is, the more likely it is that impairment losses are reported in financial statements.

Table 2.6: Influence of an increasingly stringent reporting environment on a systematic and prudent application of IAS 36 requirements

Variable	Sign	Probit
Intercept	?	-1.923***
		(13.273)
$Enforce_{jt}$	+	0.454***
		(4.317)
$Return_{jt}$	-?	-0.025
		(0.268)
$Return_{jt}$*$Enforce_{jt}$	-?	-0.078
		(1.196)
$Beta_{jt}$	+?	0.148
		(1.621)
$Beta_{jt}$*$Enforce_{jt}$	+?	-0.044
		(0.670)
MtB_{jt}	-?	-0.014
		(0.210)
MtB_{jt}*$Enforce_{jt}$	-?	-0.094**
		(1.978)
#CGU_{jt}	+?	0.008
		(0.524)
#CGU_{jt}*$Enforce_{jt}$	+?	0.032***
		(2.896)
$BinaryLagIL_{jt-1}$	+	1.298***
		(10.441)
$BinaryLagIL_{jt-1}$*$Enforce_{jt}$	0	-0.062
		(0.710)
# of obs.		13549
Pseudo R2		0.221
Percent classified correctly		77.22

Table 2.6: Continued

Table 2.6 reports the results of the probit regression to test whether IAS 36 requirements are applied more systematically (hypothesis 2.2) and more prudently (hypothesis 2.3) as the stringency of the reporting environment increases. Hypothesis 2.2 is tested using the interacting term between $Enforce_{jt}$ and the determinants that capture IAS 36 requirements. Hypothesis 2.3 is tested using $Enforce_{jt}$ on a standalone basis. The dependent variable $BinaryIL_{jt}$ separates the sample into the occurrence and nonoccurrence of IAS 36 impairments. For a description of $BinaryIL_{jt}$ see Table 2.5 and for all variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Table 2.6 shows that while the coefficients on MtB_{jt} and $\#CGU_{jt}$ are insignificantly different from zero, the coefficient on $MtB_{jt}*Enforce_{jt}$ is significantly negative and the coefficient on $CGU_{jt}*Enforce_{jt}$ is significantly positive. The results imply that the more stringent the reporting environment is, the more likely it is that the market-to-book ratio and the number of CGUs is systematically linked to the occurrence of impairments so that an overstatement of assets is avoided. Thus, evidence is provided that firms operating in a stringent reporting environment are more likely to define CGUs as required by IAS 36 than firms operating in a weak reporting environment. Accordingly, the findings also imply that in a weak reporting environment CGUs are exploited to mask impaired assets, resulting in an overstated asset base. The results confirm hypothesis 2.2 and, whereas I do not find evidence that the reporting environment impacts managers' exploitation or nonexploitation of discretion in projecting future net cash flows and discount rates, the idea that a weak reporting environment encourages opportunistic identification of CGUs supplements the findings in prior studies (Finch 2006; Carlin et al. 2010; Petersen and

Plenborg 2010; Carlin and Finch 2011; Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Kim et al. 2003).

In Table 2.6, the coefficient on $Enforce_{jt}$ is positive to $BinaryIL_{jt}$. This suggests that the more stringent the reporting environment is, the more likely it is that firms report impairment charges in financial statements. The findings imply that when enforcement is stringent, managers apply IAS 36 requirements (use discretion) prudently so that impairment losses (bad news about a firm's asset quality) are released earlier rather than later (or not at all). This confirms hypothesis 2.3.

The positive coefficient on $Enforce_{jt}$ in Table 2.6 might imply that in a stringent reporting environment managers understate assets opportunistically, whereas in a weak reporting environment managers overstate assets opportunistically. This argument is to some extent supported by the coefficients on $Return_{jt}$, $Return_{jt}*Enforce_{jt}$, $Beta_{jt}$, and $Beta_{jt}*Enforce_{jt}$. These coefficients are insignificantly different from zero, which can indicate that in both environments managers do not apply the requirements systematically with respect to projecting future net cash flows and estimating discount rates.

To my knowledge, prior studies did not explicitly suggest that managers report impairment losses in operating income to understate assets opportunistically in a stringent reporting environment. Some studies find that managers (in particular, recently appointed managers) report large amounts of impairments in financial statements (take a big bath), which can indicate that they understate assets to avoid reporting impairments (boost earnings) in future years (e.g., Zucca and Campbell 1992; Cotter et al. 1998; Riedl 2004; Vanza et al. 2011). Yet, those studies do not discriminate between stringent and weak reporting environments. In addition, the findings in those studies could also indicate that managers are induced to report accumulated economic losses in financial statements and/or estimate the value of assets prudently to avoid litigation. Finally, the estimation procedure of IAS 36 impairments is more an art than a science. Thus, estimates of values in use of CGUs are subject to unintentional errors (see also Hoogendoorn 2006; Petersen and Plenborg 2010). Accordingly, a firm's asset base can be overstated. An overstatement of assets presumably increases managers' and firms' risk of litigation, in particular, when the firms issue financial statements in a stringent reporting environment. To reduce the likelihood of litigation, managers can estimate the value of a firm's asset base prudently. As a result, an understatement of assets in a stringent reporting environment is more likely driven by managers' concern of litigation than by managers' opportunistic behavior (see also Ball et al. 2000; Ball et al. 2003; Kim et al. 2003).

The literature, however, finds that managers avoid reporting impairments in financial statements, resulting in an overstatement of assets (see section 2.2.2). This phenomenon is, in particular, attributable to managers' reluctance to provide information about the deterioration of a firm's asset base (Kothari et al. 2009). Consequently, when the reporting environment is stringent, I argue that managers on average use discretion to avoid an overstatement of assets, which can result in an understatement of assets. This practice likely decreases managers' and firms' risk of litigation.[37]

Table 2.7 exhibits the OLS regression analysis for testing hypothesis 2.4 that predicts that each determinant that reflects a stringent reporting

[37] While an overstatement of assets implies that managers withhold bad news about a firm's asset quality, an nonopportunistic understatement of assets indicates that bad news about a firm's asset quality is released at an early stage of the decline in value the firm's asset base. Thus, an understatement of assets should be preferable to an overstatement of assets to investors, and should reduce managers' and firms' risk of litigation.

environment affects the magnitude of impairment losses—captured by the dependent variable $ILTA_{jt}$. Thus, all coefficients on the variables within the category "reporting environment" should be significantly different from zero. This analysis provides further evidence on how managers avoid an overstatement of assets in a strong reporting environment. Determinants (variables) related to IAS 36 requirements (category: "IAS 36 requirements") are used to document that the amount of IAS 36 impairment losses reported in a European firm's financial statements is on average systematically related to IAS 36 requirements. Subsequently, the determinants are used as control variables in testing hypothesis 2.4. Since I use impairers only, the OLS regression analysis is restricted to 4,426 firm-year observations.

Focusing on the determinants (variables) of IAS 36 requirements: Column 1 of Table 2.7 shows that the coefficients on all variables have the predicted signs and are strongly significantly related to $ILTA_{jt}$. The findings imply that firms that perform worse and bear higher equity risk report larger amounts of impairment charges in financial statements. Furthermore, results suggest that firms that have higher market-to-book ratios, have more CGUs, and have reported impairment losses in financial statements in the previous period report smaller amounts of impairment charges.[38] In summary, the findings including those in Table 2.5 suggest that managers on average report impairment losses in coherence with IAS 36 requirements.[39]

[38] Beatty and Weber (2006) find no evidence that the number of CGUs impacts the magnitude of goodwill impairments. Yet, the authors apply a sample taken between the transition from SFAS 121 to SFAS 142 to explicitly analyze managers' opportunistic behavior. My findings are inconsistent with Vanza et al. (2011), where no relation between the magnitude of IAS 36 impairment charges and the number of CGUs is suggested. However, the sample differed from mine in that the authors studied large Australian firms that are expected to report impairments.

[39] The results imply that the process of comparing the derived values in use of identified CGUs with their book values is systematically related to IAS 36 requirements captured by MtB_{jt}, $\#CGU_{jt}$, and $BinaryLagIL_{jt-1}$. This, however, also suggest that firms' impairment reporting

Next, I control for the variables (determinants) related to IAS 36 requirements and I include into the regression the variables that capture a stringent reporting environment one by one (columns 2–6) and all at once (column 7). Table 2.7 is organized in a manner equivalent to Table 2.5.

Columns 2–7 of Table 2.7 exhibit that all variables are related to $ILTA_{jt}$, confirming hypothesis 2.4. Furthermore, whereas the coefficients on $Rule_{j2006}$, FC_j, $AfterFC_j$, and $Ind\#IL_{jt}$ are positive, the coefficients on $AnFol_{jt}$ and $Big4_{jt}$ are negative. Thus, evidence is provided that a stringent country-level enforcement system and periods of intense scrutiny over a firm's financial reporting encourage managers to report large impairment charges.[40]

depends on firms' amount of unrecognized economic values. The amount of unrecognized economic values is firm and time specific, which reduces the comparability of financial statements across firms and time periods.

[40] After controlling for economic performance, Francis et al. (1996) provide evidence that the amounts of inventory and restructuring charges are positively and the amount of goodwill impairments is negatively related to the intensity of industry write-offs. The study's results are in part consistent with results in this study. However, Francis et al. (1996) use a time period in which no specific impairment standard was in place for long-term assets (pre-SFAS 121 sample) and the authors' proxy for the intensity of industry impairments differs from my proxy; they add the number of write-offs of peer firms of the previous five years.

Table 2.7: Influence of determinants that capture a stringent reporting environment on the amount of IAS 36 (nonzero) impairment losses

Category	Variable	Sign	IAS 36 requirements	$Rule_{j2006}$	FC_j/ $AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	Full
			(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Intercept	?	0.036***	0.026***	0.031***	0.029***	0.037***	0.042***	0.021***
			(13.503)	(10.881)	(11.896)	(8.355)	(13.744)	(12.748)	(5.480)
IAS 36 requirements									
	$Return_{jt}$	-	-0.009***	-0.008***	-0.007***	-0.009***	-0.009***	-0.009***	-0.008***
			(4.856)	(4.666)	(3.326)	(4.881)	(5.327)	(4.976)	(3.799)
	$Beta_{jt}$	+	0.008***	0.007***	0.006***	0.008***	0.009***	0.008***	0.007***
			(4.632)	(4.455)	(3.838)	(4.588)	(5.339)	(4.688)	(4.287)
	MtB_{jt}	-	-0.008***	-0.010***	-0.008***	-0.008***	-0.006***	-0.007***	-0.008***
			(6.348)	(7.783)	(6.462)	(6.337)	(4.522)	(5.945)	(6.091)
	$\#CGU_{jt}$	-	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.002***	-0.001***
			(8.283)	(8.703)	(8.223)	(8.305)	(5.846)	(7.031)	(5.902)
	$BinaryLagIL_{jt-1}$	-	-0.007***	-0.006***	-0.006***	-0.007***	-0.005***	-0.006***	-0.005***
			(3.915)	(3.856)	(3.810)	(4.211)	(2.804)	(3.549)	(2.911)

Table 2.7: Continued

Reporting environment									
	$Rule_{j2006}$	≠0		0.018***					0.018***
				(11.382)					(11.239)
	FC_j	≠0			0.010***				0.007***
					(4.025)				(2.903)
	$AfterFC_j$	≠0			0.008***				0.006***
					(5.299)				(3.617)
	$Ind\#IL_{jt}$	≠0				0.022**			0.020**
						(2.468)			(2.088)
	$AnFol_{jt}$	≠0					-0.005***		-0.004***
							(5.990)		(4.012)
	$Big4_{jt}$	≠0						-0.012***	-0.009***
								(4.094)	(3.215)
# of obs.			4426	4426	4426	4426	4426	4426	4426
Adj. R2			0.069	0.096	0.074	0.070	0.079	0.076	0.114

Table 2.7: Continued

Table 2.7 reports the results of the OLS regression to test hypothesis 2.4 that predicts that each determinant that captures a stringent reporting environment influences the amount of (nonzero) impairment charges. The dependent variable $ILTA_{jt}$ is the pretax amount of IAS 36 impairment losses in fiscal year (*t*) deflated by lagged (*t-1*) total assets of firm (*j*). IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Determinants that capture IAS 36 requirements are used to show that impairment losses are on average reported systematically in a European setting. Subsequently, they are used as control variables in testing hypothesis 2.4. For a description of the variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

A stringent country-level enforcement system is assumed to be permanently stringent over the sample period. Accordingly, managers are less likely to report large amounts of impairment charges in financial statements to account for previously unaccounted economic losses (i.e., assets were less likely overstated in previous periods in a stringent country-level enforcement system). As a result, findings indicate that managers estimate the asset base prudently to avoid litigation, which leads to reports of large impairment charges and might result in an understatement of assets. This argument is consistent with prior studies (Ball et al. 2000; Ball et al. 2003).[41] In periods of intense scrutiny over a firm's financial reporting managers might have reported large amounts of impairment charges to understate assets. Yet, the move to a more stringent reporting environment possibly encourages managers to account for previous unaccounted economic losses so that assets are not overstated any longer.

Finally, findings suggest that firm-specific determinants that capture a stringent reporting environment induce managers to report losses of smaller magnitude in financial statements. Because these determinants are positively aligned to the likelihood of impairments (see Table 2.5) (and possibly capture a permanent rather than temporary stringent reporting environment), the results probably suggest that managers are induced to impair assets frequently, which, in turn, reduces the magnitude of losses.

[41] Again, I do not refer to an opportunistic understatement of assets since this is unlikely the driver in a stringent country-level enforcement system. The understatement of assets is possibly driven by managers' and firms' risk of litigation as argued previously (see also Ball et al. 2000; Ball et al. 2003). In addition, as documented in Kaufmann et al. (2009), Ireland is above and the United Kingdom is just below the median in 2007 and 2008. Using for 2006 the United Kingdom and for the other years Ireland (instead of the U.K.) as countries with stringent country-level enforcement systems keeps results essentially the same. However, a stringent country-level enforcement system does not affect the magnitude of impairment losses, which mitigates concern that assets are understated in such a system.

Taken together, I show that impairment reporting is not only a function of the requirements set forth in IAS 36, it is also is a function of the stringency of the reporting environment. My findings imply that in a stringent reporting environment managers' inclination to overstate assets is curbed and they are encouraged to apply the requirements of IAS 36 more systematically and prudently than managers issuing financial statements in a weak reporting environment. In addition, I find some evidence that managers recognize economic losses previously unaccounted for or report impairments frequently in financial statements to avoid an overstatement of assets. Managers might be even induced to understate assets in a stringent reporting environment to reduce risk of litigation. These findings imply that managers' various uses of discretion in estimating impairments reduce the comparability of operating performance across firms and time periods. Increasing the comparability of firms' operating performance is one of the IASB's major goals (IASB 2010).

2.6 Additional sensitivity analyses

In this section, I analyze whether the results reported in Tables 2.5, 2.6, and 2.7 are robust after controlling for firm size and financial leverage. Both variables are used by prior write-off studies as control or test variables (Francis et al. 1996; Cotter et al. 1998; Beatty and Weber 2006; Godfrey and Koh 2009; Vanza et al. 2011). Consequently, I introduce into my models two new firm-specific determinants that might drive reports of impairment charges in financial statements and thus might affect my main results.

Stice (1991) and Heninger (2001) find a positive association between firm size and risk of litigation. Plaintiffs (capital suppliers) potentially pursue cases of alleged audit failure in those instances where their losses are the largest (Stice 1991). Furthermore, political cost exposure is potentially higher for large firms than for small firms. Stakeholders tend to pay more attention to large firms due to their large wealth, which needs to be allocated to the stakeholders (Watts and Zimmerman 1990). To reduce their wealth and hence their exposure to public scrutiny, large firms possibly reduce earnings through asset impairments (Godfrey and Koh 2009). Consequently, large firms are more likely to frequently report impairment losses in financial statements, which, in turn, should lead to reports of small amounts of impairment charges.

Equity acts as a protection against losses of senior capital. Thus, debtholders in highly leveraged firms are more concerned about the transfer of a firm's wealth to shareholders (and managers) than debtholders in low leveraged firms (Easton et al. 2011). In addition, the higher the claim of debtholders on a firm's assets (i.e., the higher a firm is leveraged financially), the greater the influence of debtholders on the firm's decision making power (Ahmed et al. 2002). Consequently, highly leveraged firms are possibly more conservative than low leveraged firms (see also Watts 2003; Ahmed and Guler 2007; Ball et al. 2008; Easton et al. 2011).[42] Thus, highly leveraged firms might frequently report impairment charges in financial statements, which, in turn, should reduce the magnitude of impairment losses. However, highly leveraged firms might also evade reporting impairment charges in financial statements to avoid violating the debt covenant, reducing the likelihood of impairment reports.

Both firm size and financial leverage could have been incorporated as firm-specific determinants of impairment losses. Yet, to avoid an

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[42] That is, debtholders are more interested than shareholders in encouraging managers to report (unrealized) losses immediately and gains only when they are realized in future years.

overspecification of my models, and due to ambiguous hypotheses for financial leverage, they are used as control variables only.

Firm size ($Size_{jt}$) is equal to the natural logarithm of market capitalization of firm (*j*) at the end of fiscal year (*t*) (Beatty and Weber 2006; Easton et al. 2011). To allow for various currencies across European countries, I translate the market capitalization of firms operating in noneurozone countries to euro values using the average exchange rate of May 2011, coherent with the sample selection date. I take the natural logarithm to account for nonlinearity. Financial leverage ($Leverage_{jt}$) is measured by long-term debts over total assets of firm (*j*) at the end of fiscal year (*t*) (Beatty and Weber 2006; Godfrey and Koh 2009; Easton et al. 2011).

After controlling for both variables, the results outlined in Appendix 2.3 (Table 2.5 retabulated) are essentially unchanged from those in Table 2.5.[43] The results indicate that managers of European firms on average report IAS 36 impairment charges systematically. In addition, the coefficient on each variable (determinant) that captures a stringent reporting environment is positive. This suggests that assets are less likely overstated in a stringent reporting environment than in a weak reporting environment, confirming hypothesis 2.1.

In Appendix 2.4 (Table 2.6 retabulated) the findings are essentially the same as those in Table 2.6. The coefficient on $MtB_{jt}*Enforce_{jt}$ is negative and the coefficient on $CGU_{jt}*Enforce_{jt}$ is positive, which provides evidence that a stringent reporting environment curbs managers' use of discretion in opportunistically defining CGUs to hide impaired assets. Thus,

[43] Due to missing data on $Leverage_{jt}$, the sample declines to 13.522 firm-year observations. When impairers are applied only (Appendix 2.5), the sample declines to 4,423 firm-year observations.

in a stringent reporting environment managers report impairments in financial statements more systematically than managers in a weak reporting environment, confirming hypothesis 2.2. Also, the coefficient on $Enforce_{jt}$ is still positive, which is consistent with the idea that managers are encouraged to define and estimate the value in use of CGUs prudently in a strong reporting environment (hypothesis 2.3).

The results documented in Appendix 2.5 (Table 2.7 retabulated) are essentially unchanged from those in Table 2.7. Yet, in Appendix 2.5 it is striking that the coefficient on $AnFol_{jt}$ is positive (0.003, column 5 and 0.002, column 7) and the coefficient on $Big4_{jt}$ is insignificantly negative (-0.004, column 6) but significantly negative when using all determinants that capture a stringent reporting environment (-0.006, column 7). Yet, $Size_{jt}$ is strongly correlated to $AnFol_{jt}$ and $Big4_{jt}$ (see Appendix 2.2: Pearson correlation matrix), which can induce mulitcollinearity issues. Thus, results might be driven by the fact that the variables proxy for the same underlying characteristics.[44]

[44] Further untabulated results show that the Variance Inflation Factors (VIFs) for $Size_{jt}$, $AnFol_{jt}$, and $Big4_{jt}$ are well below the critical value of 10. This indicates that no mulitcollinearity issues are present (see also Anderson et al. 2009, 578; Woolridge 2009, 99). Yet, VIFs are highest for $Size_{jt}$ (3.92) and $AnFol_{jt}$, (2.94), and just looking at the value of VIF might be of limited use to infer that both determinants (variables) do not affect each other (Woolridge 2009, 99). Thus, I exclude $Size_{jt}$ and measure again the VIF for $AnFol_{jt}$. I find that the VIF for $AnFol_{jt}$ declines from 2.94 to 1.63. This suggests that $AnFol_{jt}$ and $Size_{jt}$ proxy partly for the same underlying characteristics, which possibly affects the coefficient on $AnFol_{jt}$. In addition, the coefficient on $Size_{jt}$ is significantly positive when $BinaryIL_{jt}$ is employed as a dependent variable, documented in Appendix 2.3. Thus, the larger the firm is, the more likely it is that impairments are reported in financial statements. This implies that firm size represents a firm-specific determinant that captures a stringent reporting environment in which managers' overstatement of the asset base is restricted. Appendix 2.5 documents that the coefficient on $Size_{jt}$ is significantly negative to $ILTA_{jt}$. This suggest that the larger the firm is, the lower the amount of impairment charges is and the more regularly assets are possibly restated. Consequently, I imply that firm-specific determinants related to a stringent reporting environment in general induce managers to report small amounts of impairment charges and possibly to restate assets more frequently to avoid an overstatement of a firm's asset base.

2.7 Summary, conclusions, and limitations

Prior studies indicate that discretional asset impairments are aligned to economic factors, but also to managers' desire to avoid reporting impairment losses (bad news) in financial statements (e.g., Francis et al. 1996; Cotter et al. 1998; Riedl 2004; Beatty and Weber 2006; Boone and Raman 2007; Vanza et al. 2011; Li et al. 2011; Li and Sloan 2011; Ramanna and Watts 2012). This study provides further evidence on managers' use of discretion in impairment reporting by analyzing the effect of the reporting environment on managers' application of IAS 36 requirements.

I expect that a stringent reporting environment curbs managers' tendency to exploit IAS 36 requirements. In a stringent reporting environment a firm's financial reporting is carefully scrutinized. As a result, an overstatement of a firm's asset base is likely to be detected, possibly increasing managers' and firms' risk of litigation. Accordingly, managers are less likely to overstate a firm's asset base in a stringent reporting environment.

To conduct my analysis, I identify determinants of impairment charges that capture IAS 36 requirements to show that, on average, managers of European firms report impairments systematically (i.e., in accordance with the requirements of IAS 36). Next, I use the determinants related to IAS 36 requirements as control variables and identify determinants that capture a stringent reporting environment to test my four hypotheses.

I predict that each determinant related to a stringent reporting environment increases the occurrence of impairments and hence curbs managers' overstatement of assets (hypothesis 2.1). Managers can avoid an overstatement of assets in two ways (not mutually exclusive). First, managers might apply systematically the elements of the value in use approach set forth in IAS 36, a practice that I expect to be more pronounced in a stringent reporting environment than in a weak reporting environment (hypothesis 2.2). Second, managers might use discretion prudently by defining more rather than fewer CGUs and estimating smaller rather than larger values in use of the defined GGUs. I expect such prudent behavior in a stringent reporting environment (hypothesis 2.3). Reporting systematic and prudent impairment losses leads to informing investors about the deterioration of asset quality earlier rather than later (or not at all) so that managers' and firms' risk of litigation declines. Finally, to provide further evidence on how managers avoid an overstatement of assets. I predict that managers report large amounts of impairment charges to account for previous economic losses that have not been accounted for or report small amounts of impairment charges, possibly indicating that managers regularly adjust the asset base (hypothesis 2.4).

I find that, in general, managers report impairment losses systematically. After controlling for IAS 36 requirements, I find that in a stringent reporting environment managers are more likely to impair CGUs than managers in a weak reporting environment. This implies that a stringent reporting environment curbs managers' inclination to overstate assets (hypothesis 2.1). The findings supplement results in Vanza et al. (2011). The authors find (unexpectedly) that investors' uncertainty of impairers' asset quality is lower than investors' uncertainty of nonimpairers' asset quality. This suggests that managers are not motivated by investors' uncertainty about a firm's asset quality to report impairment charges in financial statements. My findings provide evidence that managers are encouraged to impair CGUs in a stringent reporting environment in which a firm's financial reporting is carefully scrutinized.

In addition, I find evidence that in a stringent reporting environment managers avoid an overstatement of assets by applying IAS 36 requirements more systematically (hypothesis 2.2) and prudently (hypothesis 2.3) than managers in a weak reporting environment. Turning to hypothesis 2.2: I interact an increasing stringent reporting environment with determinants of impairments that capture the elements of the value in use approach set forth in IAS 36. I find that determinants that capture the comparison of the values in use of identified CGUs with their book values are systematically aligned with the occurrence of reports of impairments when the reporting environment is stringent. This implies that in a weak reporting environment managers exploit CGUs to mask impaired assets. This might be, for instance, accomplished by defining fewer CGUs than required, to hide impaired assets in CGUs with (large) unrecognized economic values. Thus, reports of impairments are avoided. The evidence in this study that a stringent reporting environment curbs managers' opportunistic use of discretion in overstating the asset base supplements prior literature (Finch 2006; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011; Ball et al. 2000; Ball et al. 2003; Leuz et al. 2003; Kim et al. 2003).

Turning to hypothesis 2.3: I find that as the stringency of the reporting environment increases, the occurrence of impairments increases. This implies that managers apply the requirements of IAS 36 more prudently in a stringent reporting environment than in a weak reporting environment. Defining CGUs and estimating the value in use of the defined CGUs are more an art than a science. Thus, estimates of values in use of CGUs are prone to unintentional errors (see also Hoogendoorn 2006; Petersen and Plenborg 2010) so that a firm's asset base can be overstated.

To reduce the likelihood of an overstatement of the asset base, I argue that in a stringent reporting environment managers on average apply IAS 36 requirements prudently, this practice can lead to an understatement of assets (see also Ball et al. 2000; Ball et al. 2003; Kim et al. 2003).

Results for hypothesis 2.4 reveal that in a stringent country-level enforcement system large amounts of impairment charges are reported in financial statements. Since a stringent country-level enforcement system is possibly permanently stringent, large amounts of impairment losses are less likely reported to account for previously unaccounted economic losses. Accordingly, results suggest that managers estimate the asset base (i.e., the amount of impairment charges) prudently to reduce risk of litigation, this practice can lead to an understatement of assets, consistent with the view of prior literature (Ball et al. 2000; Ball et al. 2003). In addition, I find that in periods of intense scrutiny over a firm's financial reporting managers recognize large impairment charges. This can indicate that assets are understated and that, in particular, accumulated economic losses are reported in financial statements (i.e., the firm's financial reporting was potentially not carefully scrutinized beforehand so that the asset base might have been overstated). In contrast, I find some evidence that firm-specific determinants that capture a stringent reporting environment encourage managers to report losses of small magnitude. Since I find that firm-specific determinants that capture a stringent reporting environment increase the occurrence of impairment losses (hypothesis 2.1), results possibly indicate that in such a stringent reporting environment managers are encouraged to adjust a firm's asset base frequently, this practice likely leads to low amounts of impairment charges.

Overall, my results imply that managers' use of discretion in reporting impairments to assets varies depending on the reporting environment. The various uses of discretion lead to substantial heterogeneity in impairment reporting, reducing the comparability of operating performance across firms and time periods. Accordingly, the findings should be of interest to the research community, standard setters, accountants, and users of financial statements.

My findings are consistent across various tests; their implications are based on two aspects. First, my results imply that a firm's financial reporting was more scrutinized and the requirements of IAS 36 were more conservatively applied after the global financial crisis of 2008–2009 than before the crisis. Yet, the results do not suggest that this is a lasting stringent reporting environment. A richer data set comprising a longer period after the crisis might determine whether the crisis began a new era of intense scrutiny over a firm's financial reporting.

Second, in combination with prior studies my findings provide evidence that a stringent reporting environment encourages managers to avoid an overstatement of the asset base. However, I cannot exclude the possibility that a stringent reporting environment and hence a possible high risk of litigation induces managers to understate assets, which might increase rather than decrease investors' uncertainty about the quality of a firm's assets.

Future studies can address the limitations of this study. Particularly, it would be interesting to examine whether the amount of information provided to investors through reports of IAS 36 impairment losses in financial statements depends on the stringency of the reporting environment.

Appendix 2.1
Variable list

Notation	Calculation
Dependent Variables	
BinaryIL$_{jt}$	Binary variable equal to unity if firm (*j*) reports IAS 36 impairment losses in fiscal year (*t*) and zero otherwise. IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Data are obtained from Datastream.
ILTA$_{jt}$	Pretax amount of IAS 36 impairment losses in fiscal year (*t*) deflated by lagged (*t-1*) total assets of firm (*j*). IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Data are obtained from Datastream.
IAS 36 requirements	
Return$_{jt}$	Dividend adjusted share price returns of firm (*j*) measured for fiscal year (*t*) over the period from (*t-1*) to (*t*). Data are obtained from Datastream.
Beta$_{jt}$	Absolute beta of firm (*j*) is measured for the end of fiscal year (*t*) using 36 monthly dividend adjusted share price returns from (*t-3*) to (*t*). The returns of firm (*j*) need to be available in sequence and are regressed on market returns. Market returns are proxied by summing weighted monthly returns of all noninsurance, nonfinancial, and nonreal estate firms that apply IFRS according to the sampling requirements set out in Table 2.1 (sample selection criteria) but before sample reductions. The weights are based on firms' market capitalizations by multiplying common shares outstanding and the monthly share price. The coefficient on market returns is the beta factor. The absolute value of the beta factor is taken. Data are obtained from Datastream.
MtB$_{jt}$	Natural logarithm of the ratio of market value of equity to book value of equity before IAS 36 impairment losses of firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream.

Appendix 2.1
Continued

$\#CGU_{jt}$	Number of cash generating units based on the diversification level proxied by the aggregated number of geographic and product segments of firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream.
$BinaryLagIL_{jt-1}$	Binary variable equal to unity if firm (*j*) reported IAS 36 impairment losses in fiscal year (*t-1*) and zero otherwise.
Reporting Environment	
$Rule_{j2006}$	Binary variable equal to unity if firm (*j*) operates in a country in which the "*rule of law*" measure in the year 2006, drawn from Kaufamnn et al. (2007), is above the median 1.675 and zero otherwise.
$BeforeFC_j$	Binary variable equal to unity for firm (*j*) if the fiscal year ends before August 2008 and zero otherwise.
FC_j	Binary variable equal to unity for firm (*j*) if the fiscal year ends after July 2008 and before August 2009 and zero otherwise.
$AfterFC_j$	Binary variable equal to unity for firm (*j*) if the fiscal year ends after July 2009 and zero otherwise.
$Ind\#IL_{jt}$	Proportion of IAS 36 impairment observations to the total number of observations of firms that are in the same industry (SIC code 1) and whose fiscal year ends within a specified time frame related to fiscal year end (*t*) of firm (*j*). The time frame spans from fiscal year (*t*) to 11 months before fiscal year (*t*) of firm (*j*). The proportion is calculated based on the initial IFRS sample as outlined in Table 2.1 but before any sample reductions. At least five total observations are required within the industry and in the time frame.

Appendix 2.1
Continued

$AnFol_{jt}$	Natural logarithm of 1 + the number of analysts following firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream. Note: If the number of analysts following firm (*j*) at the end of fiscal year (*t*) is not available, the number is assumed to be zero. The rationale is that no zero values are exhibited by Datastream (IBES).
$Big4_{jt}$	Binary variable equal to unity if firm (*j*) is audited at the end of fiscal year (*t*) by Ernst & Young, PWC, Deloitte & Touche, or KPMG and zero otherwise. Data are obtained from Datastream.
$Enforce_{jt}$	Sum of all determinants that capture the reporting environment. For nonbinary variables (determinants) $Ind\#IL_{jt}$ and $AnFol_{jt}$, the median is calculated. Based on the median, a binary variable is created equal to unity if the number of the variable (determinant) of firm (*j*) in fiscal year (*t*) is above the median and zero otherwise. Next, 1 is added to the index and the natural logarithm is taken.

Additional tests

$Leverage_{jt}$	Long-term debts over total assets of firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream.
$Size_{jt}$	Natural logarithm of market capitalization of firm (*j*) at the end of fiscal year (*t*). To allow for various currencies across European countries, I translate the market capitalization of firms operating in noneurozone countries to euro values using the average exchange rate of May 2011. Data are obtained from Datastream.

Appendix 2.2
Pearson correlation matrix

Panel A. Full sample

Variable	$BinaryIL_{jt}$	$Return_{jt}$	$Beta_{jt}$	MtB_{jt}	$\#CGU_{jt}$	$Binary LagIL_{jt-1}$	$Rule_{j2006}$	$BeforeFC_j$	FC_j	$AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	$Leverage_{jt}$	$Size_{jt}$
$BinaryIL_{jt}$	1.0000														
$Return_{jt}$	-0.0347*	1.0000													
$Beta_{jt}$	0.0968*	0.0866*	1.0000												
MtB_{jt}	-0.0504*	0.3018*	-0.0130	1.0000											
$\#CGU_{jt}$	0.2508*	0.0523*	0.1354*	0.0198*	1.0000										
$BinaryLagIL_{jt-1}$	0.4769*	0.0457*	0.0834*	0.0048	0.2369*	1.0000									
$Rule_{j2006}$	0.0424*	0.0415*	-0.0042	0.2505*	0.0351*	0.0604*	1.0000								
$BeforeFC_j$	-0.0578*	0.0825*	-0.1275*	-0.0112	0.0090	-0.0280*	-0.0311*	1.0000							
FC_j	0.0230*	-0.4826*	0.0128	-0.1315*	-0.0165*	-0.0546*	0.0280*	-0.3825*	1.0000						
$AfterFC_j$	0.0359*	0.3250*	0.1110*	0.1207*	0.0052	0.0724*	0.0062	-0.6342*	-0.4718*	1.0000					
$Ind\#IL_{jt}$	0.1241*	0.0059	0.0440*	-0.0243*	0.0601*	0.1055*	-0.0484*	-0.3259*	0.0730*	0.2499*	1.0000				
$AnFol_{jt}$	0.2873*	0.0467*	0.1869*	0.2450*	0.4417*	0.2720*	0.1050*	0.0373*	-0.0114	-0.0260*	0.1159*	1.0000			
$Big4_{jt}$	0.1758*	0.0280*	0.0561*	0.1424*	0.2695*	0.1677*	0.1442*	0.0477*	-0.0223*	-0.0268*	0.0385*	0.4147*	1.0000		
$Leverage_{jt}$	0.1138*	-0.0356*	0.0635*	-0.0944*	0.1589*	0.0947*	-0.0668*	0.0003	0.0077	-0.0067	0.1397*	0.2624*	0.1332*	1.0000	
$Size_{jt}$	0.2865*	0.1842*	0.0911*	0.3179*	0.4922*	0.2807*	-0.0044	0.1719*	-0.1241*	-0.0603*	0.1392*	0.7953*	0.4416*	0.2571*	1,0000

Appendix 2.2
Continued

Panel B. BinaryIL sample

Variable	$ILTA_{jt}$	$Return_{jt}$	$Beta_{jt}$	MtB_{jt}	$\#CGU_{jt}$	$Binary\ LagIL_{jt-1}$	$Rule_{j2006}$	$BeforeFC_j$	FC_j	$AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	$Leverage_{jt}$	$Size_{jt}$
$ILTA_{jt}$	1.0000														
$Return_{jt}$	-0.1508*	1.0000													
$Beta_{jt}$	0.0569*	0.1004*	1.0000												
MtB_{jt}	-0.1645*	0.3523*	-0.0272*	1.0000											
$\#CGU_{jt}$	-0.1613*	0.1039*	0.1298*	0.0153	1.0000										
$BinaryLagIL_{jt-1}$	-0.0976*	0.0910*	0.0481*	0.0616*	0.1536*	1.0000									
$Rule_{j2006}$	0.1357*	0.0385*	0.0254*	0.1741*	0.0263*	0.0008	1.0000								
$BeforeFC_j$	-0.1000*	0.0635*	-0.1670*	0.0102	0.0179	0.0193	0.0118	1.0000							
FC_j	0.1211*	-0.5261*	0.0047	-0.1873*	-0.0539*	-0.0828*	0.0406*	-0.3633*	1.0000						
$AfterFC_j$	-0.0110	0.3891*	0.1495*	0.1500*	0.0293*	0.0527*	-0.0454*	-0.6101*	-0.5165*	1.0000					
$Ind\#IL_{jt}$	0.0300*	0.0159	0.0362*	0.0035	0.0557*	0.0931*	-0.0119	-0.3216*	0.0777*	0.2295*	1.0000				
$AnFol_{jt}$	-0.1838*	0.0714*	0.1734*	0.2344*	0.4220*	0.2156*	0.0123	0.0623*	-0.0102	-0.0486*	0.1256*	1.0000			
$Big4_{jt}$	-0.1452*	0.0405*	0.0370*	0.0878*	0.2907*	0.1143*	0.0495*	0.0653*	-0.0280*	-0.0363*	0.0713*	0.4099*	1.0000		
$Leverage_{jt}$	-0.0824*	-0.0284*	0.0579*	-0.0593*	0.1453*	0.0600*	-0.0420*	-0.0132	0.0083	0.0051	0.1367*	0.2484*	0.1308*	1.0000	
$Size_{jt}$	-0.2814*	0.2219*	0.0550*	0.3334*	0.4992*	0.2539*	-0.0363*	0.1849*	-0.1386*	-0.0521*	0.1579*	0.7847*	0.4489*	0.2188*	1.0000

This table exhibits the Pearson correlations of the regression variables; Panel A exhibits the full sample and panel B exhibits the impairment sample (*BinaryIL*) only. For a description of the variables see Appendix 2.1. * indicates a significance level of less than 10%.

Appendix 2.3

Table 2.5 retabulated by including control variables for financial leverage and firm size:
Influence of determinants that capture a stringent reporting environment on the occurrence of IAS 36 impairment losses

Category	Variable	Sign	IAS 36 requirements	$Rule_{j2006}$	FC_j/ $AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	Full
			(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Intercept	?	-2.710***	-2.863***	-3.018***	-2.914***	-2.342***	-2.667***	-2.963***
			(32.808)	(32.827)	(33.219)	(32.172)	(21.110)	(32.157)	(22.879)
IAS 36 requirements									
	$Return_{jt}$	-	-0.202***	-0.199***	-0.188***	-0.203***	-0.178***	-0.197***	-0.174***
			(8.287)	(8.129)	(6.674)	(8.322)	(7.167)	(8.055)	(6.082)
	$Beta_{jt}$	+	0.125***	0.124***	0.093***	0.122***	0.101***	0.124***	0.080***
			(5.516)	(5.467)	(3.941)	(5.352)	(4.307)	(5.450)	(3.277)
	MtB_{jt}	-	-0.174***	-0.203***	-0.194***	-0.169***	-0.181***	-0.176***	-0.217***
			(9.760)	(10.837)	(10.561)	(9.400)	(10.086)	(9.819)	(11.265)
	$\#CGU_{jt}$	+	0.031***	0.029***	0.028***	0.032***	0.030***	0.030***	0.026***
			(7.484)	(6.989)	(6.730)	(7.675)	(7.137)	(7.236)	(6.165)
	$BinaryLagIL_{jt-1}$	+	1.192***	1.181***	1.181***	1.184***	1.185***	1.188***	1.161***
			(40.014)	(39.496)	(39.337)	(39.682)	(39.706)	(39.795)	(38.434)

Appendix 2.3
Continued

Reporting environment								
$Rule_{j2006}$	+		0.161***					0.144***
			(5.733)					(4.890)
FC_j	+			0.253***				0.199***
				(6.859)				(5.214)
$AfterFC_j$	+			0.261***				0.216***
				(9.240)				(6.952)
$Ind\#IL_{jt}$	+				0.834***			0.517***
					(6.363)			(3.578)
$AnFol_{jt}$	+					0.102***		0.064***
						(4.893)		(3.003)
$Big4_{jt}$	+						0.117***	0.084**
							(3.698)	(2.573)

Appendix 2.3
Continued

Control variables							
$Leverage_{jt}$	0.081	0.091	0.034	0.025	0.036	0.076	-0.016
	(0.840)	(0.935)	(0.344)	(0.258)	(0.369)	(0.781)	(0.165)
$Size_{jt}$	0.126***	0.132***	0.142***	0.121***	0.088***	0.116***	0.111***
	(16.376)	(16.974)	(17.581)	(15.667)	(8.009)	(14.528)	(9.314)
# of obs.	13522	13522	13522	13522	13522	13522	13522
Pseudo R2	0.224	0.226	0.229	0.226	0.225	0.224	0.233
Percent classified correctly	77.80	77.64	77.81	77.84	77.71	77.68	77.72

This table replicates Table 2.5 and reports the results of the probit regression including the control variables financial leverage ($Leverage_{jt}$) and firm size ($Size_{jt}$) to test hypothesis 2.1. Hypothesis 2.1 predicts that each determinant that captures a stringent reporting environment increases the occurrence of impairments. The dependent variable $BinaryIL_{jt}$ separates the sample into the occurrence and nonoccurrence of IAS 36 impairments. For a description of $BinaryIL_{jt}$ see Table 2.5 and for all variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Appendix 2.4

Table 2.6 retabulated by including control variables for financial leverage and firm size: Influence of an increasingly stringent reporting environment on a systematic and prudent application of IAS 36 requirements

Variable	Sign	Probit
Intercept	?	-2.891***
		(18.278)
$Enforce_{jt}$	+	0.355***
		(3.490)
$Return_{jt}$	-?	-0.178*
		(1.847)
$Return_{jt}*Enforce_{jt}$	-?	0.011
		(0.155)
$Beta_{jt}$	+?	0.173*
		(1.924)
$Beta_{jt}*Enforce_{jt}$	+?	-0.063
		(0.980)
MtB_{jt}	-?	0.045
		(0.693)
$MtB_{jt}*Enforce_{jt}$	-?	-0.197***
		(4.130)
$\#CGU_{jt}$	+?	-0.014
		(0.851)
$\#CGU_{jt}*Enforce_{jt}$	+?	0.029***
		(2.579)
$BinaryLagIL_{jt-1}$	+	1.299***
		(10.564)
$BinaryLagIL_{jt-1}*Enforce_{jt}$	0	-0.101
		(1.169)

Appendix 2.4
Continued

Control variables	
$Leverage_{jt}$	-0.005
	(0.047)
$Size_{jt}$	0.111***
	(14.077)
# of obs.	13522
Pseudo R2	0.233
Percent classified correctly	77.65

This table replicates Table 2.6 and reports the results of the probit regression including the control variables financial leverage ($Leverage_{jt}$) and firm size ($Size_{jt}$) to test hypotheses 2.2 and 2.3. The probit regression tests whether IAS 36 requirements are applied more systematically (hypothesis 2.2) and prudently (hypothesis 2.3) as the stringency of the reporting environment increases. Hypothesis 2.2 is tested using the interacting term between $Enforce_{jt}$ and the determinants that capture IAS 36 requirements. Hypothesis 2.3 is tested using $Enforce_{jt}$ on a standalone basis. The dependent variable $BinaryIL_{jt}$ separates the sample into the occurrence and nonoccurrence of IAS 36 impairments. For a description of $BinaryIL_{jt}$ see Table 2.5 and for all variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Appendix 2.5

Table 2.7 retabulated by including control variables for financial leverage and firm size:
Influence of determinants that capture a stringent reporting environment on the amount of IAS 36 (nonzero) impairment losses

Category	Variable	Sign	IAS 36 requirements	$Rule_{j2006}$	FC_j/ $AfterFC_j$	$Ind\#IL_{jt}$	$AnFol_{jt}$	$Big4_{jt}$	Full
			(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Intercept	?	0.081***	0.067***	0.076***	0.072***	0.091***	0.081***	0.062***
			(13.728)	(12.001)	(12.567)	(12.334)	(12.599)	(13.815)	(9.031)
IAS 36 requirements									
	$Return_{jt}$	-	-0.008***	-0.007***	-0.006***	-0.008***	-0.007***	-0.008***	-0.006***
			(4.428)	(4.314)	(2.849)	(4.450)	(3.972)	(4.487)	(2.975)
	$Beta_{jt}$	+	0.008***	0.007***	0.007***	0.007***	0.007***	0.008***	0.006***
			(4.661)	(4.506)	(4.175)	(4.602)	(4.011)	(4.675)	(3.620)
	MtB_{jt}	-	-0.004***	-0.006***	-0.004***	-0.004***	-0.004***	-0.004***	-0.006***
			(3.142)	(4.699)	(3.307)	(2.970)	(3.218)	(3.184)	(4.692)
	$\#CGU_{jt}$	-	-0.001***	-0.001***	-0.001***	-0.001**	-0.001***	-0.001***	-0.001***
			(2.717)	(3.543)	(2.886)	(2.557)	(2.795)	(2.591)	(3.399)
	$BinaryLagIL_{jt-1}$	-	-0.003*	-0.003*	-0.003*	-0.003**	-0.003*	-0.003*	-0.004**
			(1.751)	(1.909)	(1.749)	(2.045)	(1.804)	(1.754)	(2.223)

Appendix 2.5
Continued

Reporting environment								
$Rule_{j2006}$	≠0		0.016***					0.016***
			(10.311)					(10.123)
FC_j	≠0			0.007***				0.004
				(3.009)				(1.575)
$AfterFC_j$	≠0			0.004**				0.002
				(2.573)				(1.399)
$Ind\#IL_{jt}$	≠0				0.039***			0.034***
					(4.257)			(3.448)
$AnFol_{jt}$	≠0					0.003**		0.002*
						(2.363)		(1.949)
$Big4_{jt}$	≠0						-0.004	-0.006**
							(1.348)	(2.094)
Control variables								
$Leverage_{jt}$		-0.015***	-0.014**	-0.015***	-0.017***	-0.016***	-0.014***	-0.018***
		(2.651)	(2.541)	(2.765)	(3.177)	(2.935)	(2.623)	(3.249)
$Size_{jt}$		-0.005***	-0.004***	-0.004***	-0.005***	-0.006***	-0.004***	-0.004***
		(9.616)	(8.685)	(8.884)	(9.950)	(8.868)	(8.762)	(6.946)

Appendix 2.5
Continued

# of obs.	4423	4423	4423	4423	4423	4423	4423
Adj. R2	0.100	0.121	0.102	0.105	0.101	0.101	0.129

This table replicates Table 2.7 and reports the results of the OLS regression including the control variables financial leverage ($Leverage_{jt}$) and firm size ($Size_{jt}$) to test hypothesis 2.4. Hypothesis 2.4 predicts that each determinant that captures a stringent reporting environment influences the amount of (nonzero) impairment charges. The dependent variable is $ILTA_{jt}$. For a description of $ILTA_{jt}$ see Table 2.7 and for a description of all variables see Appendix 2.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

3 Informativeness of nonopportunistic impairment losses to investors

Abstract

This chapter examines whether investors benefit from managers' nonopportunistic application of IAS 36 requirements. Estimates of impairment losses are subject to managers' use of discretion and managers tend to use discretion opportunistically. As a result, impairment charges often provide little information about a firm's expected future operating performance to investors. I identify nonopportunistic impairment losses to test whether they are informative to investors. Using a sample of European firms over the post-IFRS period, I find that the information content of managers' reports of nonopportunistic impairment charges in financial statements are fully anticipated when investors are well informed about a firm's asset quality by analysts. Furthermore, I find that when investors are not well informed by analysts, managers' reports of nonopportunistic impairment losses in financial statements provide information to investors. Yet, I provide evidence that the losses only partially eliminate investors' uncertainty about a firm's asset quality that increased before the losses are released to investors. My results imply that information provided through nonopportunistic impairment losses lags economic losses and is of low quality. Based on these results, I argue that managers trade-off the benefit of providing timely and qualitative information about impaired assets for the benefit of cost reductions derived from delaying and reducing the quality of the information. To my knowledge, this is the first empirical study that argues that managers' cost reductions can reduce the informativeness of managers' impairment loss reports to investors.

3.1 Introduction

Impairment losses should reveal managers' expectations about a firm's future operating performance. Thus, impairment charges reported in financial statements should provide managers' private information about the firm's asset quality (value), reducing the information asymmetry between managers and investors. However, extant literature shows that asset write-offs provide little information to investors (e.g., Zucca and Campbell 1992; Francis et al. 1996; Hirschey and Richardson 2003; Bens et al. 2011; Muller et al. 2012). The low usefulness of impairment losses to investors might be due to managers' opportunistic use of the discretion inherent in impairment guidelines.

IAS 36 "*Impairment of Assets*" requires firms to report losses of tangible or intangible assets when discounted projected future net cash flows—that is, the value in use—of a cash generating unit (CGU) are lower than the book value of the CGU.[45] Thus, IAS 36 provides substantial discretion in terms of identifying CGUs and in projecting future net cash flows and estimating discount rates of the identified CGUs.

Prior literature suggests that managers tend to exploit the discretion inherent in impairment guidelines by estimating the value of assets opportunistically when issuing financial statements (e.g., Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004; Beatty and Weber 2006). Consequently, impairment charges often provide little information to investors (Watts 2003; Ramanna 2008; Ramanna and Watts 2012). However, it is not well understood whether asset impairments estimated—in the absence of managers' opportunistic use of discretion—produce

[45] A CGU represents the smallest identifiable group of tangible and intangible assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB 2004a).

information that is useful to investors. To my knowledge, this is the first study to test whether nonopportunistic IAS 36 impairments are informative to investors.

I argue that in an effort to reduce costs, managers delay and reduce the quality of information about impaired assets that is provided to investors. Firms face high direct costs to conduct impairment tests (i.e., comparing the value in use of a CGU with its book value). To decrease costs (expenses) and hence increase fiscal year earnings, managers might be motivated to postpone impairment tests for all CGUs until the fiscal year end in accordance with the external audit and (year-end) internal budgeting process (see also Elliott and Shaw 1988; Zucca and Campbell 1992).[46] This practice delays reports of impairment losses. Furthermore, firms face high indirect (proprietary) costs when disclosing sensitive data to competitors. Disclosing sensitive data possibly reduces a firm's competitive advantage and earnings in future years. Thus, managers are motivated to reduce the disclosure quality about impaired assets (see also e.g., Petersen and Plenborg 2010; Carlin and Finch 2011). Consequently, I argue that managers compromise the provision of timely and highly qualitative information about impaired assets in the interest of cutting direct and indirect costs (and by implication, increasing current and future earnings).

Managers' cost considerations are separate from managers' opportunistic or nonopportunistic behavior. Reporting impairment charges opportunistically is related to deliberately manipulating the identification of CGUs, the expected future net cash flows of CGUs, and the discount rates of CGUs to avoid or boost impairment charges to managers' advantage. For instance, managers avoid impairments to increase their bonus awards (e.g.,

[46] Broadly speaking, only annual financial reports of European firms are required to be audited (European Parliament and the Council 2004; SIX Swiss Exchange 2010; Oslo Bors 2012).

Beatty and Weber 2006; Muller et al. 2012; Ramanna and Watts 2012) and recently appointed managers boost asset write-offs that might increase income (and their bonus awards) in future years (e.g., Cotter et al. 1998; Riedl 2004; Vanza et al. 2011). The benefit of such behavior accrues only to managers while the benefit of cost reductions is primarily received by investors who own the company.

To analyze the informativeness of nonopportunistic impairments to investors, I decompose the sample into a high analyst coverage environment and a low analyst coverage environment. Analysts act as intermediaries between firms and investors by processing market, industry, and firm data and disseminating the processed data to investors (Lang and Lundholm 1996; Barker 1998; Piotroski and Roulstone 2004). Accordingly, if analyst coverage is high, investors receive information about a firm's asset quality in a timely manner, irrespective of managers' impairment loss reports (Bens et al. 2011; Muller et al. 2012; see also Brennan et al. 1993). Thus, the information content of nonopportunistic impairments should be (to a high degree) anticipated by investors in a high analyst coverage environment, indicating that nonopportunistic impairment losses are reported with a delay in a firm's financial statements.

In contrast, in a low analyst coverage environment market, industry, and firm data that indicate an impairment of assets are not thoroughly processed by analysts. Thus, information asymmetry between managers and investors should increase before the release of nonopportunistic impairment charges. This suggests that nonopportunistic impairment losses are not reported in a firm's financial statements in a timely fashion. Because in a low analyst coverage environment, investors tend to rely on the release of managers' (private) information about a firm's asset quality (see Botosan 1997), the increase in investors' uncertainty should be partly eliminated through reports of nonopportunistic impairments. The elimination of only part of investors' uncertainty indicates that the disclosure quality of the nonopportunistic impairments is low.

I define prereporting and reporting periods of nonopportunistic impairment losses and measure the information asymmetry between managers and investors in these periods. The prereporting period captures an eight month period ending at a firm's fiscal year end. The reporting period captures a four month period ending at the end of the fourth month following a firm's fiscal year end. The periods are defined in this manner because it is assumed that firms report nonopportunistic impairment charges predominantly at the fiscal year end (see also e.g., Heintges and Herre 2007; Spear and Taylor 2011; Muller et al. 2012). To capture the change in information asymmetry, I use the difference (delta) between the bid-ask spread at the end and at the beginning of the respective periods. Positive delta values represent an increase, whereas negative delta values represent a decrease in information asymmetry between managers and investors. By using the prereporting period, I am able to test the timeliness of information provided through reports of nonopportunistic impairment losses in financial statements. In the prereporting period I predict a decline of the bid-ask spread in a high analyst coverage environment and an increase in the bid-ask spread in a low analyst coverage environment. By using both the reporting period and the combined 12 month period (prereporting and reporting periods), I am able to test the quality of information provided through reports nonopportunistic impairment losses in financial statements. I predict that the bid-ask spread declines in the reporting period but increases over the combined periods in a low analyst coverage environment.

To define nonopportunistic impairment losses, I select impairments that satisfy three conditions: (1) impairments need to be reported in conjunction with fiscal year negative returns (proxy for economic losses), (2) impairments need to be reported by a firm that operates at least two CGUs if the firm's market-to-book ratio (MtB) before impairments is above 1 at the fiscal year end (this condition is relaxed if the MtB before impairments is equal to or below 1), (3) impairments need to be approved by large auditors. The first condition suggests that discounted future net cash flows (the value in use) of a firm's CGUs are on average adjusted downwards. However, when the value in use of a CGU declines, it can still be above the book value of the CGU. An MtB above 1 before impairment losses signals that the values in use of a firm's CGUs are on average higher than the book value of the CGUs. Accordingly, if a firm operates at least two CGUs (second condition), an MtB of above 1 before impairments can be related to one CGU (that performs well) while the other CGU(s) is (are) impaired. Because impairment losses can be estimated opportunistically (e.g., to boost or lower impairment charges), I require impairment charges to be approved by large auditors (third condition) that have expertise in detecting managers' opportunistic behavior (e.g., Francis and Krishnan 1999).

I use a sample of 19 European countries and 9,504 firm-year observations over the post-IFRS period from 2006 to 2010. Results reveal that the information content of nonopportunistic impairment losses is fully anticipated in a high analyst coverage environment. Furthermore, I find that in a low analyst coverage environment information asymmetry increases in the prereporting period and is partly eliminated through reports of nonopportunistic impairments. Results imply that impairment charges lag economic losses and provide limited information to investors. My findings are robust to the use of additional specifications of capturing low and high analyst coverage environments and to the assumption that impairments are predominantly reported at the fiscal year end.

In examining the informativeness of nonopportunistic impairment charges in high and low analyst coverage environments, I supplement prior literature in three ways. First, I examine the informativeness of IAS 36 impairments for a large sample of European countries, whereas prior studies either focused on U.S. GAAP (e.g., Francis et al. 1996; Bens et al. 2011; Li et al. 2011; Muller et al. 2012) or reported evidence from a single asset (e.g., IAS 36 goodwill impairments: Knauer and Wöhrmann 2012) or a single country (e.g., Australia: Vanza et al. 2011). Second, while prior studies analyzed impairment losses as reported, I propose a method to identify nonopportunistic impairment charges to examine their informativeness. Third, this is the first empirical study that argues that managers' cost considerations can reduce the informativeness of impairment charges to investors.

The remainder of this paper is organized as follows. In section 3.2, I provide background information and develop the hypotheses. In section 3.3, I define criteria to identify nonopportunistic impairment losses. In section 3.4, I specify the model. The sample selection and descriptive statistics are described in section 3.5. In section 3.6, empirical results are outlined. In section 3.7, I report the results of additional sensitivity analyses. In section 3.8, this study concludes with a summary, conclusions, and limitations.

3.2 Background information and hypotheses development

3.2.1 Accounting for IAS 36 asset impairments

IAS 36 provides impairment guidelines for tangible and intangible assets. Tangible assets (e.g., property, plant, and equipment) and intangible assets (e.g., goodwill and patents) are impaired when the book value of the asset is not recoverable. A book value of an asset is not recoverable when the economic value (i.e., recoverable amount) of the asset decreases below the book value.

Specifically, IAS 36 requires calculation of the recoverable amount of an asset; that is, the higher of an asset's fair value less costs to sell and its value in use. The value in use requires the firm to project and discount future net cash flows of individual assets or group of assets. The discount rate (risk-adjusted rate) can be decomposed into the market risk-free rate and (asset) risk premium. The market risk-free rate and the (asset) risk premium reflect the time value of money and uncertainty of future net cash flows (asset risk), respectively (IASB 2004a).

Projected net cash flows—to be estimated when using the value in use approach—on individual assets are not easily identified (see Mackenzie et al. 2011, 326; Baltazar et al. 2012, 1378). When future net cash flows on individual assets are not identifiable, IAS 36 prescribes to estimate the recoverable amount of a CGU. A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets (IASB 2004a). Because the CGU's fair value (less costs to sell)—based on an offer by another firm, market value, or value of the trade of a comparable CGU—is often not available (Beumer 2006; Heintges and Herre 2007; Petersen and Plenborg 2010; Carlin et al. 2010; Carlin and Finch 2011), firms usually apply the value in use approach to measure the recoverable amount of a CGU. For example, survey results suggest that German and Danish firms mainly utilize the value in use approach (Beumer 2006; Heintges and Herre 2007; Petersen and Plenborg 2010). Also impairment testing in Hong Kong and Australia tends to be based on the value in use approach (Carlin et al. 2010; Carlin and Finch 2011).

Relating the recoverable amount to the value in use of a CGU (and not to the higher of the fair value less costs to sell and the value in use) is not a breach of IAS 36 requirements. IAS 36 prescribes that if the fair value is not determinable, the value in use is the recoverable amount of the CGU (IASB 2004a).

To test for the occurrence of asset impairments, the value in use is compared to the book value of the CGU. An impairment test is to be conducted once a year for intangible assets with an indefinite economic life (e.g., goodwill) and for all intangible assets and tangible assets any time indicators signal that assets are impaired.[47] An impairment of the CGU is to be reported in a firm's financial statements when the value in use is below the book value (IASB 2004a). Thus, impairment losses are reported once the unrecognized economic value of a CGU (i.e., the positive difference between the value in use and the book value of a CGU) is absorbed.

After the impairment loss is determined, the amount is first allocated to goodwill. When the book value of goodwill is zero, the remainder of the impairment loss is allocated proportionally to the other (individual) assets of the CGU. However, the book value of the individual assets cannot be reduced below its fair value less costs to sell (if determinable) or zero (IASB 2004a). While the fair value of a CGU is generally not determinable, the fair value might be determinable for individual assets of a CGU. When determinable, the fair value less costs to sell of an individual asset is used as a benchmark, which corresponds with IAS 36 requirements. That is, the book value of an individual asset is not reduced below the higher of its

[47] Indicators are grouped into external and internal sources of information. External indications are, for instance, a significant not expected market value decline of assets or a significant adverse effect on a firm's assets due to technological, market, economic, or legal environment development. Internal indicators are, for instance, obsolescence, physical damage of an asset, or plans to discontinue or restructure the operation to which an asset belongs (IASB 2004a).

value in use (derived from the value in use of the CGU to which the individual asset belongs) or its fair value less costs to sell. If the impairment loss of a CGU allocated to its individual assets would in part reduce the asset's book value below its fair value less costs to sell, that part is proportionally allocated across the other assets (IASB 2004a). As firms tend to estimate impairment losses for CGUs, and the allocation of estimated impairment charges to individual assets is possibly arbitrary, I combine a firm's impairment charges reported in the financial statements for its individual intangible and tangible assets in a particular year.

In summary, IAS 36 impairments are based on managers' estimates of the future operating performance of CGUs. Thus, reports of asset impairments in financial statements should provide information about the quality (value) of impaired CGUs in a timely manner, decreasing the information asymmetry between managers and investors.

3.2.2 Related literature

Research on the information content of impairments began with broadly defined write-offs (e.g., restructuring charges and general asset impairments) (Strong and Meyer 1987; Elliott and Shaw 1988; Bunsis 1997; Bartov et al. 1998). Francis et al. (1996) were one of the first that decomposed impairments into write-offs for inventory, tangible assets, goodwill, and restructuring charges. Other studies focus on specific asset impairments, such as for tangible assets (Zucca and Campbell 1992), loans (Musumeci and Sinkey 1990; Docking et al. 1997), and goodwill (Hirschey and Richardson 2002, 2003; Hayn and Hughes 2006; Bens et al. 2011; Jarva 2012; Muller et al. 2012). Overall, those studies suggest that impairment charges on average provide little information to investors and a significant portion of the information content of impairment losses is revealed by market, industry, and other accounting data.

The amount of information available about impairment losses is suggested to be a function of the analyst coverage environment (Bens et al. 2011; Muller et al. 2012). Bens et al. (2011) and Muller et al. (2012) show that the informativeness of reported write-offs of goodwill is higher in low compared to high analyst coverage environments. The results indicate that in a high analyst coverage environment investors are on average well informed about a firm's asset quality. Thus, investors tend to rely less on managers' reports about their expectations of a firm's future operating performance in such an environment (see Botosan 1997).

Knauer and Wöhrmann (2012) supplement the extensive body of U.S. GAAP-based research. In a European setting from 2005 to 2009 the authors find that IAS 36 goodwill impairment losses drove market expectations about future operating performance downward; this was particularly apparent in a stringent country-level enforcement system and when managers related impairment charges to external factors.

The research summarized previously primarily uses share price returns to measure the informativeness of impairment charges. Using a U.S. sample from 1996–2006, Li et al. (2011) find that upon the announcement of goodwill impairments, market participants, but also analysts, revised expectations about a firm's future operating performance downwardly in the SFAS 121 and SFAS 142 regime.[48] In addition, Li et al. (2011) find that SFAS 121 and 142 goodwill impairments predict a firm's future operating

[48] SFAS No. 121 "A*ccounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of*" became effective for fiscal years beginning after December 15, 1995. Impairment tests for intangible assets with an indefinite life were carved out of SFAS 121 and incorporated in the new standard SFAS 142 "*Goodwill and Other Intangible Assets*" for fiscal years beginning after December 15, 2001 (FASB 1995; FASB 2001a).

performance (i.e., sales and operating income). Applying a U.S. sample in the adoption period of SFAS 142, Zhang (2008) finds that goodwill impairments trigger negative market reactions and downward revisions of analysts' earnings forecasts. Based on a U.S. sample, Jarva (2009) and Lee (2011) suggest that after the introduction of SFAS 142, goodwill impairments improved the ability to predict future operating cash flows reported by firms in financial statements.

Recent working papers analyze the information content of impairment losses by using the bid-ask spread (Amiram et al. 2011; Vanza et al. 2011). Amiram et al. (2011) show that during the global financial crisis of 2008–2009, write-downs of loans, asset-backed securities held for trading purposes, and retained financial interest of securitized assets increased investors' uncertainty about a firm's asset quality. Vanza et al. (2011) use an Australian sample and a post-IFRS adoption period. The authors find that reported IAS 36 impairment losses of CGUs on average reduce information asymmetry. All those studies analyze impairment charges that are estimated on managers' use of discretion.

Managers might use discretion opportunistically to manage accounting data (Holthausen and Watts 2001; Watts 2003; Ramanna 2008; Jarva 2009; Ramanna and Watts 2012). The literature on impairments (not specific to IAS 36) finds some evidence that discretionary impairment losses signal the trend of future operating performance (Rees et al. 1996; Godfrey and Koh 2009; Stokes and Webster 2010; Chalmers et al. 2011). Most of the studies, however, suggest that managers use discretion opportunistically, for instance, to report large write-offs to increase income in the following years (Strong and Meyer 1987; Zucca and Campbell 1992; Francis et al. 1996; Cotter et al. 1998; Riedl 2004; Boone and Raman 2007;

Zhang 2008; Vanza et al. 2011) or to reduce impairment charges to increase the capital base of U.S. banks (e.g., Laeven and Majnoni 2003).[49]

During the transition period from SFAS 121 to SFAS 142, managers were required to recognize goodwill impairments below-the-line of operating income.[50] Using this U.S. setting, Beatty and Weber (2006) find that both contracting and market incentives affect firms' goodwill impairment reporting. Thus, managers accelerate impairment charges to report them below the line of operating income or delay them and thereby hope to avoid impairment losses in the foreseeable future. Similarly, Zhang (2008) finds that managers opportunistically prevent transition SFAS 142 goodwill impairment charges to avoid violation of debt covenants or accelerate these impairments to increase earnings in future years.

Using a post-transition period of SFAS 142 from 2008 to 2009, Ramanna and Watts (2012) find that managers use discretion opportunistically to avoid goodwill impairments. The authors suggest that overstating goodwill is linked to managers' reputation and contracting incentives. Likewise, other studies show that the opportunistic use of discretion in goodwill impairments results in avoiding them (Henning et al. 2004; Hayn and Hughes 2006; Chen et al. 2008; Hamberg et al. 2011; Li et al. 2011; Li and Sloan 2011; Jarva 2012).

In summary, the majority of the studies argue that managers use discretion in estimating impairment charges opportunistically (see also Watts 2003). As a result, impairment charges provide on average little

[49] Due to the change of the capital structure requirements, loan loss reserves are restricted to 1.25 percent of banks' risk weighted assets (Basel Committee on Banking Supervision 2004). Thus, instead of allocating expected losses to loan loss reserves, U.S. banks tend to allocate them to retained earnings that are not restricted to the capital base (Laeven and Majnoni 2003).

[50] At the adoption date of SFAS 142, goodwill impairment charges were to be reported in the income statement between the captions extraordinary items and net income. Any impairment loss recognized after the adoption was to be taken to the income statement line items within continuing operations as deemed appropriate by each firm (Beatty and Weber 2006).

information to investors (Watts 2003; Ramanna 2008; Ramanna and Watts 2012).

3.2.3 Hypotheses development

The existing literature does not analyze whether reports of (IAS 36) impairment charges in financial statements are informative in the absence of managers' opportunistic behavior. Accordingly, I develop the following four hypotheses based on prior anecdotal and descriptive evidence. The first two hypotheses are linked to the timeliness of reports of nonopportunistic impairments in financial statements. The next two hypotheses are related to the quality of the information content of nonopportunistic impairments.

Turning to the timeliness of reports of nonopportunistic impairments in financial statements: IAS 36 requires firms to release write-offs at any time if assets are impaired (IASB 2004a). At a minimum, impairment charges are to be reported (if an impairment exists) as a part of financial statements that are to be released at least semiannually in accordance with the transparency requirements of EU-regulated markets (European Parliament and the Council 2001, 2004; IASB 2000).[51] From 2008 onward, firms listed on a EU regulated market are required to disseminate interim management statements in the first and third quarters of the fiscal year. Interim management statements include disclosures of the impact of significant events on the condensed financial statement data (European Parliament and the Council 2004). Consequently, interim management

[51] The transparency requirements of European firms are based on the EU regulations or a stock exchange regulated market (Investor Markets Team Deusche Boerse AG 2009). In general, the transparency requirements are lower in stock exchange regulated markets (open markets) but, at a minimum, semiannual reports are to be released as well (see e.g., Entry Standard (Deutsche Börse), Alternative Investment Market (London Stock Exchange), and Alternext (NYSE Euronext): Investor Markets Team Deusche Boerse AG 2009).

statements include impairment reporting (if impairments have occurred). For countries, such as Norway and Switzerland that are included in the sample but are not EU members, similar transparency requirements apply. However, Norwegian firms need to report quarterly and Swiss firms are not required to disseminate financial reports or interim management statements in the first and third quarters (Ministry of Finance 2007; Oslo Bors 2012; SIX Swiss Exchange 2010). In summary, EU firms, Norwegian firms, and Swiss firms are, at a minimum, required to release semiannual reports (and permitted to release additional (voluntary) reports more frequently during the fiscal year). Yet, I argue that in an effort to reduce direct costs, managers are likely to report IAS 36 nonopportunistic impairment charges with a delay at the fiscal year end.

Anecdotal evidence suggests that the guidelines of IAS 36 for the value in use approach are complex and their implementation requires costly impairment tests that involve technical (financial) knowledge and IT processing, which is occasionally obtained outside the firm (Beumer 2006; Hoogendoorn 2006; Heintges and Herre 2007; Husmann and Schmidt 2008; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011). IAS 36 requirements take into account the high costs in estimating the value in use of CGUs. This is evidenced in two main shortcuts in the estimation procedure (allowed under IAS 36). First, for intangible assets with a definite life and tangible assets, IAS 36 requires the recoverable amount (value in use) to be estimated only when indicators signal an asset impairment (negative events signal that the value in use of a CGU is below its book value). Second, for the purpose of annual impairment testing of intangible assets with an indefinite useful life (e.g., goodwill), the most recent detailed estimate of the value in use of the CGU to which the intangible asset belongs can be used under certain circumstances.[52]

The high costs of applying the value in use approach set forth in IAS 36 requirements materializes in several ways. First, firms need to identify the smallest group of assets that independently generate cash flows (CGUs). This process is challenging and requires a great deal of judgment because only a few overall guidelines are provided by IAS 36 (IASB 2004a; Hoogendoorn 2006; Alfredson et al. 2009, 474–476; Petersen and Plenborg 2010). Thus, managers possibly justify and exhaustively document how they identify CGUs. A challenging part is also the allocation of goodwill and corporate assets (e.g., headquarters building, research center) to CGUs that are expected to benefit from those assets. Both goodwill and corporate assets can benefit several CGUs and the allocation procedure requires managers to apply a great deal of judgment. While the assets included in CGUs should be consistent from period to period, a firm's operation is dynamic rather than static. This can lead to an analysis and adjustments of the asset composition of the CGUs in each reporting period (IASB 2004a; Alfredson et al. 2009, 478–486).

Furthermore, future net cash flows need to be estimated for each CGU. This requires firms to make budget assumptions based on economic circumstances. While this task is challenging, the fundamental data might be obtained from fiscal year end internal budget estimations, which should reduce direct costs. In addition, firms need to frequently adjust the assumptions used in the internal budget estimations in order to project future net cash flows of CGUs in accordance with IAS 36. IAS 36

[52] Broadly speaking, a "new" estimate of the value in use of a CGU that contains an intangible asset with an indefinite useful life is not required when the most recent estimate was substantially higher than its book value, and according to all evidence an impairment of the CGU is remote (IASB 2004a).

prescribes that projected future net cash flows are (generally) to be estimated on the current condition of a CGU. Thus, future restructuring to which a firm is not committed but that affects the value in use of a CGU, or future expenditure to improve and enhance the performance of a CGU, should be not taken into account. In addition, future net cash flows are to be projected before finance costs and tax, which might require further adjustments to the internal budget estimations (IASB 2004a; Heintges and Herre 2007; Petersen and Plenborg 2010; Baltazar et al. 2012, 1409 and 1412–1416).

Finally, discount rates are to be estimated for each identified CGU, which is also a challenging task. The application of the capital asset pricing model (CAPM) might be a starting point—it measures the levered beta which results in a firm's cost of equity (equity risk), but the levered beta needs to be unlevered to obtain the discount rate that reflects asset risk. Instead of using the unlevered beta, the weighted average cost of capital (WACC) might be estimated to obtain a discount rate that captures a firm's asset risk. The discount rate needs to be adjusted to reflect the risk of each identified CGU if the risk of the CGU deviates from the total asset risk of the firm. In addition, the estimated discount rates need to be recalculated to obtain the pretax discount rates as prescribed by IAS 36 (IASB 2004a; Heintges and Herre 2007; Husmann and Schmidt 2008; Baltazar et al. 2012, 1406–1416).

In summary, firms face high direct costs in estimating impairment losses, which may outweigh the benefit of providing timely information to investors about a firm's asset quality. Particularly, the costs are directly observed by managers, can be accurately measured by managers, and reduce a firm's current earnings. In contrast, the benefit of informing investors in a timely manner are challenging to grasp and to measure by managers (see also Heintges and Herre 2007). Accordingly, managers possibly conduct impairment tests for all CGUs at the fiscal year end, which can lead to reporting impairments with a delay in a firm’s annual financial statements.

Nontimely reports of impairment charges during the fiscal year can increase managers’ and firms’ risk of litigation. Yet, the estimates are based on managers’ use of discretion and are subject to estimation errors (even if estimated genuinely) (see also e.g., Hoogendoorn 2006; Petersen and Plenborg 2010). Higher estimation errors possibly increase risk of litigation. The risk of litigation should decrease when the estimates are approved by (large) auditors. However, only annual financial reports of European firms are (generally) required to be audited (European Parliament and the Council 2004; SIX Swiss Exchange 2010; Oslo Bors 2012) and additional (voluntary) audits during the year are costly and decrease a firm’s current earnings.[53]

Taken together, firms face high direct costs to estimate impairment charges, reducing a firm’s fiscal year earnings. To cut these direct costs (for the benefit of investors), managers might be motivated to conduct impairment tests for all CGUs at the fiscal year end in alignment with a firm’s external audit and (year-end) internal budgeting process, irrespective of the time of year that economic losses trigger asset impairments (see also Elliott and Shaw 1988; Zucca and Campbell 1992). That firms report impairment charges predominantly in their annual financial statements is evidenced in contemporary U.S. and German based research (Elliott and Shaw 1988; Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004;

[53] Furthermore, long-term (and medium-term) orientated investors might be less likely to litigate managers and firms that delay nonopportunistic impairments until the fiscal year end when the delay results in a reduction in direct costs that are received by investors.

Spear and Taylor 2011; Muller et al. 2012; Heintges and Herre 2007). Consequently, I argue that managers trade-off the benefit of timely delivery of information about a firm's asset quality to investors for the benefit of direct cost reductions derived from delaying the information until the fiscal year end. Next, I develop hypotheses 3.1 and 3.2 that capture the consequences of reporting nonopportunistic impairment losses with a delay in a firm's annual financial statements.

To develop and test my hypotheses, I split the sample into a high analyst coverage environment and a low analyst coverage environment. Bens et al. (2011) and Muller et al. (2012) suggest that in a high analyst coverage environment goodwill impairments provide less new information to the market than in a low analyst coverage environment. The results imply that in a high analyst coverage environment the value of assets is to a large extent known before impairment charges are reported in a firm's financial statements. This is consistent with results in Brennan et al. (1993). The authors find that the speed of information incorporation in the share price increases with an increase in the number of analysts following a firm. Thus, I expect that in a high analyst coverage environment, available market, industry, and firm data that signal an impairment of assets are thoroughly processed and widely disseminated by analysts to investors. As a consequence, in a high analyst coverage environment the information content of nonopportunistic impairment charges should be (to a high degree) anticipated. Hypothesis 3.1 is outlined below:

Hypothesis 3.1: Nonopportunistic impairment losses are reported with a delay in a firm's annual financial statements, thus, the information content of these impairments is (to a high degree) anticipated during the fiscal year in a high analyst coverage environment.

In contrast, in a low analyst coverage environment I predict that investors' uncertainty about a firm's asset quality increases before nonopportunistic impairment losses are reported in the firm's annual financial statements. In this environment available data that signal impaired assets are not thoroughly processed by analysts, increasing investors' uncertainty about a firm's asset quality. Hypothesis 3.2 is outlined below:

Hypothesis 3.2: Nonopportunistic impairment losses are reported with a delay in a firm's annual financial statements, thus, information asymmetry between managers and investors increases during the fiscal year in a low analyst coverage environment.

Turning to hypothesis 3.3: Investors tend to rely on reports of managers' expectations about a firm's future operating performance when the analyst coverage environment is low (see Botosan 1997). Because I select impairment losses that are estimated in the absence of managers' opportunistic behavior, these nonopportunistic impairments should contain information about a firm's asset quality. Consequently, I expect that investors' uncertainty that increased during the fiscal year declines with reports of nonopportunistic impairment charges. [54] Hypothesis 3.3 is outlined below:

[54] Results confirming hypotheses 3.1 to 3.3 would supplement the findings in Botosan (1997). Botosan suggests that managers' disclosures about a firm's projected future operating performance (e.g., nonopportunistic impairment charges) reduce information asymmetry (measured by a firm's cost of capital) when these firms are followed by a low number of analysts. Yet, when a firm's analyst coverage environment is high, disclosures about the firm's historical performance decreases information asymmetry between managers and investors (Botosan 1997).

Hypothesis 3.3: In a low analyst coverage environment the information asymmetry between managers and investors declines through reports of nonopportunistic impairment losses in a firm's annual financial statement.

Turning to hypothesis 3.4: Descriptive evidence documents that managers are unwilling to disclose highly qualitative information about their estimation procedure of IAS 36 impairment losses (Beumer 2006; Heintges and Herre 2007; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011). Managers might not provide a description of identified CGUs including the allocation procedure of assets, such as goodwill and corporate assets, to the CGUs and key assumptions used to estimate future net cash flows, or they might not provide input parameters, such as discount rates, budget years, and growth rates for the terminal value (Beumer 2006; Heintges and Herre 2007; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011).[55] These disclosures are required in certain circumstances under IAS 36 (IASB 2004a).

Assuming that the sample firms comply with the IAS 36 disclosure requirements in full, the required disclosures are in general insufficient to enable investors to verify managers' estimates of the quality of a firm's assets. While the IAS 36 disclosure requirements are an improvement over local GAAP (Lonergan 2007), they are broad and descriptive rather than detailed and quantitative; for instance, projected future net cash flows for individual years are not required to be disclosed for the CGUs (IASB 2004a).

[55] Broadly speaking, the value in use of a CGU is estimated using future net cash flows that are projected within the budget years (e.g., 5 years) and extended (to infinity) based on the projection of the last budget year. The latter part or remainder of the value in use of the CGU is termed the terminal value.

Furthermore, according to IAS 36 managers are encouraged to use no more than five budget years for projecting future net cash flows before using the terminal value and steady or declining growth rates for the terminal value. A deviation from these input parameters is to be justified and disclosed (IASB 2004a). Accordingly, managers might be motivated to use these suggested input parameters even if they are not aligned to the firm's industry practice (Lonergan 2007). Applying these suggested input parameters restricts the "genuine" use of managers' discretion and hence curbs the release of private (highly qualitative) information about a firm's projected future operating performance to investors (see also Boone and Raman 2007). Additionally, future restructuring charges and benefits are generally not included in the value in use of CGUs (outlined previously), which also reduces the information content of impairment charges. Firms are not required to provide disclosures on these issues (IASB 2004a).

Managers can provide additional (voluntary) information about the quality of assets. However, they tend to be reluctant to provide such information to investors. This phenomenon can be inferred from studies on the mandatory adoption of IFRS. While in many jurisdictions additional (voluntary) information could have been disclosed in financial statements under local GAAP, the mandatory adoption of IFRS increased a firm's disclosures in financial statements (see e.g., Ball 2006; Daske et al. 2008; Byard et al. 2011).

The provision of additional information about nonopportunistic impairment losses generally increases a firm's transparency. This, in turn, should reduce the cost of capital and increase the value of a firm (see e.g., Botosan 1997; Leuz and Verrecchia 2000; Botosan and Plumlee 2002; Daske et al. 2008). However, detailed disclosures (sensitivity data) are also beneficial to a firm's competitors (see also Leuz 2010). Thus, managers are possibly reluctant to put such data in the public domain (see also Holland 2005).[56] Consequently, disclosure of low quality information (i.e., no sensitive data) about estimates of nonopportunistic impairments can cut indirect (proprietary) costs by extending a firm's competitive advantage and sustains earnings in future years (for the benefit of investors). However, cutting these costs reduces the quality of information provided through nonopportunistic impairment losses and increases the challenge for investors to infer a firm's asset quality.

Taken together, I argue that managers trade-off the benefit of releasing qualitative information about a firm's asset quality for cost reductions derived from reducing the disclosure quality. Consequently, the increased information asymmetry between managers and investors in a low analyst coverage environment (see hypothesis 3.2) should be eliminated to some extent only through reports of nonopportunistic impairment losses. Hypothesis 3.4 is outlined below:

Hypothesis 3.4: Nonopportunistic impairment losses are of low quality, thus, in a low analyst coverage environment the information content of nonopportunistic impairment losses reduces only in part the information asymmetry between managers and investors that increased during the fiscal year.

[56] Another reason that managers might be unwilling to provide additional (voluntary) information is to reduce the risk of litigation. As outlined previously, estimates of nonopportunistic impairment charges are subject to estimation errors. Thus, the higher a firm's transparency, the more likely it is that estimation errors come to the surface. This increases the likelihood that investors litigate a firm. The estimation error can be reduced by investing in the estimation procedure of IAS 36 impairments, which, in turn, increases a firm's direct costs.

3.3 Identification of nonopportunistic impairment losses

To test my hypotheses, I identify impairment losses that are estimated in the absence of managers' opportunistic behavior. Thus, I define selection criteria to identify nonopportunistic impairment losses.

I select impairment charges reported by firm (*j*) at the end of fiscal year (*t*) that satisfy the following three write-off conditions. First, the impairment charges are required to be reported with fiscal year economic losses proxied by negative share price returns adjusted for dividends of firm (*j*) in fiscal year (*t*) ($NegReturn_{jt}$). $NegReturn_{jt}$ reflects both systematic (market) and unsystematic (idiosyncratic) economic losses of a firm. Assuming an efficient market, $NegReturn_{jt}$ captures negative changes in a firm's environment as well as a firm's (negative) strategic and operating decisions instantaneously by adjusting the firms' projected net cash flows downward (see also Basu 1997; Ball et al. 2000; Ball et al. 2003).[57] In addition, $NegReturn_{jt}$ captures an increase in equity risk, which is reflected in higher discount rates. Accordingly, a firm's market value may decline when equity risk increases during the fiscal year, everything else being equal. This, in turn, leads to a decline of discounted projected future net cash flows and may trigger impairment losses. In summary, $NegReturn_{jt}$

[57] Using negative share price returns as a proxy for economic losses is based on the assumption that individual countries' stock markets incorporate information immediately based on the efficiency hypothesis. Some of the sample countries have lower liquidity than others. This might produce noise in share price returns in these countries. In defense of my proxy, by aggregating countries and using a one year period of negative raw returns, the noise should be negligible. In addition, to be consistent with the standard, I do not use market-adjusted returns. Using market-adjusted returns would test whether negative idiosyncratic projected future net cash flows affect reports of impairment charges and might bias the inference of my tests. Even though idiosyncratic projected future net cash flows are negative, total projected future net cash flows can be positive so that an IAS 36 impairment is not triggered.

proxies for a firm's downwardly adjusted values in use of CGUs during the fiscal year.[58]

Second, impairment losses need to be reported by firm (*j*) that operates at least two CGUs at the end of fiscal year (*t*). To proxy for the number of CGUs ($\#CGU_{jt}$), I use the number of regions and products operated by firm (*j*) at the end of fiscal year (*t*). This should reflect the number of the firm's operating segments according to IFRS 8 "*Operating segments*" at the fiscal year end.[59] The requirement of operating at least two CGUs is relaxed when the MtB before IAS 36 impairment losses of firm (*j*) at the end of fiscal year (*t*) (MtB_{jt}) is equal to or below 1. The rationale for this requirement is that $NegReturn_{jt}$ suggests that the value in use of CGUs is on average downwardly adjusted. Yet, impairment losses are not trigged as long as the difference between the value in use and the book value of a CGU is positive. An MtB_{jt} of above 1 indicates that unrecognized economic values are not absorbed on average over all CGUs of a firm. Accordingly,

[58] To address concern that negative events in the first months of the fiscal year are incorporated in impairment charges of the previous fiscal year, I use dividend adjusted share price returns of firm (*j*)—measured from the end of the third (fourth) month following the end of fiscal year (*t-1*) to the end of the third (fourth) month following the end of fiscal year (*t*)—as a robustness test. The results are essentially unchanged except that nonopportunistic impairments are not fully anticipated in a high analyst coverage environment (i.e., they provide some information in this environment), which is still consistent with hypothesis 3.1. In addition, concern might arise that the bid-ask spread and share price returns are both based on the same underlying market information and returns might not be efficient even though noise should be negligible (see former footnote). To address both concerns, I swap $NegReturn_{jt}$ with negative net income before impairment losses in fiscal year (*t*) deflated by total assets at the end of fiscal year (*t-1*) of firm (*j*) ($NegROA_{jt}$) as a part of the conditions of nonopportunistic impairment losses. $NegROA_{jt}$ is not driven by market information and should to some extent capture economic losses in a timely manner (Basu 1997). The results are essentially unchanged when $NegROA_{jt}$ is used.

[59] According to IAS 36 a CGU cannot be larger than an operating segment as defined in IFRS 8. Consequently, my measure should capture a firm's minimum required number of CGUs. A firm's segment reporting is provided in Datastream, which is aligned to IAS 14 "*Segment Reporting.*" IAS 14 is superseded by IFRS 8 for periods beginning on January 2009. However, the sample is spread over 2006 to 2010. Thus, the period incorporates the change from IAS 14 to IFRS 8. Yet, the difference between IAS 14 and IFRS 8 is to some extent marginal (IASB 2004a; IASB 2006; Alfredson et al. 2007, 754–785).

impairment charges are not triggered by IAS 36. However, if a firm operates two CGUs, an unrecognized economic value can be related to one CGU while the other CGU is impaired so that an asset write-off is to be reported in a firm's financial statements. As a result, impairment charges are triggered (estimated) by the guidelines set forth in IAS 36.

Third, I require that impairment charges of firm (*j*) are approved by a big four auditing firm (Ernst & Young, PWC, Deloitte & Touche, or KPMG) at the end of fiscal year (*t*) ($Big4_{jt}$). I cannot observe the values in use and the book values of a firm's identified CGUs when the firm operates multiple operating segments. To improve the validity of nonopportunistic impairment charges, I use $Big4_{jt}$. Previous research finds a relation between the size of auditors and audit quality (Palmrose 1988; Teoh and Wong 1993; Francis and Krishnan 1999; Kim et al. 2003; Lennox and Pittman 2010). Because large auditing firms get more media attention than small auditing firms, and because a financial scandal damages the reputations of a firm's auditors, large auditing firms require firms to use discretionary accruals prudently (Kim et al. 2003). In addition, large auditing firms have more expertise than small auditing firms and can afford sophisticated technology to detect opportunistic behavior (Francis and Krishnan 1999; Kim et al. 2003). Consequently, firms audited by large auditors should estimate impairment charges that reflect the quality of a firm's assets to a higher extent than the estimates of firms audited by small auditors (see also Stokes and Webster 2010).[60]

[60] Managers might report large impairment charges to account for accumulated economic losses that were triggered by a change from a small auditor to a big four auditor. However, more than 99.80 percent of my nonopportunistic impairment loss sample firms were audited by a big four auditor in the year previous to the year analyzed. In addition, some nonopportunistic impairment firms have an MtB_{jt} below 1. I assume that these firms have written-off sufficiently based on four reasons (see also Baltazar et al. 2012, 1381–1382). First, valuation techniques and assumptions used by investors diverge to some extent to the requirements or suggestions of

3.4 Model specification

My hypotheses require a model that tests the information content of nonopportunistic impairment losses. This requires a measurement that captures the construct of information asymmetry. Most research uses share price returns to measure the information content of impairment losses (see section 3.2.2). Yet, returns are related to both projected future net cash flows and discount rates (see section 3.3).

Impairment charges can induce market participants to downwardly adjust expectations about a firm's projected future net cash flows. Everything else being equal, this should lead to negative returns. Yet, such a market reaction suggests that impairment losses provide information and reduce information asymmetry between managers and market participants. The degree of information asymmetry is a component of and positively related to a firm's discount rate (Leuz and Verrecchia 2000). Thus, when impairment charges contain information (i.e., reduce information asymmetry), a firm's discount rate declines, which, in turn, increases returns, everything else being equal. Consequently, negative returns aligned to downward adjustments of a firm's expected future net cash flows are upwardly "biased." This can lead to the erroneous conclusion that impairment charges contain little information.

I focus on the bid-ask spread. The bid-ask spread is the least noisiest measure to capture the construct of information asymmetry and thus has been frequently applied outside the literature on impairments (see e.g.,

IAS 36 (see Lonergan 2007). Second, managers might have private information that is not released to investors (e.g., to sustain competitive advantage) and processed by investors (see also Hitz 2007). Third, the market might overreact (e.g., during the global financial crisis of 2008–2009) (Hellwig 2009). Finally, several values of a firm are proposed to investors; market value, based on supply and demand, is only one of these values.

Chordia et al. 2000; Leuz and Verrecchia 2000; Daske et al. 2008; Armstrong et al. 2010; Muller et al. 2011).[61]

I use the relative bid-ask spread measured by the ratio of the daily ask price less the daily bid price to the midpoint (average) of the daily ask price and the daily bid price (Stoll 1978; Daske et al. 2008; Muller et al. 2011).[62] The daily bid-ask spread is the (relative) amount the ask price exceeds the bid price; it captures among other things information costs (Stoll 1978). Information costs materialize when an investor asks or makes an offer for a firm's shares due to the fact that the investor is more informed than the dealer (uninformed party). Consequently, the dealer fears a loss since she or he is uncertain about the quality of a firm's shares, asked or offered for by the investor (informed party). As a result, the less informed a dealer is about the quality of a firm's shares, the higher is the bid-ask spread (Stoll 1978; Glosten and Milgrom 1985). Thus, I expect that the (relative) bid-ask spread (*BidAsk*) is a valid proxy to capture the construct of information asymmetry.

Determinants of the bid-ask spread suggested by theory are used as control variables (see e.g., Stoll 1978; Lee et al. 1993; Chordia et al. 2000; Leuz and Verrecchia 2000; Muller et al. 2011). These control variables are: (1) share price (*Price*), (2) turnover (*TurnOver*), (3) volatility (*Volat*), (4) free float shares (*FreeFloat*), and (5) analyst following (*AnFol*). Failure to control for these factors can result in correlated omitted variable bias.

[61] Share price returns, cost of capital, volatility of share price returns, share turnover, and trading days are not employed. They are more noisy measures for capturing the construct of information asymmetry than the bid-ask spread (see discussion in this section and Leuz and Verrecchia 2000; Hail 2002; Daske et al. 2008; Armstrong et al. 2010; Amiram et al. 2011; Muller et al. 2011).

[62] For example, the daily ask price is 100 Euro and the daily bid price is 90 Euro. The relative daily bid-ask spread equals 0.1053 [(100 - 90) / (100+90)/2].

Price is expected to control for market-makers' order processing costs, which are proportionately smaller for higher priced stocks; hence a negative relation to *BidAsk* is estimated.[63] *TurnOver* and *Volat* control for market-makers' inventory holding costs and risk, respectively. Higher turnover reduces the probability that an inventory of shares has to be held for a long time and a higher volatility of shares increases the risk of carrying the inventory. Consequently, a negative (positive) association between *TurnOver (Volat*) and *BidAsk* is estimated. *FreeFloat* controls for differences in the availability of tradable shares. A negative relation to *BidAsk* is estimated, as information asymmetry among market participants should be lower in firms with a higher proportion of tradable shares. *AnFol* controls for the firm's information environment. A negative association to *BidAsk* is predicted as a greater number of analysts following the firm should reduce information asymmetries.

I average the daily $BidAsk_j$, $Price_j$, $TurnOver_j$, $Volat_j$, $FreeFloat_j$, *and* $AnFol_j$ of firm (*j*) over the month at the end of fiscal year (*t*) ($BidAsk_{jt}$, $Price_{jt}$, $TurnOver_{jt}$, $Volat_{jt}$, $FreeFloat_{jt}$, *and* $AnFol_{jt}$), the fourth month following fiscal year end (*t*) ($4BidAsk_{jt}$, $4Price_{jt}$, $4TurnOver_{jt}$, $4Volat_{jt}$, $4FreeFloat_{jt}$, *and* $4AnFol_{jt}$), and the fourth month following the end of fiscal year (*t-1*) ($4BidAsk_{jt-1}$, $4Price_{jt-1}$, $4TurnOver_{jt-1}$, $4Volat_{jt-1}$, $4FreeFloat_{jt-1}$, *and* $4AnFol_{jt-1}$). In addition, I take the natural logarithm of the variables, which is applied, for instance, by Leuz and Verrecchia (2000), Daske et al. (2008), Muller et al. (2011), and is based on Stoll (1978). However, before taking the natural logarithm, I add 1 to the variables except for $Price_{jt}$, $4Price_{jt}$, and $4Price_{jt-1}$ to consider zero values.

[63] To allow for various currencies across European countries, I translate the share price of firms operating in noneurozone countries to euro values using the average exchange rate of May 2011 which is the month data collection was completed. Results are essentially unchanged when share prices are not translated to euro values.

I do not conduct an event study because it is difficult to identify the first impairment announcement for a particular firm and year in a European setting (see also Muller et al. 2011; Vanza et al. 2011). This study tests the hypotheses using a 12 month window. The window ranges from the fourth month following the end of fiscal year (*t-1*) to the fourth month following the end of fiscal year (*t*) of firm (*j*) as outlined in Figure 3.1. Figure 3.1 exhibits the decomposition of the 12 month window used to test hypothesis 3.4 into one eight month period and one four month period. The eight month period captures the prereporting period of nonopportunistic impairment losses and is used to test hypotheses 3.1 and 3.2.

Figure 3.1: Prereporting and reporting periods of nonopportunistic IAS 36 impairment losses to test hypotheses 3.1 to 3.4

<u>High analyst coverage environment:</u>

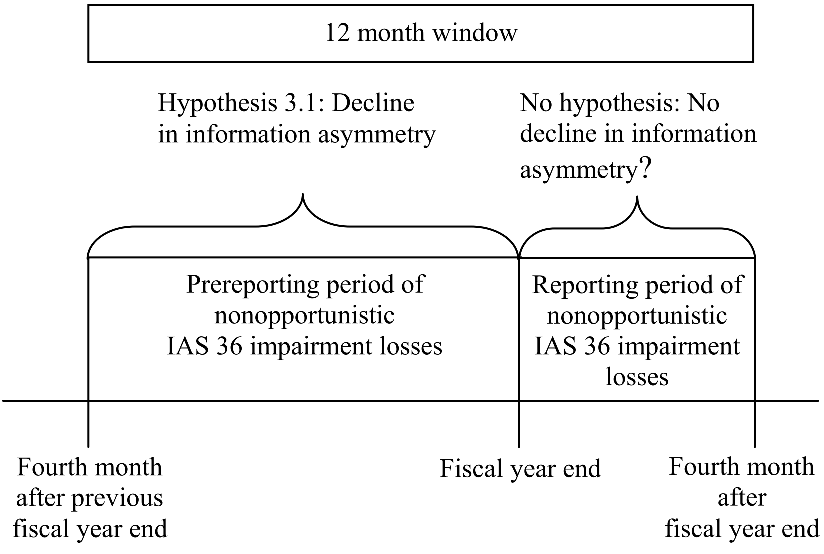
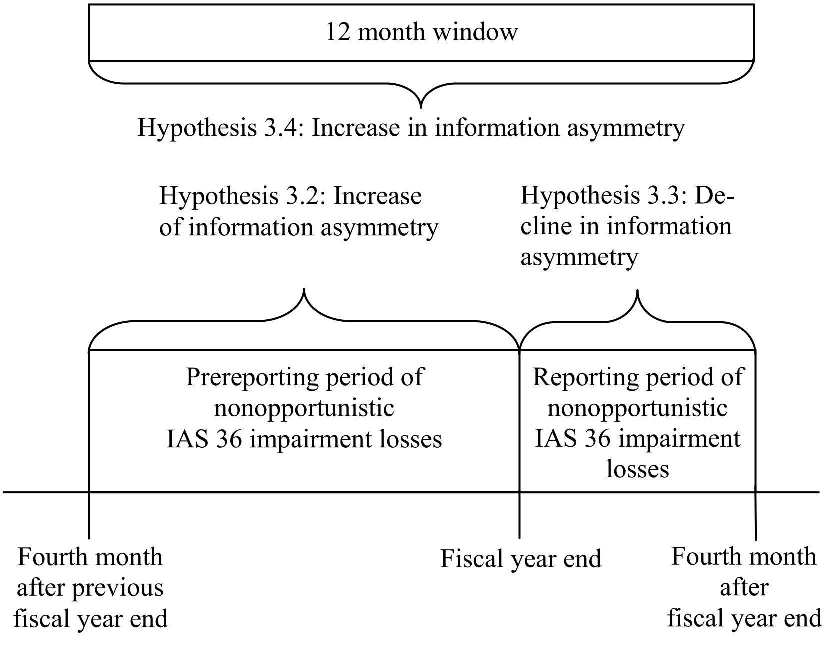


Figure 3.2: Continued

Low analyst coverage environment:



The four month period reflects the reporting period of nonopportunistic impairment losses and is used to test hypothesis 3.3.

Focusing on the prereporting period: I calculate the difference between $BidAsk_{jt}$ and $4BidAsk_{jt-1}$ ($D8BidAsk_{jt}$). I assume that impairments are predominantly reported in the fourth quarter or in the annual financial statements of a firm (see also Elliott and Shaw 1988; Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004; Heintges and Herre 2007; Spear and Taylor 2011; Muller et al. 2012).[64] Additionally, I expect that the

[64] In section 3.7 (additional sensitivity test section), I address a potential concern of using this assumption by decomposing the sample into firm size, country-level enforcement systems, and

prereporting period does not coalesce with the annual accounting data released in fiscal year (*t-1*) and that during the prereporting period available data other than impairment losses signal that assets are impaired. Thus, $D8BidAsk_{jt}$ should decline in a high analyst coverage environment (hypothesis 3.1) and increase in a low analyst coverage environment (hypothesis 3.2).

Turning to the reporting period: I calculate the difference between $4BidAsk_{jt}$ and $BidAsk_{jt}$ ($D4BidAsk_{jt}$). Thus, I assume that impairment charges are released by managers and processed by investors within the first four months following the fiscal year end (Chen et al. 2008; Muller et al. 2011). $D4BidAsk_{jt}$ tests the information content of nonopportunistic impairment losses. In a high analyst coverage environment $D4BidAsk_{jt}$ will reveal the degree to which the information content is anticipated (no hypothesis is stated). If there is no decline of $D4BidAsk_{jt}$, the information content is fully anticipated. If there is a decline of $D4BidAsk_{jt}$, the information content is in part anticipated. Furthermore, $D4BidAsk_{jt}$ should decline in a low analyst coverage environment (hypothesis 3.3).

Concentrating on the combined period (i.e., 12 month window: prereporting and reporting periods): I calculate the difference between $4BidAsk_{jt}$ and $4BidAsk_{jt-1}$ ($D12BidAsk_{jt}$). $D12BidAsk_{jt}$ should increase over the combined period (hypothesis 3.4).

The control variables (outlined previously) are differenced in the same way as $D8BidAsk_{jt}$, $D4BidAsk_{jt}$, and $D12BidAsk_{jt}$. Using the differences in the bid-ask spread and control variables controls for country, industry, and firm fixed effects. I apply a difference-in-difference study in an ordinary least squares (OLS) regression. I compare nonimpairers with

time periods. If results are essentially unchanged across the partitions, some evidence is provided that my assumption is valid.

impairers separately in a low and high analyst coverage environment. Thus, I control for changes that are attributable to the respective environments.

$$DMBidAsk_{jt} = \alpha_0 + \alpha_1 HACE_{jt} + \alpha_2 BinaryNOIL_{jt}*HACE_{jt} + \alpha_3 BinaryNOIL_{jt}*LACE_{jt} + \sum_{k=4}^{8} \alpha_k Controls_{jt} + \varepsilon_{jt}, \tag{3.1}$$

where "*M*" (in $DMBidAsk_{jt}$) stands for 8, 4, and 12. Thus, $DMBidAsk_{jt}$ is equal to $D8BidAsk_{jt}$, $D4BidAsk_{jt}$, and $D12BidAsk_{jt}$. $HACE_{jt}$ is a binary variable equal to unity if firm (*j*) operates at the end of fiscal year (*t*) in a high analyst coverage environment and zero otherwise. $BinaryNOIL_{jt}*HACE_{jt}$ is a binary variable that takes the value of one if firm (*j*) reports nonopportunistic impairment charges in a high analyst coverage environment at the end of fiscal year (*t*) and zero otherwise. Finally, $BinaryNOIL_{jt}*LACE_{jt}$ is a binary variable equal to unity if firm (*j*) reports nonopportunistic impairment losses in a low analyst coverage environment at the end of fiscal year (*t*) and zero otherwise.[65]

A high analyst coverage environment and a low analyst coverage environment are proxied by the number of analysts following a firm, similar to Bens et al. (2011) and Muller et al. (2012). When the number of analysts following the analyzed firm at the fiscal year end is above the median, the analyst coverage environment is assumed to be high, otherwise it is assumed to be low.[66]

[65] I focus on nonopportunistic impairment losses. Consequently, I exclude other impairment losses in the sample, as described in more detail in section 3.5.

[66] In section 3.7 (additional sensitivity test section), I use alternative specifications of analyst coverage environments.

$Controls_{jt}$ are the control variables described previously. Variable definitions and data sources are reported in Appendix 3.1.

Using model 3.1, I compare nonimpairers with impairers with respect to their analyst coverage environments. Turning to the high analyst coverage environment: The intercept α_0 and the coefficient on *$HACE_{jt}$* capture the change of information asymmetry between managers and investors (*$DMBidAsk_{jt}$*) of nonimpairers that issue financial statements in a high analyst coverage environment. The coefficient on the interacting variable *$BinaryNOIL_{jt}$*$HACE_{jt}$* reflects the incremental change of information asymmetry between managers and investors (*$DMBidAsk_{jt}$*) of impairers to nonimpairers in a high analyst coverage environment. Thus, if information asymmetry of impairers increases to a lower (higher) extent than that of nonimpairers, the coefficient on *$BinaryNOIL_{jt}$*$HACE_{jt}$* will be negative (positive). Alternatively, if information asymmetry of impairers decreases to a higher (lower) extent than that of nonimpairers, the coefficient on *$BinaryNOIL_{jt}$*$HACE_{jt}$* will be negative (positive).

Hypothesis 3.1 predicts that the coefficient on *$BinaryNOIL_{jt}$*$HACE_{jt}$* is negative when *$D8BidAsk_{jt}$* is employed as a dependent variable. Thus, in a high analyst coverage environment nonopportunistic impairment losses are anticipated (*$D8BidAsk_{jt}$*). This indicates that they are reported with a delay in a firm's annual financial statements when the analyst coverage environment is high. I do not predict the coefficient on *$BinaryNOIL_{jt}$*$HACE_{jt}$* when *$D4BidAsk_{jt}$* is employed as a dependent variable. However, if the coefficient is insignificantly different from zero, nonopportunistic impairment charges convey no information in the reporting period (*$D4BidAsk_{jt}$*) and their information content is fully anticipated in the prereporting period (*$D8BidAsk_{jt}$*). If the coefficient is negative, nonopportunistic impairment charges convey information in the reporting period (*$D4BidAsk_{jt}$*) and their information content is in part anticipated in the prereporting period (*$D8BidAsk_{jt}$*). Consequently, the coefficient on *$BinaryNOIL_{jt}$*$HACE_{jt}$* (when *$D4BidAsk_{jt}$* is employed as a dependent variable) will reveal the extent to which the information content of nonopportunistic impairment charges is anticipated in a high analyst coverage environment.

Focusing on the low analyst coverage environment: The intercept α_0 captures the change of information asymmetry between managers and investors (*$DMBidAsk_{jt}$*) of nonimpairers that issue financial statements in a low analyst coverage environment. The coefficient on the interacting variable *$BinaryNOIL_{jt}$*$LACE_{jt}$* reflects the incremental change of information asymmetry between managers and investors (*$DMBidAsk_{jt}$*) of impairers to nonimpairers in a low analyst coverage environment. Again, if the interacting coefficient is positive, information asymmetry of impairers increases relatively to that of nonimpairers and if the interacting coefficient is negative, information asymmetry of impairers decreases relatively to that of nonimpairers.

Hypothesis 3.2 predicts that the coefficient on *$BinaryNOIL_{jt}$*$LACE_{jt}$* is positive (when *$D8BidAsk_{jt}$* is employed as a dependent variable). Thus, in a low analyst coverage environment investors' uncertainty about a firm's asset quality increases before nonopportunistic impairment losses are reported in a firm's annual financial statements. This indicates that nonopportunistic impairment losses are reported with a delay when the analyst coverage environment is low.

Hypothesis 3.3 predicts a negative coefficient on *$BinaryNOIL_{jt}$*$LACE_{jt}$* (when *$D4BidAsk_{jt}$* is applied as a depended variable). Accordingly, investors' uncertainty that increased in the prereporting period (*$D8BidAsk_{jt}$*) is reduced in the reporting period of nonopportunistic impairment losses (*D4BidAsk*$_{jt}$). This indicates that investors focus on managers' reports of a firm's asset quality in a low analyst coverage environment.

Hypothesis 3.4 predicts a positive coefficient on *BinaryNOIL*$_{jt}$**LACE*$_{jt}$ (when *D12BidAsk*$_{jt}$ is employed as a dependent variable). That is, in a low analyst coverage environment information asymmetry that increased in the prereporting period is not fully eliminated in the reporting period of nonopportunistic impairment losses. This indicates that the information content of nonopportunistic impairment losses is of low quality.

3.5 Sample and descriptive statistics

The sample selection criteria are reported in Table 3.1. I select 20 European countries and firm-year observations over the post-IFRS adoption period 2006 to 2010. To avoid distortion, I drop the first year of firms' IFRS reporting. Distortion might arise due to the first time application of IFRS and use of the adoption guidelines set forth in IFRS 1 "*First-time Adoption of International Financial Reporting Standards.*"[67] This leads to an initial sample of 22,364 firm-year observations. The initial sample is based on firms that apply IFRS continuously after adoption and have applied IFRS at least since 2009 to assure a two year period.

[67] According to my IFRS selection procedure, earlier IFRS adopters could have been incorporated for the end of fiscal year 2005. Yet, to have a consistent starting point and allow for the accounting change of intangible assets from March 2004 onward, I exclude 2005 data for those firms. Before March 2004, IAS 38 "*Intangible Assets*" viewed goodwill and other intangible assets as having a useful life. Thus, they were to be amortized. According to IFRS 3 "*Business Combinations*," goodwill acquired in a business combination has now an indefinitely useful life. Other intangible assets need to be analyzed to determine whether they generate unlimited periods of cash flows. In connection with IFRS 3 and IAS 38, IAS 36 requires an impairment test at least once a year for intangible assets with an indefinite life, but they are not subject to systematic amortization (IASB 2004a, 2004b, 2008).

Table 3.1: Sample selection criteria

	Deletion	Cumulative # of observations after deletions
Initial IFRS sample of firms that apply IFRS continuously after adoption and at least since 2009		22,364
Exclusion of insurance, financial, and real estate firms (SIC codes 6000 to 6799)	4,455	17,909
Book value of equity is equal to or below zero	929	16,980
Bid-Ask Spread below zero	223	16,757
Missing data	2,853	13,904
Outlier reduction - 0.5% obs. at the top and bottom of dependent and control regression variables - Impairment loss is greater than one year lagged book value of equity	1,808	12,096
Impairment losses not defined as nonopportunistic	2,592	9,504
Final sample, 2006–2010	# of unique firms	# of observations
	3,424	9,504

The starting point of data selection is the sample of European firms that apply IFRS continuously after adoption and at least since 2009 on Datastream. For a description of the variables see Appendix 3.1.

I exclude insurance, financial, and real estate firms (SIC codes 6000 to 6799) because they are subject to special regulations, and adjustments of their primary asset base is captured in other IFRS standards. Furthermore, I remove firms with one occurrence of a book value of equity equal to or below zero. Those firms are potentially in severe distress. This might induce investors to speculate on acquisitions and turnarounds, irrespectively of reported accounting data. Thus, including those firms increases noise and leads to less representative results.

In addition, I eliminate observations when the bid-ask spread is below zero (i.e., the ask price is less than the bid price, see section 3.4). After dropping observations of missing data of the regression variables, I allow for outliers by deleting 0.5 percent of observations that are at the top and bottom of the dependent and control variable values (see Jarva 2009).[68] To allow for outliers of impairment losses, I remove observations where the amount of impairment losses is larger than the lagged book value of equity.

Finally, since the focus of my study is to analyze nonopportunistic asset write-offs, I keep only impairment loss observations that are defined as nonopportunistic impairments.[69] This leads to a reduction by 2,592 firm-year observations.[70] In summary, the final sample consists of 3,424 firms

[68] The results are essentially unchanged when the data are truncated at a 2.0 percent level (see Lee 2011). Yet, the results suggests that impairment losses do not provide information in a low analyst coverage environment (the coefficient on $BinaryNOIL_{jt}*LACE_{jt}$ to $D4BidAsk_{jt}$ is negative but insignificantly different from zero). This is inconsistent with hypothesis 3.3. Winsorizing the data at 0.5 and 2.0 percent levels lead to similar results. However, the results of using the 0.5 percent level suggest that in a low analyst coverage environment investors' uncertainty about a firm's asset quality neither increases in the prereporting period nor over the 12 month period (coefficients on $BinaryNOIL_{jt}*LACE_{jt}$ to $D8BidAsk_{jt}$ and $D12BidAsk_{jt}$ are positive but insignificantly different from zero). This is inconsistent with hypotheses 3.2 and 3.4. Using the 2.0 percent level, findings imply that in a low analyst coverage environment investors' uncertainty does not increase over the 12 month period (the coefficient on $BinaryNOIL_{jt}*LACE_{jt}$ to $D12BidAsk_{jt}$ is positive but insignificantly different from zero). This is inconsistent with hypothesis 3.4. In summary, the results confirm hypothesis 3.1 and, overall hypotheses 3.2 to 3.4. Hypotheses 3.2 and 3.3 are confirmed by three out of four tests. Hypothesis 3.4 is confirmed by two out of four tests and the signs in all tests are as predicted.

[69] In Appendix 3.2 I show and explain briefly the results using the full sample (all IAS 36 impairments). The results provide some evidence that my selection criteria for nonopportunistic impairments are valid.

[70] Firm-year observations with missing data of variables used to select nonopportunistic impairment losses are not explicitly dropped. Yet, if a missing variable (e.g., $NegReturn_{jt}$) is needed to fulfill the condition for nonopportunistic write-offs, the observation is allocated mechanically to the dropped impairment loss observations.

and 9,504 firm-year observations from 19 countries and spread over 2006–2010.[71]

Of these firm year-observations, 1,568 are IAS 36 nonopportunistic impairment loss observations that are collected from Datastream. However, Datastream frequently provides no impairment losses for tangible and intangible assets (i.e., NA). By dropping the whole firm-year observation when the value of an impairment loss for a tangible or intangible asset is not provided, the sample would be reduced from 9,504 to 334 firm-year observations (1,568 to 214 IAS 36 nonopportunistic impairment loss observations) after the sample selection criteria are applied. To include nonprovided impairment charges, I adjust them to zero values. Consequently, I assume the firm did not report an impairment loss for the particular tangible or intangible asset in the financial statements. This approach is consistent with that in prior literature (Ramanna and Watts 2012).

Table 3.2 exhibits the sample composition of nonopportunistic impairment losses (NOIL) sorted by the analyst coverage environment.

Table 3.2: Sample composition of nonopportunistic impairment losses sorted by analyst coverage environments

Analyst Coverage Environment	# of firms	# of firms NOIL	% of firms NOIL	# of obs.	# of obs. NOIL	% of obs. NOIL
	(1)	(2)	(3)	(4)	(5)	(6)
High (HACE)	1,684	757	45.0	4,684	1,155	24.7
Low (LACE)	2,075	327	15.8	4,820	413	8.6
Total/Average				9,504	1,568	16.5

NOIL stands for nonopportunistic impairment losses. For a description of the variables see Appendix 3.1.

[71] Due to the sample elimination procedure that differs from chapter 2, I lose one country the Czech Republic.

Column 3 of Table 3.2 reports that the percentage of firms in the sample that reported an impairment loss at least once is equal to 45.0 in a high analyst coverage environment (HACE) and 15.8 in a low analyst coverage environment (LACE). In relation to total observations in the respective environments, 24.7 percent impairments were reported in a high and 8.6 percent of impairments were reported in a low analyst coverage environment (column 6). Consequently, descriptive statistics indicate that firms covered by three or more analysts (i.e., a high analyst coverage environment) report more nonopportunistic impairment losses in financial statements than firms covered by less than three analysts (i.e., a low analyst coverage environment).

Table 3.3 exhibits descriptive statistics of $DMBidAsk_{jt}$ (i.e., $D8BidAsk_{jt}$, $D4BidAsk_{jt}$, and $D12BidAsk_{jt}$) sorted by hypotheses 3.1 to 3.4. $DMBidAsk_{jt}$ is employed in the regression analyses as a dependent variable to examine the informativeness of nonopportunistic impairment losses (NOIL).

Turning to the mean values of $D8BidAsk_{jt}$ (column 2 of Table 3.3) outlined in group "H3.1; HACE:" In a high analyst coverage environment (HACE), $D8BidAsk_{jt}$ increases more quickly if nonopportunistic impairment losses are reported (NOIL sample: 0.0042) than if they are not reported (NonNOIL sample: 0.0006). Thus, the delta is positive (0.0036). Inconsistent with hypothesis 3.1, the descriptive results document that nonopportunistic impairment charges are not anticipated (in fact investors' uncertainty about a firm's asset quality increased in the prereporting period). In addition, column 2 shows that $D4BidAsk_{jt}$ decreases more slowly when nonopportunistic write-offs are reported (NOIL sample: -0.0008) than when they are not reported (NonNOIL sample: -0.0011), producing a small positive delta (0.003).

Table 3.3: Statistics of the delta of the (relative) bid-ask spread in the prereporting period (*D8BidAsk*$_{jt}$), reporting period (*D4BidAsk*$_{jt}$), and the combined period (*D12BidAsk*$_{jt}$) sorted by hypotheses H3.1 to H3.4

Hypotheses (H)	Sample	# of obs.	Mean	Percentile 25%	Percentile 50% Median	Percentile 75%	Standard deviation
		(1)	(2)	(3)	(4)	(5)	(6)
H3.1; HACE							
D8BidAsk$_{jt}$ (H3.1)	NOIL	1,155	0.0042	0.0000	0.0011	0.0049	0.0124
	NonNOIL	3,529	0.0006	-0.0016	0.0002	0.0025	0.0125
D4BidAsk$_{jt}$	NOIL	1,155	-0.0008	-0.0020	-0.0003	0.0005	0.0089
	NonNOIL	3,529	-0.0011	-0.0022	-0.0004	0.0007	0.0084
H3.2/H3.3; LACE							
D8BidAsk$_{jt}$ (H3.2)	NOIL	413	0.0169	-0.0007	0.0067	0.0263	0.0397
	NonNOIL	4,407	0.0032	-0.0068	0.0016	0.0116	0.0352
D4BidAsk$_{jt}$ (H3.3)	NOIL	413	-0.0052	-0.0981	-0.0015	0.0053	0.0287
	NonNOIL	4,407	-0.0027	-0.0086	-0.0008	0.0055	0.0254
H3.4; LACE							
D12BidAsk$_{jt}$	NOIL	413	0.0117	0.0029	0.0055	0.0195	0.0354
	NonNOIL	4,407	0.0005	0.0095	0.0006	0.0118	0.0358

NOIL stands for nonopportunistic impairment losses. For a description of the variables see Appendix 3.1.

The descriptive results document that nonopportunistic write-offs increase slightly investors' uncertainty when the analyst coverage environment is high (no hypothesis is stated for this).

In Table 3.3, column 2 for group "H3.2/H3.3; LACE" shows that in a low analyst coverage environment (LACE) the delta of $D8BidAsk_{jt}$ is positive (0.0169 - 0.0032 = 0.0137) and the delta of $D4BidAsk_{jt}$ is negative (-0.0052 - (-0.0027) = -0.0025). Consistent with hypotheses 3.2 and 3.3, the descriptive results document that investors' uncertainty increases in the prereporting period (H3.2) and decreases in the reporting period of nonopportunistic impairment charges (H3.3).

In Table 3.3, column 2 for group "H3.2/H3.3; LACE" also shows just a partial reduction of investors' uncertainty over the whole 12 month period (0.0137 + (-0.0025) = 0.0112). A partial reduction of uncertainty is also exhibited in column 2 of Table 3.3 for group "H3.4; LACE." $D12BidAsk_{jt}$ is more positive when nonopportunistic impairment charges are reported in financial statements (NOIL sample: 0.0117) than when they are not reported (NonNOIL sample: 0.0005). The descriptive results are consistent with hypothesis 3.4.

Table 3.4 exhibits the mean differences of *DMBidAsk* sorted by hypotheses 3.1 to 3.4. The mean differences are reported between *DMBidAsk* in the NOIL and NonNOIL samples.

Columns 3 and 4 of Table 3.4 show that the mean differences between NOIL and NonNOIL samples as reported in Table 3.3 are significant except for $D4BidAsk_{jt}$ in group "H3.1; HACE." Group "H3.1; HACE" exhibits that the mean difference of 0.0003 (Table 3.4, column 3) is insignificantly different from zero as documented by the p-value (0.4215) in column 4 of Table 3.4.

Table 3.4: Univariate analyses of the delta of the bid-ask spread in the prereporting period (*D8BidAsk*$_{jt}$), reporting period (*D4BidAsk*$_{jt}$), and the combined period (*D12BidAsk*$_{jt}$) sorted by hypotheses H3.1 to H3.4

Hypotheses (H)	Mean Sample		Delta	
	NOIL	NonNOIL	Mean	p-value
	(1)	(2)	(3)=(1)-(2)	(4)
H3.1; HACE				
D8BidAsk$_{jt}$ (H3.1)	0.0042	0.0006	0.0036	0.0000
D4BidAsk$_{jt}$	-0.0008	-0.0011	0.0003	0.4215
H3.2/H3.3; LACE				
D8BidAsk$_{jt}$ (H3.2)	0.0169	0.0032	0.0137	0.0000
D4BidAsk$_{jt}$ (H3.3)	-0.0052	-0.0027	-0.0025	0.0557
H3.4; LACE				
D12BidAsk$_{jt}$	0.0117	0.0005	0.0112	0.0000

NOIL stands for nonopportunistic impairment losses. For a description of the variables see Appendix 3.1.

The preliminary results of the univariate tests are consistent with the view that investors' uncertainly increased in the prereporting period of nonopportunistic impairment losses in both analyst coverage environments. This is inconsistent with hypothesis 3.1 but consistent with hypothesis 3.2. Finally, the preliminary results document that the increase of information asymmetry in the low analyst coverage environment is just partly eliminated in the reporting period of nonopportunistic write-offs. This is consistent with hypotheses 3.3 and 3.4. The univariate tests, however, should be interpreted carefully because I do not control for factors that are suggested by theory to affect *DMBidAsk*$_{jt}$.

3.6 Empirical Results

Table 3.5 exhibits the OLS regression analyses for testing the predictions of hypotheses 3.1 to 3.3 with respect to the timeliness and information content of nonopportunistic impairment losses. Columns 1 and 3 document results excluding the control variables and columns 2 and 4 report results including the control variables.

Columns 2 and 4 of Table 3.5 document that the coefficients on the first three control variables are significant with the expected sign. The coefficients on $DMFreeFloat_{jt}$ and $DMAnFol_{jt}$ are insignificantly different from zero. This might be due to the low variability of $DMFreeFloat_{jt}$ and $DMAnFol_{jt}$.

Table 3.5: Timeliness and information content of nonopportunistic impairment losses

Variables	Sign	$D8BidAsk_{jt}$ Prereporting period		$D4BidAsk_{jt}$ Reporting period	
		(1)	(2)	(3)	(4)
Intercept	?	0.003*** (6.546)	0.001*** (2.995)	-0.003*** (7.021)	-0.002*** (5.384)
$HACE_{jt}$	?	-0.003*** (4.832)	-0.003*** (5.269)	0.002*** (3.984)	0.002*** (4.337)
Analyzed variables					
$BinaryNOIL_{jt}*HACE_{jt}$ (H3.1)	-	0.004*** (8.361)	-0.006*** (9.860)		
$BinaryNOIL_{jt}*HACE_{jt}$	0?			0.000 (0.784)	0.000 (0.117)
$BinaryNOIL_{jt}*LACE_{jt}$ (H3.2)	+	0.014*** (6.871)	0.006*** (3.317)		
$BinaryNOIL_{jt}*LACE_{jt}$ (H3.3)	-			-0.003* (1.751)	-0.003** (2.412)

Table 3.5: Continued

Control variables					
$DMPrice_{jt}$	-		-0.019***		-0.018***
			(18.717)		(14.688)
$DMTurnOver_{jt}$	-		-0.973***		-0.816***
			(8.709)		(8.971)
$DMVolat_{jt}$	+		0.286***		0.192***
			(10.591)		(8.118)
$DMFreeFloat_{jt}$	-		0.005		-0.000
			(1.423)		(0.013)
$DMAnFol_{jt}$	-		0.000		0.001
			(0.057)		(0.357)
# of obs.		9504	9504	9504	9504
Adj. R2		0.014	0.180	0.003	0.084

Table 3.5 reports the results of the OLS regression analyses to test hypotheses 3.1 to 3.3. Hypotheses 3.1 and 3.2 predict that nonopportunistic impairment charges are reported with a delay in a firm's annual financial statements. As a result, nonopportunistic impairment charges should be (to a high degree) anticipated in a high analyst coverage environment (hypothesis 3.1) and investors' uncertainty about a firm's asset quality should increase during the fiscal year when the analyst coverage is low (hypothesis 3.2). Hypothesis 3.3 predicts that reports of nonopportunistic impairment charges in a firm's annual financial statements provide information to investors when the analyst coverage environment is low. For a description of the variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Hypothesis 3.1 predicts that the information content of nonopportunistic impairment losses is (to a high degree) anticipated in a high analyst coverage environment. Column 2 of Table 3.5 shows that the coefficient on $BinaryNOIL_{jt}*HACE_{jt}$ is negative, consistent with hypothesis 3.1. In addition, column 4 documents that the coefficient on $BinaryNOIL_{jt}*HACE_{jt}$ is insignificantly different from zero. Consequently, nonopportunistic impairment losses provide no information to investors when the analyst coverage is high, indicating that their information content is fully anticipated. The findings imply that nonopportunistic impairment losses are not reported in a timely fashion when the analyst coverage environment is high. Information about a firm's asset quality is provided to investors by analysts in a timely manner.[72]

Hypothesis 3.2 predicts that in a low analyst coverage environment investors' uncertainty about a firm's asset quality increases in the prereporting period (during the fiscal year). Column 2 of Table 3.5 reports that the coefficient on $BinaryNOIL_{jt}*LACE_{jt}$ is positive, consistent with hypothesis 3.2. This provides further evidence on the low timeliness of reports of nonopportunistic impairment losses in financial statements.

Hypothesis 3.3 predicts that in a low analyst coverage environment investors' uncertainty that increased in the prereporting period is reduced in the reporting period of nonopportunistic impairment charges. Column 4 of Table 3.5 shows that the coefficient on $BinaryNOIL_{jt}*LACE_{jt}$ is negative, consistent with hypothesis 3.3. This indicates that nonopportunistic impairment losses contain information and investors rely on managers' reports of a firm's asset quality in a low analyst coverage environment, although these reports are released in a nontimely fashion.

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[72] These findings confirm the results of the majority of financial analyst literature that suggests that analysts provide information to investors (e.g., Hong et al. 2000; Francis et al. 2002; Roulstone 2003; Barth and Hutton 2004; Piotroski and Roulstone 2004; Kimbrough 2007; Ellul and Panayides 2012; Bens et al. 2011; Muller et al. 2012). In addition, my results indicate that impairment losses are irrelevant to investors in a high analyst coverage environment. Yet, this does not contradict the findings in Lang and Lundholm (1996), Barker (1998), and Francis et al. (2002). They suggest that accounting data are used by analysts and that accounting data supplement analysts' released information. My results imply that when available data—including accounting data of a firm's historical operating performance—indicate that assets are impaired, nonopportunistic impairment losses (expected future operating performance) are anticipated (see also Botosan 1997).

These findings supplement results in Vanza et al. (2011), Bens et al. (2011), and Muller et al. (2012). Vanza et al. (2011) show that in an Australian setting IAS 36 impairment charges of CGUs decrease investors' uncertainty on average. My results imply that in a European setting impairment charges reported nonopportunistically provide information only in a low analyst coverage environment. Bens et al. (2011) and Muller et al. (2012) suggest that in a high analyst coverage environment goodwill write-offs reported under U.S. GAAP (SFAS 142) are more highly anticipated than in a low analyst coverage environment. My study provides evidence that IAS 36 nonopportunistic impairments of CGUs are fully anticipated in a high analyst coverage environment. In a low analyst coverage environment information asymmetry increases in the prereporting period and is reduced in the reporting period.

Table 3.6 exhibits the OLS regression analysis for testing hypothesis 3.4 with respect to the quality of the information content of nonopportunistic impairment losses. Column 1 shows results excluding control variables and column 2 reports results including control variables.

Table 3.6: Quality of the information content of nonopportunistic IAS 36 impairment losses

Variables	Sign	$D12BidAsk_{jt}$ Full period	
		(1)	(2)
Intercept	?	0.001	-0.000
		(1.170)	(1.135)
$HACE_{jt}$	?	-0.001**	-0.001*
		(1.920)	(1.942)
$BinaryNOIL_{jt}*HACE_{jt}$	-	0.004***	-0.005***
		(9.111)	(9.012)

Table 3.6: Continued

Analyzed variable			
BinaryNOIL$_{jt}$**LACE*$_{jt}$ (H3.4)	+	0.011***	0.003**
		(6.094)	(2.095)
Control variables			
DMPrice$_{jt}$	-		-0.016***
			(19.329)
DMTurnOver$_{jt}$	-		-1.047***
			(10.047)
DMVolat$_{jt}$	+		0.314***
			(10.832)
DMFreeFloat$_{jt}$	-		0.005
			(1.215)
DMAnFol$_{jt}$	-		-0.001
			(0.483)
# of obs.		9504	9504
Adj. R2		0.008	0.186

Table 3.6 reports the results of the OLS regression analysis to test hypothesis 3.4. Hypothesis 3.4 predicts that the information content of nonopportunistic impairment charges is of low quality. As a result, investors' uncertainty about a firm's asset quality that increased during the fiscal year should be only in part eliminated through reports of nonopportunistic impairment losses in a firm's annual financial statements. For a description of the variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Hypothesis 3.4 predicts that in a low analyst coverage environment the information content of nonopportunistic impairment losses reduces only in part the information asymmetry between managers and investors that increased in the prereporting period. Column 2 of Table 3.6 exhibits that the coefficient on *BinaryNOIL*$_{jt}$**LACE*$_{jt}$ is positive. Accordingly, investors' uncertainty about a firm's asset quality increases over the (combined) 12 month period (i.e., prereporting and reporting periods), which is consistent with hypothesis 3.4. Thus, the results indicate that the information content of nonopportunistic impairment charges is of low quality.[73]

Taken together, as discussed in the hypotheses development section (3.2.3), I argue that managers consider direct and indirect costs of estimating and reporting nonopportunistic impairment losses in financial statements. Specifically, I argue that managers trade-off the provision of timely and qualitative information about a firm's asset quality for cost reductions derived from delaying and reducing the quality of the information. In accordance with this argument, I find that the information content of nonopportunistic impairment charges is fully anticipated in a high analyst coverage environment. In a low analyst coverage environment I find that investors' uncertainty about a firm's asset quality increases. Both findings indicate that nonopportunistic impairment charges are reported with a delay in a firm's annual financial statements. In addition, I find that in a low analyst coverage environment investors' uncertainty is not fully eliminated in the reporting period of nonopportunistic impairment charges. This suggests that while nonopportunistic impairment charges contain information, the information content is of low quality.

3.7 Additional sensitivity analyses

3.7.1 Additional specifications of the analyst coverage environment

Using the median of the number of analysts following the sample firms to capture a high analyst coverage environment and a low analyst coverage

[73] Table 3.6 shows that the coefficient on $BinaryNOIL_{jt}*HACE_{jt}$ is negative. This suggests that in a high analyst coverage environment investors' uncertainty that presumably increased before the prereporting period is reduced over the 12 month period. The results, however, imply that the decline is due to the fact that available data are processed and disseminated by analysts and not attributable to managers' reports of nonopportunistic impairment charges.

environment can raise concerns. Using the median assumes a high analyst coverage once the number of analysts is three or higher and a low analyst coverage otherwise. Yet, if one or two analysts follow a firm, available market, industry, and firm data are to some extent processed and subsequently disseminated to investors. This may affect results.

Following this argument, I use three additional specifications to capture high and low analyst coverage environments and to test hypotheses 3.1 to 3.4:

I. As previously defined, a high analyst coverage environment is represented by at least three analysts following firm (*j*) at the end of fiscal year (*t*). A low analyst coverage environment represents a situation in which firm (*j*) is not followed by analysts at the end of fiscal year (*t*). Dropping observations that are not allocated to one of these groups (i.e., when the number of analysts following firm (*j*) is either one or two), reduces the sample by 2,436 to 7,068 firm-year observations.

II. A high analyst coverage environment is defined as in (I). In a low analyst coverage environment firm (*j*) is not followed by analysts or is followed by one analyst at the end of fiscal year (*t*). Eliminating observations that are not allocated to one of the groups (i.e., when two analysts follow firm (*j*), reduces the sample by 925 to 8,579 firm-year observations.

III. A high analyst coverage environment represents at least one analyst following firm (*j*) at the end of fiscal year (*t*). In a low analyst coverage environment firm (*j*) is not followed by analysts at the end of fiscal year (*t*). Since all observations are allocated, the sample is not reduced.

Tables 3.5 and 3.6 are retabulated in Appendix 3.3. Appendix 3.3 shows the results of the three additional specifications of the analyst coverage environment. The three specifications are captured in $HACE\_X_{jt}$ and $LACE\_X_{jt}$ (where "*X*" stands for "*I*," "*II*," and "*III*"). Columns 1–3 report results for the prereporting period ($D8BidAsk_{jt}$)—related to hypotheses 3.1 and 3.2—and columns 4–6 document findings on the reporting period ($D4BidAsk_{jt}$)—related to hypothesis 3.3. Columns 7–9 present results on the combined period ($D12BidAsk_{jt}$)—related to hypothesis 3.4.

Columns 1–3 report negative coefficients on $BinaryNOIL_{jt}*HACE\_X_{jt}$ and positive coefficients on $BinaryNOIL_{jt}*LACE\_X_{jt}$ for all three specifications of the analyst coverage environments. These results confirm hypotheses 3.1 and 3.2 and provide evidence that in the prereporting period investors' uncertainty about a firm's asset quality declines (nonopportunistic impairment charges are anticipated) and increases in a high analyst coverage environment.

Columns 4–6 document that the coefficients on $BinaryNOIL_{jt}*HACE\_X_{jt}$ are insignificantly different from zero for all three specifications of the analyst coverage environment. This indicates that the information content of nonopportunistic impairment charges is fully anticipated in a high analyst coverage environment. In addition, the coefficients on $BinaryNOIL_{jt}*LACE\_X_{jt}$ are negative for all three specifications. These results confirm hypothesis 3.3 that nonopportunistic impairment charges contain information and decrease investors' uncertainty in a low analyst coverage environment.

Focusing on the combined period: Columns 7–9 report positive coefficients on $BinaryNOIL_{jt}*LACE\_X_{jt}$ for all three specifications. Yet, the coefficient for the third specification ($BinaryNOIL_{jt}*LACE\_III_{jt}$) is insignificantly different from zero. These findings imply that nonopportunistic write-downs partly reduce investors' uncertainty when the first two specifications are applied, consistent with hypothesis 3.4. When the last specification is used, the uncertainty is fully eliminated through reports of nonopportunistic write-offs. Notwithstanding this result, the third specification may not be well specified by allocating also one or two analysts to a high analyst coverage environment. One or two analysts might not be able to thoroughly process data that indicate impaired assets and subsequently disseminate the processed data widely to investors. This can increase the noise and affect the relationship between $BinaryNOIL_{jt}*LACE\_III_{jt}$ and $D12BidAsk_{jt}$. In summary, the findings are essentially unchanged compared to the findings obtained using the median specification to capture analyst coverage environments.

3.7.2 Reports of nonopportunistic impairment losses at the fiscal year end

Another concern that needs to be addressed is the assumption that nonopportunistic impairment losses are reported predominantly at the fiscal year end. Based on this assumption, I argue that impairments are anticipated in a high analyst coverage environment (hypothesis 3.1). However, my findings can be driven by the fact that in a high analyst coverage environment managers are motivated or enforced to report impairment losses quarterly during the fiscal year. This would imply that nonopportunistic impairment losses are reported in a timely manner and reduce investors' uncertainty in the prereporting period, inconsistent with hypothesis 3.1.

To address this concern, I decompose the sample with respect to firm size. Overall, large firms release more information than small firms (Atiase 1985; Freeman 1987; Watts and Zimmerman 1990; Teoh and Wong 1993; Botosan and Plumlee 2002; Sellhorn and Gornik-Tomaszewski 2006). In addition, large firms are more likely than small firms to provide a comprehensive set of quarterly financial data to attract investors.[74] Furthermore, large firms usually have more resources than small firms to conduct impairment tests (Bens et al. 2011). Finally, large firms face on average a higher risk of litigation (Stice 1991; Heninger 2001) and political costs (Watts and Zimmerman 1990) than small firms. Thus, managers of large firms should be more motivated than managers of small firms to conduct impairment tests quarterly if the benefit to investors outweighs the high direct costs of conducting quarterly impairment tests. Consequently, firm size should be a good proxy to test the concern that in a high analyst coverage environment information asymmetry declines through reports of nonopportunistic impairment losses. If this drives results, I expect a decline in information asymmetry for large firms only in a high analyst coverage environment.

Findings of the prereporting regression ($D8BidAsk_{jt}$) are outlined in Appendix 3.4. Columns 1 and 2 report the median specification of the

[74] Some specific national stock exchange segments and foreign stock exchanges require firms to publish a comprehensive set of financial data quarterly. For instance, large (in terms of market capitalization and stock exchange turnover) German firms are generally listed on the Prime Standard, a market segment of the Frankfurt Stock Exchange. As a consequence, they are required to publish quarterly reports that are more informative than interim management statements (Frankfurt Stock Exchange 2012; see also for information content of quarterly IFRS reports and interim management statements: IASB 2000; European Parliament and the Council 2004; Financial Services Authority 2012). In addition, firms that are cross-listed in the U.S. capital market need to file quarterly reports (10-Q) with the U.S. Securities and Exchange Commission (United States Congress 1934, section 13 and 15(d)). Large firms are more likely to be cross-listed than small firms due to their appetite for capital. Finally, large firms might comply more rigorously with reporting requirements than small firms. This is, for instance, evidenced by firms that are listed in the U.K. and report interim management statements (Financial Services Authority 2009).

analyst coverage environment. Columns 3–8 exhibit the additional three specifications as defined previously. The columns of each specification are decomposed into small and large firms measured by market capitalization. At the fiscal year end the market capitalization of small firms is below and that of large firms is above the median of the market capitalization of the sample firms.[75]

In Appendix 3.4 the coefficients on $BinaryNOIL_{jt}*HACE_{jt}$ and $BinaryNOIL_{jt}*HACE\_X_{jt}$ are negative, irrespective of firm size. Yet, the negative coefficient of the third specification ($BinaryNOIL_{jt}*HACE\_III_{jt}$) is insignificantly different from zero for small firms (column 7). As outlined previously, the third specification might be to some extent misspecified by the allocation of one or two analysts to a high analyst coverage environment. This can bias results. Firm size and the number of analysts following a firm are positively correlated (see the Pearson correlation matrix in Appendix 2.2, chapter 2). Thus, more than 35 percent of the nonopportunistic write-off observations are allocated to small firms that are followed by one or two analysts (untabulated). In contrast, less than 9 percent are allocated to large firms. This should upward bias the coefficient on $BinaryNOIL_{jt}*HACE\_III_{jt}$ in the group of small firms, resulting in an insignificant coefficient.

Overall, results support the notion that nonopportunistic impairment losses are reported predominately with a delay and data thoroughly processed and widely disseminated by analysts help investors to anticipate impairments, consistent with hypothesis 3.1. This is also evidenced in the positive coefficients on $BinaryNOIL_{jt}*LACE_{jt}$ and $BinaryNOIL_{jt}*LACE\_X_{jt}$ for large firms (Appendix 3.4). This indicates that in a low analyst coverage

[75] To allow for different currencies, I translate the market capitalization of noneurozone countries to euro values with the average exchange rate of May 2011. In addition, by decomposing the sample into large and small firms, I can analyze whether thinly traded firms affect the results (Vanza et al. 2011).

environment investors' uncertainty increases in the prereporting period of large firms.[76]

In another approach to test this concern, I decompose the sample using country-level enforcement systems and time periods.[77] In countries with stringent legal enforcement systems managers understate rather than overstate the asset base (Ball et al. 2000; Ball et al. 2003). The global financial crisis of 2008–2009 intensified the attention paid by regulators to a firm's financial reporting (Stokes and Webster 2010) and might have raised the level of such scrutiny for the foreseeable future (see chapter 2). Thus, in stringent country-level enforcement environments and in the time periods during and after the economic crisis (2008–2009) managers might have been encouraged to report impairments during the fiscal year to avoid litigation.

Results in Appendix 3.5 are organized in a format similar to that in Appendix 3.4 except that firm size is replaced by country-level enforcement systems (Panel A) and time periods (Panel B). To distinguish between weak and strict country-level enforcement systems, I use the "*rule of law*" measure of the country in the year 2006 based on Kaufmann et al. (2007). If firm (j) operates in a country in which the "*rule of law*" measure is above the value of 1.675, it operates in a strict enforcement environment and otherwise it operates in a weak enforcement environment.[78] To distinguish

[76] In addition, findings imply that a high amount of information (provided by large firms) needs to be processed to derive the quality of a firm's assets (see also Francis et al. 2002).
[77] I do not use the intensity of industry write-offs (see chapter 2) because the measure is based on the assumption that impairments are reported at the fiscal year end, which conflicts with the purpose of the additional sensitivity tests.
[78] To be consistent, I apply the median of 1.675 as measured in chapter 2. The median in chapter 3 would be slightly higher because the Czech Republic is not included due to the sample reduction procedure. By recalculating the median, the U.K. would represent the median with a value of 1.73. The following countries are above the median of 1.675: Austria, Denmark, Finland, Germany, Luxembourg, Netherlands, Norway, Sweden, Switzerland, and the United

between periods of strict and lax scrutiny over a firm's financial reporting, I assign observations to the period during and after the global financial crisis (2008–2009) when the fiscal year of firm (*j*) ends after July 2008. I allocate observations to the period before the crisis when the fiscal year of firm (*j*) ends before August 2008. This approach is similar to the approach in chapter 2. Appendix 3.5 shows that the findings are essentially the same as the results for the firm size decomposition.

In summary, I cannot exclude the possibility that some firms report quarterly impairment losses, particularly, when they disseminate a full set of accounting data in a strict enforcement environment. The additional sensitivity tests, however, are consistent with the view that firms report predominantly nonopportunistic impairment losses at the fiscal year end, which is also suggested in prior literature (Elliott and Shaw 1988; Zucca and Campbell 1992; Francis et al. 1996; Riedl 2004; Heintges and Herre 2007; Spear and Taylor 2011; Muller et al. 2012). As a result, impairment loss reports lag negative economic events and their information content is anticipated when investors are well informed about a firm's asset quality. This is consistent with hypothesis 3.1.

3.8 Summary, conclusions, and limitations

Asset impairment losses provide on average little information about a firm's expected future operating performance to investors (e.g., Zucca and Campbell 1992; Francis et al. 1996; Hirschey and Richardson 2003; Bens et al. 2011; Muller et al. 2012). The low informativeness is suggested to be related to managers' opportunistic use of discretion in calculating impairment charges (Watts 2003; Ramanna 2008; Ramanna and Watts

Kingdom. Belgium, France, Greece, Hungary, Ireland, Italy, Poland, Portugal, and Spain are below the median.

2012). In this study, I examine whether nonopportunistic impairment losses are informative to investors.

Firms face high direct and indirect (proprietary) costs to produce and disclose information about a firm's impaired assets. To cut direct costs, I argue that managers report nonopportunistic impairment losses on average with a delay in the firm's annual financial statements. To cut indirect cost, I argue that, on average, managers reduce the value of the information content of these losses. Based on these arguments, I propose four hypotheses. The first two hypotheses reflect the timeliness of reports of nonopportunistic impairment charges. The next two hypotheses capture the quality of the information content of nonopportunistic impairment losses.

Hypothesis 3.1 predicts that the information content of nonopportunistic impairment losses is anticipated during the fiscal year when investors are well informed about a firm's asset quality by analysts (i.e., in a high analyst coverage environment). This is because nonopportunistic impairments are predicted to be reported with a delay. My findings are consistent with this prediction. Results are robust to several specifications of the analyst coverage environment and also hold after splitting the sample into firm size and enforcement environments.

Hypothesis 3.2 predicts that information asymmetry between managers and investors increases during the fiscal year in a low analyst coverage environment. This is because available market, industry, and firm data that indicate an impairment of assets are not thoroughly processed by analysts and nonopportunistic impairments are predicted to be reported with a delay. My findings are consistent with this view and are robust to several specifications of the analyst coverage environment.

The findings are based annual data. This is because an event study is difficult to conduct in a European setting and quarterly data for IAS 36 impairment losses are not available in Datastream. Yet, my findings, coupled with those in prior literature (see e.g., Heintges and Herre 2007; Muller et al. 2012), indicate that the sample firms tend to report nonopportunistic impairment charges with a delay at the fiscal year end.

I argue that the results are due to the fact that managers trade-off the benefit of releasing timely information about a firm's impaired CGUs for the benefit of direct cost reductions realized by delaying the information. To decrease high direct costs in conducting impairment tests, managers tend to conduct impairment tests for all CGUs during the year end external audit and internal budgeting process (see also Elliott and Shaw 1988; Zucca and Campbell 1992). In that way, they delay reports of nonopportunistic impairment charges until the fiscal year end but increase fiscal year earnings.

Delaying impairment charges can increase managers' and firms' risk of litigation. However, increasing fiscal year earnings should be in the interest of investors. This, in turn, should reduce the risk that, in particular, long-term (and medium-term) orientated investors litigate managers and firms for delaying impairment charges that are reported in the absence of managers' opportunistic behavior. In addition, estimates of nonopportunistic impairments are subject to estimation errors (see also Hoogendoorn 2006; Petersen and Plenborg 2010) that potentially increase managers' and firms' risk of litigation. The risk of litigation is possibly reduced when the genuine estimates are approved by (large) auditors. Yet, financial reports are generally audited at the end of the fiscal year (see European Parliament and the Council 2004; SIX Swiss Exchange 2010; Oslo Bors 2012) and voluntary audits during the fiscal year are costly, which, in turn, decreases current earnings. This suggest that managers often delay reports of nonopportunistic impairment charges until the fiscal year end.

Hypothesis 3.3 predicts that in a low analyst coverage environment the information asymmetry between managers and investors declines through reports of nonopportunistic impairment losses in a firm's annual financial statements. That is, when analyst coverage is low, investors tend to rely on managers' reports of information about a firm's asset quality (see Botosan 1997), even when the information is reported with a delay in the firm's annual financial statements. My findings are consistent with this view and are robust to several specifications of the analyst coverage environment.

Hypothesis 3.4 predicts that the increase of information asymmetry between managers and investors in the prereporting period (see hypothesis 3.2) is only partly reduced by reports of nonopportunistic impairment losses. This is because the information content of nonopportunistic impairment losses is predicted to be of low quality. My findings are consistent with this view and are robust to several specifications of the analyst coverage environment.

I argue that the results are due to the fact that managers trade-off the benefit of releasing highly qualitative information about a firm's impaired CGUs for the benefit of indirect cost reductions realized by reducing the quality of the information. Providing highly qualitative information about a firm's asset quality increases the firm's transparency, but also reveals sensitive data to the firm's competitors (see also Leuz 2010). Managers tend to be reluctant to put such data in the public domain (see also Holland 2005); because not doing so cuts indirect (proprietary) costs and extends a firm's competitive advantage to sustain future earnings for the benefit of investors.

To my knowledge, this is the first study to address the impact of managers' cost considerations on the informativeness of impairment charges. I cannot exclude the possibility that causes other than cost reductions drive my results. However, I can exclude the possibility that managers' opportunistic behavior drives them by assuming that my three selection criteria (see section 3.3) to identify nonopportunistic impairment charges are valid. The patterns of my results (e.g., the anticipation of the information content of nonopportunistic impairment losses during the fiscal year in a high analyst coverage environment) and the results of my additional analyses that are based on the full IAS 36 impairment loss sample (e.g., no anticipation of the information content of IAS 36 impairment charges in a high analyst coverage environment; see Appendix 3.2) provide some evidence that my selection criteria are valid. Future studies might supplement my research by refining the selection criteria to identify nonopportunistic impairment charges and using quarterly data to analyze the effect of managers' cost considerations on the informativeness of impairment charges. My study adds to the extant research on impairments that focus on managers' opportunistic behavior. Accordingly, my findings should be of particular interest to the research community as well as to standard setters, accountants, and users of financial statements.

Appendix 3.1
Variable list

Notation	Calculation
Analyzed independent variables	
$BinaryNOIL_{jt}$	Binary variable equal to unity if firm (*j*) reports nonopportunistic IAS 36 impairment losses in fiscal year (*t*) and zero otherwise. IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Data are obtained from Datastream. Specifically, $BinaryNOIL_{jt}$ is a binary variable equal to unity if firm (*j*) reports IAS 36 impairment losses in fiscal year (*t*) and if the following three conditions (variables are explained below) are satisfied: $NegReturn_{jt}$, MtB_{jt} and $\#CGU_{jt}$ are above 1, and $Big4_{jt}$ or $NegReturn_{jt}$, MtB_{jt} is equal to or below 1, and $Big4_{jt}$ and zero otherwise.
$NegReturn_{jt}$	Negative dividend adjusted share price returns of firm (*j*) measured for fiscal year (*t*) over the period from (*t-1*) to (*t*). Data are obtained from Datastream.
MtB_{jt}	Ratio of market value of equity to book value of equity before IAS 36 impairment losses of firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream.

Appendix 3.1
Continued

#CGU$_{jt}$	Number of cash generating units based on the diversification level proxied by the aggregated number of geographic and product segments of firm (*j*) at the end of fiscal year (*t*). Data are obtained from Datastream.
Big4$_{jt}$	Binary variable equal to unity if firm (*j*) is audited at the end of fiscal year (*t*) by Ernst & Young, PWC, Deloitte & Touche, or KPMG and zero otherwise. Data are obtained from Datastream.
HACE$_{jt}$	High analyst coverage environment: Binary variable equal to unity if the number of analysts following firm (*j*) at the end of fiscal year (*t*) is above the median and zero otherwise. Data are obtained from Datastream. Note: If the number of analysts following firm (*j*) at the end of fiscal year (*t*) is not available, the number is assumed to be zero. The rationale is that no zero values are exhibited by Datastream (IBES).
BinaryNOIL$_{jt}$***HACE*$_{jt}$	Binary variable equal to unity if firm (*j*) reports nonopportunistic impairment losses in fiscal year (*t*) and the number of analysts following firm (*j*) at the end of fiscal year (*t*) is above the median and zero otherwise.
LACE$_{jt}$	Low analyst coverage environment: Binary variable equal to unity if the number of analysts following firm (*j*) at the end of fiscal year (*t*) is below the median and zero otherwise. Note: If the number of analysts following firm (*j*) at the end of fiscal year (*t*) is not available, the number is assumed to be zero. The rationale is that no zero values are exhibited by Datastream (IBES).

Appendix 3.1
Continued

$BinaryNOIL_{jt}*LACE_{jt}$	Binary variable equal to unity if firm (*j*) reports nonopportunistic impairment losses in fiscal year (*t*) and the number of analysts following firm (*j*) at the end of fiscal year (*t*) is below the median and zero otherwise.
Dependent Variables	
$BidAsk_{j}$	Daily (relative) bid-ask spread of firm (*j*) measured by the firm's ratio of the ask price less the bid price to the midpoint (average) of the bid price and ask price. Data are obtained from Datastream.
$BidAsk_{jt}$	$BidAsk_{j}$ averaged over the month at the end of fiscal year (*t*). Next, 1 is added to the average bid-ask spread and the natural logarithm is taken.
$4BidAsk_{jt}$	$BidAsk_{j}$ averaged over the fourth month following the end of fiscal year (*t*). Next, 1 is added to the average bid-ask spread and the natural logarithm is taken.
$4BidAsk_{jt-1}$	$BidAsk_{j}$ averaged over the fourth month following the end of fiscal year (*t-1*). Next, 1 is added to the average bid-ask spread and the natural logarithm is taken.
$D8BidAsk_{jt}$	The difference between $BidAsk_{jt}$ and $4BidAsk_{jt-1}$.
$D4BidAsk_{jt}$	The difference between $4BidAsk_{jt}$ and $BidAsk_{jt}$.
$D12BidAsk_{jt}$	The difference between $4BidAsk_{jt}$ and $4BidAsk_{jt-1}$.

Appendix 3.1
Continued

Control variables	
$Price_j$	Daily share price of firm (j). Share price is the midpoint (average) of the bid price and ask price. To allow for various currencies across European countries, I translate the midpoint of the bid and ask price of firms operating in noneurozone countries to euro values using the average exchange rate of May 2011 which is the month data collection was completed. Data are obtained from Datastream.
$Price_{jt}$	$Price_j$ averaged over the month at the end of fiscal year (t). Next, the natural logarithm is taken.
$4Price_{jt}$	$Price_j$ averaged over the fourth month following the end of fiscal year (t). Next, the natural logarithm is taken.
$4Price_{jt-1}$	$Price_j$ averaged over the fourth month following the end of fiscal year (t-1). Next, the natural logarithm is taken.
$D8Price_{jt}$	The difference between $Price_{jt}$ and $4Price_{jt-1}$.
$D4Price_{jt}$	The difference between $4Price_{jt}$ and $Price_{jt}$.
$D12Price_{jt}$	The difference between $4Price_{jt}$ and $4Price_{jt-1}$.
$TurnOver_j$	Daily share turnover: Common shares traded over common shares outstanding of firm (j). Data are obtained from Datastream.
$TurnOver_{jt}$	$TurnOver_j$ averaged over the month at the end of fiscal year (t). Next, 1 is added to the average share turnover and the natural logarithm is taken.

Appendix 3.1
Continued

$4TurnOver_{jt}$	$TurnOver_j$ averaged over the fourth month following the end of fiscal year (t). Next, 1 is added to the average share turnover and the natural logarithm is taken.
$4TurnOver_{jt-1}$	$TurnOver_j$ averaged over the fourth month following the end of fiscal year (t-1). Next, 1 is added to the average share turnover and the natural logarithm is taken. Note: If common shares outstanding in the month in question are not available, the closest month in which they are available is used. The justification is that the variation of common shares outstanding of a firm is predicted to be low.
$D8TurnOver_{jt}$	The difference between $TurnOver_{jt}$ and $4TurnOver_{jt-1}$.
$D4TurnOver_{jt}$	The difference between $4TurnOver_{jt}$ and $TurnOver_{jt}$.
$D12TurnOver_{jt}$	The difference between $4TurnOver_{jt}$ and $4TurnOver_{jt-1}$.
$FreeFloat_j$	Daily free float shares over daily common shares outstanding of firm (j). Free float shares are not closely or strategically held. Data are obtained from Datastream. Note: In contrast to Datastream, I do not use the percentage and hence divide the ratio obtained from Datastream by 100.
$FreeFloat_{jt}$	$FreeFloat_j$ averaged over the month at the end of fiscal year (t). Next, 1 is added to the average free float shares over common shares outstanding and the natural logarithm is taken.

Appendix 3.1
Continued

$4FreeFloat_{jt}$	$FreeFloat_j$ averaged over the fourth month following the end of fiscal year (t). Next, 1 is added to the average free float shares over common shares outstanding and the natural logarithm is taken.
$4FreeFloat_{jt-1}$	$FreeFloat_j$ averaged over the fourth month following the end of fiscal year ($t-1$). Next, 1 is added to the average free float shares over common shares outstanding and the natural logarithm is taken.
$D8FreeFloat_{jt}$	The difference between $FreeFloat_{jt}$ and $4FreeFloat_{jt-1}$.
$D4FreeFloat_{jt}$	The difference between $4FreeFloat_{jt}$ and $FreeFloat_{jt}$.
$D12FreeFloat_{jt}$	The difference between $4FreeFloat_{jt}$ and $4FreeFloat_{jt-1}$.
$AnFol_j$	Daily number of analysts following firm (j). Data are obtained from Datastream.
$AnFol_{jt}$	$AnFol_j$ averaged over the month at the end of fiscal year (t). Next, 1 is added to the average number of analysts following and the natural logarithm is taken.
$4AnFol_{jt}$	$AnFol_j$ averaged over the fourth month following the end of fiscal year (t). Next, 1 is added to the average number of analysts following and the natural logarithm is taken.

Appendix 3.1
Continued

$4AnFol_{jt-1}$	$AnFol_j$ averaged over the fourth month following the end of fiscal year (t-1). Next, 1 is added to the average number of analysts following and the natural logarithm is taken. Note: If the number of analysts following firm (j) in the month in question is not available, the number is assumed to be zero. The rationale is that no zero values are exhibited by Datastream (IBES).
$D8AnFol_{jt}$	The difference between $AnFol_{jt}$ and $4AnFol_{jt-1}$.
$D4AnFol_{jt}$	The difference between $4AnFol_{jt}$ and $AnFol_{jt}$.
$D12AnFol_{jt}$	The difference between $4AnFol_{jt}$ and $4AnFol_{jt-1}$.
Variables used in the additional sensitivity test section	
$HACE\_X_{jt}$/ $LACE\_X_{jt}$	Three additional specifications of the analyst coverage environments: I: $HACE\_I_{jt}$ is a binary variable equal to unity if the number of analysts following firm (j) at the end of fiscal year (t) is more than two and zero otherwise. $LACE\_I_{jt}$ is a binary variable equal to unity if the number of analysts following firm (j) at the end of fiscal year (t) is zero and zero otherwise. II: $HACE\_II_{jt}$ is a binary variable equal to unity if the number of analysts following firm (j) at the end of fiscal year (t) is more than two and zero otherwise. $LACE\_II_{jt}$ is a binary variable equal to unity if the number of analysts following firm (j) at the end of fiscal year (t) is below two and zero otherwise.

Appendix 3.1
Continued

	III: *$HACE\_III_{jt}$* is a binary variable equal to unity if the number of analysts following firm (*j*) at the end of fiscal year (*t*) is more than zero and zero otherwise. *$LACE\_III_{jt}$* is a binary variable equal to unity if the number of analysts following firm (*j*) at the end of fiscal year (*t*) is zero and zero otherwise.
$Size_{jt}$	Market capitalization of firm (*j*) at the end of fiscal year (*t*). To allow for various currencies across European countries, I translate the market capitalization of firms operating in noneurozone countries to euro values using the average exchange rate of May 2011. Data are obtained from Datastream.
$Rule_{j2006}$	If firm (*j*) operates in a country in which the "*rule of law*" measure in the year 2006, drawn from Kaufamnn et al. (2007), is above (below) 1.675, I assume a strict (weak) rule of law. The value is the median measured in chapter 2.
$TimePeriod_j$	If the fiscal year of firm (*j*) ends before August 2008, the time period is before the global financial crisis and otherwise it is during/after the global financial crisis. The split of the time period is consistent with that in chapter 2.

Appendix 3.2
Timeliness and information content of IAS 36 impairment losses

Table of Appendix 3.2 shows the results of the full sample (full IAS 36 sample). The OLS regressions used to obtain the results is described below the table. Columns 1 and 3 report the results without decomposing the sample into a high analyst coverage environment and a low analyst coverage environment; columns 2 and 4 document the results of the decomposed sample.

Table of Appendix 3.2
Timeliness and information content of IAS 36 impairment losses

Variables	$D8BidAsk_{jt}$ Prereporting period		$D4BidAsk_{jt}$ Reporting period	
	(1)	(2)	(3)	(4)
Intercept	0.000	0.001***	-0.001***	-0.002***
	(1.014)	(2.876)	(5.653)	(5.861)
$HACE_{jt}$		-0.002***		0.002***
		(5.295)		(5.508)
Analyzed variables				
$BinaryIL_{jt}$	0.000		0.000	
	(0.785)		(0.766)	
$BinaryIL_{jt}*HACE_{jt}$		0.000		0.000
		(0.355)		(0.935)
$BinaryIL_{jt}*LACE_{jt}$		0.002**		-0.001
		(2.555)		(1.270)
Control variables				
$DMPrice_{jt}$	-0.018***	-0.018***	-0.019***	-0.019***
	(20.846)	(20.721)	(16.086)	(16.073)
$DMTurnOver_{jt}$	-0.876***	-0.922***	-0.757***	-0.790***
	(9.157)	(9.624)	(9.382)	(9.704)
$DMVolat_{jt}$	0.270***	0.276***	0.179***	0.180***
	(11.208)	(11.469)	(8.526)	(8.591)
$DMFreeFloat_{jt}$	0.001	0.002	0.002	0.002
	(0.404)	(0.607)	(0.573)	(0.528)
$DMAnFol_{jt}$	-0.000	-0.000	0.000	0.001
	(0.157)	(0.043)	(0.441)	(0.506)

Table of Appendix 3.2
Continued

# of obs.	12096	12096	12096	12096
Adj. R2	0.174	0.178	0.080	0.084

This table documents the results using all collected IAS 36 impairments (the full sample). Columns 1 and 3 document the results without decomposing the sample into a high analyst coverage environment and a low analyst coverage environment. Columns 2 and 4 document the results of the decomposed sample. The following regressions are applied:

Column 1: $D8BidAsk_{jt} = \alpha_0 + \alpha_1 BinaryIL_{jt} + \sum_{k=2}^{6} \alpha_k Controls_{jt} + \varepsilon_{jt}$,

Column 2: $D8BidAsk_{jt} = \alpha_0 + \alpha_1 HACE_{jt} + \alpha_2 BinaryIL_{jt}{*}HACE_{jt} + \alpha_3 BinaryIL_{jt}{*}LACE_{jt} + \sum_{k=4}^{8} \alpha_k Controls_{jt} + \varepsilon_{jt}$,

Column 3: $D4BidAsk_{jt} = \alpha_0 + \alpha_1 BinaryIL_{jt} + \sum_{k=2}^{6} \alpha_k Controls_{jt} + \varepsilon_{jt}$,

Column 4: $D4BidAsk_{jt} = \alpha_0 + \alpha_1 HACE_{jt} + \alpha_2 BinaryIL_{jt}{*}HACE_{jt} + \alpha_3 BinaryIL_{jt}{*}LACE_{jt} + \sum_{k=4}^{8} \alpha_k Controls_{jt} + \varepsilon_{jt}$,

where $BinaryIL_{jt}$ is a binary variable equal to unity if firm (*j*) reports IAS 36 impairment losses in fiscal year (*t*) and zero otherwise. IAS 36 impairment losses are an aggregate of impairment losses of tangible assets, goodwill, and other intangible assets. Data are obtained from Datastream. For a description of the other variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Column 2 shows that the coefficient on $BinaryIL_{jt}*HACE_{jt}$ is insignificantly different from zero. This indicates that IAS 36 impairment charges reported in financial statements by European firms are not anticipated in a high analyst coverage environment. When IAS 36 impairment losses are reported opportunistically in a firm's financial statements, they might contain no information that can be anticipated in a high analyst coverage environment. For instance, impairment losses that were to be reported in the previous fiscal year but are opportunistically postponed until the current fiscal year are unlikely anticipated during the current fiscal year when the analyst coverage environment is high. Yet, the information content of nonopportunistic IAS 36 impairment losses is anticipated during the fiscal year in a high analyst coverage environment (see Table 3.5 in section 3.6). Thus, the results provide some evidence that my selection criteria to identify nonopportunistic IAS 36 impairment losses are valid. Furthermore, column 4 documents that the coefficients on $BinaryIL_{jt}*HACE_{jt}$ and $BinaryIL_{jt}*LACE_{jt}$ are insignificantly different from zero. This implies that reports of IAS 36 impairments do not provide information in a European setting, irrespective of the analyst coverage environment, supplementing results in prior U.S. based studies (e.g., Zucca and Campbell 1992; Francis et al. 1996; Hirschey and Richardson 2003; Bens et al. 2011; Muller et al. 2012) as well as IAS 36 based studies in an Australian setting (Vanza et al. 2011) and in a European setting (Knauer and Wöhrmann 2012). In addition, the results provide further evidence of the validity of my selection criteria (see section 3.3) to identify nonopportunistic impairments that provide information to investors in a low analyst coverage environment (see Table 3.5 in section 3.6).

Appendix 3.3

Tables 3.5 and 3.6 retabulated using additional specifications of high and low analyst coverage environments to examine the timeliness, information content, and quality of the information content of nonopportunistic impairment losses

	Sign	$D8BidAsk_{jt}$ Prereporting period			$D4BidAsk_{jt}$ Reporting period			$D12BidAsk_{jt}$ Full period		
		Additional specifications of high and low analyst coverage environments								
		I	II	III	I	II	III	I	II	III
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	?	0.002***	0.002***	0.002***	-0.002***	-0.002***	-0.002***	0.001	-0.000	0.000
		(3.446)	(3.220)	(2.667)	(3.398)	(4.956)	(3.231)	(0.880)	(0.642)	(0.273)
$HACE\_X_{jt}$	?	-0.003***	-0.003***	-0.002***	0.002***	0.002***	0.001	-0.002**	-0.001*	-0.001**
		(4.462)	(5.115)	(3.149)	(2.673)	(4.147)	(1.555)	(2.558)	(1.919)	(2.158)
$BinaryNOIL_{jt}*HACE\_X_{jt}$	-							-0.003***	-0.004***	-0.003***
								(6.136)	(8.425)	(5.587)

Appendix 3.3
Continued

Analyzed variables										
$BinaryNOIL_{jt}$*$HACE\_X_{jt}$ (H3.1)	-	-0.004*** (7.139)	-0.005*** (9.267)	-0.004*** (6.530)						
$BinaryNOIL_{jt}$*$HACE\_X_{jt}$	0?				0.000 (0.490)	0.000 (0.127)	0.000 (0.080)			
$BinaryNOIL_{jt}$*$LACE\_X_{jt}$ (H3.2)	+	0.009*** (3.048)	0.009*** (3.772)	0.008*** (2.675)						
$BinaryNOIL_{jt}$*$LACE\_X_{jt}$ (H3.3)	-				-0.005* (1.900)	-0.005** (2.559)	-0.005** (1.982)			
$BinaryNOIL_{jt}$*$LACE\_X_{jt}$ (H3.4)	+							0.005* (1.820)	0.005** (2.274)	0.004 (1.367)
Control variables are included										
# of obs.		7068	8579	9504	7068	8579	9504	7068	8579	9504
Adj. R2		0.147	0.170	0.175	0.066	0.082	0.082	0.148	0.174	0.184

Appendix 3.3
Continued

This table exhibits the OLS regression analyses to test hypotheses 3.1 to 3.4 (H3.1 to H3.4) by using three additional specifications of high and low analyst coverage environments (headings: “I”, “II”, and “III”), captured in $HACE\_X_{jt}$ and $LACE\_X_{jt}$. Hypotheses 3.1 and 3.2 predict that nonopportunistic impairment charges are reported with a delay in a firm’s annual financial statements. As a result, nonopportunistic impairment charges should be (to a high degree) anticipated in a high analyst coverage environment (hypothesis 3.1) and investors’ uncertainty about a firm’s asset quality should increase during the fiscal year when the analyst coverage is low (hypothesis 3.2). Hypothesis 3.3 predicts that reports of nonopportunistic impairment charges in a firm’s annual financial statements provide information to investors when the analyst coverage environment is low. Hypothesis 3.4 predicts that the information content of nonopportunistic impairment charges is of low quality. As a result, investors’ uncertainty about a firm’s asset quality that increased during the fiscal year should be only in part eliminated through reports of nonopportunistic impairment losses in a firm’s annual financial statements. *HACE* (*LACE*) is equal to a high (low) analyst coverage environment. “*X*” stands for the three specifications (I, II, III). *HACE_I* (*LACE_I*) is a binary variable equal to unity if firm (*j*) is followed by three or more (no) analysts at the end of fiscal year (*t*) and zero otherwise. 2,436 firm-year observations that are not allocated to $HACE\_I_{jt}$ or $LACE\_I_{jt}$ are dropped. *HACE_II* (*LACE_II*) is a binary variable equal to unity if firm (*j*) is followed by three or more (no or one) analysts at the end of fiscal year (*t*) and zero otherwise. 925 firm-year observations that are not allocated to *HACE_II* or *LACE_II* are dropped. *HACE_III* (*LACE_III*) is a binary variable equal to unity if firm (*j*) is followed by one or more (no) analysts at the end of fiscal year (*t*) and zero otherwise. No observations are dropped for the third specification. $D4BidAsk_{jt}$, $D8BidAsk_{jt}$, and $D12BidAsk_{jt}$ are dependent variables. Control variables are included but untabulated. For a description of the variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Appendix 3.4

Examination of the timeliness of reports of nonopportunistic impairment losses in high analyst coverage environments by splitting the sample by firm size

Variables	Sign	*D8BidAsk* Prereporting period							
		Analyst coverage environment							
		Main specification		Additional specifications					
		Median		I		II		III	
		Firm size							
		Small	Large	Small	Large	Small	Large	Small	Large
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	?	0.002***	0.000	0.002***	0.003	0.002***	0.001	0.002***	0.002
		(3.961)	(0.406)	(3.148)	(1.273)	(3.701)	(0.796)	(2.882)	(1.001)
$HACE_{jt}$	?	-0.003***	-0.002						
		(4.101)	(1.579)						
$HACE\_X_{jt}$	?			-0.003***	-0.003*	-0.003***	-0.002*	-0.001*	-0.003
				(3.180)	(1.691)	(3.944)	(1.683)	(1.777)	(1.504)
$BinaryNOIL_{jt}*LACE_{jt}$	+	0.006***	0.007*						
		(2.689)	(1.802)						
$BinaryNOIL_{jt}*LACE\_X_{jt}$	+			0.007**	0.014**	0.007***	0.011**	0.007**	0.012*
				(2.154)	(2.011)	(2.982)	(2.113)	(2.009)	(1.819)

Appendix 3.4
Continued

Analyzed variables									
BinaryNOIL$_{jt}$***HACE*$_{jt}$	-	-0.004*** (3.289)	-0.006*** (8.558)						
BinaryNOIL$_{jt}$***HACE_X*$_{jt}$	-			-0.003*** (2.662)	-0.003*** (5.204)	-0.004*** (3.298)	-0.005*** (7.604)	-0.001 (1.098)	-0.005*** (6.705)
Control variables are included									
# of obs.		4752	4752	3219	3849	4157	4422	4752	4752
Adj. R2		0.212	0.152	0.182	0.115	0.206	0.138	0.208	0.151

This table exhibits the OLS regression analysis to examine the timeliness of reports of nonopportunistic impairment losses in high analyst coverage environments to confirm hypothesis 3.1. Hypothesis 3.1 predicts that nonopportunistic impairment charges are reported with a delay in a firm's annual financial statements, thus, they should be anticipated in a high analyst coverage environment. This table is sorted by firm size and all specifications of high analyst coverage environments. The main (median) specification of a high analyst coverage environment is captured by *HACE*. The additional three specifications are captured by *HACE_X*. The definitions of *HACE_X* and sample reductions of applying the first two additional specifications of high analyst coverage environments are documented in Appendices 3.1 and 3.3. *D8BidAsk* is a dependent variable. Control variables are included but untabulated. For a description of the variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

Appendix 3.5

Examination of the timeliness of reports of nonopportunistic impairment losses in high analyst coverage environments by splitting the sample by a firm's enforcement environment

Panel A. Country-level enforcement environment

Variables	Sign	*D8BidAsk*							
		Prereporting period							
		Analyst coverage environment							
		Main specification		Additional specifications					
		Median		I		II		III	
		Country-level enforcement system							
		Weak	Strict	Weak	Strict	Weak	Strict	Weak	Strict
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	?	0.003***	0.001	0.004***	0.002*	0.004***	0.001	0.004***	0.001
		(5.065)	(0.852)	(4.009)	(1.683)	(4.881)	(1.204)	(3.942)	(0.915)
$HACE_{jt}$	?	-0.003***	-0.002***						
		(4.144)	(3.506)						
$HACE\_X_{jt}$	?			-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.002*
				(3.437)	(2.863)	(4.113)	(3.334)	(2.628)	(1.860)
$BinaryNOIL_{jt}*LACE_{jt}$	+	0.009***	0.004*						
		(3.165)	(1.753)						
$BinaryNOIL_{jt}*LACE\_X_{jt}$	+			0.011**	0.008**	0.012***	0.006**	0.011**	0.007*
				(2.388)	(1.996)	(3.681)	(2.088)	(2.311)	(1.650)

Appendix 3.5
Continued

Analyzed variables									
$BinaryNOIL_{jt}*HACE_{jt}$	-	-0.002***	-0.008***						
		(3.071)	(9.775)						
$BinaryNOIL_{jt}*HACE\_X_{jt}$	-			-0.002**	-0.005***	-0.002***	-0.007***	-0.001	-0.006***
				(2.427)	(7.106)	(2.899)	(9.171)	(1.068)	(7.205)
Control variables are included									
# of obs.		3348	6156	2564	4504	3048	5531	3348	6156
Adj. R2		0.200	0.183	0.181	0.140	0.199	0.170	0.194	0.179

Appendix 3.5
Continued

Panel B. Time period

Variables	Sign	*D8BidAsk* Prereporting period							
		Analyst coverage environment							
		Main specification		Additional specifications					
		Median		I		II		III	
		Time period in relation to the global financial crisis							
		Before	During/ After	Before	During/ After	Before	During/ After	Before	During/ After
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	?	0.003***	0.001	0.004***	0.002*	0.004***	0.001	0.004***	0.001
		(5.014)	(1.148)	(3.876)	(1.870)	(4.944)	(1.365)	(3.788)	(1.053)
$HACE_{jt}$	?	-0.004***	-0.002***						
		(6.361)	(3.017)						
$HACE\_X_{jt}$	?			-0.005***	-0.003***	-0.004***	-0.002***	-0.004***	-0.002
				(4.710)	(2.579)	(5.974)	(3.009)	(3.620)	(1.572)
$BinaryNOIL_{jt}*LACE_{jt}$	+	-0.002	0.009***						
		(1.206)	(3.833)						
$BinaryNOIL_{jt}*LACE\_X_{jt}$	+			-0.000	0.014***	-0.002	0.012***	-0.001	0.012***
				(0.151)	(3.372)	(0.866)	(4.248)	(0.253)	(3.076)

Appendix 3.5
Continued

Analyzed variables									
BinaryNOIL$_{jt}$***HACE*$_{jt}$	-	-0.001**	-0.007***						
		(2.005)	(10.135)						
BinaryNOIL$_{jt}$***HACE_X*$_{jt}$	-			-0.001*	-0.005***	-0.001*	-0.007***	-0.002***	-0.005***
				(1.668)	(7.503)	(1.957)	(9.544)	(3.216)	(6.113)
Control variables are included									
# of obs.		3301	6203	2504	4564	2967	5612	3301	6203
Adj. R2		0.072	0.213	0.067	0.174	0.066	0.204	0.068	0.207

This table exhibits the OLS regression analysis to examine the timeliness of reports of nonopportunistic impairment losses in high analyst coverage environments to confirm hypothesis 3.1. Hypothesis 3.1 predicts that nonopportunistic impairment charges are reported with a delay in a firm's annual financial statements, thus, they should be anticipated in a high analyst coverage environment. This table is sorted by the enforcement environment and all specifications of high analyst coverage environments. The enforcement environment is captured by the country-level enforcement environment (Panel A) and time period (Panel B).The main (median) specification of a high analyst coverage environment is captured by *HACE*. The additional three specifications are captured by *HACE_X*. The definitions of *HACE_X* and sample reductions of applying the first two additional specifications of high analyst coverage environments are documented in Appendices 3.1 and 3.3. *D8BidAsk* is a dependent variable. Control variables are included but untabulated. For a description of the variables see Appendix 3.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively. The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009).

4 Value relevance of historical cost income versus fair value based income[79]

Abstract

IFRS permits firms to report unrealized gains and unrealized losses on investment properties in financial statements (fair value model). U.S. GAAP, which forbids firms to report unrealized gains on investment properties in financial statements, requires firms to report impairment losses once the depreciated book value of the property is not recoverable (historical cost model). The asymmetric treatment under U.S. GAAP is due to the U.S. FASB's concern that the faithful representation of fair value appreciations is low so that errors are introduced into income numbers. Yet, estimation errors of fair value decrements below costs (impairments) are expected to be small so that impairments contain value relevant information. I subject the U.S. FASB's concern to an empirical test and expect that unrealized gains on properties are more value relevant than historical cost income. I also argue that because properties are carried at cost, impairments are less value relevant than unrealized losses (reported under the fair value model). I test my predictions using U.S. real estate firms' reporting of investment properties under U.S. GAAP and U.K. real estate firms' reporting of investment properties under IFRS. As expected, I find that unrealized gains explain the economic performance of investment properties in a timely manner. In addition, while I provide some evidence that during the period from 2007–2009 (around the severe real estate crisis) unrealized losses are less useful in explaining share prices than impairments, both kinds of fair value decrements do not contain timely information about severe economic losses. In conclusion, this study provides evidence that outside of the severe crisis, the fair value model for investment properties is superior to the historical cost model in explaining market price variations.

[79] This chapter is based on a joint research project with Igor Goncharov.

4.1 Introduction

The Securities and Exchange Commission (SEC) strongly supports the agreement between the U.S. FASB and IASB to work together toward greater convergence between U.S. GAAP and IFRS (SEC 2010). In addition, since 2007 the SEC allows firms cross-listed in the U.S. to apply IFRS instead of reconciling IFRS to U.S. GAAP (IASB 2007). Moreover, the SEC has been considering the adoption of IFRS for U.S. listed firms in the foreseeable future. However, U.S. GAAP and IFRS differ in their approach to reporting nonfinancial fixed assets in financial statements.

While U.S. GAAP requires firms to apply the historical cost model for nonfinancial fixed assets, IFRS allows (under certain conditions) firms to apply the fair value model for these assets. Proponents of the historical cost model and the U.S. FASB have expressed concern about the estimation error (faithful representation) of fair value appreciations of nonquoted assets, as this may introduce errors into accounting income numbers (Holthausen and Watts 2001; Watts 2003; Kothari et al. 2010; Barth 1994; Barth and Landsman 1995; Cotter and Zimmer 2003). Even though subjectively estimated, fair value decrements below cost (impairments) are perceived to introduce less errors into accounting income numbers than fair value appreciations and contain information about an asset's economic losses (Kothari et al. 2010). In this paper, I subject those views to an empirical test and examine the relative value relevance of fair value based income versus historical cost income. Specifically, I examine whether concerns about the estimation error of unrealized gains are justified, whether unrealized losses convey more value relevant information than impairments (and depreciation), and whether fair value based income is of higher value relevance than historical cost income.[80]

I conduct this study using the real estate setting and the variation in accounting for investment property between U.S. GAAP and IFRS.[81] Under U.S. GAAP, investment properties are reported in financial statements at historical cost, which permits only downward adjustments below cost to assets' fair value (impairments) in accordance with SFAS 144 "*Accounting for the Impairment or Disposal of Long-Lived Assets*" (PWC 2009; FASB 2001b). IFRS (IAS 40 "*Investment Property*") allows firms to carry investment properties at fair value, and to report in financial statements on both upward adjustments (unrealized gains) and downward adjustments (unrealized losses) to assets' fair value (IASB 2003b).

I use U.S. and U.K. real estate firms that are highly invested in investment properties, a sample with several advantages. First, the U.S. and U.K. both have highly developed capital and real estate markets and are both common law countries with similar enforcement systems (Muller et al. 2011; Goncharov et al. 2013; La Porta et al. 1997, 1998; Ball et al. 2000; Ball et al. 2003; La Porta et al. 2006; Leuz 2010). This reduces the likelihood that results are driven by country institutional differences. Second, although IAS 40 provides an option to report investment properties at historical cost in financial statements, U.K. firms historically reported investment properties at fair value and continued to report them at fair value after the IFRS transition (Christensen and Nikolaev 2009; Cairns et al. 2011). This mitigates any concern with the self-selection of a historical cost

[80] Value relevance indicates that the estimation error of fair values is sufficiently low to summarize information affecting a firm's share prices and share price returns (e.g., Barth et al. 2001).

[81] Investment property is defined by IAS 40 "*Investment Property*" as a property held for rental income and/or capital appreciation (IASB 2003b).

model or a fair value model. Third, the major asset class of my collected real estate firms is investment property. As a result, I reduce the likelihood that other income statement components drive results. Finally, using investment properties allows me to address the concern expressed by Bernard (1993) and Sloan (1999) that fair values for other tangible assets are not directly related to a firm's value. Fair values for investment properties are explicitly linked to a real estate firm's business model.

Few prior studies examined the value relevance of impairment charges and unrealized gains/losses on investment properties (Fields et al. 1998; Danbolt and Rees 2008). Using a U.S. setting and a time period before asset impairment guidelines became effective, Fields et al. (1998) find that impairment charges reported by real estate firms are incrementally related to share prices. Using the same setting, the authors additionally find some incremental value relevance of voluntarily disclosed fair values over historical cost income. Applying a U.K. setting and a pre-IFRS period, Danbolt and Rees (2008) find that fair values mandatorily reported in financial statements by real estate firms are associated with share price returns.

I follow prior literature that shows that fair value based income for investment properties provides more information to investors than historical cost income (Muller et al. 2011). Thus, I predict that unrealized gains on investment properties are more value relevant than historical cost income. I next inquire whether impairments and unrealized losses can be substituted for each other. I argue that despite similarities in the accounting for impairment charges under U.S. GAAP and unrealized losses under IFRS, there are two reasons to suspect lower value relevance when impairments are reported in financial statements than when unrealized losses are reported. First, impairments are only reported in financial statements if fair value decrements are sufficiently large to compensate for prior (nonreported) fair value increments. Accordingly, it is possible that impairments are either not triggered for all investment properties that suffer economic losses or that the reported impairment charges do not fully capture the economic losses of the impaired properties. This should reduce their informativeness about bad news. Second, the valuation process under the fair value model is well established while the valuation of impairments is likely to be conducted in a nonroutine setting, where the valuation process still needs to be established and audited (Goncharov et al. 2013). Nonroutine impairment testing possibly increases the errors in impairment estimates, which should reduce the value relevance of impairments relatively to unrealized losses.

My sample selection strategy leads to a sample comprising 112 U.S. and 32 U.K. listed real estate firms and 743 firm-year observations. My descriptive results reveal that in contrast to historical cost income, fair value based income is to a reasonable extent aligned to the real estate market's upward and downward trends over 2005–2011. Yet, unrealized losses—predominantly reported in financial statements over 2007–2009—lag and do not fully capture the severe economic losses that U.K. real estate firms suffered over 2007–2008.

Furthermore, descriptive results show that the market-to-book ratio is not different from its theoretical value of 1 when fair value increments (unrealized gains) are reported in financial statements.[82] Additionally, the market-to-book ratio is above 1 when historical cost income is applied over the whole period and over 2007–2009, a time period of high uncertainty about the value of properties. This indicates that since no fair value increments are reported in financial statements, properties are on average

[82] The rationale for a theoretical value of 1 is explained in more detail in Section 4.5.3 and Appendix 4.2.

understated relative to the market value even around the severe real estate crisis of 2007–2009. In contrast, when unrealized losses are reported through the income statement (based on upwardly adjusted book values), I find that properties are overstated (i.e., market-to-book ratio is below 1).

To assess the relative value relevance of fair value based income versus historical cost income, I split the sample into five subsamples: (1) U.S. firms with no impairments in a particular year, (2) U.S. firms with impairments in a particular year, (3) U.K. firms that reported unrealized gains in financial statements in a particular year, (4) U.K. firms that reported unrealized losses in financial statements in a particular year, and (5) all U.K. firms (3 and 4 aggregated). This procedure gradually moves the sample from "pure" historical cost income (i.e., no recognition of fair value decrements) to limited recognition of fair value decrements (as impairment charges) to fair value based income.

To assess the relative value relevance, I compare the explanatory power (adjusted R^2) across the five subsamples using share price and share price return regressions. The price regression tests whether impairment charges and unrealized gains and losses capture the total economic performance of properties. I supplement this analysis using the return specification to examine whether fair value adjustments are reported in financial statements on a timely basis.

The results of the price and return regressions reveal that unrealized gains contain more value relevant information than historical cost income that excludes or includes impairment charges. Additionally, I find some evidence that impairments are more useful in explaining share prices over 2007–2009 than unrealized losses. Using the return regression, I find that fair value decrements (impairments and unrealized losses) do not contain timely value relevant information over 2007–2009. Overall, I provide evidence that outside of the severe crisis, fair value based income is of higher value relevance than historical cost income for investment properties.

To my knowledge, this is the first study to compare the value relevance of impairment charges with unrealized gains and unrealized losses on investment properties. My findings supplement prior literature in three ways. First, I show that IAS 40 fair value increments are value relevant. Second, I show that IAS 40 unrealized losses on investment properties are not more value relevant than SFAS 144 impairment charges during the severe crisis. Third, I provide evidence for the superiority of fair value based income for investment properties measured in accordance with IAS 40 to historical cost income including SFAS 144 impairments outside of crises. Prior research analyzed the value relevance of voluntarily disclosed fair values in a setting in which assets additionally are depreciated and written-off (Fields et al. 1998) and of mandatorily reported fair values in the pre-IFRS period in which no other property adjustments are taken to the income statement (Danbolt and Rees 2008). Based on the findings, I identify the area that requires further convergence efforts, as the fair value model under IFRS produces a markedly different result from the historical cost model under U.S. GAAP.

The remainder of this paper is organized as follows. In section 4.2, I provide background information and develop the hypotheses. In section 4.3, I specify the model. In section 4.4, I describe the sample. The descriptive results are outlined in section 4.5. In section 4.6, I report the results of the value relevance regressions. In section 4.7, a summary, conclusions, and limitations of the study are presented.

4.2 Background information and hypotheses development

4.2.1 Institutional setting

To examine the relative value relevance of impairments versus unrealized gains and unrealized losses on investment properties, I compare samples of U.S. and U.K. real estate firms. While U.S. real estate firms report investment properties under the historical cost model (U.S. GAAP), U.K. real estate firms report them under the fair value model (IFRS).

The SEC has permitted firms cross-listed in the U.S. to report under IFRS without requiring reconciliation to U.S. GAAP, and is currently considering the adoption of IFRS for U.S. listed firms. In contrast to U.S. GAAP, IFRS provides an option to report nonfinancial fixed assets at their fair values in financial statements.

Under IFRS, fair values can be applied for property, plant, and equipment (PPE) (IAS 16: "*Property, Plant and Equipment*"), and actively traded intangibles (IAS 38: "*Intangible Assets*"), with asset adjustments beyond cost taken to the comprehensive income statement and below cost taken to the income statement (IASB 2003a; IASB 2008). While the fair value option for these kinds of assets is rarely used in practice by European firms, reporting fair values of investment properties is common practice, in particular, by U.K. real estate firms (see Christensen and Nikolaev 2009; Cairns et al. 2011). Investment properties are separated from other tangible fixed assets and can be reported at fair value in accordance with IAS 40. Under IAS 40, investment properties are held either at fair value on the balance sheet and unrealized gains/losses are taken to the income statement, or at cost and fair values are disclosed in the notes to financial statements. When applying the fair value model, depreciation rates and impairment losses are not estimated (IASB 2003b).

The U.S. FASB has expressed concern about the faithful representation of fair values reported in financial statements for tangible and intangible fixed assets (Barth 1994; Barth and Landsman 1995; Cotter and Zimmer 2003).[83] As a result, U.S. GAAP mandates historical cost accounting for investment property as for other tangible fixed assets. This requires U.S. real estate firms to depreciate the initial costs of the investment property over its useful life. In addition, according to SFAS 144, reports of fair value decrements are required when the property's book value is not recoverable (PWC 2009; FASB 2001b).

Specifically, properties held and used are to be tested for recoverability or impairment whenever events or a change in circumstances indicate that an impairment might exist.[84] An impairment is considered to exist if the sum of undiscounted projected future net cash flows is less than the book value of that property. The magnitude of impairment charges is based on fair value by writing down the book value to the estimated fair value (e.g., discounted projected future net cash flows). A reversal of former impairment charges is not allowed (FASB 2001b). Thus, under U.S. GAAP, real estate firms apply conservative accounting for their primary assets by reporting losses immediately and gains when they materialize in financial statements (see also Basu 1997). This approach aims to prevent an overstatement of assets, similar to IFRS requirements to report unrealized losses in financial statements.

[83] In September 2010, the IASB and U.S. FASB completed their joint project on the objectives and qualitative characteristics of financial reporting incorporated in the financial frameworks of IFRS and U.S. GAAP. Within this project, the U.S. FASB and IASB substituted the term "faithful representation" for "reliability," as they expect the former to capture more clearly than the latter the intended meaning that accounting information represents what it purports to represent (FASB 2010).

[84] Indicators for investment properties are, for instance, a significant decline in occupancy rates, deterioration in the physical condition of the property, and decline in general economic conditions (see also FASB 2001b).

The valuation basis and definition of impairment charges outlined in SFAS 144 is similar to those of unrealized gains/losses set forth in IAS 40. Impairments are to be estimated on the lowest group of long-lived assets for which identifiable net cash flows are largely independent of the net cash flows of other assets (FASB 2001b). Investment properties are expected to generate net cash flows independently of other assets (IASB 2003b). Thus, as with U.K. firms, U.S. firms are required to asses property-by-property.

For both accounting models the definition of fair value excludes benefits that are attributable to the firm using the investment property (FASB 2001b). Consequently, factors that are specific to the firm, such as tax benefits and legal rights, are to be excluded (IASB 2003b). Fair values of investment properties should be measured based on current prices for identical properties in an active market. As market values of identical properties are unlikely to be available, fair values are estimated based on current market conditions (e.g., rental rates and occupancies for comparable properties), on recent sales data for comparable properties, and, where applicable, on contracts or the results of negotiations with purchasers or prospective purchasers. Thus, they are based on level two or level three of the fair value hierarchy (Fields et al. 1998; Danbolt and Rees 2008; Goncharov et al. 2013). Fair value measures according to SFAS 157 "*Fair Value Measurements*" and IFRS 13 "*Fair Value Measurement*" are classified using a three-level hierarchy that depends on the availability of market data. The first level is quoted prices in active markets, level two prices are based on input components that are observable for other similar assets, while level three fair value estimates are based on valuation models and unobservable market inputs (FASB 2006; IASB 2011). Levels two and three fair values include subjective estimates, which are prone to intentional and unintentional errors (Fields et al. 1998; Danbolt and Rees 2008).

The use of U.S. and U.K. real estate firms provides an opportunity to compare the value relevance of impairment charges versus unrealized gains and unrealized losses on investment properties in a strong setting. The U.S. and U.K. are common law countries and have similar strong enforcement rules, which possibly affect the informativeness of accounting disclosures (La Porta et al. 1997, 1998; Ball et al. 2000; La Porta et al. 2006; Leuz 2010). Accordingly, managers and firms in these countries tend to bear a high risk of litigation, which can lead to a prudent reporting of fair value adjustments (Ball et al. 2000; Ball et al. 2003).[85]

Additionally, using U.K. real estate firms mitigates any concern with the self-selection of a historical cost model or a fair value model. U.K. real estate firms used the fair value model for investment properties under the U.K. GAAP (The Institute of Chartered Accountants 1981) and continued applying the fair value model after IFRS adoption (Christensen and Nikolaev 2009; Cairns et al. 2011).[86]

4.2.2 Related literature

I use a value relevance study to analyze the relative usefulness of the fair value model versus the historical cost model in explaining market fluctuations. Accounting data are value relevant when they explain share prices and share price returns. Value relevant accounting data summarize information, regardless of the source, that is used by investors in valuing a

[85] Notwithstanding the similarities between both countries, I account for potential differences (explained in section 4.3).

[86] U.K. firms that held investment properties under a lease should be depreciated when the unexpired term is 20 years or less (The Institute of Chartered Accountants 1981). Under IAS 40, even properties held under an operating lease may be classified as investment properties if the properties would otherwise meet the definition of an investment property and the lessee applies the fair value model (IASB 2003b). Consequently, under IAS 40, fair values are more generously applied than under U.K. GAAP.

firm's net assets. Thus, to be value relevant, accounting data do not need to be decision useful (relevant) to investors. Investors may focus on information other than on accounting data to infer a firm's net asset quality (value) (Easton et al. 1993; Barth and Clinch 1998; Collins et al. 1999; Francis and Schipper 1999; Sloan 1999; Barth et al. 2001).

The value relevance concept is to some extent aligned to the concept of relevance defined by the U.S. FASB and IASB. According to the definition of the U.S. FASB and IASB, an accounting amount is relevant if it is "capable" of being decision useful (relevant) to investors (FASB 2010; see also Sloan 1999; Barth et al. 2001; Herrmann et al. 2006). Accordingly, investors may already be aware of information provided by financial statements, or they might focus on information other than that provided by financial statements (FASB 2010). As a result, the U.S. FASB and IASB define relevance in a sense that fair values reported by managers should contain information that explain assets' economic performance but they do not need to provide "new" information to investors. However, whether fair values of assets can be sufficiently faithfully represented to sustain their relevance to investors has been debated for more than a decade (Schipper 2005; Hitz 2007; Lapointe-Antunes et al. 2009).

This study sheds light on this debate. If the estimation error of levels two and three fair values of investment properties is sufficiently low, they should be value relevant. As a result, fair values should explain market fluctuations and be capable of being decision relevant to investors. However, if fair values of investment properties are measured intentionally or unintentionally with high errors by real estate firms, they should have little or no value relevance to investors.

Prior literature sheds some light on the faithful representation of fair values by examining the value relevance of impairment charges and unrealized gains/losses on assets. Alciatore et al. (2000) examine impairment charges reported by U.S. oil and gas firms. U.S. GAAP allows firms to capitalize the exploration cost of dry and successful wells (i.e., the full cost approach). The capitalized wells are subject to quarterly impairment tests—the "ceiling test." The ceiling test is based on comparing the book value with estimated discounted projected future net cash flows of the capitalized wells (Boone and Raman 2007; Bragg 2010, 479–480 and 1250–1252). Using a period of sharp decline in oil prices 1984–1987, Alciatore et al. (2000) find that impairment losses are reflected in both current and past quarterly returns. The results suggest that share prices partly anticipate impairment losses.

Boone and Raman (2007) also examine impairment charges of firms that primarily operate oil and gas wells. However, the authors compare the value relevance of impairment charges of firms that use the full cost and successful effort approach. The impairment guidelines for full cost firms (ceiling test) are more rigid than those set forth in SFAS 121 for successful effort firms.[87] Using a post-SFAS 121 sample, 1996–2001, Boone and Raman (2007) show that impairment charges for both kinds of firms are related to returns. However, the value relevance is somewhat lower for full cost firms. The authors suggest that rigid rules restrict managers' ability to provide information about a firm's underlying economics.

[87] To measure the fair value of wells, full cost firms have to discount future net cash flows (similar to the requirements set forth in SFAS 121). However, all full cost firms are required to use discount rates of 10 percent and to estimate future net cash flows on the prevailing fiscal year end oil and gas spot prices (Boone and Raman 2007). SFAS No. 121 "*Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of*" became effective for fiscal years beginning after December 15, 1995. Impairment tests for intangible assets with an indefinite life were carved out of SFAS 121 and incorporated in the new standard SFAS 142 "*Goodwill and Other Intangible Assets*" for fiscal years beginning after December 15, 2001. SFAS 121 became superseded in the same year by SFAS 144 (FASB 1995; FASB 2001a; FASB 2001b).

Ahmed and Guler (2007) and Chen et al. (2008) examine the value relevance of goodwill impairments surrounding the transition period of SFAS 142 "*Goodwill and Other Intangible Assets*." The studies show that share price returns are associated with impairment charges, in particular, in the post-SFAS 142 period. Using a Canadian setting in which SFAS 142 is applied, Lapointe-Antunes et al. (2009) find that during the (SFAS 142) transition period, goodwill impairments reported retrospectively in retained earnings are impounded in current and past market values. The findings of those studies suggest that the new impairment guidelines of SFAS 142 increase the quality of goodwill impairment losses. Furthermore, using a post-IFRS period from 2005 to 2006, AbuGhazaleh et al. (2012) find that IAS 36 goodwill impairments are useful in explaining market values. Finally, Fields et al. (1998) focus on investment properties and examine the value relevance of pre-SFAS 121 impairment charges reported by U.S. real estate firms. The authors find that impairment losses are incrementally useful in explaining share prices.

Prior literature provides mixed evidence for the value relevance of unrealized gains/losses on nonfinancial fixed assets reported under the fair value model. The majority of those studies focus on the revaluations of nonfinancial fixed assets (including PPE), which were permitted in Australia, New Zealand, and the U.K. While some studies find that fair value adjustments are not value relevant (e.g., Emanuel 1989; Barth and Clinch 1996), others find some incremental value relevance of fair value adjustments over historical cost income (Amir et al. 1993; Easton et al. 1993; Easton and Eddey 1997; Barth and Clinch 1998; Aboody et al. 1999).

Fair values for PPE might not be related to a firm's future net cash flows, which reduces their value relevance, even when estimated without errors (Bernard 1993; Sloan 1999). In contrast, fair values for investment properties are in general related to a real estate firm's business model. Thus, these fair values should explain market fluctuations when they are faithfully represented. Studies focusing on fair values for investment properties show that they are value relevant (Fields et al. 1998; Danbolt and Rees 2008). Fields et al. (1998) analyze the value relevance of fair values for investment properties disclosed in the notes to financial statements by 12 U.S. real estate firms. The authors find that these fair values explain share prices beyond historical cost income. However, these fair values are not fully captured by share prices, which implies that they are estimated with errors (Fields et al. 1998). Danbolt and Rees (2008) apply a U.K. and pre-IFRS setting. The authors use 100 real estate firms that neither depreciate nor impair investment properties but report fair values for them in financial statements. Danbolt and Rees (2008) find that these fair values explain share price returns. In addition, they find that the estimation error of these fair values is higher than the estimation error of fair values for financial instruments.

In summary, prior studies find that both limited fair value decrements (impairment charges) reported under the historical cost model and "pure" fair value adjustments on various assets summarize information that affects share prices and share price returns. However, those studies do not compare fair value decrements reported in financial statements under the historical cost model versus fair value adjustments reported under the fair value model. My setting allows me to compare the value relevance of impairments versus unrealized gains and unrealized losses for the major operating asset class of a real estate firm (i.e., investment property). This is different from prior literature that examines whether pre-IAS 40 fair values for investment properties are incrementally: (i) value relevant over historical cost income (including depreciation and pre-SFAS 121 impairment charges) or (ii) more value relevant over income (excluding depreciation and impairments) than fair values for financial assets. Thus, I have a stronger real estate setting than prior studies to inquire whether the concern about estimation errors of unrealized gains is justified and whether impairment losses and unrealized losses can be substituted for each other.

4.2.3 Hypotheses development

Some prior studies expressed concern about the faithful representation of managers' fair value estimates (Holthausen and Watts 2001; Watts 2003; Kothari et al. 2010) and the role of (level one) fair values in boom periods (Penman 2003). However, with the passage of time, cost book values of assets are likely to become unrelated to the economic value of the assets (Penman 2007). Accordingly, historical cost accounting lacks transparency (Laux and Leuz 2009) and captures by chance the economic performance of assets (Dietrich et al. 2001).

Dietrich et al. (2001) find that fair values for investment properties are more closely aligned to selling prices than investment properties measured at cost. That is, unrealized gains are not reported in financial statements and, instead, assets are depreciated, although depreciated assets can increase in value (Dietrich et al. 2001; Herrmann et al. 2006). Consequently, reporting investment properties in financial statements at cost is to a high extent arbitrary and, thus, the economic value of assets is possibly not documented. Fair values are at least vaguely precise in estimating the economic value of investment properties (see Dietrich et al. 2001; Barth 2006; Herrmann et al. 2006). Thus, I predict that unrealized gains on investment properties are more value relevant than historical cost income. Hypothesis 4.1 is outlined below:

Hypothesis 4.1: Unrealized gains on investment properties are more value relevant than historical cost income for investment properties.

Depreciation rates are likely to be estimated arbitrarily and possibly do not reflect economic losses of investment properties. However, there are similarities in the accounting of impairment charges under U.S. GAAP and unrealized losses under IFRS. These similarities suggest that these constructs can be substituted for each other to reveal bad news about a property's fair value. Nevertheless, I expect that impairments do not portray the whole economic picture of a real estate firm and hence should be less value relevant than unrealized losses. That is, the growth in value of a property is not reported in financial statements under the historical cost model. In this case, any downward change in the fair value of the property should be sufficiently large to compensate for past (nonreported) fair value increments to trigger an impairment charge. As a result, it is possible that impairments are either not triggered for all investment properties that suffer economic losses or that the amount of impairment losses reported in a firm's financial statements does not fully capture the economic losses of the impaired properties. This reduces their informativeness about bad news. Furthermore, as value changes are frequently reported in financial statements under the fair value model, the valuation process is well established and is confirmed with an auditor and external appraiser. Any value decrements follow from updating the models with current information. In contrast, impairment tests are conducted in a nonroutine setting, where the valuation process still needs to be established and audited (Goncharov et al. 2013). This should increase the estimation error when reporting impairment losses. As a result, impairments may be less useful in explaining market fluctuations than unrealized losses. Hypothesis 4.2 is outlined below:

Hypothesis 4.2: Unrealized losses on investment properties are more value relevant than historical cost income that includes impairment losses of investment properties.

Based on the discussion above, fair value increments are expected to be more value relevant than historical cost income and increase the value relevance of unrealized losses over impairments. Depreciation possibly does not capture the economic performance of investment properties. Thus, fair value based income should portray to a higher extent the economic picture of a real estate firm's major assets than historical cost income. Hypothesis 4.3 (implications of hypotheses 4.1 and 4.2) is outlined below:

Hypothesis 4.3: Fair value based income for investment properties is more value relevant than historical cost income for investment properties.

4.3 Model specification

I use value relevance regressions to test hypotheses 4.1, 4.2, and 4.3. My value relevance regression analyses use a price specification and a return specification. The price regression examines whether the accounting amount is relevant, while the returns regression also reveals whether an accounting amount is reported in a timely manner (Bernard 1993; Easton et al. 1993; Easton 1999; Easton and Sommers 2003). The regressions are derived from earlier work of Preinreich (1938), Edwards & Bell (1961), Easton and Harris (1991), Ohlson (1995), and Feltham & Ohlson (1995). Based on prior literature, I formulate the price regression as follows:[88]

$$Price_{jt} = \alpha_0 + \alpha_1 BVE_{jt-1} + \alpha_2 NIexc_{jt} + \alpha_3 DepIP_{jt} + \alpha_4 ImpLossIP_{jt} + \alpha_5 UnrGainIP_{jt} + \alpha_6 UnrLossIP_{jt} + \varepsilon_{jt}, \quad (4.1)$$

where $Price_{jt}$ is the market value including dividends at the end of the third month following the end of fiscal year (*t*) of U.S. real estate firm (*j*) and the fourth month following the end of fiscal year (*t*) of U.K. real estate firm (*j*). Using different time frames accounts for the fact that I find that U.S. real estate firms release their financial reports about one month earlier than U.K. real estate firms. Thus, I assume that the U.S. market processes accounting data about one month earlier than the U.K. market.[89] BVE_{jt-1} is the book value of equity of firm (*j*) at the end of fiscal year (*t-1*) (see e.g., Collins et al. 1999; Gornik-Tomaszewksi and Jermakowicz 2001).

I next decompose net income into its components, differentiating between income before investment property adjustments and investment property adjustments, which are depreciation and impairments on historical cost investment properties (U.S. GAAP real estate firms), and unrealized gains and unrealized losses on fair value investment properties (IFRS real estate firms). $NIexc_{jt}$ is the bottom-line earnings excluding investment property adjustments of firm (*j*) in fiscal year (*t*). Investment property

[88] The price regression is developed in Appendix 4.2.
[89] As a robustness test, I use either three months or four months following the end of the fiscal year for both U.S. and U.K. firms. The results are essentially unchanged. While the findings indicate that historical cost income that includes impairment losses are more value relevant than unrealized losses (inconsistent with hypothesis 4.2), the findings are mixed whether fair value decrements that trigger unrealized losses are less value relevant than fair value decrements that trigger impairment charges around the severe real estate crisis of 2007–2009.

adjustments are depreciation ($DepIP_{jt}$), impairment losses ($ImpLossIP_{jt}$), net unrealized gains ($UnrGainIP_{jt}$), and net unrealized losses ($UnrLossIP_{jt}$) reported by firm (*j*) in fiscal year (*t*). I exclude $DepIP_{jt}$ from $NIexc_{jt}$ since depreciation is not reported by firms that apply the fair value model.[90] Consequently, $NIexc_{jt}$ can be viewed as realized earnings. As suggested by research, I deflate all variables by outstanding shares to account for heteroscedasticity (Barth and Clinch 1998; Fields et al. 1998).

The return regression is derived from the price regression by taking the first difference of all variables except from investment property adjustments (see e.g., Easton and Harris 1991):

$$Return_{jt} = \xi_0 + \xi_1 NI_{jt-1} + \xi_2 DeltaNIexcl_{jt} + \xi_3 DepIP_{jt} + \xi_4 ImpLossIP_{jt} + \xi_5 UnrGainIP_{jt} + \xi_6 UnrLossIP_{jt} + \varepsilon_{jt}, \tag{4.2}$$

where $Return_{jt}$ is share price returns including dividends of firm (*j*) at the end of the third month (U.S. real estate firms) and fourth month (U.K. real estate firms) following the end of fiscal year (*t*). NI_{jt-1} is the bottom-line earnings per share of firm (*j*) in fiscal year (*t-1*).[91] $DeltaNIexcl_{jt}$ is the first difference in the bottom-line earnings per share that excludes property adjustments of firm (*j*) in fiscal year (*t*). The other variables are defined as in model 4.1. In addition, all variables are deflated by lagged share prices

[90] I would need to collect depreciation related to investment properties only. However, for the sake of simplicity, I use the total amount of depreciation also related to PPE. In defense of my approach, the amount of depreciation for PPE is relatively low compared to that of investment properties. Consequently, my results should not be affected by this simplification.
[91] As a robustness test, I use either three months or four months following the end of the fiscal year for both U.S. and U.K. firms. The results are essentially unchanged and impairments are not value relevant, even when the full period from 2005–2011 is applied (instead of the period from 2007–2009, around the severe real estate crisis).

(see e.g., Easton and Harris 1991). Variable definitions and sources are reported in Appendix 4.1.

For both models 4.1 and 4.2, hypotheses 4.1 and 4.2 predict that the coefficients on $UnrGainIP_{jt}$ and $UnrLossIP_{jt}$ are significantly positive. Thus, unrealized gains and losses add to the explanatory power of the model. While significant positive coefficients on $UnrGainIP_{jt}$ and $UnrLossIP_{jt}$ indicate that unrealized gains and unrealized losses are value relevant, they do not necessarily imply that the unrealized gains and unrealized losses are more value relevant than historical cost income. Historical cost income includes depreciation ($DepIP_{jt}$) and might additionally include impairment charges ($ImpLossIP_{jt}$) of a real estate firm's properties. Both investment property adjustments might be value relevant. Thus, analysis of the coefficients on $UnrGainIP_{jt}$ and $UnrLossIP_{jt}$ is insufficient to confirm the hypotheses.

To analyze my hypotheses, I differentiate between five subsamples and compare their explanatory power (adjusted R^2). I use U.S. real estate firms that reported no impairments in fiscal year (*t*) to capture "pure" historical cost income (subsample 1: PureHC). I apply U.S. real estate firms that reported impairments in fiscal year (*t*) to capture historical cost income that includes impairment charges (subsample 2: HC–ImpLoss). To compare the value relevance of unrealized gains and unrealized losses with the historical cost subsamples and to test hypotheses 4.1 and 4.2, I split the U.K. sample into two subsamples. The subsamples are U.K. real estate firms that reported unrealized gains in financial statements in fiscal year (*t*) (subsample 3: FV–UnrGain) and U.K. real estate firms that reported unrealized losses in financial statements in fiscal year (*t*) (subsample 4: FV–UnrLoss). Finally, I use U.K. real estate firms reporting "pure" fair value based income that mandates recognition of unrealized gains and unrealized losses to test hypothesis 4.3 (subsample 5: FV); consequently, subsamples 3 and 4 aggregated equal subsample 5.

Next, I regress prices (model 4.1) and returns (model 4.2) on the "control" variables and property adjustment variables for each of the five subsamples. Thus, I run models 4.1 and 4.2 for U.S. firm-years with no impairments (subsample 1), U.S. firm-years with impairments (subsample 2), U.K. firm-years with unrealized gains (subsample 3), U.K. firm-years with unrealized losses (subsample 4), and U.K. firm-years with unrealized gains and unrealized losses (subsample 5).

Hypothesis 4.1 predicts that the coefficient on $UnrGainIP_{jt}$ is significantly positive when using U.K. firm-years with unrealized gains (subsample 3). Hypothesis 4.2 predicts that the coefficient on $UnrLossIP_{jt}$ is significantly positive when using U.K. firm-years with unrealized losses (subsample 4). As outlined previously, this indicates that unrealized gains ($UnrGainIP_{jt}$) and unrealized losses ($UnrLossIP_{jt}$) are value relevant, a necessary but not sufficient condition to confirm hypotheses 4.1 and 4.2.

If one of these coefficients is insignificantly different from zero, I can stop my analysis and reject the hypothesis that belongs to the coefficient. For instance, if the coefficient on $UnrLossIP_{jt}$ is insignificantly different from zero, I can imply that unrealized losses are value irrelevant. Thus, unrealized losses are not more value relevant than impairments (and depreciation) and I can reject hypothesis 4.2.

If the necessary condition is fulfilled for the U.K. subsamples, I next assess the value relevance of the fair value based income versus historical cost income by contrasting the adjusted (adj.) R^2s obtained from models 4.1 and 4.2 for the five subsamples. The adj. R^2s from models 4.1 and 4.2 reveal the explanatory power of the respective five subsamples.

Comparing adj. R^2s across subsamples is challenging as the subsamples can generate different distributions of adj. R^2s, which can lead to spurious results (see e.g., Gu 2007). Thus, my concern is that inference can be affected by tests that make assumptions about the underlying distributions of adj. R^2s, in particular, for small samples (e.g., the Cramer test used in Harris et al. (1994) and Ball et al. (2000)).

To make no assumptions about the (unknown) underlying distribution of adj. R^2, I need to generate a set of adj. R^2s for each of my five subsamples. Yet, my small subsamples do not allow generating variations of adj. R^2s on, for instance, years. I have just 7 years (2005–2011) and for my U.K. real estate firms the observations vary from 12 to 27 across the years and in some years the firms report almost no unrealized gains (subsample 3) and (almost) no unrealized losses (subsample 4) through the income statement (see Panel B of Table 4.3 in subsection 4.5.2).[92] Accordingly, I generate an empirical distribution of adj. R^2 using the bootstrapping technique.

Bootstrapping is a common technique applied in recent research to compare statistically the explanatory power (mean value of adj. R^2) between subsamples (e.g., Barth et al. 2008; Barth et al. 2012; Florou et al. 2012; Lin et al. 2012). Following those studies, I draw with replacement 500 random samples from the population (captured by each of my five test subsamples) and estimate models 4.1 and 4.2 to generate two times 500 bootstrapped adj. R^2s.[93] I replicate this procedure for each of my five test subsamples so that I

[92] For instance, Balachandran and Mohanram (2011) generate variations of adj. R^2s across subsamples capturing different degrees of conservative accounting for years 1975–1989 and 1990–2004. The authors had for each subsample in total at least 19,121 firm-year observations. Accordingly, they had (presumably) sufficient observations for each year.

[93] Due to the small size of the subsamples, I draw 500 random samples (e.g., Lin et al. 2012) instead of 1,000 random samples (e.g., Barth et al. 2008; Barth et al. 2012; Florou et al. 2012).

obtain five times 500 bootstrapped adj. R^2s (for each model). Accordingly, I obtain an empirical distribution of adj. R^2 for each of my five test subsamples. Then, I estimate the means of the bootstrapped adj. R^2s. Finally, I use a t-test to assess whether the means (of 500 generated bootstrapped adj. R^2s) are statistically different between the two historical cost subsamples and the three fair value subsamples.

Hypothesis 4.1 predicts that the mean value of bootstrapped adj. R^2 for FV–UnrGain is statistically significantly higher than the mean values of bootstrapped adj. R^2 for both PureHC and HC–ImpLoss. This indicates that unrealized gains recognized through the income statement on investment properties are more value relevant than historical cost income for investment properties.

Hypothesis 4.2 predicts that the mean value of bootstrapped adj. R^2 for FV–UnrLoss is statistically significantly higher than the mean value of bootstrapped adj. R^2 for HC–ImpLoss. This suggests that unrealized losses recognized through the income statement on investment properties are more value relevant than impairment charges of investment properties (or historical cost income that includes impairment charges of investment properties).

Hypothesis 4.3 predicts that the mean value of bootstrapped adj. R^2 for FV is statistically significantly higher than the mean values of bootstrapped adj. R^2 of both PureHC and HC–ImpLoss. This provides evidence that fair value based income for investment properties is more value relevant than historical cost income.

Furthermore, I estimate incremental bootstrapped adj. R^2s to difference out any variations in the pricing of accounting information across

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In addition, due to my small sample size, I am not able to conduct robustness tests by drawing the 500 samples without replacement (e.g., Barth et al. 2012).

the subsamples and alleviate any concern that my results are driven by the differences in pricing of the accounting information between the U.S. market and the U.K. market. To obtain incremental bootstrapped adj. R^2s, I take the same 500 random samples generated for the calculation of bootstrapped adj. R^2s using the unrestricted models 4.1 and 4.2 that include investment property adjustments. I next estimate the explanatory power (adj. R^2) of the 500 random samples using the restricted versions of models 4.1 and 4.2 that include just the "control" variables but exclude investment property adjustments. I then subtract the bootstrapped adj. R^2 generated from the restricted models from the bootstrapped adj. R^2s obtained from the unrestricted model so that I obtain 500 incremental bootstrapped adj. R^2s. I replicate this procedure for each of the five subsamples. Thus, I generate for each of the five subsamples 500 incremental bootstrapped adj. R^2s. Finally, I estimate the means of incremental bootstrapped adj. R^2s and use a t-test to assess whether the means are different between the two historical cost subsamples and the three fair value subsamples.

As outlined previously, hypotheses 4.1, 4.2, and 4.3 predict that the means of incremental bootstrapped adj. R2s of FV–UnrGain, FV–UnrLoss, and FV are significantly higher than those of PureHC and HC–ImpLoss. This indicates that unrealized gains and unrealized losses recognized through the income statement for investment properties are more value relevant than historical cost income for investment properties.

Use of incremental bootstrapped adj. R2s controls additionally for past reported unrealized gains and unrealized losses captured by lagged book values (BVE_{jt-1}) used in model 4.1 and lagged net income (NI_{jt-1}) used in model 4.2. In particular, the value relevance might be affected by BVE_{jt-1}. BVE_{jt-1} should be more related to share prices when the fair value model is used by firms than when the historical cost model is applied (see Appendix

4.2 and also Barth and Landsman 1995; Danbolt and Rees 2008). Thus, using incremental bootstrapped adj. R^2s provides further evidence for whether fair value based income is more value relevant than historical cost income that includes impairment charges.

4.4 Sample

To analyze the value relevance of fair values reported for investment properties in financial statements, I need to follow the guidelines set forth in IAS 40. I collect net unrealized gains/losses for investment properties including those that are expected to be disposed of.[94] That is, IAS 40 requires that investment properties be measured at fair value also when they are reclassified to “held for sale” (IASB 2003b). SFAS 144 covers additionally long-lived assets to be held for sale. These assets are not depreciated but impairment charges are to be reported in financial statements once the fair value less cost to sell is lower than the book value (FASB 2001b). Consequently, to be aligned to IAS 40, I collect SFAS 144 impairment losses of investment properties that are held and used and held for sale.[95]

Impairment charges and net unrealized gains/losses are also collected for development projects. That is, in May 2008 IAS 40 was amended in the process of annual improvements. It requires that development of properties for future use as investment properties are to be classified as investment properties and measured at fair value. The fair value adjustments are taken

[94] Net unrealized gains/losses capture the sum of unrealized gains and unrealized losses of a U.K. real estate firm’s investment properties that the firm took to the income statement at the end of the fiscal year.

[95] In this study, properties that are held and used and then reclassified as held for sale are summarized under investment properties. In addition, impairment charges for investment properties held for sale are to be reversed when the fair value increases. However, data on reversals are rare and have not been analyzed.

to the income statement (IASB 2003b). The amendment that became effective on January 2009 and applied prospectively replaced the previous accounting treatment set forth in IAS 16. Under IAS 16, U.K. real estate firms had the option to report the development properties at cost or fair value in financial statements with fair value adjustments beyond cost taken to the comprehensive income statement and fair value adjustments below cost taken to the income statement (IASB 2003a). However, only some U.K. real estate firms held development projects and few reported them at cost before 2009 (the book value was relatively small). For the other real estate firms, net unrealized gains/losses of the development projects are clearly stated in the comprehensive income statement.

The impairment losses are collected by hand from 10-K reports. The net unrealized gains/losses are obtained from Datastream but most of the data are checked and occasionally adjusted. Adjustments occurred, in particular, in the earlier years. At that time, net unrealized gains/losses were less reliably stated in Datastream than in current years. In addition, fair value changes above cost for investment properties in the development stage are not stated separately from other fixed assets in Datastream (see also discussion in the previous paragraph).

Table 4.1 summarizes the sample selection criteria. I select real estate firms—classified by SIC codes—that are located in the U.S. and the U.K. and apply U.S. GAAP and IFRS, respectively. This leads to an initial sample of 1,404 firm-year observations over the post-IFRS period from 2005 to 2011.[96] I include observations of the IFRS adoption year because U.K. real estate firms reported under U.K. GAAP fair values for investment

[96] In the sample, U.K. firms apply IFRS for the first time in the fiscal year staring after 2004. Thus, to align U.S. firms with U.K. firms, I remove firm-year observations of U.S. firms with the fiscal year starting before 2005.

properties in a similar way. Thus, I do not expect that the application of IFRS for first time adopters and the use of the adoption guidelines set forth in IFRS 1 "*First-time Adoption of International Financial Reporting Standards*" induce noise in my results.[97]

I drop firm-year observations when the main business model is not within the scope of IAS 40. Some of the real estate firms predominantly follow business models other than dealing with investment properties. Accounting treatments of other assets can increase noise and bias results. Thus, I collect real estate firms for which property, plant, and equipment, and investment property (PPEIP) comprises at least 60 percent of total assets. I use PPEIP since U.S. real estate firms do not show investment properties separately.

Although the proportion of PPEIP to total assets is above 60 percent, some real estate firms do not operate predominantly investment properties. They, for instance, operate timberland, manage hotels, or lease out petroleum facilities (requiring huge investments in tanks and equipment). These business models increase the proportion of PPEIP to total assets but they are not in the scope of IAS 40. Thus, I analyze carefully the business model of the selected real estate firms and drop firm-year observations when a real estate firm's business model in a particular year does not involve dealing primarily with investment properties as defined in IAS 40.

[97] Using one year lagged income can induce noise into the return regression (model 4.2). That is, under U.K. GAAP, U.K. firms adjust assets to fair value but take unrealized gains/losses above cost directly to equity. By using as a robustness test current net income before investment property adjustments instead of one year lagged net income (see Easton and Harris 1991), the results are essentially unchanged and show that unrealized losses are not value relevant irrespective of the time period applied.

Table 4.1: Sample selection criteria

	Deletion		Cumulative # of obs. after deletions	
Initial sample of firms with SIC codes 6500 to 6653, and 6798 that apply U.S. GAAP (U.S. real estate firms) and IFRS (U.K. real estate firms)			1,404	
Operations with investment properties is not the main business model: - The sum of the book value of property, plant, and equipment, and investment property is less than 60% of total assets - The firm business model does not focus on using properties for rental income and capital appreciations	571		833	
Book value of equity is equal to or below zero in the current or previous year	47		786	
Missing stock price and accounting data	9		777	
Exclusion of U.S. observations if - No 10-K report is available - Information on impairment losses cannot be identified - There is ambiguity about the business model - Firm reports reversals of impairment losses	34		743	
	# of unique firms		# of obs.	
Final sample, 2005–2011	U.S.	U.K.	U.S.	U.K.
	112	32	583	160

The starting point of data selection is the sample of U.S. and U.K. real estate firms on Datastream.

I exclude firm-year observations with the occurrence of a book value of equity equal to or below zero in the current or previous year. At that time real estate firms are potentially in severe distress. This might induce investors to speculate on acquisitions and turnarounds, irrespective of reported accounting data. Thus, including those observations increases noise and leads to less representative results.[98]

After eliminating firm-year observations of missing share prices and accounting data, I drop U.S. firm-year observations for which no 10-K reports are available, impairment losses are not stated clearly, the business model is ambiguous, or impairment loss reversals are reported in financial statements.

In summary, the final sample consists of 112 U.S. and 32 U.K. firms and 583 U.S. and 160 U.K. firm-year observations from 2005 to 2011. The primary business model of the sample firms is to hold properties as defined in IAS 40. The sample firms acquire properties by purchasing, leasing and/or developing them and subsequently managing them to generate profit through rental income and/or holding them for capital appreciation. The property portfolio of the sample real estate firms includes retail, residential, industrial, office, and other properties (e.g., entertainment and wellness centers as well as senior and healthcare facilities).

Table 4.2 shows statistics indicating the primary business model of the sampled real estate firms. Column 2 of Table 4.2 reports an average proportion of PPEIP to total assets (TA) of 0.86 (i.e., 86 percent) across the accounting systems (subsamples).

[98] Another reason to drop observations in the turnaround year is that the price regression contains lagged *BVE*, which would be negative. I do not drop the whole firm due to the small sample size.

Table 4.2: Business model of the sampled real estate firms sorted by accounting system

	Accounting system	# of obs.	Mean	Percentile 25%	Percentile 50% Median	Percentile 75%	Standard deviation
		(1)	(2)	(3)	(4)	(5)	(6)
PPEIP/TA							
	PureHC	347	0.86	0.81	0.90	0.93	0.09
	HC–ImpLoss	236	0.85	0.80	0.86	0.91	0.07
	FV	160	0.86	0.79	0.88	0.95	0.10
	Total/Average	743	0.86	0.80	0.88	0.92	0.09
IP/PPEIP							
	FV	160	0.99	0.99	1.00	1.00	0.03
RI/TR							
	PureHC	347	0.88	0.80	0.92	0.99	0.14
	HC–ImpLoss	236	0.89	0.82	0.92	0.99	0.11
	FV	160	0.86	0.82	0.97	1.00	0.21
	Total/Average	743	0.88	0.81	0.93	0.99	0.15

PPEIP/TA is the proportion of property, plant, and equipment, and investment property (PPEIP) to total assets (TA). IP/PPEIP is the proportion of investment property (IP) to PPEIP. RI/TR is the proportion of rental income (RI) to total revenues (TR). PureHC is the sample of U.S. real estate firms that report “pure” historical cost income in financial statements in a particular year (i.e., no impairment losses are reported). HC–ImpLoss is the sample of U.S. real estate firms that report historical cost income that includes impairment charges in financial statements in a particular year. FV is the sample of U.K. real estate firms that report fair value based income (i.e., unrealized gains and unrealized losses) in financial statements.

The proportion shows little variation across the accounting systems (mean: 0.85–0.86). In addition, investment properties (IPs) are very close to PPEIP (mean: 0.99). This indicates that the sampled U.K. real estate firms use properties primarily for rental income and capital appreciation. This is also valid for U.S. firms, as shown in the ratio of rental income (RI) to total revenues (TR). The average ratio of RI/TR of the "pure" historical cost sample (PureHC) is 0.88 and of the historical cost sample that includes impairments (HC–ImpLoss) is 0.89. The average ratios of the historical cost samples are slightly higher than the average ratio of the fair value sample (FV), 0.86. Consequently, in all three accounting systems, a real estate firm's major business model is to operate investment properties.

4.5 Descriptive results

4.5.1 Development of market performance versus accounting performance

In this section (4.5), I present the descriptive results. I first exhibit graphically the alignment of historical cost income and fair value based income for investment properties to the real estate market's upward and downward trends.

Figure 4.1 shows the development of market versus accounting performance indices of U.S. real estate firms (left-hand-side) and U.K. real estate firms (right-hand-side). Panel A of Figure 4.1 exhibits the FTSE EPRA/NAREIT indices that track share price returns including dividends of all listed U.S. and U.K. real estate firms that held properties for generating rental income and trading/selling gains (Financial Times Stock Exchange (FTSE), European Platform of Regulatory Authorities (EPRA) and National Association of Real Estate Investment Trusts (NAREIT) 2012). I rescaled the indices to start with 100, similar to my treatment of the accounting performance indices. However, the starting day is February 2005 because no (reliable) data are available before that date. FTSE EPRA/NAREIT indices are compared to the accounting performance indices (sample firms).

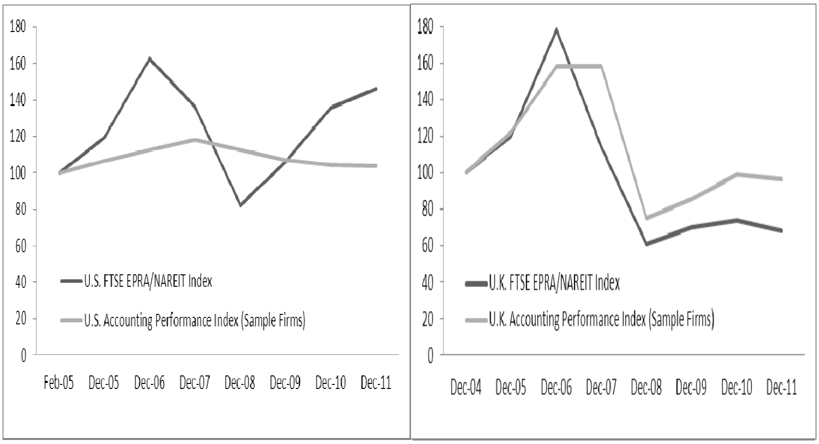
Accounting performance indices are constructed for the sample real estate firms. Firm-year observations are dropped if a firm's fiscal year does not coincide with the calendar year (i.e., to improve the comparability between the development of market performance and accounting performance). The accounting performance indices are measured on net income in fiscal year (*t*)—deflated by market capitalization at the end of fiscal year (*t-1*)—of real estate firm (*j*). I sum the deflated net income of the U.S. firms (U.S. accounting index) and U.K. firms (U.K. accounting index) in fiscal year (*t*). The indices start with 100 in December 2004 and accumulate the accounting performance over the following years (2005–2011).

Panel B of Figure 4.1 substitutes FTSE EPRA/NAREIT indices with indices that track changes in the market value including dividends of the sample real estate firms that are incorporated in constructing the accounting performance index. I aggregate the total market performance of U.S. firms and U.K. firms in fiscal year (*t*). The indices start with 100 in December 2004 and accumulate the total market performance over the following years.

The FTSE EPRA/NAREIT indices (Figure 4.1, Panel A) show that over 2005–2006 the market performance of U.S. and U.K. real estate firms increase, followed by a decline starting in 2007. The downward trend ended about the beginning of 2009 and turned to an upward trend. U.K. real estate firms again experienced a small downward trend in 2011. The market performance indices (sample firms) show a similar trend (Figure 4.1, Panel B).

Figure 4.1: Development of market and accounting performance indices of U.S. and U.K. real estate firms from 2005 to 2011

Panel A. U.S. and U.K. FTSE EPRA/NAREIT Index versus Accounting Performance Index (Sample Firms)



Panel B. U.S. and U.K. Market Performance Index versus Accounting Performance Index (Sample Firms)

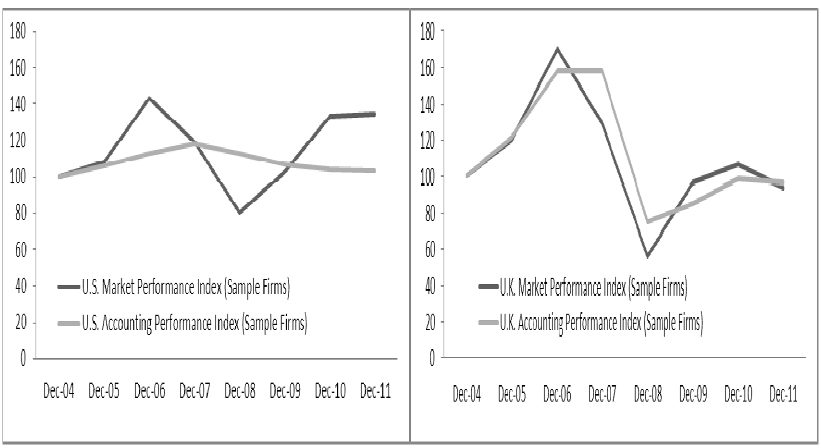


Figure 4.1: Continued

In Panel A FTSE EPRA/NAREIT indices are obtained from Financial Times Stock Exchange (FTSE), the European Platform of Regulatory Authorities (EPRA), and the National Association of Real Estate Investment Trusts (NAREIT). The indices track stock price returns including dividends of all listed U.S. and U.K. real estate firms that held properties for generating rental income and trading/selling gains (FTSE, EPRA, and NAREIT 2012). FTSE EPRA and NAREIT indices were rescaled to start at 100 on February 18, 2005. Accounting performance indices track the changes in net income deflated by the lagged market value of equity. The accounting performance indices in Panels A and B are based on the sample of 112 U.S. and 32 U.K. real estate firms. The observations are, however, restricted to real estate firms with a fiscal year coinciding with the calendar year. Net income and market capitalization are obtained from Datastream. In Panel B I construct the market performance indices that track share price returns including dividends of the U.S. and U.K. real estate firms that are used to construct the accounting performance indices. Data on returns and dividends are obtained from Datastream.

A comparison of FTSE EPRA/NAREIT indices and market performance indices with accounting performance indices shows that the market fluctuations are not captured by historical cost income (Figure 4.1, Panels A and B, left-hand-side). Historical cost income neither depicts the fluctuations of the upward trends nor the severe downward trend of 2007–2008. In contrast, fair value based income reflects to a reasonable extent the market performance including the severe downward trend (Figure 4.1, Panels A and B, right-hand-side). However, Figure 4.1 also exhibits that fair value based income lag and do not fully capture the severe market downward trend of 2007–2008 (Panels A and B, right-hand-side).

4.5.2 Impairment charges and unrealized losses/gains over 2005 to 2011

Table 4.3 reports the sample composition sorted by year and country. Specifically, it documents the number and percentage of impairment charge and unrealized loss observations (relative frequency of impairment charges and unrealized losses) over 2005–2011. Additionally, it shows the ratio of impairment charges, unrealized losses, and unrealized gains to PPEIP (relative amount of impairment charges, unrealized losses, and unrealized gains) over 2005–2011. Furthermore, Panel A shows the descriptive results for the restricted sample that contains real estate firms with a fiscal year coinciding with the calendar year while Panel B exhibits the results for the full sample.

Turning to Panel A of Table 4.3: Column 3 documents that the relative frequency of impairment losses is lower in 2007 (23.3 percent) and higher over 2008–2011 (52.6, 59.5, 48.6, and 59.4 percent) than over 2005–2006 (28.4 and 25.0 percent). While the descriptive results show that the severe crisis of 2007–2008 triggers impairments, they also reveal that impairment losses lag on average the severe crisis, and about 50 percent (2008) and 40 percent (2009) are nonimpairment observations, which is similar to the years outside of the crisis (2010–2011). In connection with Figure 4.1, this indicates that nonreports of fair value upward adjustments in a U.S. real estate firm's financial statements during the growth in value of the U.S. real estate firm's property base prevent to some extent the reporting of impairment charges during the severe market downward trend.

Table 4.3: Sample composition by year and country

Panel A. Sample of real estate firms with a fiscal year end in December

	U.S.				U.K.			
Year	# of obs.	# of HC–ImpLoss	% HC–ImpLoss	Mean ImpLoss/PPEIP	# of obs.	# of FV–UnrLoss	% FV–UnrLoss	Mean UnrLoss/PPEIP/ UnrGain/PPEIP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2005	95	27	28.4	-0.007	12	0	0.0	-0.000/ +0.093
2006	80	20	25.0	-0.005	12	0	0.0	-0.000/ +0.105
2007	77	18	23.3	-0.004	14	6	42.9	-0.071/ +0.017
2008	76	40	52.6	-0.010	13	13	100.0	-0.212/ +0.000
2009	74	44	59.5	-0.015	11	8	72.7	-0.064/ +0.053
2010	74	36	48.6	-0.016	11	1	9.1	-0.000/ +0.050
2011	69	41	59.4	-0.022	9	4	44.4	-0.024/ +0.034
Total/Average	545	226	41.5	-0.011	82	32	39.0	-0.053/ +0.050

Table 4.3: Continued

Panel B. Full sample of real estate firms

Year	U.S.				U.K.			
	# of obs.	# of HC–ImpLoss	% HC–ImpLoss	Mean ImpLoss/PPEIP	# of obs.	# of FV–UnrLoss	% FV–UnrLoss	Mean UnrLoss/PPEIP/ UnrGain/PPEIP
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2005	96	28	29.2	-0.006	12	0	0.0	-0.000/ +0.093
2006	87	22	25.3	-0.005	26	1	3.9	-0.006/ +0.111
2007	83	20	24.1	-0.004	27	6	22.2	-0.071/ +0.060
2008	83	41	49.4	-0.010	27	26	96.3	-0.173/ +0.016
2009	80	46	57.5	-0.015	24	21	87.5	-0.221/ +0.053
2010	80	38	47.5	-0.015	23	1	4.3	-0.000/ +0.053
2011	74	41	55.4	-0.022	21	8	38.1	-0.028/ +0.042
Total/Average	583	236	40.5	-0.011	160	63	39.4	-0.071/ +0.061

HC–ImpLoss is the sample of U.S. real estate firms that report historical cost income that includes impairment charges in financial statements in a particular year. ImpLoss/PPEIP is the amount of impairment losses reported for investment properties (IPs) in financial statements scaled by property, plant, and equipment, and investment properties (PPEIP). FV–UnrLoss is the sample of U.K. real estate firms that report unrealized losses in financial statements in a particular year. UnrLoss/PPEIP (UnrGain/PPEIP) is the net amount of unrealized losses (gains) scaled by PPEIP.

That is, the severe decline in value of the property base of some U.S. real estate firms is presumably not large enough to absorb past nonreported fair value increments and trigger an asset impairment.[99]

This view is supported by statistics documented in column 7 of Panel A (Table 4.3). Column 7 of Panel A shows that in 2008 the relative frequency of unrealized losses increases to 100.0 percent after the lower values recorded in 2005/2006 (0.0 percent) and 2007 (42.9 percent). The relative frequency of unrealized losses declines again in 2009 and 2010 (72.7 and 9.1 percent, respectively). However, in connection with Figure 4.1, the descriptive results indicate also that unrealized losses lag the severe crisis. The relative frequency of unrealized losses is highest in 2008/2009 and not in 2007/2008.

In Table 4.3, column 7 of Panels A and B documents that U.K. real estate firms reported net unrealized losses through income statements primarily around the severe real estate crisis of 2007–2009. During that period, I expect that no (or few) properties of a U.S. real estate firm that reported impairment charges in its financial statement increased in value. In addition, around the severe crisis, the value of a property might be more uncertain than in the other periods, which increases possibly the estimation error of fair value decrements (impairments and unrealized losses). Consequently, to increase the validity of my tests in analyzing the value relevance of impairments versus unrealized losses (hypothesis 4.2), I restrict

[99] In addition, the results may also indicate that during the severe market downward trend, unrecognized fair value appreciations are to some extent absorbed, which increases the likelihood that individual properties are impaired after the severe crisis relative to before the severe crisis. This argument is supported by descriptive results documented in column 7 of Panel A (Table 4.3). Column 7 of Panel A shows that the relative frequency of unrealized losses declines in 2010 to 9.1 percent, which is close to the relative frequency of unrealized losses before the crisis (2005/2006: 0.0 percent). While the relative frequency of unrealized losses declines after the severe crisis, the relative frequency of impairment losses does not decline, which provides some evidence for my argument.

additionally the historical cost samples (subsamples 1 and 2) and unrealized loss sample (subsample 4) to the period from 2007–2009.

In Table 4.3, column 4 of Panel A shows that during 2008, U.S. firms reported in financial statements larger relative impairment charges (-0.010) than in 2005 (-0.007) and 2006 (-0.005). Yet, the relative impairment charges are lower in 2008 than in the following years (-0.015 to -0.022). In addition, the relative amount of impairment charges is even lower in 2007 (-0.004) than in 2005 and 2006. These descriptive results also indicate that impairments do not portray the severe economic losses that U.S. real estate firms suffered during the crisis (see Figure 4.1).

In Table 4.3, column 8 of Panel A exhibits that over 2007–2008 the relative amount of unrealized losses (-0.071 to -0.212) is larger than the largest relative amount of impairment charges reported in financial statements over 2005–2011. The largest relative amount of impairment losses was reported in 2011 (-0.022). This indicates that reporting unrealized gains in financial statements increases the amount of unrealized losses relative to the amount of impairment charges. That is, fair value increments increase the book value of investment properties so that unrealized losses are reported based on the upwardly adjusted book value. Accordingly, unrealized losses should be reported for all properties that suffer economic losses and fully capture the economic losses, which is not necessarily true for impairment charges.

In addition, in Table 4.3, column 8 of Panel A documents that the amount of unrealized losses is larger over 2007–2008 than the amount of unrealized losses over the other periods. Yet, the relative amount of unrealized losses in 2007 is lower than that in 2008 and slightly higher than that in 2009 (-0.064), which supports the view that economic losses of the severe crisis of 2007–2008 are captured over 2007–2009 and hence reported with some delay.

Furthermore, in Table 4.3, column 8 of Panel A shows that the amount of unrealized gains is largest over 2005–2006 (0.093 to 0.105) and lowest in 2007 (0.017) and 2008 (0.000). Unrealized gains increase again in 2009 (0.053) and 2010 (0.050) and again decline in 2011 (0.034). In connection with Figure 4.1, these descriptive results indicate that unrealized gains follow to a reasonable extent market trends.

4.5.3 Market-to-book ratio across subsamples

In this subsection, I present the alignment between the market value of equity and the book value of equity. Based on the law of one price, the market value of equity should be equal to the economic value of underlying net assets. Thus, when fair values are reported for investment properties (the major asset class of the sample firms), a real estate firm's net asset value (i.e., the sum of the fair values of the investment properties after deducting liabilities) should be about the market value of the real estate firm (e.g., Capozza and Lee 1995; Barkham and Ward 1999; Clayton and MacKinnon 2001). In addition, using the market value as a benchmark is consistent with the value relevance literature on investment properties, which sees any deviations of the book value from the market value as anomalous and potentially caused by estimation errors of levels two and three fair values (Fields et al. 1998; Danbolt and Rees 2008). Consequently, if unrealized gains and losses on investment properties are sufficiently faithfully represented, the book value of equity of IFRS real estate firms (reporting unrealized gains and unrealized losses) should be close to the market value of equity.[100]

I calculate the market-to-book ratio (MtB_{jt}) using the market value of firm (j) at the end of the third month following the end of fiscal year (t) for U.S. real estate firms and the fourth month following the end of fiscal year (t) for U.K. real estate firm (j).[101] The market value is deflated by the book value of equity. The book value of equity of real estate firm (j) is the value recorded at the end of fiscal year (t). To provide some preliminary evidence of the relative value relevance of fair value based income versus historical cost income, I test the differences in the mean value of MtB_{jt} to its theoretical value of 1 across the five subsamples.

Table 4.4 reports the univariate analyses of the market-to-book ratio (MtB_{jt}) across the five subsamples PureHC, HC–ImpLoss, FV–UnrGain, FV–UnrLoss, and FV. Panel A documents the results of the full period, whereas Panel B documents the results of the restricted sample period over 2007–2009.

In Table 4.4, columns 2 and 3 of Panel A show that for the fair value increment sample (FV–UnrGain) the mean value of MtB_{jt} is 0.97, statistically insignificantly different from its theoretical value of 1. This indicates that unrealized gains align the book value of equity to the market value of equity. The results provide some preliminary evidence that unrealized gains on investment properties are faithfully represented and

[100] See also Appendix 4.2.

[101] Using either three months or four months following the end of the fiscal year leads to qualitatively similar results for both U.S. and U.K. firms.

useful in explaining market fluctuations (to some extent consistent with hypothesis 4.1).[102]

Table 4.4: Effect of accounting for investment properties on market-to-book ratio

Panel A. Analysis based on the full period from 2005 to 2011

Accounting system	# of obs.	Mean MtB_{jt}	MtB_{jt}=1? (p-value)	Q1	Median	Q3	Standard deviation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PureHC	347	2.44	<0.01	1.21	1.92	2.97	2.41
HC–ImpLoss	236	1.55	<0.01	0.90	1.38	1.96	1.51
FV–UnrGain	97	0.97	>0.10	0.73	0.92	1.18	0.32
FV–UnrLoss	63	0.70	<0.01	0.49	0.65	0.84	0.44
FV	160	0.86	<0.01	0.64	0.82	1.04	0.40

	Difference in MtB_{jt}	p-value
	(8)	(9)
PureHC vs. HC–ImpLoss	0.89	<0.01
FV–UnrGain vs. HC–ImpLoss	-0.58	<0.01
FV–UnrLoss vs. HC–ImpLoss	-0.85	<0.01
FV vs. HC–ImpLoss	-0.69	<0.01

Panel B. Analysis based on the restricted period from 2007 to 2009

Accounting system	# of obs.	Mean MtB_{jt}	MtB_{jt}=1? (p-value)	Q1	Median	Q3	Standard deviation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PureHC	139	2.02	<0.01	0.89	1.49	2.35	2.29
HC–ImpLoss	107	1.35	<0.10	0.57	1.05	1.68	2.01
FV–UnrLoss	53	0.69	<0.01	0.47	0.65	0.84	0.48

[102] Concern might arise that stock market bubbles are incorporated into fair value increments. Yet, this can be discounted to some extent because fair value appreciations are estimated and not marked-to-market (see also Penman 2003).

Table 4.4: Continued

	Difference in MtB_{jt}	p-value
	(8)	(9)
PureHC vs. HC–ImpLoss	0.67	<0.05
FV–UnrLoss vs. HC–ImpLoss	-0.66	<0.05

Table 4.4 reports the market-to-book ratio (MtB_{jt}) across five subsamples to show the deviation from its theoretical value of 1. Panel A shows the results of the full period and Panel B exhibits the results of the restricted period, which is around the severe real estate crisis of 2007–2009. PureHC is the sample of U.S. real estate firms that report "pure" historical cost income in financial statements in a particular year (i.e., no impairment charges are reported). HC–ImpLoss is the sample of U.S. real estate firms that report historical cost income that includes impairment charges in financial statements in a particular year. FV–UnrGain is the sample of U.K. real estate firms that report unrealized gains in financial statements in a particular year. FV–UnrLoss is the sample of U.K. real estate firms that report unrealized losses in financial statements in a particular year. FV is the sample of U.K. real estate firms that report fair value based income (i.e., unrealized gains and unrealized losses) in financial statements. Column 3 reports the p-value of a t-test that assesses whether the mean value of MtB_{jt} is statistically significantly different from 1. Column 8 reports the difference in the mean values of MtB_{jt} between two subsamples. Column 9 reports the p-value of a t-test to assess whether the difference between the two subsample means is significant.

In Table 4.4, column 2 of Panels A and B documents that for the "pure" historical cost sample (PureHC) the mean values of MtB_{jt} are 2.44 (Panel A) and 2.02 (Panel B) and for the impairment loss sample (HC–ImpLoss) the mean values of MtB_{jt} are 1.55 (Panel A) and 1.35 (Panel B). The mean values for HC–ImpLoss are significantly below the mean values for PureHC (columns 8 and 9) and all mean values are significantly above 1 (column 3). These results indicate that impairments are trigged during a decline in value of a firm's property base. However, the findings also indicate that reporting no fair value increments in financial statements (under the historical cost model) leads to an MtB_{jt} above its theoretical value of 1 and prevents to some extent the reporting of impairment losses in financial statements during the severe crisis. Specifically, the mean value of MtB_{jt} for HC–ImpLoss in Panel B provides some evidence that past nonreported fair value increments are not fully absorbed during the crisis so that impairments are not triggered for all properties that suffer economic losses. This may suggest that impairment charges are less value relevant than unrealized losses (consistent with hypothesis 4.2).

In Table 4.4, columns 2 and 3 of Panels A and B document that for the unrealized loss sample (FV–UnrLoss) the mean values of MtB_{jt} are significantly below 1. The values of MtB_{jt} are 0.70 (Panel A) and 0.69 (Panel B). This may indicate that the amount of unrealized losses are not faithfully represented, resulting in an overstated property base (consistent with Figure 4.1 and Table 4.3). Thus, the results can suggest that unrealized losses are not more value relevant than impairment charges (inconsistent with hypothesis 4.2).

Finally, in Table 4.4, columns 2 and 3 of Panel A document that the mean value of MtB_{jt} is 0.86 for the "pure" fair value sample (FV). The mean value is closer to 1 than the mean values of MtB_{jt} for PureHC and HC–ImpLoss. This may suggest that, on average, fair value based income is superior to historical cost income (consistent with hypothesis 4.3).

Overall, the findings provide preliminary evidence that, in particular, unrealized gains reported in financial statements align the book value closely to the economic value of real estate assets. As a result, the fair value model appears to be superior to the historical cost model in explaining market fluctuations.

4.6 Value relevance regression results

4.6.1 Results of the share price regression

In this section (4.6), I present the results of the value relevance regressions, testing hypotheses 4.1 to 4.3. Table 4.5 reports results of the OLS price regressions. Panel A documents the results for the full period. The first five columns of Panel A show the regression results including property adjustments. Columns 1 and 2 document the results for the historical cost subsamples. Columns 3 and 4 report the results for the unrealized gain sample and unrealized loss sample, respectively. Column 5 shows the results for the fair value sample (all U.K. real estate firms).

In Table 4.5, Panel B documents the results for the restricted period, around the severe real estate crisis of 2007–2009, to provide further evidence for hypothesis 4.2. Thus, I include only the historical cost subsamples (columns 1 and 2) and the unrealized loss sample (column 3). In both panels, adj. R^2 analyses are documented below the regression results (specifically, columns 16–23 in Panel A and columns 10–13 in Panel B).

Hypothesis 4.1 predicts that unrealized gains on investment properties are more useful in explaining share prices than historical cost income. Panel A of Table 4.5 shows that the coefficients on $UnrGainIP_{jt}$ in columns 3 and 5 are significantly positive. This suggests that unrealized gains are value relevant, which is a necessary but not a sufficient condition to confirm hypothesis 4.1. Panel A reports that the mean value of bootstrapped adj. R^2 is higher for FV–UnrGain (0.935, column 3) than for the historical cost subsamples (PureHC 0.293, column 1 and HC–ImpLoss 0.462, column 2). Columns 16 and 17 show that the differences of the means are statistically significant as established by a t-test. The results provide evidence for hypothesis 4.1.

Table 4.5: The usefulness of impairment losses, unrealized gains, and unrealized losses in explaining contemporaneous share prices

Panel A. Regression analysis based on the full period from 2005 to 2011

Variables	Sign	Unrestricted model					Restricted model excluding IP income adjustments				
		PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV	PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	?	19.890***	9.444**	126.123***	61.412**	121.961***	18.739***	5.977	241.164***	93.491**	154.615***
		(4.659)	(2.449)	(3.788)	(2.701)	(3.782)	(4.306)	(1.423)	(3.349)	(2.635)	(3.653)
BVE_{jt-1}	+	0.842***	1.028***	0.355***	0.638***	0.395***	0.904***	0.854***	0.709***	0.377***	0.633***
		(3.049)	(4.675)	(9.720)	(6.915)	(7.932)	(3.068)	(3.546)	(9.486)	(7.131)	(21.786)
$NIexcl_{jt}$	+	4.193**	3.819***	1.044**	0.279	0.878***	1.890	3.426***	-0.308	0.542	-0.317
		(2.345)	(3.567)	(2.227)	(0.760)	(2.906)	(1.365)	(3.042)	(0.256)	(1.528)	(0.233)
$DepIP_{jt}$	+	5.505**	5.284***								
		(2.215)	(3.218)								
Analyzed variables											
$ImpLossIP_{jt}$	+		6.484***								
			(4.262)								
$UnrGainIP_{jt}$	+			3.313***		3.130***					
				(7.729)		(8.902)					
$UnrLossIP_{jt}$	+				0.941***	0.331***					
					(3.650)	(4.239)					

Table 4.5: Continued

# of obs.	347	236	97	63	160	347	236	97	63	160
Adj. R^2	0.283	0.450	0.927	0.838	0.916	0.247	0.364	0.728	0.755	0.659
Mean bootstr. adj. R^2	0.293	0.462	0.935	0.849	0.921	0.253	0.374	0.757	0.783	0.676

Incremental contribution of IP income adjustments
Incremental bootstrapped adj. R^2

PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV
(11)= (1)-(6)	(12)= (2)-(7)	(13)= (3)-(8)	(14)= (4)-(9)	(15)= (5)-(10)
0.040	0.088	0.178	0.066	0.245

Comparing explanatory power of different accounting systems

Level of bootstrapped adj. R^2				Incremental bootstrapped adj. R^2			
PureHC vs. HC–ImpLoss	FV–UnrGain vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss	FV vs. HC–ImpLoss	PureHC vs. HC–ImpLoss	FV–UnrGain vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss	FV vs. HC–ImpLoss
(16)=(1)-(2)	(17)=(3)-(2)	(18)=(4)-(2)	(19)=(5)-(2)	(20)=(11)-(12)	(21)=(13)-(12)	(22)=(14)-(12)	(23)=(15)-(12)
-0.169***	0.473***	0.387***	0.459***	-0.048***	0.090***	-0.022**	0.157***
(47.046)	(162.958)	(102.000)	(155.579)	(29.928)	(29.862)	(10.809)	(50.856)

Table 4.5: Continued

Panel B. Regression analysis based on the restricted period from 2007 to 2009

Variables	Sign	Unrestricted model			Restricted model excluding IP income adjustments		
		PureHC	HC–ImpLoss	FV–UnrLoss	PureHC	HC–ImpLoss	FV–UnrLoss
		(1)	(2)	(3)	(4)	(5)	(6)
Intercept	?	15.913***	9.439**	68.288***	14.424***	6.454	91.937**
		(4.292)	(2.478)	(2.870)	(3.854)	(1.576)	(2.467)
BVE_{jt-1}	+	0.375**	1.002***	0.627***	0.455*	0.735***	0.375***
		(2.169)	(4.088)	(6.583)	(1.932)	(3.045)	(7.129)
$NIexcl_{jt}$	+	5.984***	1.618	0.287	3.037**	1.308	0.504
		(4.811)	(1.322)	(0.782)	(2.631)	(1.333)	(1.423)
$DepIP_{jt}$	+	6.283***	5.654**				
		(3.434)	(2.546)				
Analyzed variables							
$ImpLossIP_{jt}$	+		7.072***				
			(3.181)				
$UnrLossIP_{jt}$	+			0.918***			
				(3.386)			
# of obs.		139	107	53	139	107	53
Adj. R^2		0.356	0.351	0.831	0.283	0.240	0.752
Mean bootstr. adj. R^2		0.373	0.373	0.841	0.301	0.254	0.776

Table 4.5: Continued

Incremental contribution of IP income adjustments

Incremental bootstrapped adj. R^2		
PureHC	HC–ImpLoss	FV–UnrLoss
(7)=(1)-(4)	(8)=(2)-(5)	(9)=(3)-(6)
0.072	0.119	0.065

Comparing explanatory power of different accounting systems

Level of bootstrapped adj. R^2		Incremental bootstrapped adj. R^2	
PureHC vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss	PureHC vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss
(10)=(1)-(2)	(11)=(3)-(2)	(12)=(7)-(8)	(13)=(9)-(8)
0.000	0.468***	-0.047***	-0.054***
(0.132)	(92.374)	(17.391)	(20.434)

Table 4.5: Continued

Panel A (full period) shows for each subsample the results of the share price regression that includes investment property income adjustments (columns 1–5) and excludes investment property income adjustments (columns 6–10). The subsamples are described in Table 4.4 and Appendix 4.1. Impairment losses (ImpLoss), unrealized gains (UnrGain), and unrealized losses (UnrLoss) on investment properties are economically signed (i.e., impairment losses and unrealized losses have a negative sign and unrealized gains have a positive sign). The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009). Columns 11–15 show the incremental bootstrapped adj. R^2. The incremental bootstrapped adj. R^2 is obtained by calculating the difference between the mean value of bootstrapped adj. R^2 derived from the share price regression that includes investment property income adjustments (columns 1–5) and the mean value of bootstrapped adj. R^2 derived from the share price regression that excludes investment property income adjustments (columns 6–10). The mean values of the bootstrapped adj. R^2s and the incremental bootstrapped adj. R^2 are calculated by drawing 500 random samples with replacement for each of the five subsamples PureHC, HC–ImpLoss, FV–UnrGain, FV–UnrLoss, and FV. Columns 16–19 show the differences in the mean values of the level of bootstrapped adj. R^2s between two subsamples. Columns 20–23 report the differences in the mean values of the incremental bootstrapped adj. R^2s between two subsamples. Negative and positive values indicate that share prices are less and more explained by PureHC, FV–UnrGain, FV–UnrLoss, and FV than by HC–ImpLoss, respectively. The parentheses (columns 16–23) contain the t-statistics based on a t-test that assesses whether the differences between the subsample mean values of the level of bootstrapped adj. R^2 (columns 16–19) and incremental bootstrapped adj. R^2 (columns 20–23) are statistically significant.

Panel B documents the results of the restricted period, which is around the severe real estate crisis of 2007–2009. Panel B is organized in a manner equivalent to Panel A and excludes FV–UnrGain and FV. For a description of the variables see Appendix 4.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively.

In Table 4.5, columns 6–10 of Panel A report the regression results excluding property adjustments. They show that the mean value of bootstrapped adj. R^2 is highest for the fair value subsamples (0.676–0.783), implying that lagged fair value equity explains a high proportion of the variation in economic value of investment properties. To provide further evidence for the superiority of unrealized gains to historical cost income, I calculate the incremental bootstrapped adj. R^2 documented in columns 11–15 and described in section 4.3. Panel A documents a higher increase of the explanatory power for FV–UnrGain (0.178, column 13) than for PureHC (0.040, column 11) and for HC–ImpLoss (0.088, column 12). Columns 20 and 21 show that the means are statistically significantly different as established by a t-test. Consequently, the results confirm hypothesis 4.1.

Hypothesis 4.2 predicts that unrealized losses on investment properties are more useful in explaining share prices than historical cost income that includes impairment charges. Thus, hypothesis 4.2 predicts that unrealized losses on investment properties are more value relevant (with respect to explaining share prices) than impairment charges of investment properties.

Panel A of Table 4.5 shows that the coefficients on $ImpLossIP_{jt}$ (column 2) and $UnrLossIP_{jt}$ (columns 4 and 5) are significantly positive.[103] This suggests that both impairment losses and unrealized losses are value relevant. In addition, the mean value of bootstrapped adj. R^2 is higher for FV–UnrLoss (0.849, column 4) than for HC–ImpLoss (0.462, column 2), which is statistically significant as documented in column 18. However, as

[103] In addition, columns 1 and 2 show that the coefficient on $DepIP_{jt}$ is positive (depreciation is negatively signed), consistent with the findings in Field et al. (1998). This implies that maintenance and repairs are useful in explaining share prices.

outlined previously, lagged fair value equity explains a high proportion of the variation of properties' economic values.

In Table 4.5, the incremental bootstrapped adj. R^2 is higher for HC–ImpLoss (0.088, column 12) than for FV–UnrLoss (0.066, column 14). Column 22 shows that the difference is statistically significant. In addition, the incremental bootstrapped adj. R^2 for FV–UnrLoss is statistically significantly higher than that for PureHC (0.040, column 11).[104] The findings, however, do not necessarily imply that historical cost income that includes impairments are more value relevant than unrealized losses. In contrast to impairments, unrealized losses are clustered around the severe real estate crisis of 2007–2009 (see Table 4.3), a period of high uncertainty about a property's value, which might bias results.

Using the period over 2007–2009 only, Panel B of Table 4.5 documents results similar to Panel A for PureHC, HC–ImpLoss, and FV–UnrLoss, except that the incremental bootstrapped adj. R^2 for FV–UnrLoss (0.065, column 9) is statistically significantly lower than that for PureHC (0.072, column 7).[105] The findings suggest that unrealized losses are less value relevant than depreciation during the severe crisis (the difference is economically low). Because depreciation contributes to the value relevance (the coefficient on $DepIP_{jt}$ is statistically significantly positive, outlined in columns 1 and 2), the results of Panel B do not suggest that impairments are more value relevant than unrealized losses.[106]

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[104] The t-test is not tabulated and available from the author on request.
[105] The t-test is not tabulated and available from the author on request.
[106] The difference of the incremental bootstrapped adj. R^2 for HC–ImpLoss (0.119, column 8) and that for PureHC (0.072, column 7) is 0.047. The difference is lower than the incremental bootstrapped adj. R^2 for FV–UnrLoss (0.065, column 9), which may imply that impairment losses are less value relevant than unrealized losses. However, I need to establish a t-test using the impairment loss sample (HC–ImpLoss) and unrealized loss sample (FV–UnrLoss) to infer that the value relevance of impairment losses is lower than the value relevance of unrealized losses (see following paragraph).

To provide evidence for whether impairments and unrealized losses can be substituted for each other in the severe crisis, I generate 500 incremental bootstrapped adj. R^2s for HC–ImpLoss by rerunning model 4.1 excluding $DepIP_{jt}$. Next, I deduct from the obtained bootstrapped adj. R^2s, bootstrapped adj. R^2s derived from model 4.1 excluding $ImpLossIP_{jt}$ and $DepIP_{jt}$ (see section 4.3). I find that the incremental bootstrapped adj. R^2 for HC–ImpLoss is statistically significantly higher than that for FV–UnrLoss (untabulated).[107] This provides some evidence that impairments are more useful in explaining share prices during the crisis than unrealized losses (the difference is economically 1ow). Yet, this is inconsistent with hypothesis 4.2 and suggests that unrealized losses are not faithfully represented, which, in turn, is consistent with descriptive results in Figure 4.1, Table 4.3, and Table 4.4. The descriptive results indicate that unrealized losses lag and do not capture fully the severe economic losses of 2007–2008 (the book value of investment properties is understated over 2007–2009).

Hypothesis 4.3 predicts that fair value based income is more useful in explaining share prices than historical cost income for investment properties. Panel A of Table 4.5 documents that for FV the level of bootstrapped adj. R^2 (0.921, column 5) and the incremental bootstrapped adj. R^2 (0.245, column 15) are higher than those for HC–ImpLoss (and PureHC), which is statistically significant as outlined in columns 19 and 23, respectively. The results are consistent with hypothesis 4.3.

4.6.2 Results of the share price return regression

Table 4.6 reports results of the OLS return regressions. Panel A documents the results for the full period. Panel B documents the results for the

[107] Untabulated results are available from the author on request.

restricted period, around the severe real estate crisis of 2007–2009. The findings are organized in a manner equivalent to Panels A and B of Table 4.5.

Hypothesis 4.1 predicts that unrealized gains on investment properties are more useful in explaining share price returns than historical cost income. In Table 4.6, columns 3 and 5 of Panel A show that the coefficients on $UnrGainIP_{jt}$ are significantly positive. Columns 1 to 3 document that the mean value of bootstrapped adj. R^2s is higher for FV–UnrGain (0.242, column 3) than for PureHC (0.010, column 1) and for HC–ImpLoss (0.119, column 2). Columns 16 and 17 show that the results are significant. In addition, columns 11 to 13 show that the incremental bootstrapped adj. R^2 is higher for FV–UnrGain (0.204, column 13) than for the historical cost samples (PureHC 0.001, column 11 and HC–ImpLoss 0.108, column 12). The differences are statistically significant (columns 20 and 21). In summary, the results suggest that fair value increments are reported in financial statements in a timely manner so that unrealized gains are more value relevant than historical cost income, confirming hypothesis 4.1.

Hypothesis 4.2 predicts that unrealized losses on investment properties are more useful in explaining share price returns than historical cost income that includes impairment charges. Thus, hypothesis 4.2 predicts that unrealized losses on investment properties are more value relevant (with respect to explaining share price returns) than impairment charges of investment properties.

Table 4.6: The usefulness of impairment losses, unrealized gains, and unrealized losses in explaining contemporaneous share price returns

Panel A. Regression analysis based on the full period from 2005 to 2011

Variables	Sign	Unrestricted model					Restricted model excluding IP income adjustments				
		PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV	PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	?	0.117***	0.094	0.021	-0.116	-0.052	0.122***	0.267***	0.151***	-0.218***	0.009
		(5.215)	(1.525)	(0.483)	(1.469)	(1.179)	(5.635)	(5.705)	(7.382)	(4.674)	(0.406)
NI_{jt-1}	+	0.361	0.017	-0.045	-0.541***	-0.225***	0.366	0.034	-0.062	-0.451***	-0.210***
		(1.162)	(0.024)	(1.097)	(2.994)	(3.098)	(1.195)	(0.065)	(1.699)	(2.853)	(5.098)
$DeltaNIexcl_{jt}$	+	-0.107	-1.046	0.050**	0.070	0.153***	-0.108	-0.397	0.034	0.067	0.107***
		(0.281)	(1.348)	(2.270)	(0.169)	(3.165)	(0.284)	(0.743)	(1.528)	(0.173)	(4.197)
$DepIP_{jt}$	+	-0.113	-5.123***								
		(0.271)	(3.338)								
Analyzed variables											
$ImpLossIP_{jt}$	+		1.058**								
			(2.357)								
$UnrGainIP_{jt}$	+			0.766***		0.928***					
				(2.915)		(4.067)					
$UnrLossIP_{jt}$	+				0.374*	0.299					
					(1.819)	(1.311)					

Table 4.6: Continued

# of obs.	347	236	97	63	160	347	236	97	63	160
Adj. R^2	-0.001	0.094	0.200	0.292	0.263	0.002	0.001	-0.003	0.256	0.088
Mean bootstr. adj. R^2	0.010	0.119	0.242	0.359	0.307	0.009	0.011	0.038	0.282	0.094

Incremental contribution of IP income adjustments

Incremental bootstrapped adj. R^2				
PureHC	HC–ImpLoss	FV–UnrGain	FV–UnrLoss	FV
(11)=(1)-(6)	(12)=(2)-(7)	(13)=(3)-(8)	(14)=(4)-(9)	(15)=(5)-(10)
0.001	0.108	0.204	0.077	0.213

Comparing explanatory power of different accounting systems

Level of bootstrapped adj. R^2				Incremental bootstrapped adj. R^2			
PureHC vs. HC–ImpLoss	FV–UnrGain vs. HC–ImpLoss	FV–UL vs. HC–ImpLoss	FV vs. HC–ImpLoss	PureHC vs. HC–ImpLoss	FV–UnrGain vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss	FV vs. HC–ImpLoss
(16)=(1)-(2)	(17)=(3)-(2)	(18)=(4)-(2)	(19)=(5)-(2)	(20)=(11)-(12)	(21)=(13)-(12)	(22)=(14)-(12)	(23)=(15)-(12)
-0.109***	0.123***	0.240***	0.189***	-0.107***	0.095***	-0.031***	0.105***
(40.758)	(25.161)	(44.850)	(42.411)	(40.908)	(20.071)	(7.253)	(22.943)

Table 4.6: Continued

Panel B. Regression analysis based on the restricted period from 2007 to 2009

Variables	Sign	Unrestricted model			Restricted model excluding IP income adjustments		
		PureHC	HC–ImpLoss	FV–UnrLoss	PureHC	HC–ImpLoss	FV–UnrLoss
		(1)	(2)	(3)	(4)	(5)	(6)
Intercept	?	-0.168***	0.085	-0.217**	-0.130**	0.483***	-0.298***
		(2.688)	(0.655)	(2.259)	(2.595)	(4.122)	(5.653)
NI_{jt-1}	+	2.198**	-2.470	-0.607***	2.246**	-2.081	-0.557***
		(2.187)	(1.083)	(3.154)	(2.194)	(1.109)	(3.121)
$DeltaNIexcl_{jt}$	+	-1.706*	-2.135	-0.103	-1.810*	-1.798	-0.119
		(1.721)	(1.333)	(0.226)	(1.765)	(1.162)	(0.277)
$DepIP_{jt}$	+	-0.814	-8.306***				
		(1.298)	(3.911)				
Analyzed variables							
$ImpLossIP_{jt}$	+		-0.308				
			(0.102)				
$UnrLossIP_{jt}$	+			0.255			
				(1.205)			
# of obs.		139	107	53	139	107	53
Adj. R^2		0.087	0.158	0.335	0.086	0.003	0.327
Mean bootstr. adj. R^2		0.097	0.202	0.416	0.090	0.027	0.363

Table 4.6: Continued

Incremental contribution of IP income adjustments

Incremental bootstrapped adj. R^2		
PureHC	HC–ImpLoss	FV–UnrLoss
(7)=(1)-(4)	(8)=(2)-(5)	(9)=(3)-(6)
0.007	0.175	0.053

Comparing explanatory power of different accounting systems

Level of bootstrapped adj. R^2		Incremental bootstrapped adj. R^2	
PureHC vs. HC–ImpLoss	FV–UL vs. HC–ImpLoss	PureHC vs. HC–ImpLoss	FV–UnrLoss vs. HC–ImpLoss
(10)=(1)-(2)	(11)=(3)-(2)	(12)=(7)-(8)	(13)=(9)-(8)
-0.105***	0.214***	-0.168***	-0.122***
(21.041)	(35.840)	(46.593)	(26.799)

Table 4.6: Continued

Panel A (full period) shows for each subsample the results of the share price return regression that includes investment property income adjustments (columns 1–5) and excludes investment property income adjustments (columns 6–10). The subsamples are described in Table 4.4 and Appendix 4.1. Impairment losses (ImpLoss), unrealized gains (UnrGain), and unrealized losses (UnrLoss) on investment properties are economically signed (i.e., impairment losses and unrealized losses have a negative sign and unrealized gains have a positive sign). The parentheses contain the t-statistic that equals regression coefficients scaled by the coefficient standard error clustered at a firm level (Peterson 2009). Columns 11–15 show the incremental bootstrapped adj. R^2. The incremental bootstrapped adj. R^2 is obtained by calculating the difference between the mean value of bootstrapped adj. R^2 derived from the share price return regression that includes investment property income adjustments (columns 1–5) and the mean value of bootstrapped adj. R^2 derived from the share price return regression that excludes investment property income adjustments (columns 6–10). The mean values of the bootstrapped adj. R^2s and the incremental bootstrapped adj. R^2 are calculated by drawing 500 random samples with replacement for each of the five subsamples PureHC, HC–ImpLoss, FV–UnrGain, FV–UnrLoss, and FV. Columns 16–19 show the differences in the mean values of the level of bootstrapped adj. R^2s between two subsamples. Columns 20–23 report the differences in the mean values of the incremental bootstrapped adj. R^2s between two subsamples. Negative and positive values indicate that share price returns are less and more explained by PureHC, FV–UnrGain, FV–UnrLoss, and FV than by HC–ImpLoss, respectively. The parentheses (columns 16–23) contain the t-statistics based on a t-test that assesses whether the differences between the subsample mean values of the level of bootstrapped adj. R^2 (columns 16–19) and incremental bootstrapped adj. R^2 (columns 20–23) are statistically significant.

Panel B documents the results of the restricted period, which is around the severe real estate crisis of 2007–2009. Panel B is organized in a manner equivalent to Panel A and excludes FV–UnrGain and FV. For a description of the variables see Appendix 4.1. *, **, *** indicate significance levels of less than 10%, 5%, and 1%, respectively.

In Table 4.6, Panel A documents positive coefficients on $ImpLossIP_{jt}$ (column 2) and $UnrLossIP_{jt}$ (columns 4 and 5). However, the coefficient on $UnrLossIP_{jt}$ is weakly significant as shown in column 4 and insignificantly different from zero as documented in column 5. The regression results confirm descriptive statistics that indicate that unrealized losses lag the severe market downward trend of 2007–2008 (see Figure 4.1 and Table 4.3). Furthermore, columns 1, 2, and 4 show that the mean value of bootstrapped adj. R^2 is higher for FV-UnrLoss (0.359, column 4) than for the historical subsamples. Columns 11, 12, and 14 document that the incremental bootstrapped adj. R^2 for FV–UnrLoss (0.077, column 14) is higher (lower) than for PureHC (HC–ImpLoss). The results are significant, as outlined in column 18 (level of bootstrapped adj. R^2) and column 22 (incremental bootstrapped adj. R^2). The incremental bootstrapped adj. R^2 for FV–UnrLoss is significantly higher than that for PureHC (untabulated). As outlined previously, the results might be affected by the fact that unrealized losses are clustered around 2007–2009.

In Table 4.6, columns 2 and 3 of Panel B show that that the coefficients on $ImpLossIP_{jt}$ and $UnrLossIP_{jt}$ are insignificantly different from zero. This is inconsistent with hypothesis 4.2 but consistent with prior studies that suggest that during severe crises, fair values of investment properties are not useful in explaining returns (Easton and Eddey 1997; Hellwig 2009). The findings imply that the estimation error of fair values (projected future operating performance) for investment properties is higher in severe crises than in other periods. Thus, fair value decrements (impairments and unrealized losses) are not useful in explaining market fluctuations in a timely manner.

Hypothesis 4.3 predicts that fair value based income is more useful in explaining share price returns than historical cost income of investment properties. In Table 4.6, columns 1, 2, and 5 and columns 11, 12, and 15 of Panel A document that the mean values of bootstrapped adj. R^2 and the incremental bootstrapped adj. R^2 are higher for FV (0.307, column 5 and 0.213, column 15) than for the historical cost subsamples. This is consistent with hypothesis 4.3.

4.6.3 Summary of the value relevance regression results

The findings imply that unrealized gains on investment properties are more value relevant than historical cost income that includes impairment losses. Furthermore, the results provide some evidence that unrealized losses on investment properties are less useful in explaining share prices over 2007–2009 than impairments. In addition, both kinds of fair value decrements are not useful in explaining the economic losses that real estate firms suffered over 2007–2008 in a timely manner.

The results suggest that unrealized losses are not superior to impairment charges in explaining market fluctuations during 2007–2009, which is inconsistent with hypothesis 4.2. Under the fair value model, unrealized gains are reported in financial statements. Accordingly, unrealized losses are supposed to be reported immediately with the economic losses of the investment properties and in a routine fashion, which is not necessarily true for impairment charges. This should increase the value relevance of unrealized losses over impairment charges (see hypothesis 4.2). However, reporting fair value increments in financial statements increases the amount of unrealized losses relative to the amount of impairment charges. In general, real estate firms report larger amounts of unrealized losses than impairment losses for their investment property portfolio. This is particularly true during severe crises when the value of most properties suffer a downward trend (see also section 4.5.2 and Table 4.3). When managers are reluctant to report large amounts of unrealized losses in financial statements, the faithful representation declines. Reducing the amount of unrealized losses in severe crises leads to overstated book values of investment properties; this effect is documented in Table 4.4 (the mean value of MtB_{jt} is below its theoretical value of 1 for the unrealized loss sample). This practice should result in low or no value relevance of unrealized losses, as documented in section 4.6. Consequently, my unexpected findings might be driven by the fact that managers are reluctant to report large amounts of fair value decrements in financial statements.

My results also imply that outside of severe crises, fair value based income is superior to historical cost income in explaining the economic performance of investment properties.[108] In conclusion, this study finds no evidence to support the concern of the U.S. FASB that the estimation error of fair value increments of investment properties is too high to contain value relevant information. However, the results imply that special attention needs to be paid to fair value decrements reported in financial statements around severe crises.

4.7 Summary, conclusions, and limitations

The SEC has been considering the adoption of IFRS. This would presumably result in U.S. listed real estate firms reporting fair value

[108] I provide evidence that fair value decrements are not useful in explaining market fluctuations in a timely manner around the severe real estate crisis of 2007–2009. Thus, the value relevance of historical cost income that includes impairments should be higher outside the crisis than over 2007–2009. Outside the crisis, predominately unrealized gains are reported in financial statements. Accordingly, I conduct an additional test by using a restricted sample that excludes the period from 2007–2009. The results imply that fair value increments are still more useful in explaining market fluctuations in a timely manner than historical cost income that includes impairment charges.

increments for their primary assets (i.e., investment properties) in financial statements. However, fair values of investment properties tend to be estimated with error, which can reduce their usefulness in explaining market fluctuations (Fields et al. 1998; Danbolt and Rees 2008). This study compares the value relevance of “pure” historical cost income, historical cost income with limited fair value decrements (impairments), and “pure” fair value based income for investment properties.

I use a sample of U.S. real estate firms that apply the historical cost model under U.S. GAAP and U.K. real estate firms that use the fair value model under IFRS. All real estate firms included in the sample are highly invested in investment properties.

Descriptive results reveal that in contrast to historical cost income, fair value based income reflects to a reasonable extent the latest economic cycle, 2005–2011. Yet, they also show that unrealized losses lag and do not fully capture the severe real estate market downward trend of 2007–2008.

In addition, descriptive results document that unrealized gains align the book values of investment properties with their market values, providing some preliminary evidence that they are faithfully represented (i.e., their estimation error is low). Furthermore, descriptive results indicate that investment properties of U.S. real estate firms are understated in financial statements relative to their market values, even when impairment charges are reported around the severe real estate crisis of 2007–2009. This provides some evidence that during the severe crisis, unrecognized fair value increments are not fully absorbed so that not all properties that suffer economic losses are impaired. Further results reveal that when U.K. real estate firms report unrealized losses clustered around 2007–2009, investment properties are overstated in financial statements (relative to their market values), which may indicate that unrealized losses are not faithfully represented during the severe crisis.

To test my three hypotheses, I use the price and return value relevance regressions. Hypothesis 4.1 predicts that unrealized gains are more useful in explaining prices and returns than historical cost income. My findings show that the explanatory power of both regressions increases to a higher extent when U.K. real estate firms report unrealized gains in financial statements than when U.S. real estate firms report historical cost income that excludes or includes impairment charges. This is consistent with hypothesis 4.1.

Hypothesis 4.2 predicts that unrealized losses are more useful in explaining prices and returns than historical cost income that includes impairment losses. Thus, unrealized losses would be more value relevant than impairments. My findings document that the explanatory power of the price regression increases to a higher extent for U.S. real estate firms that report deprecation and impairment charges around the severe crisis of 2007–2009 than for U.K. real estate firms that report unrealized losses in financial statements. Additional analyses provide some evidence that impairments are of higher value relevance than unrealized losses during that period. The return regression reveals that around the severe crisis neither impairments nor unrealized losses are value relevant. This implies that both kinds of fair value decrements are not reported in financial statements in a timely manner. The results are inconsistent with hypothesis 4.2.

I hypothesized that unrealized losses are reported in financial statements immediately with the economic losses of investment properties, which is not necessarily true (even in severe crises) for impairment charges. Impairment losses are only triggered when the economic losses (fair value decrements) of the properties are sufficiently large to compensate for past (nonreported) fair value increments. In addition, I hypothesized that unrealized losses are estimated in a routine fashion, which should increase their faithful representation over impairment charges. As a result, I expected that unrealized losses are of higher value relevance than impairments. Based on the unexpected results, I argue that the hypothesized effect is (over) compensated by the reluctance of managers to report large amounts of fair value decrements in financial statements. In contrast to impairment charges, unrealized losses are based on upwardly adjusted book values. Accordingly, unrealized losses are likely reported for all properties of a real estate firm around the crisis of 2007–2009 and capture fully the economic losses of the properties. This leads to large amounts of unrealized losses relative to impairment charges, which is also documented in the descriptive results. Thus, managers of U.K. real estate firms might be induced to overstate the book value of investment properties so that unrealized losses lag and do not fully capture the severe market downward trend of 2007–2008. This reduces the faithful representation and value relevance of reports of unrealized losses in financial statements over the crisis.

Hypothesis 4.3 predicts that fair value based income is more useful in explaining prices and returns than historical cost income. I find that the increase in explanatory power of both regressions is higher under the fair value model than under the historical cost model. This is consistent with hypothesis 4.3.

Overall, findings suggest that fair values are measured with errors, which is consistent with prior studies (Fields et al. 1998; Dietrich et al. 2001; Danbolt and Rees 2008). However, the estimation error is sufficiently low so that, outside of the severe crisis, fair value based income is superior in explaining market variations to historical cost income. These findings may be of interest, particularly to standard setters, as the results point to an area that requires further convergence.

Although my findings are consistent across various tests, I highlight the following four caveats. First, I cannot fully exclude that results are driven by other factors, in particular, by country fixed effects. However, this concern should be mitigated by using two common law countries that both have highly developed capital and real estate markets, by selecting real estate firms that are highly invested in investment properties, and by applying a battery of analyses. Second, I cannot exclude the possibility that discretion in estimating fair values of investment properties is exploited by managers, in particular, when unrealized losses are reported around severe crises. However, I can conclude that fair values of investment properties are on average sufficiently faithfully represented to be more value relevant outside the real estate crisis than historical cost income. Third, while I cannot conclude that fair values of investment properties are decision relevant to investors, results suggest that the fair values are capable of being decision relevant (i.e., value relevant) outside of the crisis. Finally, my results might not be generalizable to other settings. For instance, the estimation of fair values of asset other than investment properties, such as intangibles, requires considerably more judgment.

Future studies can address the limitations of my study and/or analyze cross sectional differences of the value relevance of fair value estimates. In addition, further research is needed to analyze why unrealized losses are not superior to impairments during a severe crisis and whether unrealized losses are faithfully represented outside of a crisis.

Appendix 4.1

Variable list

Notation	Calculation
MtB_{jt}	Ratio of market value of equity to book value of equity of real estate firm (*j*). The market value of equity is used at the end of the third month following the end of fiscal year (*t*) if real estate firm (*j*) is located in the U.S. and at the end of the fourth month following the end of fiscal year (*t*) if real estate firm (*j*) is located in the U.K. The book value of equity of real estate firm (*j*) is used at the end of fiscal year (*t*). Data are obtained from Datastream.
Dependent Variables	
$Price_{jt}$	Share price including dividends of real estate firm (*j*). Share price is used at the end of the third month following the end of fiscal year (*t*) if real estate firm (*j*) is located in the U.S. and at the end of the fourth month following the end of fiscal year (*t*) if real estate firm (*j*) is located in the U.K. Data are obtained from Datastream.
$Return_{jt}$	Dividend adjusted share price returns of real estate firm (*j*). Share price returns are measured over a period of one year. If real estate firm (*j*) is located in the U.S., the period is measured from the end of the third month following the end of fiscal year (*t-1*) to the end of the third month following the end of fiscal year (*t*). If real estate firm (*j*) is located in the U.K., the period is measured from the end of the fourth month following the end of fiscal year (*t-1*) to the end of the fourth month following the end of fiscal year (*t*). Data are obtained from Datastream

Appendix 4.1
Continued

Analyzed variables/ investment property adjustment variables	
$ImpLossIP_{jt}$	Impairment losses of investment properties per share of real estate firm (*j*) in fiscal year (*t*). Impairment losses are reported under the historical cost model. Data are hand collected from 10-K reports. For the return regression, the variable is additionally deflated by lagged share price.
$UnrGainIP_{jt}$	Net unrealized gains of investment properties per share of real estate firm (*j*) in fiscal year (*t*). Net unrealized gains are reported under the fair value model. Data are obtained from Datastream but the majority is checked and occasionally adjusted by hand collected data. For the return regression, the variable is additionally deflated by lagged share price.
$UnrLossIP_{jt}$	Net unrealized losses on investment properties per share of real estate firm (*j*) in fiscal year (*t*). Net unrealized losses are reported under the fair value model. Data are obtained from Datastream but the majority is checked and occasionally adjusted by hand collected data. For the return regression, the variable is additionally deflated by lagged share price.
$DepIP_{jt}$	Depreciation of investment properties per share of real estate firm (*j*) in fiscal year (*t*). The amount of depreciation is obtained from Datastream. For the return regression, the variable is additionally deflated by lagged share price.
Control variables of the price regression	
BVE_{jt-1}	Book value of equity per share of real estate firm (*j*) at the end of fiscal year (*t-1*). Data are obtained from Datastream and if not available data are hand collected.
$NIexcl_{jt}$	Bottom-line earnings per share before investment property adjustments of real estate firm (*j*) in fiscal year (*t*). Data are obtained from Datastream.

Appendix 4.1
Continued

Control variables of the return regression	
NI_{jt-1}	Bottom-line earnings per share of real estate firm (*j*) in fiscal year (*t-1*). The variable is deflated by lagged share price. Data are obtained from Datastream.
$DeltaNIexcl_{jt}$	Bottom-line earnings per share before investment property adjustments of real estate firm (*j*) in fiscal year (*t*) less bottom-line earnings per share before investment property adjustments of real estate firm (*j*) in fiscal year (*t-1*). The variable is deflated by lagged share price.

Subsamples	
PureHC	Subsample 1 which contains U.S. real estate firm (*j*) that reports no impairment charges in fiscal year (*t*) ("pure" historical cost income observations).
HC–ImpLoss	Subsample 2 which contains U.S. real estate firm (*j*) that reports impairment charges in fiscal year (*t*) (historical cost income including limited fair value decrement observations).
FV–UnrGain	Subsample 3 which contains U.K. real estate firm (*j*) that reports net unrealized gains in fiscal year (*t*) (net fair value increment observations).
FV–UnrLoss	Subsample 4 which contains U.K. real estate firm (*j*) that reports net unrealized losses in fiscal year (*t*) (net fair value decrement observations).
FV	Subsample 5 which contains U.K. real estate firm (*j*) that reports either net unrealized gains or net unrealized losses in fiscal year (*t*) ("pure" fair value income observations).

Appendix 4.2
Development of Model 4.1 in section 4.3

My model is derived from earlier work of Preinreich (1938), Edwards & Bell (1961), Easton and Harris (1991), Ohlson (1995), and Feltham & Ohlson (1995). Overall, they adjusted the dividend discount models by using accounting numbers. The following equation depicts the model:

$$Priceexcl_{jt} = BVE_{jt} + \sum_{t=0}^{\infty} \frac{NI_{jt+1} - BVE_{jt} * r_{ej}}{(1 + r_{ej}^{t})} \quad , \qquad \text{(A4.1)}$$

where $Priceexcl_{jt}$ is as defined in model 4.1 (see model 4.1 in section 4.3) except that dividends are excluded.[109] BVE_{jt} is the book value of equity per share of firm (j) at the end of fiscal year (t). NI_{jt+1} equals bottom-line earnings per share of firm (j) in fiscal year ($t+1$). r_{ej} equals the cost of equity of firm (j). Abnormal earnings ($AbnNi_{jt}$) of firm (j) in fiscal year (t) are defined as:

$$AbnNi_{jt} = NI_{jt} - BVE_{jt-1} * r_{ej}. \qquad \text{(A4.2)}$$

Abnormal earnings can be related to accounting value added and/or economic value added (Easton 2001). The former arises when accounting conservatism is applied by, for instance, excessively depreciating assets. This lowers the book value relatively to the economic value of equity so that the amount of cost of equity ($BVE_{jt-1} * r_{ej}$) declines and abnormal earnings ($AbnNi_{jt}$) increases (artificially in future years). Economic value added is, for instance, attributable to a firm's investment in projects with positive net present values. However, these projects, in turn, give rise to accounting value added in future years when the positive net present values are not immediately reported in the book value of equity (i.e., when accounting conservatism is applied). As a result, the amount of cost of equity grows just gradually with future income that includes the positive net present values and abnormal earnings occur in future years. In a similar vein, when unrealized gains or fair value increments of investment properties (e.g., attributable to an expected increase of future rental income) are not immediately reported in the book value of equity, the amount of cost of equity increases just gradually with the increase of future rental income and

[109] For the literature that covers valuation models, I refer to Palepu et al. (2007) and McKinsey & Company Inc. et al. (2010).

abnormal future earnings occur (see also Easton 2001; Easton and Pae 2004).

In summary, a firm's value (per share) proxied by $Priceexcl_{jt}$ is derived by the book value of equity and discounting the infinitive stream of abnormal earnings (residual earnings) via the firm's equity cost. Ohlson (1995) derives the following equation:

$$Priceexcl_{jt} = BVE_{jt} + \alpha_1 AbnNI_{jt} + \alpha_2 V_{jt}, \tag{A4.3}$$

where V_{jt} equals other value relevant information. Broadly speaking, equation A4.3 shows that α_1 is the multiplier of abnormal earnings, which is a function of equity risk and persistency of abnormal earnings. Prior studies find that the higher a firm's equity risk and the lower the persistency of abnormal earnings, the lower α_1 is (Kormendi and Lipe 1987; Collins and Kothari 1989; Easton and Zmijewski 1989). Assuming clean surplus accounting, BVE_{jt} can be expressed as

$$BVE_{jt} = BVE_{jt-1} + NI_{jt} - Div_{jt}, \tag{A4.4}$$

where Div_{jt} equals dividends per shares paid by firm (j) over fiscal year (t). By substituting equation A4.4 for BVE_{jt} and equation A4.2 for $AbnNi_{jt}$ and substituting in equation A4.3, I obtain:

$$Priceexcl_{jt} = BVE_{jt-1} + NI_{jt} - Div_{jt} + \alpha_1 NI_{jt} - \alpha_1 BVE_{jt-1} * r_{ej} + \alpha_2 V_{jt}, \tag{A4.5}$$

and further

$$Price_{jt} = (1-\alpha_1 r_{ej}) * BVE_{jt-1} + (1+\alpha_1) * NI_{jt} + \alpha_2 V_{jt}, \tag{A4.6}$$

where $Price_{jt}$ is defined as in model 4.1 (see section 4.3). By substituting

$$\alpha_2 V_t = \beta_0 + \varepsilon_{jt}, \tag{A4.7}$$

$$1-\alpha_1 r_{ej} = \beta_1, \tag{A4.8}$$

$$1+\alpha_1 = \beta_2, \tag{A4.9}$$

into equation A4.6, I get the empirical share price value relevance regression (see also Collins et al. 1999; Gornik-Tomaszewksi and Jermakowicz 2001),

$$Price_{jt} = \beta_0 + \beta_1 BVE_{jt-1} + \beta_2 NI_{jt} + \varepsilon_{jt}. \qquad \text{(A4.10)}$$

Broadly speaking, the regression specification is based on realized earnings—captured in BVE_{jt-1}—and future forecasted earnings—reflected in NI_{jt}—when conservative accounting is applied (Feltham and Ohlson 1995; Ohlson 1995). However, the more unrealized earnings are incorporated in BVE_{jt-1} by using the fair value model, the more transitory (less persistent) current earnings (NI_{jt}) are. Thus, the coefficients on β_1 and β_2 converge to 1. This suggests that lagged book value of equity (BVE_{jt-1}) becomes about equally important to current earnings (NI_{jt}) and both serve as a proxy for future forecasted earnings (see also Barth and Landsman 1995; Danbolt and Rees 2008).

Specifically, as outlined previously (equation A4.3), α_1 captures the persistency of abnormal earnings. The less persistent abnormal earnings are, everything else being equal, the lower α_1 is. Accordingly, both β_1 and β_2 converge to 1 when abnormal earnings are transitory (see equations A4.8 and A4.9). As a result, when investment properties are reported at fair values in financial statements and the fair values are faithfully represented, both β_1 and β_2 should be close to one and the current book value of equity should be close to the current market value of equity.[110]

[110] I analyze to some extent whether the coefficient on BVE_{jt-1} and explicitly whether the coefficients on $ImpLossIP_{jt}$, $UnrLossIP_{jt}$, and $UnrGainIP_{jt}$ of the value relevance regressions (see, in particular, model 4.1 in section 4.3) are significantly different from zero. However, I do not compare the magnitude of these coefficients. These coefficients might be biased, which makes it difficult (or even impossible) to draw any inference about their magnitude. For instance, the scale effects might cause heteroscedasticity in the error term, even when all variables are deflated by outstanding shares (see section 4.3). This can occur when firm size is positive associated with the magnitude of economic shocks that a firm experience, which, in turn, can bias the coefficients (see e.g., Barth and Kallapur 1996; Easton and Sommers 2003; Barth and Clinch 2009).

5 Summary and conclusions

5.1 Overview

IFRS financial statements are released by firms worldwide, including firms in the EU. Broadly speaking, the application of IFRS increases a firm's use of fair value accounting over local GAAP. Thus, managers' estimates of a firm's expected future operating performance have become an important component in income statements (Schipper 2005; Ball 2006; Barth 2006; Cairns 2006). This has changed the measurement paradigm from realized income to unrealized income (Herrmann et al. 2006; Penman 2007). This dissertation examines the usefulness to investors of managers' fair value estimates based on two standards of the IASB, IAS 36 "*Impairment of Assets*" and IAS 40 "*Investment Property*."

In this chapter, I present the summary and conclusions of my three empirical analyses outlined in research chapters 2–4. This chapter is organized as follows. In section 5.2, I provide an overview of the dissertation including research objectives, contributions to the literature, and findings of the three studies. The research questions that motivated the three analyses are presented in subsection 5.2.1. Summaries of the two studies presented in chapters 2 and 3 on IAS 36 impairment losses are provided in subsections 5.2.2 and 5.2.3, respectively. A summary of the study outlined in chapter 4 on IAS 40 fair values is provided in subsection 5.2.4.

The implications of the research are discussed in section 5.3. In section 5.4, I present limitations of the research and suggest avenues for future investigation. General limitations and opportunities for future research are provided in subsection 5.4.1. In subsections 5.4.2–5.4.4, I discuss limitations and directions for future research that are specific to the three studies.

5.2 Summary of the dissertation

5.2.1 Research questions

I conduct three standalone capital market based studies. Accordingly, I address three research questions that are tackled by a quantitative approach. The three research questions addressed in research chapters 2–4 are outlined below:

1. **Research chapter 2:** Does the reporting environment impact on managers' use of discretion in applying impairment guidelines?
2. **Research chapter 3:** Are impairment losses that are reported in the absence of managers' exploitation of discretion informative to investors?
3. **Research chapter 4:** Is fair value based income sufficiently faithfully represented to be more value relevant to investors than historical cost income including impairments?

The first two research questions are related to IAS 36. The third research question is based on IAS 40. In the following, I summarize my research study by study (chapter by chapter).

5.2.2 Summary of research presented in chapter 2: IAS 36 *"Impairment of Assets"*

Whereas reporting fair value increments of tangible and intangible fixed assets in IFRS financial statements is optional and to some extent restrictive, reporting fair value decrements below historical cost book values (i.e., impairment losses) of these assets is required according to IAS 36 (IASB 2003a, 2003b, 2004a, 2008). Estimates of IAS 36 impairment losses of tangible and intangible fixed assets are in general based on discounted projected future net cash flows (i.e., the estimated value in use) of a firm's identified CGUs and a comparison of the derived value in use of each identified CGU with its book value (impairment test) (IASB2004a). Thus, the estimation procedure involves substantial discretion in identifying CGUs, projecting CGUs' future net cash flows, and estimating CGUs' discounts rates.

Managers might exploit discretion to prevent reporting impairment losses (bad news about a firm's asset quality) in a firm's financial statements or they might apply impairment guidelines systematically to avoid an overstatement of a firm's asset base (e.g., Francis et al. 1996; Cotter et al. 1998; Riedl 2004; Beatty and Weber 2006; Boone and Raman 2007; Vanza et al. 2011; Li et al. 2011; Li and Sloan 2011; Ramanna and Watts 2012). In chapter 2, I supplement those studies by analyzing whether the reporting environment impacts managers' use of discretion in applying IAS 36 requirements.

The objective of this study is to examine which element(s) of the value in use approach managers exploit in a weak reporting environment to overstate a firm's asset base. In this context, I examine whether a stringent reporting environment restricts managers' exploitation of discretion to mask impaired assets. Another objective of this study is to analyze whether managers are encouraged to use discretion prudently in a stringent reporting environment. When discretion is used nonopportunistically and prudently, it is likely that assets would not be overstated, an outcome aligned with the intended purpose of IAS 36. Finally, I examine how an overstatement of assets is avoided in a stringent reporting environment. That is, a stringent reporting environment can encourage managers to report large impairments or frequent impairments so that assets are not overstated.

In contrast to previous research that focused on noncomprehensive systematic determinants of impairments (Francis et al. 1996; Riedl 2004; Boone and Raman 2007; Cotter et al. 1998; Vanza et al. 2011), I start my analysis by identifying determinants of impairment losses that capture the elements of the value in use approach. The determinants are identified to show that European firms on average report impairment losses systematically (i.e., in accordance with IAS 36 requirements). Subsequently, the determinants are applied as control variables.

After controlling for IAS 36 requirements, I find that in a stringent reporting environment reports of impairments in financial statements are more likely to occur than in a weak reporting environment. In a stringent reporting environment a firm's financial reporting is carefully scrutinized by, for instance, regulators, analysts, and/or auditors so that an overstatement of assets is likely to be detected. As a result, managers' and firms' risk of litigation presumably increases so that managers understate rather than overstate a firm's asset base in a stringent reporting environment (see e.g., Ball et al. 2000; Ball et al. 2003; Kim et al. 2003). Thus, my results suggest that a stringent reporting environment curbs managers' tendency to overstate the asset base, which supplements the findings in Vanza et al. (2011).

Vanza et al. (2011) find (unexpectedly) that investors' uncertainty of impairers' asset quality is lower than investors' uncertainty of nonimpairers' asset quality. This suggests that managers are not motivated by investors' uncertainty about a firm's asset quality to report impairment charges in financial statements. My findings provide evidence that managers are encouraged to impair CGUs in a stringent reporting environment in which a firm's financial reporting is carefully scrutinized.

Specifically, I find that managers report impairment losses more systematically in a stringent reporting environment than in a weak reporting environment. I provide evidence that in a weak reporting environment managers define CGUs opportunistically to mask impaired assets. For instance, CGUs can be defined opportunistically by defining fewer CGUs than required to establish CGUs with (large) unrecognized economic values. As impaired assets can be hidden in CGUs with (large) unrecognized economic values, reports of impairment charges (i.e., bad news about a firm's asset quality) can be prevented in a firm's financial statements. As a result, a firm's asset base is opportunistically overstated. My findings suggest that this is a common practice in a weak reporting environment and that a stringent reporting environment curbs managers' opportunistic use of discretion in overstating the asset base. My findings supplement prior literature that finds, based on descriptive results, that some managers opportunistically define CGUs and/or aggressively use low discount rates for CGUs to overstate a firm's asset base (e.g., Finch 2006; Carlin et al. 2010; Petersen and Plenborg 2010; Carlin and Finch 2011; Ball et al. 2000; Ball et al. 2003; Kim et al. 2003).

Additionally, I find that a stringent reporting environment encourages managers to use discretion prudently in defining CGUs and estimating the value in use of the defined CGUs. Thus, a stringent reporting environment tends to induce managers to release impairment charges (bad news about a firm's asset quality) at an early stage of the decline in value of the firm's asset base so that an overstatement of assets is avoided. The estimation of impairment charges is more an art than a science, thus, impairment losses are subject to estimation errors (see also Hoogendoorn

2006; Petersen and Plenborg 2010). This increases the possibility that assets are overstated, which can increase managers' and firms' risk of litigation. To decrease the likelihood of an asset overstatement, I argue that in an stringent reporting environment managers estimate a firm's asset base prudently (see also Ball et al. 2000; Ball et al. 2003; Kim et al. 2003).

Furthermore, I analyze the effect of the reporting environment on the magnitude of impairment losses to provide further evidence on how managers prevent overstating the asset base. A stringent reporting environment can encourage managers to report large amounts of impairment losses in a firm's financial statements to account for previously unaccounted economic losses. Alternatively, such an environment might induce managers to adjust the asset base frequently, resulting in reports of small amounts of impairment charges in financial statements. I find that managers are encouraged to report large amounts of impairment charges in periods of intense scrutiny over a firm's financial reporting. In contrast, firm-specific determinants related to a stringent reporting environment induce managers to report small amounts of impairment losses in a firm's financial statements. Some evidence is found that managers understate assets, in particular, when the country-level enforcement system is strict, consistent with the view of prior studies (Ball et al. 2000; Ball et al. 2003). Overall, the findings in chapter 2 suggest that managers' various uses of the discretion inherent in the guidelines set forth in IAS 36 reduce the comparability of operating performance across firms and time periods.

5.2.3 Summary of research presented in chapter 3: IAS 36 *"Impairment of Assets"*

Overall, prior studies find that impairment losses provide little information to investors (e.g., Strong and Meyer 1987; Elliott and Shaw 1988; Francis et al. 1996; Bartov et al. 1998; Hirschey and Richardson 2002, 2003; Bens et al. 2011). Managers' opportunistic use of discretion often reduces the informativeness to investors of impairment charges (Watts 2003; Ramanna 2008; Ramanna and Watts 2012). The research objective of my second study outlined in chapter 3 is to explore whether IAS 36 impairment losses estimated in the absence of managers' opportunistic behavior are informative to investors, an aspect of capital markets that is not well understood.

After identifying reports of nonopportunistic impairment charges, I analyze their informativeness in high and low analyst coverage environments. In a high analyst coverage environment investors are well informed in a timely manner about a firm's asset quality (Bens et al. 2011; Muller et al. 2012; see also Brennan et al. 1993) because analysts thoroughly process available market, industry, and firm data and disseminate the processed data to investors (Lang and Lundholm 1996; Barker 1998; Piotroski and Roulstone 2004). In a low analyst coverage environment investors tend to rely on managers' reports of a firm's asset quality (see Botosan 1997).

I find that the information content of nonopportunistic impairment losses is fully anticipated in a high analyst coverage environment. This indicates that in a high analyst coverage environment nonopportunistic impairment charges are reported with a delay in a firm's annual financial statements. In addition, I find that when investors are not well informed about a firm's asset quality (i.e., in a low analyst coverage environment), investors' uncertainty about a firm's asset quality increases (i.e., the information asymmetry between managers and investors increases) before nonopportunistic impairment charges are reported in a firm's annual financial statements. This indicates that nonopportunistic impairment charges are reported with a delay and since available data are not thoroughly processed by analysts, investors' uncertainty about a firm's asset quality increases. Finally, I find that the increase in investors' uncertainty is only partly eliminated through reports of nonopportunistic impairment losses in a low analyst coverage environment. This suggests that reports of nonopportunistic impairment charges contain information and investors rely on reports of managers' expectations about a firm's future operating performance in a low analyst coverage environment (see also Botosan 1997). Yet, the results also indicate that nonopportunistic impairment losses provide limited information to investors.

These findings supplement results in Vanza et al. (2011), Bens et al. (2011), and Muller et al. (2012). Vanza et al. (2011) show that in an Australian setting IAS 36 impairment charges of CGUs decrease investors' uncertainty on average. My results imply that in a European setting nonopportunistic impairment losses provide information only in a low analyst coverage environment. Bens et al. (2011) and Muller et al. (2012) find that in a high analyst coverage environment goodwill write-offs reported under U.S. GAAP are more highly anticipated than in a low analyst coverage environment. My study provides evidence that IAS 36 nonopportunistic impairments of CGUs are fully anticipated in a high analyst coverage environment. In a low analyst coverage environment information asymmetry increases in the prereporting period and is reduced in the reporting period.

In summary, I provide evidence that reports of impairment charges estimated in the absence of managers' opportunistic behavior are released in a nontimely manner (at the end of the fiscal year) and are of low quality. I argue that managers compromise disseminating qualitative information about impaired assets in a timely manner to achieve the cost reductions realized by delaying and reducing the quality of the information. Providing information about impaired assets is costly. Thus, managers tend to conduct impairment tests for all CGUs at the end of the fiscal year with the external audit and (year-end) internal planning process, regardless of the time of year that economic losses trigger impairments of CGUs (see also Elliott and Shaw 1988; Zucca and Campbell 1992). As a result, managers reduce direct costs to sustain fiscal year earnings but delay the information provided through reports of nonopportunistic impairment charges until the fiscal year end. In addition, managers prefer to avoid disclosing sensitive data to competitors (see also Holland 2005). As a result, they cut indirect (proprietary) costs to sustain a firm's future earnings (competitive advantage), which reduces the quality of information released to investors about impaired assets. The reduction in direct and indirect costs sustains fiscal year earnings and maintains the competitive advantage of the firm, providing benefits to investors, but the delay in information delivery until the fiscal year end and the exclusion of proprietary material reduce the informativeness of impairments to investors.

This analysis of the informativeness of nonopportunistic impairment losses complements prior literature (e.g., Strong and Meyer 1987; Elliott and Shaw 1988; Francis et al. 1996; Bartov et al. 1998; Hirschey and Richardson 2002, 2003; Bens et al. 2011; Watts 2003; Ramanna 2008; Ramanna and Watts 2012). Prior research suggests that managers' opportunistic behavior—behavior that is likely in the interest of managers only—reduces the informativeness to investors of impairment charges. My study provides evidence that also managers' cost considerations—that might be in the interest of investors—can reduce the informativeness to investors of impairment losses. To my knowledge, this is the first study to address the effect of managers' cost reductions on the informativeness of impairment losses.

5.2.4 Summary of research presented in chapter 4: IAS 40 "*Investment Property*"

The IASB and U.S. FASB are in the process of converging their guidelines (Schipper 2005; Kothari et al. 2010). IFRS and U.S. GAAP guidelines for financial reporting are similar in reporting fair value decrements (impairment losses) of nonfinancial fixed assets (i.e., property, plant, and equipment, intangibles, and investment properties) and fair value decrements and increments of financial assets. However, large differences still persist with respect to the use of fair value increments of nonfinancial fixed assets. The IASB allows (under certain conditions) firms to revalue nonfinancial fixed assets above their historical cost (fair value option). This option is, however, rarely used in practice for property, plant, and equipment, and intangible assets by European firms. However, reporting IAS 40 fair values for properties that are held and used for rental income and/or capital appreciations (i.e., investment properties) through the income statement is common practice, particularly, by U.K. real estate firms (Christensen and Nikolaev 2009; Cairns et al. 2011).

The U.S. FASB forbids the reporting of fair value increments of investment properties (and other nonfinancial fixed assets) because of the concern that managers' fair value estimates might not be sufficiently faithfully represented to be capable of being decision useful (relevant) to investors (PWC 2009). Yet, SFAS 144 "*Accounting for the Impairment or Disposal of Long-Lived Assets*" (U.S. GAAP) requires firms to report fair value decrements in financial statements when an investment property is impaired (FASB 2001b).

In chapter 4, I use different accounting treatments to compare the value relevance of U.S. GAAP historical cost income that includes impairments of investment properties estimated in accordance with SFAS 144 with IAS 40 fair value based income that includes upward adjustments (unrealized gains) and downward adjustments (unrealized losses) to the fair value of investment properties. Specifically, the research objectives aim to analyze whether unrealized gains are more value relevant to investors than historical cost income, whether unrealized losses convey more value relevant information to investors than impairments, and whether the fair value model is more useful in explaining market fluctuations than the historical cost model. This study addressees an area that requires further convergence efforts of the U.S. FASB and IASB, as their guidelines differ considerably with respect to investment properties.

To conduct this study, I use hand collected data regarding impairment charges of investment properties reported by U.S. real estate firms in financial statements and unrealized gains and losses on investment properties reported by U.K. real estate firms. Descriptive results show that unrealized gains and unrealized losses to a reasonable extent link a U.K. firm's operating income to the real estate market's upward and downward trends over 2005–2011. However, the descriptive results also document that unrealized losses—primarily reported around 2007–2009—lag and do not fully capture the severe economic losses of 2007–2008.

Furthermore, descriptive results document that unrealized gains link the book value to the market value of investment properties. In addition, I find that under the historical cost model, the book value of properties is understated relative to the market value, even when impairment charges are reported in a U.S. firm's financial statements around the severe real estate crisis of 2007–2009. This indicates that unrecognized fair value increments (unrealized gains) are not fully absorbed so that even around the severe crisis of 2007–2009 some investment properties that suffered economic losses are not impaired. When unrealized losses are reported in a U.K. firm's financial statements, I find that the book value of properties is overstated relative to the market value. This might indicate that unrealized losses were not faithfully represented around the severe crisis of 2007–2009.

Using share price and share price return value relevance regressions, I find that fair value appreciations are more value relevant than historical cost income, which is consistent with prior studies (see Dietrich et al. 2001; Barth 2006; Herrmann et al. 2006).[111] Furthermore, whereas my results imply that fair value decrements (impairments and unrealized losses) are useful in explaining share prices, they also provide some evidence that impairments contain more value relevant information than unrealized losses over 2007–2009. In addition, I find that both kinds of fair value decrements are not informative in explaining in a timely manner the severe economic losses that real estate firms suffered around the severe crisis of 2007–2009.

The results are inconsistent with my prediction. I expected unrealized losses to have higher value relevance than impairments because fair value increments are not reported under the historical cost model and,

[111] Dietrich et al. (2001), Barth (2006), and Herrmann et al. (2006) suggest that fair values at least vaguely represent the economic values of investment properties whereas the values of investment properties measured at cost are to a high extent arbitrary.

thus, impairments are triggered after unrecognized fair value increments are fully absorbed. Accordingly, even around severe real estate crises, it is possible that impairments are either not triggered for all investment properties that suffer economic losses (as indicated by the descriptive results) or that the amount of impairment losses reported in a firm's financial statements does not fully capture the economic losses of the impaired properties. In addition, because the historical cost model allows only downward adjustments (forbids upward adjustments) to the asset's fair value, impairment tests are possibly conducted in a nonroutine fashion, decreasing the faithful representation of impairment losses. Based on my unexpected results, I argue that these effects are (over) compensated by managers' reluctance to report large fair value decrements. In contrast to impairments, unrealized losses are based on upwardly adjusted (not based on depreciated cost) property book values. This increases their magnitude relative to impairment charges, in particular, around severe crises. Accordingly, managers might be inclined to reduce the amount of unrealized losses, possibly reducing the faithful representation and value relevance of unrealized losses.

Overall, the findings in chapter 4 suggest that fair values of investment properties are measured with errors, consistent with the results in prior literature (Fields et al. 1998; Danbolt and Rees 2008). Yet, the estimation error of fair value appreciations is on average sufficiently low (i.e., fair value appreciations are on average sufficiently faithfully represented) so that fair value based income is capable of being decision relevant (value relevant) to investors. Accordingly, my findings imply that the fair value based income for investment properties is superior to historical cost income that includes impairment losses. However, care needs to be exercised by investors in assessing fair value decrements (impairments and unrealized losses) reported in financial statements during severe crises.

Analyzing the relative usefulness of the U.S. GAAP historical cost model versus the IAS 40 fair value model in explaining market fluctuations, supplements the results in prior research (Fields et al. 1998; Danbolt and Rees 2008). Fields et al. (1998) and Danbolt and Rees (2008) find value relevance of fair values reported for investment properties. However, Fields et al. (1998) analyzed voluntarily disclosed fair values in a setting in which assets additionally are depreciated and written-off. Danbolt and Rees (2008) examined mandatorily reported fair values in the pre-IFRS period in which no other property adjustments (i.e., depreciation, impairments, and unrealized gains/losses) are taken to the income statement. In addition, my study is the first (to my knowledge) that contrasts the value relevance of SFAS 144 impairment charges with IAS 40 unrealized gains and IAS 40 unrealized losses on investment properties.

5.3 Implications of the findings of the dissertation

The findings in chapter 4 suggest that under the fair value model, managers' fair value estimates of investment properties on average increase the usefulness of income numbers in explaining market fluctuations, and that this is particularly true outside of severe crises. Thus, the fair value model set forth in IAS 40 should increase the comparability of operating (accounting) performance across real estate firms and time periods, in particular, in a low analyst coverage environment in which investors tend to rely on managers' release of information about a firm's asset quality (see chapter 3).

While my results provide evidence that recognition of unrealized gains for investment properties can benefit investors, I do not suggest reporting values in use of CGUs in a firm's financial statements when they are above the CGUs' book values. Values in use of CGUs incorporate fair values of unrecognized intangibles, such as the loyalty of customers, network of suppliers, quality of employees, and effectiveness and efficiency of the organization of a firm. Projected future net cash flows of these assets might never materialize in future years and are difficult to estimate. Managers' estimates of values in use of CGUs are very subjective and are susceptible to large (unintentional) errors. As a result, requiring firms to report quarterly values in use of CGUs might prove costly and might also be of little use, in particular, when insufficient disclosures about these values in use are released (see chapter 3). Requiring firms to release sufficient disclosures increases the transparency of the firms' asset quality to investors but imposes indirect costs to the firms that are ultimately borne by investors.

Furthermore, requiring firms to conduct impairment tests based on the value in use approach results in heterogeneous reports of impairment charges for CGUs across firms and time periods in at least three ways. First, not only a firm's economic circumstances, but also the unrecognized economic values of its CGUs affects reports of impairments in financial statements. The unrecognized economic values of CGUs are firm and time specific (see chapter 2). Second, since not all economic values of CGUs are reported, managers can exploit discretion, for instance, by identifying CGUs in a way such that impaired assets are hidden in CGUs with large unrecognized economic values. As a result, impairments are avoided and bad news about a firm's asset quality is not released to investors in a timely fashion (see chapter 2). Finally, managers can use the discretion inherent in IAS 36 prudently or aggressively, actions that affect reports of impairment losses in a firm's financial statements (see chapter 2). Consequently, the requirements of IAS 36 to value unrecognized assets (in addition to recognized assets) that are included in a firm's identified CGUs might be ill advised.

Fair values of investment properties are estimated for assets that are recognized in a firm's financial statements. The recognized fair values are to some extent verifiable, even when insufficient disclosures are provided. That is, investment properties are less opaque than intangible assets (or CGUs) since they are concrete (real) and can be located by investors. In addition, fair values of investment properties are anchored by rent indices and/or values of other properties to some extent. Consequently, the estimation error of fair values of investment properties should be relatively small compared to the estimation error of values in use of CGUs.

Overall, the results of the dissertation support (to some extent) the adoption of the IAS 40 fair value model. The findings, however, call for changes to the complex IAS 36 requirements with respect to defining CGUs and estimating the value in use of the defined CGUs.

5.4 Limitations of the research and avenues for future research

5.4.1 General overview

My results call for changes to the requirements of IAS 36. One way to improve the requirements of IAS 36 would be to impose firms to report fair value increments for CGUs in their financial statements. Yet, as discussed in section 5.3, this might prove costly. The costs of producing and disclosing information about the values of a firm's CGUs might outweigh the benefits to the firm of a highly transparent asset base. Accordingly, future studies might find ways to calculate costs and benefits that are aligned with producing fair values and providing disclosures for fair values of fixed assets or fixed asset groups, and subsequently analyze the relation between the costs and the benefits. Such analyses might support standard setters in changing effectively impairment guidelines for tangible and intangible fixed assets.

My findings support the adoption of the fair value model for investment properties, in particular, outside of severe crises. However, cross sectional differences (e.g., firm characteristics) can impact the faithful representation and value relevance of fair value increments and decrements for investment properties. In a similar vein, my results might not be generalizable to other settings. For instance, the results obtained here might be refuted if countries other than common law countries (that have generally strict enforcement systems) were used in the analysis. That is, fair value increments for investment properties might not be faithfully represented and value relevant in countries with weak enforcement systems, as managers in weak enforcement systems might be more highly motivated than managers in strict enforcement systems to exploit discretion (see chapter 2).[112] To increase our knowledge of the relative value relevance of the historical cost model versus the fair value model for investment properties, more research is needed in this area. In the following, I outline the limitations of the findings and avenues for future research of each study (chapter 2–4).

[112] In this context, the results might not be valid to assets other than investment properties. The estimation of fair values of assets other than investment properties, such as intangibles, requires considerably more judgment than fair value estimates of investment properties, which might lead to different results.

5.4.2 Limitations and future directions of the research presented in chapter 2: IAS 36 "*Impairment of Assets*"

My results suggest that managers report impairment charges more systematically in a stringent reporting environment than in a weak reporting environment. Specifically, while I provide evidence that CGUs are exploited in a weak reporting environment to prevent impairments, I find no difference in managers' opportunistic or nonopportunistic behavior in projecting future net cash flows and estimating discount rates between stringent and weak reporting environments. Accordingly, more research is needed to determine whether cash flows and discount rates are exploited opportunistically in weak and stringent reporting environments.

My implication that a stringent reporting environment restricts managers' exploitation of discretion is based on a probit regression. I construct an index that captures an increasingly stringent reporting environment. The index is constructed by adding determinants that capture strict country-level enforcement systems, periods of intense scrutiny over a firm's financial reporting, and firm-specific determinants of a stringent reporting environment. The index is then interacted with determinants of impairments that capture IAS 36 requirements to test whether the occurrence of impairments is systematically aligned to IAS 36 requirements in an increasing fashion to the stringency of the reporting environment. Consequently, I do not discriminate across determinants that capture a stringent reporting environment. However, it is interesting to examine whether there are differences that affect managers' exploitation of discretion across the determinants.

In agreement with prior studies, my findings suggest that a stringent reporting environment encourages managers to estimate impairment charges prudently to avoid overstating a firm's asset base. I draw my implication on the probit regression and the index that captures an increasingly stringent reporting environment (see previous paragraph). The constructed index tests whether impairment charges occur in an increasing fashion to the stringency of the reporting environment. This implies that managers report impairment losses more prudently in a stringent reporting environment than in a weak reporting environment. Yet, a prudent reporting (or higher occurrence) of impairment losses in a stringent reporting environment does not exclude the possibility that such an environment induces managers to understate assets.

In this context, I conclude (carefully) that managers are induced to report impairments to account for previous economic losses in periods of intense scrutiny over a firm's financial reporting. The implication is based on results of an OLS regression that relates the magnitude of (nonzero) impairment charges to determinants that capture strict country-level enforcement systems, periods of intense scrutiny over a firm's financial reporting, and firm-specific determinants of a stringent reporting environment. Higher magnitudes of impairment losses related to periods of intense scrutiny over a firm's financial reporting might not only suggest that managers report accumulated economic losses in a firm's financial statements, but also that assets are understated.

Furthermore, based on the OLS regression, I find that strict country-level enforcement systems encourage managers to report relatively large magnitudes of impairment charges in financial statements while firm-specific determinants that capture a stringent reporting environment induce managers to report relatively small amounts of impairment losses. Although country-level enforcement systems and firms-specific determinants can be assumed to be permanently strict over the sampling period, the results of the OLS regression differ. These results may provide evidence that strict country-level enforcement systems induce managers to understate assets and firm-specific determinants that capture a stringent reporting environment encourage managers to adjust the asset base frequently.

The aspects related to the understatement of assets are avenues for future research. It would be interesting to examine specifically whether strict country-level enforcement systems and periods of intense scrutiny over a firm's financial reporting encourage managers to understate a firm's asset base. In addition, future research might analyze explicitly whether firm-specific determinants drive the frequency of impairment charges. Moreover, it is interesting to analyze the consequences of an understatement of assets. Understating assets might increase rather than decrease investors' uncertainty about the quality of a firm's asset base. Also the consequences of frequent impairment reporting in financial statements are interesting to analyze. An understanding of the effect of a strict reporting environment on the consequences of reports of IAS 36 impairments would support rule setters in improving the relevance to investors of fair values reported for impaired assets in financial statements.

5.4.3 Limitations and future directions of the research presented in chapter 3: IAS 36 "*Impairment of Assets*"

My findings provide evidence that impairment charges are reported with a delay and their information content is of low quality. These findings are not driven by managers' opportunistic behavior assuming that my selection criteria to identify nonopportunistic impairment charges are valid. IAS 36 impairment charges are defined as nonopportunistic when they are:

1. reported along with fiscal year negative returns (proxy for economic losses),

2. released by a firm that operates at least two CGUs if the firm's market-to-book ratio (MtB) before impairments is above 1 at the fiscal year end (this condition is relaxed if the MtB before impairments is equal to or below 1), and

3. approved by large auditors.

While my results (including the results of my additional tests) provide some evidence that the selection criteria for nonopportunistic impairment charges are valid, future research might refine these selection criteria. Accordingly, future analyses can generate more knowledge about the (decision) relevance of impairment charges that are driven by managers' genuine application of complex impairment guidelines.

By assuming that the selection criteria to identify nonopportunistic impairment losses are valid and allowing for the fact that IAS 36 guidelines are costly to implement, my findings provide some evidence that managers' cost considerations affect the timeliness and quality of information provided through reports of impairment charges in financial statements. However, I cannot exclude (fully) that factors other than managers' opportunistic behavior and cost considerations drive results.

Specifically, I use an OLS regression that relates the bid-ask spread to nonopportunistic impairment losses reported in high and low analyst coverage environments. The delta of the bid-ask spread captures the change in information asymmetry between managers and investors. I find that the bid-ask spread decreases (increases) in the prereporting period of nonopportunistic impairment losses—that captures an eight month period ending at a firm's fiscal year end—in a high (low) analyst coverage environment. By assuming that nonopportunistic impairment losses are less likely to be reported during the fiscal year with a negative event (economic loss), I conclude that the information content of nonopportunistic impairment losses is anticipated in a high analyst coverage environment and investors' uncertainty increases in a low analyst coverage environment. My assumption, however, might not be valid, in particular, in a high analyst coverage environment; or when some firms report nonopportunistic impairment charges during the fiscal year with a negative event, these reports increase noise and can affect my results.[113] Future studies could increase the validity of the research results by collecting quarterly data which would be less noisy.

In addition, I find that in a low analyst coverage environment the bid-ask spread declines in the reporting period of nonopportunistic impairment losses that captures a four month period ending at the end of the fourth month following a firm's fiscal year end. I find, however, that over both periods (prereporting and reporting period), the bid-ask spread increases in a low analyst coverage environment. This implies that the quality of information provided by reports nonopportunistic impairment losses in financial statements is low with the result that the information content is not sufficient to reduce fully the information asymmetry between managers and investors. Based on my findings that nonopportunistic impairment charges are reported with a delay and their information content is of low quality, I argue that managers consider direct and indirect costs of providing information to the public. To increase the validity of my

[113] I assume that impairment losses are predominantly reported at the fiscal year end based on contemporaneous research (see e.g., Heintges and Herre 2007; Spear and Taylor 2011; Muller et al. 2012) and additional tests conducted in chapter 3. Accordingly, I assume also that some firms in my sample report impairment losses in financial statements during the fiscal year with a negative event.

argument, future research should analyze specifically whether managers consider cost and whether their cost considerations affect the informativeness of nonopportunistic impairment charges. Accordingly, more knowledge about the consequences of requiring firms to implement complex and costly impairment guidelines will be generated, which should be of interest to standard setters, in particular.

5.4.4 Limitations and future directions of the research presented in chapter 4: IAS 40 "*Investment Property*"

My findings suggest that, except in severe crises, fair value based income reported for investment properties by real estate firms is of higher value relevance to investors than historical cost income including impairment charges. The conclusion is based on application of the fair value model to a sample of U.K. real estate firms and application of the historical cost model to a sample of U.S. real estate firms. I cannot fully exclude that the results are driven by country fixed effects even though I use two common law countries that both have highly developed capital and real estate markets and compare incremental adj. R^2s obtained from value relevance (price and return) regressions across subsamples.

I compare the explanatory power (adj. R^2s) derived from value relevance regressions applied to historical cost subsamples and fair value subsamples. To alleviate concern that my results are driven by the differences in pricing of the accounting information between the U.S. market and the U.K. market, I additionally estimate the incremental adj. R^2s for each subsample. To obtain incremental adj. R^2s, I measure adj. R^2s using unrestricted price and return regressions that include investment property adjustments (i.e., deprecation, impairments, and fair value adjustments). I then estimate the explanatory power (adj. R^2s) using restricted versions of the value relevance regressions that exclude investment property adjustments. To obtain incremental adj. R^2, I subtract adj. R^2 derived from the restricted version from that derived from the unrestricted version. Although I use incremental adj. R^2s in my study, results might still be driven by country fixed effects.[114] Future research could supplement my study by controlling for country fixed effects in a different way.

Moreover, whereas I select real estate firms that are highly invested in investment properties and use incremental bootstrapped adj. R^2s as outlined previously, I cannot fully exclude that GAAP requirements for assets other than investment properties might affect the results. In a similar vein, firm-specific factors (other than factors related to the composition of the real estate firms' residual assets), such as financial leverage and audit quality, increase noise and hence can affect results. Future research might decrease noise by controlling for firm-specific factors (firm characteristics) more rigorously (see also subsection 5.4.1).

Furthermore, my findings suggest that the fair value model for investment properties is not superior to the historical cost model in

[114] Another approach to compare the value relevance to investors of historical cost income including impairments and fair value based income might be to focus on the coefficients on investment property adjustments in price and return regressions. Because impairment charges, unrealized gains, and unrealized losses are not based on conservative accounting and are transitory, the coefficients should be close to one when these kinds of fair values are faithfully represented (see e.g., Hanlon et al. 2008, and Appendix 4.1). Consequently, the closer the coefficients on investment property adjustments are to one, the more faithfully fair values are represented and value relevant to investors. However, the coefficients can be biased (see e.g., Barth and Kallapur 1996; Easton and Sommers 2003; Barth and Clinch 2009) and historical cost income includes depreciation based on unconditional conservatism which biases upward the coefficient on depreciation (see e.g., Hanlon et al. 2008). Thus, it is difficult (or even impossible) to draw any inference about the magnitudes of coefficients in my price and return regressions. As a result, I focus on the level of adj. R^2s and incremental adj. R^2s by applying the bootstrapping technique. The bootstrapping technique is a common approach applied in contemporaneous research to compare the value relevance of accounting data across subsamples (e.g., Barth et al. 2008; Barth et al. 2012; Florou et al. 2012; Lin et al. 2012).

explaining market price variations during severe crises. I argue that this might be related to the reluctance of managers to report large amounts of fair value decrements in financial statements and this reluctance decreases the faithful representation of unrealized losses. It would be interesting to examine specifically whether this argument is valid and whether unrealized losses are faithfully represented outside of crises.

Finally, my results imply that fair value estimates of investment properties are capable being decision useful (i.e., value relevant) to investors outside of severe real estate crises. Yet, I cannot conclude that fair value estimates of investment properties are decision useful (relevant) to investors. In other words, when fair values are sufficiently faithfully represented to be value relevant, they do not necessarily reduce information asymmetry between managers and investors. This is particularly true when the information conveyed by fair values is already known to investors.[115] Future research might supplement my analysis with a decision relevance study (e.g., using the bid-ask spread as an dependent variable).

[115] The value relevance analysis suggests a correlation between accounting data and market data, and does not necessarily indicate a causal relationship between those data. Accounting data that are value relevant summarize information, regardless of the source, that is used by investors in valuing a firm's net assets. This suggests that the accounting data do not need to be decision useful (relevant) to investors. Investors may concentrate on information other than on accounting data to infer a firm's net asset quality (value) (Easton et al. 1993; Barth and Clinch 1998; Collins et al. 1999; Francis and Schipper 1999; Sloan 1999; Barth et al. 2001). I have chosen a value relevance study since the value relevance analysis is to some extent aligned to the concept of relevance defined by the U.S. FASB and IASB. According to the definition of the U.S. FASB and IASB, accounting data are relevant if they are "capable" of being decision useful (relevant) to investors (FASB 2010; see also Sloan 1999; Barth et al. 2001; Herrmann et al. 2006). Consequently, the U.S. FASB and IASB define relevance in a sense that fair values reported by managers should contain information that explain assets' economic performance but they do not need to provide "new" information to investors.

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Nederlandse samenvatting en conclusies

1 Inleiding

Op IFRS gebaseerde jaarrekeningen worden wereldwijd door ondernemingen gepubliceerd, inclusief ondernemingen in de EU. In het algemeen kan worden gesteld dat de toepassing van IFRS leidt tot een toename van het gebruik van fair value accounting ten opzichte van lokale accountingstandaarden. Hierdoor zijn de verwachtingen van managers omtrent de toekomstige operationele prestaties van hun ondernemingen steeds belangrijker geworden. Het meet paradigma is hiermee veranderd van gerealiseerde winst naar ongerealiseerde winst. Dit proefschrift bestudeert het nut van fair value schattingen van managers gebaseerd op twee standaarden van het IASB, IAS 36 "*Impairment of Assets*" en IAS 40 "*Investment Property*".

In dit hoofdstuk presenteer ik de samenvatting en conclusies van mijn analyses. Dit hoofdstuk is als volgt gestructureerd. In sectie 2 bespreek ik de contributies van mijn onderzoek. De resultaten van mijn twee studies naar IAS 36 impairment verliezen worden beschreven in paragraaf 2.1 en de bevindingen van mijn IAS 40 onderzoek worden beschreven in 2.2. De implicaties van mijn onderzoek worden besproken in sectie 3. In sectie 4 presenteer ik wat algemene beperkingen van mijn onderzoek en suggesties voor toekomstig onderzoek.

2 Samenvatting van mijn contributies

2.1 IAS 36 "*Impairment of Assets*"

Waar het gebruik van fair value accounting voor waardestijgingen van materiële en immateriële vaste activa onder IFRS een keuze is en tot op bepaalde hoogte wordt beperkt, geldt voor waardedalingen tot onder de historische kostprijs dat het gebruik van fair value accounting verplicht is. Schattingen van bijzondere waardedalingen volgens IAS 36 zijn over het algemeen gebaseerd op een vergelijking tussen de verdisconteerde toekomstige netto kasstromen van activa die geldstromen genereren en de boekwaarde van deze activa. Deze schattingen zijn van nature subjectief aangezien de kleinste groepen activa die geldstromen genereren moeten worden geïdentificeerd. Bovendien moeten schattingen worden gemaakt van de toekomstige geldstromen en moet een verdisconteringsvoet worden bepaald. Managers kunnen van deze beslissingsruimte gebruik maken om het rapporteren van bijzondere waardedalingen of overwaarderingen te voorkomen.

In hoofdstuk 2 analyseer ik of het verslaggevingsregime een invloed heeft op het gebruik van beslissingsruimte door managers in de toepassing van IAS 36. Hierbij onderzoek ik of de mate van toezicht binnen een verslaggevingsomgeving van invloed is op het gebruik van deze beslissingsruimte. Tevens analyseer ik of de mate van toezicht van invloed is op de voorzichtigheid van managers bij het gebruik van beslissingsruimte en de mogelijke overwaardering van activa. Om deze analyse uit te voeren begin ik met het identificeren van determinanten van bijzondere waardedalingen. De geïdentificeerde determinanten laten zien dat Europese ondernemingen over het algemeen op een systematische wijze waardeverliezen rapporteren. Deze determinanten zijn vervolgens gebruikt als controle variabelen in de verdere analyses. De resultaten laten zien dat managers van Europese ondernemingen op systematische wijze waardeverliezen rapporteren.

Na te hebben gecontroleerd voor IAS 36 vereisten laat ik zien dat bijzondere waardedalingen van activa vaker voorkomen in een strikte dan in een zwakkere verslaggevingsomgeving. In een strikte verslaggevingsomgeving wordt er toezicht gehouden op de verslaggeving van ondernemingen door bijvoorbeeld standaardzetters, analisten en externe accountants. Hierdoor zijn managers waarschijnlijk eerder geneigd om de waarde van activa te onderschatten dan te overschatten. Een striktere verslaggevingsomgeving beperkt dus de mogelijkheid voor managers om activa te hoog te waarderen. Managers zullen dus minder opportunistisch handelen bij het identificeren van geldstroom genererende activa. Mijn onderzoek laat zien dat opportunistisch gebruik van impairments veelvuldig voorkomt in zwakkere verslaggevingsomgevingen.

Verder laat ik zien dat striktere verslaggevingsomgevingen managers aanmoedigen om voorzichtig om te gaan met de beslissingsruimte die IAS 36 biedt. Dit impliceert dat managers impairment verliezen vroeg rapporteren bij waardedalingen van vaste activa om overwaarderingen te voorkomen. Mogelijke onderwaarderingen van activa zijn hiervan het gevolg. Inschattingsfouten kunnen er echter ook toe leiden dat waardeverminderingen niet voldoende zijn, waardoor het risico voor managers en ondernemingen om aangeklaagd te worden toeneemt. Mijn resultaten laten zien dat ondernemingen in strikte verslaggevingsomgevingen hier voorzichtig mee omgaan en eerder geneigd zijn om activa te laag te waarderen dan om deze over te waarderen.

Tevens analyseer ik het effect van verslaggevingsomgeving op de hoogte van bijzondere waardedalingen om verder inzicht te geven in hoe managers overwaarderingen van activa trachten te voorkomen. Een strikter verslaggevingsregime moedigt managers aan tot grotere afwaarderingen om te corrigeren voor mogelijk te lage afwaarderingen in het verleden. Ik concludeer dat managers gebruik maken van grote afwaarderingen op momenten van intensief toezicht. Kleine verliezen worden vaak gerapporteerd ten gevolge van specifieke karakteristieken van ondernemingen. Bewijs is gevonden dat ondernemingen activa onderwaarderen wanneer er een streng toezichtsysteem is binnen een land. Over het geheel kan worden geconcludeerd dat het gebruik van beslissingsvrijheid in IAS 36 de vergelijkbaarheid van ondernemingen en verschillende tijdsperiodes vermindert.

Het opportunistisch gebruik van beslissingsvrijheid kan de informatiewaarde van bijzondere waardedalingen voor investeerders verminderen. In hoofdstuk 3 bekijk ik of IAS 36 impairment verliezen informatief zijn wanneer opportunistisch gedrag van managers afwezig is. Na het identificeren van rapporten waarbij sprake is van niet opportunistisch gebruik van bijzondere waardedalingen, analyseer ik de informatiewaarde in een omgeving waar ondernemingen door veel analisten worden gevolgd en een omgeving waar slechts weinig analisten zijn. Analisten verwerken gegevens over de markt, de bedrijfstak en specifieke ondernemingen. Investeerders kunnen van vervolgens van deze gegevens gebruik maken. In een omgeving waarin analisten slechts een beperkte rol spelen zullen investeerders voornamelijk gebruik moeten maken van de financiële verslaggeving van ondernemingen om een inzicht te krijgen in de kwaliteit van de activa.

Mijn resultaten tonen aan dat de informatiewaarde van niet opportunistische bijzondere waardedalingen volledig wordt geanticipeerd in omgevingen met veel analisten, hetgeen impliceert dat in zulke omgevingen niet opportunistische waardedalingen met een vertraging in het jaarverslag worden gerapporteerd. Verder vind ik dat investeerders niet goed zijn geïnformeerd over de kwaliteit van activa in een omgeving met slechts weinig analisten. Hierdoor neemt de onzekerheid van investeerders over de kwaliteit van activa toe tot het moment dat bijzondere waardedalingen worden gerapporteerd in het jaarverslag. Ten slotte concludeer ik dat de toename van de onzekerheid van investeerders slechts gedeeltelijk wordt geëlimineerd door rapportages van niet opportunistische bijzondere waardedalingen in een omgeving met weinig analisten. Dit suggereert dat zulke rapporten informatie bevatten waarop analisten vertrouwen bij het maken van schattingen over de toekomstige operationele prestaties van ondernemingen. Deze informatie is echter slechts gedeeltelijk van nut voor investeerders. Samenvattend vind ik bewijs dat rapporten over impairment verliezen, waarbij geen sprake is van opportunistisch gedrag van managers, op een niet tijdige wijze worden gerapporteerd en dat deze van lage kwaliteit zijn.

Gebaseerd op deze bevindingen stel ik dat managers tijdige verslaggeving van kwalitatieve informatie over bijzondere waardedalingen beperken. Rapportage van dit soort gegevens is kostbaar. Managers stellen het testen van impairment daarom uit tot het einde van het fiscale jaar onafhankelijk van het moment waarop de waardedaling zich daadwerkelijk voordoet. Hierdoor nemen de directe kosten van rapportage af met als gevolg dat informatie op een minder tijdige wijze aan investeerders ter beschikking wordt gesteld. Bovendien hebben managers de voorkeur om zulke gevoelige informatie niet met concurrenten te delen. Het verminderen van indirecte kosten om een competitief voordeel te behouden biedt voordelen voor investeerders, terwijl de niet tijdige rapportage van informatie nadelen met zich meebrengt. Deze studie is een aanvulling op voorgaande literatuur en toont aan dat kostenoverwegingen een nadelig effect kunnen hebben op de informatiewaarde van bijzondere waardeverminderingen.

2.2 IAS 40 "*Investment Property*"

De IASB en U.S. FASB zijn momenteel in het proces ter convergentie van hun verslaggevingsstandaarden. De richtlijnen van beide instanties zijn vergelijkbaar wat betreft fair value verminderingen van niet financiële vaste activa, en fair value verhogingen en verlagingen van financiële activa. Er zijn echter grote verschillen wat betreft waarde verhogingen van niet financiële vaste activa. Onder bepaalde omstandigheden staat het IASB toe om niet financiële vaste activa te herwaarderen boven de historische kostprijs. In de praktijk wordt echter slechts beperkt gebruik gemaakt van deze mogelijkheid om vaste activa en immateriële activa her te waarderen. Herwaarderingen van vastgoedbeleggingen is echter gebruikelijk, in het bijzonder voor vastgoedondernemingen in het Verenigd Koninkrijk.

De U.S. FASB verbiedt het rapporteren van waardestijgingen van vastgoedbeleggingen (en andere niet financiële vaste activa) vanwege het risico dat managers fair value schattingen mogelijk niet voldoende onderbouwen om van nut te zijn voor investeerders. SFAF 144 "Accounting for the Impairment or Disposal of Long-Lived Assets" (U.S. GAAP) eist echter verminderingen van de fair value van vastgoedbeleggingen worden gerapporteerd in het jaarverslag.

In hoofdstuk 4 maak ik gebruik van verschillende boekhoudmethodes om een vergelijking te maken tussen de relevantie van U.S. GAAP historische kostprijzen waarbij waardedalingen volgens SFAS 144 worden meegenomen en IAS 40 waarbij zowel (ongerealiseerde) waardedalingen als (ongerealiseerde) waardestijgingen worden meegenomen. In het bijzonder bekijk ik of ongerealiseerde waardestijgingen informatiever zijn dan historische kostprijzen, of ongerealiseerde waardedalingen informatiever zijn dan impairments, en of het fair value rapportage model geschikter is voor het verklaren van fluctuaties in de markt dan het historische kosten model. Om deze studie uit te kunnen voeren maak ik gebruik van handmatig verzamelde informatie over impairment aanpassingen die gerapporteerd zijn door vastgoedondernemingen in de VS en ongerealiseerde waarde stijgingen en dalingen gerapporteerd door vastgoedondernemingen in het Verenigd Koninkrijk.

De beschrijvende resultaten laten zien dat niet gerealiseerde winsten en verliezen voor een groot gedeelte zijn gerelateerd aan de schommelingen in de vastgoed markt van het Verenigd Koninkrijk. Echter, de resultaten laten ook zien dat ongerealiseerde verliezen die gerapporteerd zijn tussen 2007 en 2009 niet de volledige waardedalingen laten zien die tussen 2007 en 2008 plaatsvonden. Verder zien we dat ongerealiseerde winsten voor een koppeling zorgen tussen de boekwaarde en de marktwaarde van vastgoed beleggingen. Ook concludeer ik dat boekwaardes volgens het historische kostprijs model zijn ondergewaardeerd ten opzichte van de markt, zelfs wanneer bijzondere waardedalingen zijn gerapporteerd door ondernemingen in de VS gedurende de vastgoedcrisis van 2007-2009. Dit impliceert dat niet gerealiseerde waardestijgingen nog niet volledig zijn geabsorbeerd, waardoor zelfs tijdens de financiële crisis sommige vastgoedbeleggingen niet werden afgewaardeerd. Wanneer ongerealiseerde verliezen worden gerapporteerd door ondernemingen in het Verenigd Koninkrijk vind ik dat de boekwaardes van beleggingen zijn overgewaardeerd ten opzichte van de marktwaardes. Dit wijst er mogelijk op dat ongerealiseerde niet juist zijn verantwoord gedurende de periode van de crisis.

Gebaseerd op regressies van aandelenkoersen en rendementen concludeer ik dat fair value waarderingen relevanter zijn voor de waarde van ondernemingen dan historische kostprijzen. Verder tonen mijn resultaten aan dat waardedalingen (impairments en niet gerealiseerde verliezen) nuttig zijn voor het verklaren van aandelenkoersen. Tevens bieden ze bewijs dat impairments meer relevante informatie bevatten dan niet gerealiseerde verliezen tussen 2007 en 2009. Bovendien vind ik dat beide typen waardeverminderingen niet informatief zijn voor het op een tijdige wijze verklaren van de economische verliezen waar de ondernemingen gedurende de crisis mee te maken hadden.

Deze resultaten zijn niet consistent met mijn verwachtingen. Mijn verwachting was dat niet gerealiseerde verliezen relevanter waren voor waardebepalingen dan impairments. Dit is omdat stijgingen in fair values niet worden gerapporteerd onder historische kostprijs modellen waardoor impairments pas van toepassing zijn nadat niet gerealiseerde waardestijgingen volledig zijn geabsorbeerd. Daardoor is het mogelijk, dat zelfs tijdens een crisis, impairments niet noodzakeljk zijn. Een andere verklaring is dat de hoogte van de bijzondere waardedalingen niet de volledige economische verliezen reflecteert.

Tevens is het mogelijk dat impairment tests niet op een routinematige wijze worden toegepast, omdat enkel waardedalingen zijn toegestaan volgens het historische kostprijs model, waardoor weergave van bijzondere waardedalingen mogelijk minder betrouwbaar wordt. Gebaseerd op mijn resultaten stel ik dat deze effecten worden gecompenseerd door de neiging van managers om geen grote waardedalingen te rapporteren. In tegenstelling tot impairments, zijn niet gerealiseerde verliezen gebaseerd op omhoog aangepaste boekwaardes van vastgoedbeleggingen. Hierdoor neemt hun hoogte toe ten opzichte van impairment verliezen, voornamelijk rondom een crisis. Hierdoor hebben managers mogelijk de neiging om te kiezen voor een minder juiste weergave en een verminderde relevantie van niet gerealiseerde verliezen.

In lijn met voorgaande literatuur suggereren de bevindingen van hoofdstuk 4 over het geheel genomen dat fair values van vastgoedbeleggingen worden gemeten met fouten. Echter, de meetfout van fair value schattingen is gemiddeld genomen laag, waardoor winstcijfers gebaseerd op zulke schattingen als relevant kunnen worden ervaren door investeerders. Dit impliceert dat winstcijfers gebaseerd op fair value superieur zijn aan winsten gebaseerd op historische kostprijs modellen waarbij gebruik wordt gemaakt van impairments. Voorzichtigheid is echter geboden voor investeerders bij het analyseren van fair value dalingen (impairments en niet gerealiseerde verliezen) gedurende een financiële crisis.

3 Implicaties van dit proefschrift

De resultaten in hoofdstuk 4 suggereren dat fair value schattingen door managers resulteren in een toename van het nut van winstcijfers voor het verklaren van schommelingen in de markt, met name wanneer er geen sprake is van een crisis. Het fair value model zoals beschreven in IAS 40 moet dus leiden tot een toename van de vergelijkbaarheid van winstgevendheid tussen verschillende vastgoedondernemingen en tussen verschillende jaren. Dit is voornamelijk het geval wanneer er weinig analisten zijn, waardoor investeerders moeten vertrouwen op informatie die door managers ter beschikking wordt gesteld.

Hoewel mijn resultaten aantonen dat het realiseren van waardestijgingen van beleggingsinvesteringen nuttig kan zijn voor investeerders, beveel ik niet aan om gebruikswaardes te rapporteren voor kasstroom genererende eenheden wanneer deze waardes boven de boekwaardes liggen. De gebruikswaarde van zulke eenheden is ook gebaseerd op immateriële activa, zoals de loyaliteit van klanten, het netwerk van leveranciers, de kwaliteit van medewerkers, en de effectiviteit en efficiëntie van de organisatie. Het is mogelijk dat verwachte toekomstige kasstromen van deze activa nooit materialiseren. Een schatting van de waarde is daarom lastig. De schattingen van managers betreffende de waarde van kasstroom genererende activa is dan ook subjectief en gevoelig voor (onbewuste) fouten. Dit impliceert dat kwartaalreportage van de waarde van in gebruik zijnde kapitaal genererende eenheden duur en niet nuttig kan zijn, met name wanneer niet voldoende additionele informatie beschikbaar wordt gesteld aan beleggers (zie hoofdstuk 3). Het vereisen van ondernemingen dat ze meer informatie beschikbaar stellen heeft een positief effect op de transparantie van een onderneming, maar kan indirecte kosten met zich mee brengen.

Tevens kan een vereiste voor ondernemingen om impairment testen gebaseerd op de gebruikswaarde uit te voeren leiden tot de heterogene rapportage van bijzondere waardedalingen over tijd en tussen ondernemingen. Ten eerste is het mogelijk dat niet alleen de economische omstandigheden van ondernemingen, maar ook de hoeveelheid niet gerealiseerde reële waardes een invloed hebben op de financiële gegevens. Ten tweede, sinds niet alle economische waarden van geldstroom genererende eenheden worden gerapporteerd, is het mogelijk dat managers misbruik maken van hun beslissingsvrijheid. Het is bijvoorbeeld mogelijk dat bijzondere waardedalingen worden voorkomen en dat slecht nieuws over de activa van een onderneming niet tijdig met beleggers wordt gedeeld (zie hoofdstuk 2). Ten slotte is het mogelijk dat managers gebruik maken van de inherente beslissingsvrijheid van IAS 36, hetgeen van invloed kan zijn op de gerapporteerde impairment verliezen. Hierdoor is het mogelijk dat de eis van IAS 36 met betrekking tot de waardering van niet gerealiseerde activa geen toevoegde waarde heeft.

De reële waardes van vastgoedbeleggingen worden echter geschat voor activa die gerapporteerd worden in de financiële verslaggeving. Bovendien zijn deze waardes tot op een bepaalde hoogte verifieerbaar, zelfs wanneer niet voldoende informatie beschikbaar wordt gesteld. In andere woorden, vastgoedbeleggingen zijn helderder dan immateriële vaste activa omdat deze concreet zijn en kunnen worden gelokaliseerd. Bovendien zijn de reële waardes van vastgoedbelegging gebaseerd op huur indexes en ander vastgoed. De schattingsfout bij vastgoedbeleggingen is daarom relatief klein ten opzichte van de mogelijke fout bij in gebruik zijnde kasstroom genererende eenheden. Hierdoor hebben managers ook minder ruimte om op opportunistische wijze de waarde van activa te overschatten.

Concluderend biedt dit proefschrift (gedeeltelijk) bewijs dat de ingebruikname van het reële waarde model volgens IAS 40 nuttig is voor beleggers. Wijzigingen van de complexe IAS 36 vereisten met betrekking tot de definitieve van kasstroom genererende eenheden is echter aanbevelingswaardig.

4 Beperkingen van dit onderzoek en aanbevelingen voor toekomstig onderzoek

Mijn bevindingen leiden tot de aanbeveling om de vereisten van IAS 36 te wijzigen. Een vereiste voor ondernemingen om niet opportunistische reële waardes van kasstroom genererende eenheden te rapporteren is een mogelijkheid om de eisen te verbeteren. Echter, zoals besproken in sectie 3, is het nodig dat ondernemingen de rapportage van deze reële waardes complementeren met de beschikbaarstelling van additionele informatie, hetgeen indirecte kosten met zich meebrengt. Het nadeel van de hoge kosten voor het produceren en beschikbaar stellen van informatie kan mogelijk groter zijn dan het voordeel van meer transparante informatie. Voor toekomstig onderzoek is het mogelijk interessant om te kijken naar de voor- en nadelen gerelateerd aan de rapportage van reële waardes en de benodigde informatie die beschikbaar moet worden gesteld.

Mijn studie toont aan dat het gebruik van reële waardes voor vastgoedbeleggingen (tot op bepaalde hoogte) nuttig kan zijn voor beleggers. Het is echter van belang dat toekomstig onderzoek kijkt naar de relevantie van reële waardes voor waarderingen en beslissingen. Cross-sectionele verschillen (bijv. ondernemingskarakteristieken) kunnen van invloed zijn op de juiste weergave en waarde relevantie van stijgingen of dalingen in reële warde van vastgoedbeleggingen. Mijn bevindingen zijn bovendien mogelijk niet vertaalbaar naar andere omgevingen. Stijgingen in reële waardes van vastgoedbeleggingen zijn mogelijk niet waarde-relevant in landen met beperkte handhavingssystemen. Op een vergelijkbare wijze is het mogelijk dat niet gerealiseerde verliezen en bijzondere waardedalingen van financiële instrumenten een verklaring kunnen vormen voor koerswinsten en op tijdige wijze gerapporteerd worden in jaarverslagen gedurende crisisperiodes. Deze beperkingen bieden mogelijkheden voor toekomstig onderzoek.

Autobiography

Dieter Wirtz was born on September 21, 1972, in Bonn, Germany. He undertook a banking apprenticeship from 1992 to 1995 and subsequently worked as a customer advisor at a retail bank. In 1996, after completing a special program for traders and portfolio managers, Dieter worked as an in-house financial analyst and proprietary trader in the banking industry until 1999. From 1999 to 2004 he studied business administration in Germany and finance and accounting in Australia. He earned an undergraduate degree at the Applied University of Koblenz in 2003 and a postgraduate degree with Honors at the Griffith University (Brisbane) in 2004. While working as a project leader and accountant in the banking industry from 2005 to 2007, Dieter trained as a certified valuation advisor (CVA). Since 2007 he has been a consultant in the field of finance and accounting. In 2008 Dieter additionally undertook a doctoral program at the Amsterdam Business School in collaboration with the WHU–Otto Beisheim School of Management, for which he was granted a PhD in 2013. Chapters 2 and 3 of Dieter's doctoral dissertation were granted best paper awards in 2010 and 2011, respectively, at the 3rd and 4th International Accounting & Finance Doctoral Symposium. Chapter 4 has been successfully presented at the European Accounting Association in May 2013. During his PhD studies, Dieter taught various IFRS topics to students in bachelor's, master's, and executive programs and supervised students who were writing master's theses. In addition, he developed, coordinated, and taught the courses "Intermediate Financial Accounting" for students in the third year of the bachelor business program and "IFRS" for MBA/MIF (Master of International Finance) students at Amsterdam Business School.