WORKING PAPER

FAIR VALUE ACCOUNTING IN THE REAL ESTATE INDUSTRY – AN EMPIRICAL INVESTIGATION OF THE DECISION USEFULNESS OF ACCOUNTING FIGURES BASED ON IFRS AND US-GAAP

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LIST OF ABBREVIATIONS

EPRA	European Accounting Real Estate Association
et al.	et alii
FASB	Financial Accounting Standards Board
FYE	Financial Year End
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IVS	International Valuation Standards
IVSC	International Valuation Standards Committee
MoU	Memorandum of Understanding
NAREIT	National Association of Real Estate Investment Trusts
NAV	Net Asset Value
NNNAV	Triple Net Asset Value
No.	Number
OLS	Ordinary Least Squares
p.	page
pp.	pages
REIT	Real Estate Investment Trust
US/USA	United States/United States of America

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ABSTRACT

This paper evaluates the use of fair value accounting for non-financial assets by investigating the value relevance of accounting figures. Therefore, the real estate industry was chosen because it offers a unique setting to study two diametrically opposed accounting methods as set forward by IFRS and US-GAAP. While most European companies apply fair value accounting to investment properties according to IAS 40, companies in the United States must value real estate at historical costs less subsequent depreciation charges. Unlike many previous studies which only test for incremental value relevance of certain fair value disclosures this paper evaluates the fair value approach holistically based on different key accounting figures. The results obtained by yearly and cross-sectional bivariate and multiple regressions for 400 European and 385 US firm years between 2004 and 2008 show that the fair value approach as applied by most European companies is more value relevant for IFRS accounting numbers than the conservative US approach. Even in times of the difficult market environment in 2008 the results indicate the superiority of the fair value approach as used by most European companies.

FAIR VALUE ACCOUNTING IN THE REAL ESTATE INDUSTRY – AN EMPIRICAL INVESTIGATION OF THE DECISION USEFULNESS OF ACCOUNTING FIGURES BASED ON IFRS AND US-GAAP

1. INTRODUCTION

Fair value accounting is one of the most widely discussed topics in international accounting. Even though its theoretically convincing concept it must be noted that the trade-off between reliability and relevance of fair value information may limit the decision usefulness of financial statement information. Especially due to the market turmoil in 2008/2009 as a consequence of the financial crisis the concept of fair value measurement in financial statements is under criticism since it is claimed to reinforce cyclical downturns (WAGNER, 2008, p. 169). For both financial and non-financial instruments fair value measurement is used extensively in accounting systems in Europe and the US. The focus of this paper lies on the application of fair value accounting for non-financial assets in the real estate business. Since the measurement of real estate portfolios at fair value is widespread in Europe, it is, however, not allowed under US-GAAP. This setting provides a unique opportunity to investigate the differences between these two accounting methods on an empirical basis.

The goal of this paper is to show how accounting fundamentals like book value of equity or reported net income influence stock prices in the real estate industry. Unlike previous research concerning fair value accounting the focus of this paper is not on special current value disclosures and their possible incremental value relevance but either on the investigation how closely book value and earnings as a whole are reflected in the market value of a real estate company. The hypothesis is that value relevance as a base to predict stock prices of reported equity book values will be much higher for European companies than for US companies as a consequence of the extensive use of fair value accounting in the "IFRS world". Where fair value balance sheet numbers are available to investors it is assumed that earnings measures like net income lose in importance for investors. The hypotheses provided in this paper have been tested by conducting annually and pooled cross-sectional regression analysis for the years 2004-2008 for a sample of European (400 firm years) and US companies (390 firm years).

The remainder of this paper is as follows: Section 2 deals with fair value and historical cost accounting in the real estate industry according to IFRS and US-GAAP. Section 3 describes

the methodology used in this paper including the information on the basic population, the time frame considered in the study as well as the model description on which the empirical study is based. Furthermore, the study results are presented and discussed. Section 4 finally summarizes the results of the research conducted.

2. FAIR VALUE ACCOUNTING IN THE REAL ESTATE INDUSTRY

International Accounting Standard (IAS) 40 allows companies in order to account for properties held to earn rentals or for capital appreciation (so-called investment properties) to choose between the cost model or the fair value model. As opposed to IFRS no special rules concerning property investments are set forward in the financial reporting rules of the United States. According to US-GAAP real estate companies including Real Estate Investment Trusts (REITs) in the United States have to apply cost accounting. Although the IASB and FASB have been jointly working on an alignment of their financial reporting practices, this issue still remains one of the biggest differences in international accounting practice.

2.1. Fundamentals of the Real Estate Industry

In order to evaluate the accounting methods used in the real estate sector, it is crucial to understand the market environment. Generally, real estate markets are highly non-transparent (ZÜLCH, 2003, p. 31), which is due to the location bound character of real properties and the resulting heterogeneous objects. Consequently, the real estate market is divided into several sub-segments. Like other markets, the real estate sector depends on economic developments, however, adaptation to and elasticity in changing market trends are quite slow which results in extensive cyclical periods (SCHULTE/LEOPOLDSBERGER, 2007, p. 517). Consequently, the problem of determining a reliable market value is intensified by non-perfect market conditions in the real estate sector. However, the European Public Real Estate Association (EPRA), which professionally represents the real estate industry, states in its *Best Practices Recommendations* of July 2009 that "Fair value accounting will enhance uniformity, comparability and transparency of financial reporting by real estate companies." (EPRA, 2009, p. 13). These goals are in line with the International Accounting Standards Board's (IASB) and the Financial Accounting Standard Board's (FASB) concept of the decision-usefulness of financial statements. However, whether it is possible to reach the goals set forward by these bodies in terms of value relevance for certain accounting figures will be the main research issue addressed in this paper.

The subprime crisis and its aftermath caused investors to withdraw from the stock exchange resulting in vanishing markets for several financial instruments. This development gives rise to concerns about fair value measurement, for both financial and non-financial assets/liabilities. Since the subprime crisis caused stock price indices worldwide to slump, the real estate indices were affected most. By looking at the EPRA/NAREIT Global Real Estate index performance from 2005 to 2009 it can be seen that it decreased by almost 40 % (FTSE, 2009, p. 1).

2.2. Accounting of Investment Properties under IFRS

The International Accounting Standards Board (IASB), which follows the asset-liability-approach[1] in terms of developing accounting standards, has already implemented fair value accounting in numerous standards.[2] The key standard for the real estate industry is IAS 40, which deals with accounting for investment properties. According to IAS 40.5, an investment property is defined as "property […] held […] to earn rentals or for capital appreciation or both". For these types of assets, the IASB allows the fair value approach. As an alternative, companies may also account for investment properties at historical costs, but have to disclose the fair value in the notes accompanying the financial statements. Consequently, the IASB favours the fair value approach, which is also made clear in IAS 40.31: "It is highly unlikely that a change from the fair value model to the cost model will result in a more appropriate presentation." Hence, in accordance with IAS 8.14 (b), consistency in the applied accounting methods must be ensured.

With regard to the concept of decision-usefulness, the IASB considers fair values more relevant for investors than historical costs. However, if there is no active market available for the assets/liabilities considered which is the case for most real estate properties, this concept presents problems since fair values cannot be easily determined. In order to fulfil the requirement of decision-usefulness in IFRS financial statements, the four most important qualitative characteristics of accounting information, namely understandability, relevance, reliability and comparability, must be met (IASB, 2008a, F.24). The crucial criteria concerning fair value accounting are relevance and reliability since they involve a trade-off.

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1 The asset-liability-view was founded by SPROUSE/MOONITZ in 1962. In contrast to the revenue-expense approach which concentrates on the measurement of income through the income statement, the asset-liability-view measures income via changes in the balance sheet.

2 The following standards provide mandatory or voluntary fair value measurements: IAS 11, IAS 16, IAS 17, IAS 18, IAS 19, IAS 20, IAS 26, IAS 33, IAS 36, IAS 38, IAS 39, IAS 40, IAS 41, IFRS 1, IFRS 2, IFRS 3, IFRS 5.

In the accounting literature, relevance is mainly measured by the correlation between stock market prices and accounting numbers, whereas reliability is understood as precise fair value estimates (DANBOLT/REES, 2008, p. 272). However, testing for relevance and reliability in order to evaluate the decision usefulness of fair value accounting information can only be done jointly in value relevance studies (BARTH et al., 2001, p. 81). Consequently, the results of a value relevance study cannot be analyzed in a way so that it is clear how the results would have changed if reliability of fair values would have been higher or lower.

IAS 40.53 implements a so-called "reliability exception" stating that if a fair value of a real property cannot be determined reliably the asset in question must be measured at cost. This regulation implies that a certain degree of reliability for fair values is required in order to use it for financial purposes. Therefore, "information needs to pass a reliability threshold before it can be considered relevant at all" (ERNST & YOUNG, 2005, p. 2). However, neither the IASB nor the FASB have quantified the required degree of reliability. This widens the discretionary power of financial statement preparers and makes it hard for investors to assess the reliability and hence decision-usefulness of determined fair values.

2.2.1. Fair Value Determination according to IAS 40

Fair value accounting for non-financial assets is associated with a certain degree of uncertainty since market prices are often not available. According to IAS 40.5, fair value is defined as "the amount for which an asset could be exchanged between knowledgeable, willing parties in an arm's length transaction." Hence, the fair value is abstracted from any subjective influence (HOFFMANN/FREIBERG, 2008, no. 49) and should replicate the market condition at the reporting date (IAS 40.38). Since the definition of fair value by the IASB shows no material differences to the respective definition of market value as used by valuation standard setters like the International Valuations Standards Committee (IVSC) and the Royal Institution of Chartered Surveyors (RICS), the terms fair value and market value are used synonymously in this paper (HOFFMANN/FREIBERG, 2008, no. 48; ROTH, 2008, p. 44).

As IAS 40.49 (a)-(d) emphasises, the fair value of an investment property is different from its value in use and shall therefore not be influenced by additional value arising from a portfolio, synergy effects, specific legal rights/restrictions and tax benefits/burdens. According to IAS 40.37 transaction costs may not be deducted when calculating the fair value of an investment property. In a cross-country evaluation, ZAUGG/KRÄMER (2007, 72 - 76) found that the

treatment of transaction costs is quite different in European real estate companies. This result fosters the assumption of inconsistent application of IAS 40 which may undermine the comparability of financial statements.

A lack of current real estate prices increases the danger of management bias leading to an overvaluation of investment properties (HOFFMANN/FREIBERG, 2008, no. 51). Therefore, the IASB has developed a fair value hierarchy in order to provide the financial statement preparer with guidance on how to determine the fair value of investment properties. The fair value hierarchy of IAS 40 can be outlined as follows:

- **Level 1:** Current prices in an active market of similar property (IAS 40.45)
- **Level 2:** Current prices in an active market for properties of different nature/condition/ location or recent prices of similar properties on less active markets (IAS 40.46 (a)–(b))
- **Level 3:** Mark-to-model based fair values in the form of discounted cash flow projections based on reliable estimates of future cash flows (IAS 40.46 (c))

Due to the heterogeneity of real estate property and the lack of transparency in the European real estate market, level 1 and level 2 play a minor role in the real estate sector. As current prices in (less) active markets or comparable real estate property prices are not readily available,[3] the mark-to-model approach of the third level is of great importance.[4] Since the fair value is determined by non-observable input data on level 3, the trade-off between the qualitative key characteristics relevance and reliability reaches its peak. In general, estimated fair values are subject to error and manipulation (DANBOLT/REES, 2008, p. 272) and therefore are considered the least decision-useful measurement concept for non-financial assets/liabilities by European professional investors (GASSEN/SCHWEDLER, 2008, p. 21). The author of this paper assumes that this mistrust does not apply to the real estate industry to that extent, however, empirical studies confirming this assumption are missing.

Although IAS 40.32 recommends the appraisal of investment properties by an independent valuer, this is not mandatory. If property companies determine the fair values of their real

[3] Since the term „active market" is not defined in IAS 40, it seems reasonable to use the definition of IAS 36.6. Hence, an active market is defined as one in which the following conditions are cumulatively fulfilled: homogenous traded items, willing buyers and sellers are available any time and prices are publicly accessible.

[4] According to PELLENS/FÜLBIER/GASSEN/SELLHORN (2008, p. 346) the hierarchy may also be applied in a different order. However, due to the decreasing reliability of fair values with each level this approach does not seem appropriate.

estate internally, this may lead to an increase in bias. However, external appraisers may also be a source of error, since they are engaged by the company and therefore potentially subject to being influenced by management (DANBOLT/REES, 2008, p. 272). In an educational session with the IASB, the IVSC stated that "it is inevitable that not all valuations will carry the same degree of certainty." (IASB, 2008b, p. 4). However, financial statement users may not be aware of the uncertainty inherent to real estate appraisal since the disclosures in the notes of financial statements do not contain such detailed information. It is this uncertainty which will be tackled by the IASB since not all real estate appraisals, especially those not conducted by external certified valuers, seem reliable.

Recent developments like the IASB's annual improvements project of 2008 further intensified possible biased fair value determination: beginning with January 1, 2009, real estate under construction may be accounted for at fair value since it falls within the scope of IAS 40.[5] This development widens the discretionary power of real estate companies in terms of fair value accounting because the reliable estimation of future cash flows for properties under construction may be difficult. Due to the prevalence of fair values in international financial reporting and advanced appraisal methods in the real estate industry this approach is considered appropriate by the IASB (PELLENS/FÜLBIER/GASSEN/SELLHORN, 2008, p. 341).

2.2.2. Treatment of Fair Value Changes in the Income Statement

If a company chooses the fair value model according to IAS 40.30 it is obliged to revalue its investment properties on a yearly basis. As stated in IAS 40.35, fair value changes resulting in a gain or loss have to be accounted for in the income statement. Besides agricultural products as regulated in IAS 41, investment properties are the only non-financial assets in which gains and losses arising from revaluations affect the IFRS income statement. Although this results in a higher volatility of earnings, it also leads to a better understanding concerning the performance of the real estate properties (HEINTGES et al., 2008, p. 2037). However, due to declining real estate values of investment properties as a consequence of the subprime crisis and the resulting lower or even negative earnings the discussion on the inclusion of unrealized fair value gains and losses in the income statement has regained attention in Europe. For example, representatives of the German real estate industry demand a change of IAS 40 in order to show yearly real estate appraisal variations in the revaluation reserve and hence in

[5] Up to this point real estate under construction was subject to IAS 16 and could only be valued at cost (IAS 40.22; IAS 40.BC16-22). IAS 16 was changed by a modification of IAS 16.5.

other comprehensive income (BECK et al., 2009). These arguments are based on the fact that fair value changes of financial instruments categorized as "available for sale" according to IAS 39 must be shown in the revaluation reserve as regulated in IAS 39.55 (b).[6] According to BECK et al. (2009) it is further argued that the holding period of real estate properties is quite long and therefore the application of the same rules as for financial instruments classified as "held for trading" seems not to be consistent with the IAS 40.

However, in contrast to the view presented above, proponents of the inclusion of fair value changes in the income statement argue that it leads to a transparent presentation without causing any accounting mismatches or problems with recycling or reclassification of items not previously included in profit or loss (IAS 40.B65 (a)-(c)). Furthermore, recent developments of the Conceptual Framework Project (Phase B) which is jointly undertaken by the FASB and IASB must be considered as well. In this project, the standardsetters aim at the mandatory presentation of profit and loss and other comprehensive income in a single statement.[7] Although this development is considered a mere presentation issue so far, a change of IAS 40 towards including fair value changes in the revaluation reserve does not seem to be an appealing and likely solution since the single statement approach tries to extend investors' views to comprehensive income in total. However, since the profit/loss bottom line has always been one of the key figures for investors (PELLENS et al., 2008, p. 142), opponents fear that presenting comprehensive income in one statement will lead to investor confusion and therefore decreasing decision usefulness of financial reporting.[8] A major issue raised in this discussion is that neither the IASB nor the FASB have developed consistent criteria when fair value changes have to be shown in profit/loss or other comprehensive income so far. Consequently, as long as this fundamental problem concerning performance measurement is not resolved, it seems doubtful that the discussion of presentation issues contributes to the future development of financial reporting. The ICAEW puts its criticism concerning the single statement approach as follows: „[…] the split between net income and OCI is currently merely a "page break" issue as there is no principle articulated as to what should be in one or the other. […] – the boards are thus asking the wrong question at the wrong time." (ICAEW, 2009, no. 52).

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6 In case the fair value change is considered being an impairment it must be reported in the profit or loss of the company.

7 Currently, entities can present all items of income and expense either in a single statement or in two separate statements (IAS 1.81).

8 For a thorough understanding of the critical views on this development consult the comment letters on this issue which are available on http://www.fasb.org/jsp/FASB/CommentLetter_C/CommentLetterPage&cid=1218220137090&project_id=1630-100.

By extending the theoretical view to capital market research it is revealed that the empirical studies conducted in the past concerning how to deal with fair value changes resulting from the application of IAS 40 lead to mixed results. For example, OWUSU-ANSAH/YEOH (2006) do not report higher value relevance resulting from the reporting of fair value income for companies from New Zealand for the time period from 1990-1999. In contrast, a recently published study by SO/SMITH (2009) found higher value relevance for reporting fair value changes in the profit or loss account of companies listed on the Hong Kong Stock Exchange. The latter study seems more powerful since companies with positive and negative fair value changes were considered, whereas in OWUSU-ANSAH/YEOH only companies with positive fair value changes are included in the sample. Another study which deals with this issue was published by DANBOLT/REES (2008) for real estate companies reporting under UK-GAAP. The authors report no increase in value relevance when fair value income is reported. They suggest that while fair value balance sheet figures are available, income measurement will decrease in importance. The authors interpret their results as a proof that the British accounting standard SSAP 19 which regulates the inclusion of fair value changes in the revaluation reserve should not be altered (DANBOLT/REES, 2008). The second regression set which is presented in Section 3 of this paper will further extend on this theory for the European and US sample as well.

2.3. Accounting for Investment Properties under US-GAAP

In contrast to IFRS the term „investment property“ is not incorporated in US financial reporting because US-GAAP does not differentiate between real estate held for use, held to earn rentals or for capital appreciation. For accounting purposes, both types of real estate are included in the long-term investment section in the balance sheet and measured at historical costs less subsequent depreciation charges. The US-GAAP treatment of investment properties differs considerably from the fair value approach which has been adopted by most European companies over the last few years. Therefore, the memorandum of understanding (MoU) between the FASB and IASB, which aims at the harmonization of US-GAAP and IFRS listed this issue as a subject of examination by the FASB with regard to the fair value option project (FASB/IASB 2006, p. 2). Whereas the updated version of the 2008 memorandum (FASB/IASB, 2008) still contains the alignment of reporting for investment properties it seems that the FASB has dropped its efforts in between. The latest publication of the FASB/IASB does not include this agenda issue any longer (FASB/IASB, 2009). Therefore, it

is not expected that US-GAAP will change from historical cost to fair value accounting in the medium run.

The accounting methods applied in the US and in Europe are substantially different and provide a unique setting to investigate the different effects fair value accounting can have on non-financial assets within the same industry. Although the comparison of cross-sample analysis between two datasets must be conducted carefully the results are significant enough to draw inferences.

3. VALUE RELEVANCE STUDY

3.1. Introduction

Real estate research is still mainly dominated by Anglo-Saxon countries, especially the United States. However, Europe and the Asia-Pacific region have increased their share of participation over the last years (CHAN et al., 2008, p. 1ff). Empirical studies in the past investigated both reliability and relevance of fair value accounting in the real estate industry. While relevance of fair values is mostly tested with value relevance studies, the assessment of reliability of real estate appraisals is not that popular (DANBOLT/REES, 2008, p. 275). However, a study testing the reliability of fair value estimates carried out in the UK revealed that fair values determined by appraisal techniques differ only about 6 % from actual real estate selling prices. The authors of the study found this result convincing and concluded that fair values are a better valuation basis than historical costs (DIETRICH/HARRIS/MULLER, 2001).

The aim of this paper is to analyze the use of fair value accounting in the real estate industry based on two different samples comprised of companies from Europe and the United States. The findings of this paper contribute to the existing literature in several ways: First, the effect of fair value accounting is analyzed not only for the disclosure of certain values but for key accounting figures like equity and net income as a whole. Therefore, the similar characteristics of the European and US sample derived from the same industry offer a unique research possibility due to the diametrically opposed accounting methods applied. Furthermore, pooled and cross-sectional analyzes were conducted over the time period from 2004-2008 which made it possible to study the consequences of fair value accounting in a difficult market surrounding as implied by the financial crisis beginning in late 2007. As presented in the next section, the comparison between the conservative US approach and the

progressive fair value application used by European real estate companies reveals interesting results.

3.2. Description of Data, Sample and Models used

This paper proofs how different accounting figures with a special focus to equity book value as reported by European or US companies according to IFRS or US-GAAP is reflected in share price. Therefore, an association model in the form of a price model is used. WAGENHOFER (2008) points out, that fair value accounting is mostly researched in the context of giving incremental information, which means that in many studies both historical and current cost accounting figures are available. Unlike other studies it must be noted that the approach in this study differs since neither for European nor for US companies both fair value and historical cost amounts are available. Consequently, equity and income figures for European companies are investigated without having historical cost figures available for the same set of companies. In the case of US companies only the cost accounting approach is measurable due to a lack of the disclosure of current real estate values. However, the lack of these figures in the financial statements of the companies provides the opportunity to compare two completely different approaches used within the same industry over and above the evaluation of incremental differences. Since the two samples investigated are derived from different countries, institutional differences may have an influence on the study results and the calculated R^2 have to be interpreted carefully.

The samples investigated are both derived from the *FTSE/EPRA NAREIT Global Real Estate Index* as composed of December 2008. Consequently, the companies included in the study represent the most influential real estate companies worldwide. For Europe the sample was extended to all EPRA members as of December 2008 as well. Both samples were balanced leading to 80 companies for the European sample (400 firm years) and 77 companies for the US sample (390 firm years). The financial statements data used are derived from Thomson Datastream Advance 4.0. Table 1 shows the sample selection methods used for the European and the US basic population. A detailed list of the companies included in the two samples is given in Appendix 1.

SAMPLE	EUROPE	USA
FTSE/EPRA NAREIT Mitglieder	85	100
+ EPRA-members not listed in the Index	48	0
TOTAL INITIAL SAMPLE	**133**	**100**
Missing or unsuitable data		
Financial statements not available	*-10*	-
Company withdrew from the Stock Exchange	*-1*	-
Merger with another company	*-2*	-
Companies do not report investment/real properties	*-5*	-
Share prices missing	*-5*	-
Negative Equity Number	*0*	*-4*
UNBALANCED SAMPLE	**110**	**96**
Eliminate companies with further missing variables	**-30**	**-18**
Elimination of extreme outliers	**-**	**-1**
BALANCED SAMPLE	**80**	**77**

Table 1: Sample Overview

The European sample is comprised of 80 companies derived from 11 different member states of the European Union as well as Switzerland. Although institutional differences might exist between these countries it is assumed that the IFRS application provides a homogenous base for the study conducted. Unlike previous studies the sample is selected from a single industry which further enhances comparability. An overview about the composition of the European sample is given in the following table:

Country	Number of companies	Relative Amount
Belgium	6	7,5%
Denmark	1	1,3%
Germany	7	8,8%
Finnland	3	3,8%
France	8	10,0%
Great Britain	29	36,3%
Italy	2	2,5%
The Netherlands	6	7,5%
Austria	5	6,3%
Sweden	5	6,3%
Spain	4	5,0%
Switzerland	4	5,0%
Total number of companies	**80**	**100,0%**

Table 2: European Sample Composition

Great Britain dominates the European sample (36 %), followed by companies from France (10 %) and Germany (9 %). The variables used in the following study include the market value of the company (MV), basic net asset value (NAV) which equals the book value of

equity excluding preference shares and net income (NI) available to common shareholders. In the following different regression analysis are run by applying the same models to the European and US sample respectively.

3.2.1. First set of regressions – US and European Sample

The first regression model is underpinned by the theory that if fair value accounting is used for real estate properties the equity book value referred to as basic net asset value (NAV) in the real estate industry approximates the intrinsic value of a share (ADAMS/VENMORE-ROWLAND, 1989). Due to the high ratio of investment properties in relation to total assets of the companies this point is well made for European companies appraising their investment properties at fair value. However, since the historical cost approach is used in the US it is expected that R^2 is much lower for the American sample since balance sheet values understate the true value of the properties. Due to the considerable decline in investment property fair values as a consequence of the subprime crisis and the resulting high volatility of share prices the regressions were run separately for each year as well as for the pooled dataset. Inferences are mostly drawn from the yearly regressions since the pooled data must be interpreted carefully due to the structural change in the dataset for the year 2008.

The model for the first set of regression analysis can be described as follows:

$$MV_{i,t} = \alpha_{0,t} + \alpha_{1,t} NAV_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where MV is the market value of the company, NAV equals the book value equity excluding preference capital and ε is the error term capturing other value relevant information not included in the model. The currency used in the pooled European sample is Euros. If European companies reported their financial statements in any other currency the accounting figures were converted to Euros by using the exchange rate applied at the respective financial year-end. For the US sample the regression analysis was conducted in USD. All extreme values were verified against their primary source (published financial statements) and adjusted if data errors were found.

The variables used for both samples were derived from Thomson Datastream/Worldscope. However, as some European companies did not switch to International Financial Reporting Standards (IFRS) until 2005 the figures for 2004 were hand collected from the financial statements of the first year the company reported its results under IFRS. Consequently, for

some companies the year 2004 historical share prices are compared to accounting figures derived from financial statements published one year after. This method was chosen in order to avoid losing a year of comparison. However, it is not expected that this exerts an undue influence on the regression results because British companies which represent the largest subgroup within the European sample were required by local accounting standard SSAP 19 to apply fair value accounting to investment properties even before the introduction of IFRS. Consequently, equity figures for British companies reported under local GAAP do not deviate significantly from IFRS accounting numbers.

Following normal practice applied in value relevance studies model 1 is scaled by the number of shares (Thomson Datastream mnemonic NOSH) leading to the following price model specification:

$$P_{i,t} = \alpha_{0,t} + \alpha_{1,t} nav\ per\ share_{i,t} + \varepsilon_{i,t} \qquad (2)$$

The dependent variable P equals unadjusted price (Thomson Datastream mnemonic UP) at the end of the first quarter of the respective financial year-ends of the companies.[9] The chosen time lag allows financial statement information to be reflected in share prices.

A study conducted by BARTH/CLINCH (2009) dealing with the remedy of scale effects in regression analysis found that either levels regression or models scaled by number of shares (price regressions) perform best when the type of scale effect is unknown. Consequently, model 2 is applied to the European and US sample. Several regression test diagnostics were conducted in order to ensure robust regression results. The tests performed are based on the pooled data for 400 European firm years and 390 US firm years (before outlier elimination). Variable analysis revealed that the distribution of share prices and net asset values exhibit positive kurtosis and right skew, which is not surprising for capital markets data. While the data of the European sample were transformed on the basis of their natural logarithm in order to meet the linearity assumptions on which the validity of ordinary least squares (OLS) regressions is based, the US data were used in their raw form. Descriptive statistics reported in Table 4 for the European sample will be reported on their raw as well as retransformed scale for the purpose of comparability.

[9] The use of unadjusted prices is justified on the grounds that a price model rather than a return model is used in this study and therefore the association between historical prices and financial accounting figures is better captured by using unadjusted prices.

Extreme outliers were eliminated on the basis of scatter plots before running the regression analysis. Further outlier detection procedures included the analysis of values for which the standard deviation exceeded the mean more than three times. Furthermore, Cook's distances were checked for all regressions. A thorough residuals analysis was undertaken in order to confirm further regression assumptions including heteroscedasticity. Since scatter plots and the Shapiro-Wilk test revealed that a heteroscedasticity problem might exist for some data the method of WHITE (1980) in reporting robust standard errors will be followed for all regressions.

RESULTS

The descriptive statistics reported for the European sample include raw data as well as the transformed (natural logarithm) data which were raised back to the higher power for reporting purposes. The descriptive statistics before elimination of outliers for the pooled European and US sample can be described as follows:

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Standard Deviation	Skew		Kurtosis	
RAW DATA	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	SE	Statistics	SE
PriceQu1POOL	385	1,36	137,18	36,90	24,61	1,28	0,12	2,11	0,25
NAVPOOL	385	0,06	62,84	16,19	8,55	1,21	0,12	3,75	0,25

Table 3: Descriptive Statistics for the Pooled US sample

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Standard Deviation	Skew		Kurtosis	
RAW DATA	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	SE	Statistics	SE
PriceQu1POOL	400	0,13	262,50	27,16	36,03	2,35	0,122	7,12	0,24
NAVPOOL	400	0,05	168,40	23,17	28,19	1,92	0,122	3,85	0,24
RETRANSFORMED DATA									
PriceQu1POOL	400	0,13	262,50	11,77	4,11	0,76	1,13	0,83	1,28
NAVPOOL	400	0,05	168,40	11,38	3,61	0,74	1,13	1,57	1,28

Table 4: Descriptive Statistics for the Pooled European sample

The results for the bivariate cross-sectional regressions for the US sample are reported in the following. As expected, the results vary between the first four years of the study (2004-2007) and the last year 2008. This is due to the structural change in the data because of the subprime crisis and the resulting distorted share prices. The adjusted R^2 for the overall pooled cross-section OLS regression of the US sample accounts to 35,8 %. Therefore, the equity book

value explains about one third of the company's share price over the years 2004 to 2008. Taking into account the yearly cross-sectional results presented in Table 6 from 2004 to 2007 it becomes clear that the pooled analysis is highly influenced by the comparably low R^2 of the year 2008 which reaches only 26,7 %. In order to reaffirm this assumption another pooled OLS analysis for the years 2004-2007 revealed a R^2 of 49,3 % (not reported), which is in line with the remaining cross-sectional results.

Compared to the US results the value relevance of the equity book value of European companies accounts to 86,20 % for the pooled data.[10] This considerably high figure can be traced back to the extensive use of fair value accounting of European real estate companies and its strong association with stock prices. By looking at the yearly cross-sectional results it can be seen that the relationship between share price and equity book value remains quite stable over the years 2004-2007 with values around 90 %. However, in 2008 the R^2 drops to 83,8 % which may be traced back to high share price fluctuations. In the following the detailed regression results are shown:

	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R^2	F-test
POOLED REGRESSION 2004-2008						
Constant	**9,073**		2,072	4,378		
White-Adjusted			*(2,000)*	*(4,000)*	**35,80%**	
NAVPOOL	**1,681**	**0,600**	0,115	14,557		0,000
White-Adjusted			*(0,200)*	*(10,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 5: Results for the Pooled Regression Analysis (US sample)

CROSS-SECTION 2004	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R^2	F-test
Constant	**9,542**		2,963	3,221		
White-Adjusted			*(3,000)*	*(3,000)*	**51,10%**	
NAV2004	**1,595**	**0,719**	0,178	8,967		0,000
White-Adjusted			*(0,200)*	*(8,000)*		
CROSS-SECTION 2005						
Constant	**11,194**		4,648	2,409		
White-Adjusted			*(5,000)*	*(2,000)*	**44,40%**	
NAV2005	**2,156**	**0,672**	0,274	7,857		0,000
White-Adjusted			*(0,300)*	*(7,000)*		

[10] The given R^2 was reached after iterative outlier elimination. Without any outlier adjustment R^2 would account to 78.3 %.

CROSS-SECTION 2006						
Constant	**11,354**		5,273	2,153		
White-Adjusted			*(5,000)*	*(2,000)*	**47,40%**	
NAV2006	**2,296**	**0,694**	0,275	8,342		0,000
White-Adjusted			*(0,300)*	*(7,000)*		
CROSS-SECTION 2007						
Constant	5,34*		3,921	1,362		
White-Adjusted			*(4,000)*	*(1,000)*	**53,70%**	
NAV2007	**1,993**	**0,737**	0,214	9,326		0,000
White-Adjusted			*(0,300)*	*(8,000)*		
CROSS-SECTION 2008						
Constant	2,694*		3,015	0,894		
White-Adjusted			*(3,000)*	*(0,800)*	**26,70%**	
NAV2008	**0,889**	**0,526**	0,168	5,284		0,000
White-Adjusted			*(0,200)*	*(4,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 6: Results for the Cross-Sectional Analysis (US sample)

Below the results for the European sample are presented. It must be noted that all variables of the European sample were transformed by using the natural logarithm of every variable.

	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R^2	F-test
POOLED REGRESSION 2004-2008						
Constant	-0,047*		0,059	-0,795		
White-Adjusted			*(0,060)*	*(-0,800)*	**86,20%**	
NAVPOOL	**1,033**	**0,929**	0,021	48,836		0,000
White-Adjusted			*(0,020)*	*(50,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 7: Results for the Pooled Regression Analysis (European sample)

CROSS-SECTION 2004						
Constant	0,133*		0,081	1,645		
White-Adjusted			*(0,070)*	*(2,000)*	**93,90%**	
NAV2004	**1,006**	**0,969**	0,030	34,077		0,000
White-Adjusted			*(0,020)*	*(50,000)*		
CROSS-SECTION 2005						
Constant	**0,328**		0,090	3,648		
White-Adjusted			*(0,090)*	*(4,000)*	**92,40%**	
NAV2005	**0,996**	**0,962**	0,033	30,573		0,000
White-Adjusted			*(0,030)*	*(30,000)*		

CROSS-SECTION 2006						
Constant	**0,383**		0,103	3,703		
White-Adjusted			*(0,100)*	*(3,000)*	**90,40%**	
NAV2006	**0,976**	**0,951**	0,036	26,937		0,000
White-Adjusted			*(0,040)*	*(30,000)*		
CROSS-SECTION 2007						
Constant	**-0,281**		0,107	-2,625		
White-Adjusted			*(0,090)*	*(-3,000)*	**90,80%**	
NAV2007	**1,061**	**0,954**	0,038	27,975		0,000
White-Adjusted			*(0,030)*	*(30,000)*		
CROSS-SECTION 2008						
Constant	**-0,794**		0,140	-5,690		
White-Adjusted			*(0,100)*	*(-6,000)*	**83,80%**	
NAV2008	**1,047**	**0,917**	0,053	19,737		0,000
White-Adjusted			*(0,050)*	*(20,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 8: Results for the Cross-Sectional Analysis (European sample)

Inferences drawn from the comparison between the European and US sample point into the direction that reported equity book values of European companies provide investors with valuable information reflected in the share price of a company. The results indicate that IFRS equity is more informative for investors than the equity figures of US financial statements. Furthermore, it must be noted that even with capital markets highly distorted due to the financial crisis, the decline in R^2 for the European companies in 2008 is not that high as for US companies. This may be due to the fact that real estate assets reflected at fair value in the balance sheet of European companies experienced high valuation decreases lately and therefore leading to lower equity figures. Hence, the reported results indicate that the upward as well as the downward trend in the revaluation of real estate is better captured in equity figures of European companies than in those of the US sample.

3.2.2. Second set of regressions – US and European Sample

The second set of regressions extends the bivariate model applied in the previous section. The hypothesis tested is whether earnings provide additional useful information when fair value accounting figures of real estate properties are available to investors as it is the case for the European sample. Consequently, it is assumed that earnings figures are of higher relevance for investors in the US than in Europe. The model applied in order to test this hypothesis

relies on the "linear information dynamics" introduced by OHLSON (1995) and is based on a levels regression model specified as follows:

$$MV_{i,t} = \alpha_{0,t} + \alpha_{1,t} NAV_{i,t} + NI_{i,t} + \varepsilon_{i,t} \quad (3)$$

where MV is the market value of the company, NAV equals the book value equity excluding preference capital and NI is net income available to common shareholders. Again scaling by number of shares leads to the following price model specification:

$$P_{i,t} = \alpha_{0,t} + \alpha_{1,t} nav\ per\ share_{i,t} + ni\ per\ share_{i,t} + \varepsilon_{i,t} \quad (4)$$

The dependent variable P equals unadjusted price (Thomson Datastream mnemonic UP) at the end of the first quarter of the respective financial year ends of the companies in order to allow financial statement information to be reflected in share prices.

The hypothesis that adding net income figures to the bivariate analysis previously conducted will result in a relatively better model fit for the US than in Europe was partly confirmed. As previously reported the adjusted R^2 for the US data by considering equity figures only accounted to 35,8 %. By including net income adjusted R^2 increases to 41,6 % which is a slight rise in 5,8 percentage points for the US sample. The yearly cross-sectional regressions for the US sample (unreported) show a similar picture with slight increases in R^2 over all years varying from 4-6 percentage points.

However, as hypothesized the model fit for the European sample did not increase much if earnings figures are included because of the presence of fair value balance sheet numbers which are readily available for investors. The results show that for the pooled European sample the adjusted R^2 rose from 86,2 % as reported for the first set of regressions to 86,7 %. Although the regression coefficient for both net asset value and net income is significant for European companies the slight increase in R^2 of 0,5 % percentage points can be neglected. The unreported findings for the cross-sectional yearly regressions are in line with the pooled results and indicate an increase in R^2 between 0,5 and 1 percentage points. Therefore, the tables below show the detailed regression results for the pooled analysis for the US and European sample:

	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R2	F-test
POOLED REGRESSION 2004-2008						
Constant	**8,460**		2,018	4,192		
White-Adjusted			*(2,000)*	*(4,000)*		
NAVPOOL	**1,430**	**0,500**	0,120	11,961	**41,60%**	
White-Adjusted			*(0,200)*	*(9,000)*		
NIPOOL	**5,043**	**0,274**	0,768	6,564		0,000
White-Adjusted			*(1,000)*	*(5,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 9: Results for the Pooled Analysis (US sample)

	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R2	F-test
POOLED REGRESSION 2004-2008						
Constant	**-3,161**		0,376	-8,416		
White-Adjusted			*(0,400)*	*(-9,000)*		
NAVPOOL	**0,944**	**0,849**	0,023	41,822	**86,70%**	
White-Adjusted			*(0,020)*	*(40,000)*		
NIPOOL	**1,080**	**0,171**	0,128	8,412		0,000
White-Adjusted			*(0,100)*	*(9,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 10: Results for the Pooled Analysis (European sample)

The inferences drawn from the results above show that earnings figures reported by companies using the fair value model (which is the case for most European real estate firms) lose in importance. This is especially true when the results are compared to the findings for the US where net income provides relatively more additional information to investors.

3.2.3. Third set of regressions –European Sample only

In this section an additional analysis of the European sample is conducted since IAS 40 allows companies to use either the cost or fair value model. Since the group of companies using historical cost accounting in the European real estate industry has considerably decreased between 2004 and 2008 the fact that it is even applied by companies in the European sample was neglected in the first two sets of regressions. However, this section looks at the differences between value relevance of companies applying historical costs and those applying the fair value model within the European sample. The following table provides

information about the European basic population and the respective use of the applied accounting methods for investment properties:

	2004	2005	2006	2007	2008	Total
Number of companies applying the cost model	18	14	9	6	6	**53**
Number of companies applying the fair value model	62	66	71	74	74	**347**
Total number of companies	**80**	**80**	**80**	**80**	**80**	**400**
Cost Model Application in %	22,5%	17,5%	11,3%	7,5%	7,5%	**13,3%**
Fair Value Model Application in %	77,5%	82,5%	88,8%	92,5%	92,5%	**86,8%**

Table 11: Model Application in the European Real Estate Industry

It becomes clear that the fair value model is the predominant accounting method chosen for companies reporting under IFRS. In 2007 and 2008 only 7,5 % (six companies) chose the historical cost method in order to account for investment properties on the balance sheet. By looking at the pooled data in the last column of Table 11 it can be seen that companies using historical cost as the predominant measurement method for investment properties add up to 53 (13,3 %) in total. In order to investigate whether the accounting method chosen by European companies has an impact at all a dummy variable called *FVmethod* indicating that the company uses the fair value model was added to model 2 resulting in the following equation:

$$P_{i,t} = \alpha_{0,t} + \alpha_{1,t} nav\ per\ share_{i,t} + FVmethod + \varepsilon_{i,t} \qquad (5)$$

The regression coefficient of the dummy variable *FVmethod* is significantly different from zero which leads to the hypothesized result that the accounting method chosen by European companies impacts share prices. Consequently, a more thorough analysis between fair value and cost model users is undertaken in the following. Therefore, regression model 2 as introduced in the first set of regressions is applied to fair value and historical cost users separately in order to test the hypotheses that the association between share price and equity book value is higher for companies using the fair value model for investment properties. Model 2 was previously specified as follows:

$$P_{i,t} = \alpha_{0,t} + \alpha_{1,t} nav\ per\ share_{i,t} + \varepsilon_{i,t}$$

The results presented in Table 12 are reported for the pooled ordinary least square regressions separated by fair value and cost model users. Due to the declining number of companies using historical cost accounting over the time period investigated yearly cross-sectional results are not reported.

	Regression Coefficient	Beta Coefficient	Standard Error	T-Statistics	Adjusted R^2	F-test
POOLED REGRESSION 2004-2008						
COST MODEL USED						
Constant	**0,805**		0,185	4,350	**78,80%**	
White-Adjusted			*(0,400)*	*(2,000)*		
NAVPOOL	**0,909**	**0,890**	0,066	13,786		0,000
White-Adjusted			*(0,100)*	*(7,000)*		
POOLED REGRESSION 2004-2008						
FAIR VALUE MODEL USED						
Constant	-0,077*		0,057	-1,361	**88,80%**	
White-Adjusted			*(0,060)*	*(-1,000)*		
NAVPOOL	**1,015**	**0,938**	0,021	49,466		0,000
White-Adjusted			*(0,020)*	*(50,000)*		

Regression coefficients reported in bold are significant at the 5 % level.
*Regression coefficients with an asterisk are non-significant on both 5% and 10% level.
White adjusted standard errors were calculated using an adjusted method for small and intermediate sample sizes according to LEVESQUE, 2008 and HAYES/CAI 2007.

Table 12: Results for the Pooled Regression Analysis separated for the Cost and Fair Value Model

The results for both reported subsamples show considerably high R^2. However, the association between share price and basic net asset value is higher for fair value model users (88,8 %) than for companies using the cost model (78,8 %).[11] A fact that might impact these results and therefore leading to a higher R^2 for companies using the cost model is that fair value figures for these companies are available for investors since IAS 40.79 (e) requires disclosing them in the notes. However, this effect cannot be controlled for explicitly because no reference group without disclosed fair value exists within the European subsample.

Since fair value changes of investment properties must be included in profit or loss according to IAS 40.35 a high correlation between the reported equity number and a change in income is obvious. Although it was shown in the second set of regressions that income figures add only a very small amount in explaining share prices on top of equity figures, investor decisions and therefore share price variations may still be driven by the bottom line of the income statement. By adding a dummy variable to the previously defined model 2 it will be investigated whether profit or loss years impact the model applied. The following analysis is undertaken by splitting the sample between fair value and historical cost users and investigating whether the results are impacted by profit or loss years. The following table summarizes information on the reported profit and loss years for the European sample:

[11] The figures reported are adjusted for outliers exceeding three standard deviations from the mean. However, with no outlier elimination the results for the cost model would yield a R^2 of 74,5 % for the cost model and 80,3 % for the fair value model.

	2004	2005	2006	2007	2008	Total
No. of companies reporting a profit	78	77	80	61	19	53
No. of companies reporting a loss	2	3	0	19	61	347
Total years	**80**	**80**	**80**	**80**	**80**	**400**
Profit reported in %	97,5%	96,3%	100,0%	76,3%	23,8%	**78,8%**
Loss reported in %	2,5%	3,8%	0,0%	23,8%	76,3%	**21,3%**

Table 13: Overview of Profit/Loss Years reported by European companies

The table above shows that for the pooled data the years in which companies reported a profit account to 78,8 %. Overall the number of companies reporting negative earnings begins to rise in 2007 and reaches a peak in 2008 with 61 out of 80 companies reporting a loss. This development is partly due to declining real estate values from 2007 on for which the changes must be accounted for in the income statement when fair value accounting is the method of choice. The previously specified model 2 was applied to historical cost and fair value users separately by using the following model specification in which profit represents the dummy variable indicating the company reported positive net income.

$$P_{i,t} = \alpha_{0,t} + \alpha_{1,t} nav\ per\ share_{i,t} + profit + \varepsilon_{i,t} \qquad (6)$$

By analyzing the subgroup of fair value model users the coefficient of the dummy variable *profit* is significantly different from zero indicating that the existence of a profit or loss year has an impact on the results. Therefore, the null hypothesis of no impact either the company faces a profit or loss year can be rejected for fair value users. However, for the cost model subgroup the regression coefficient of the dummy variable is not significant which leads to the conclusion that reporting a profit or loss does not make a difference in predicting share price deviations for companies applying the cost model. The difference in the reported results may be traced back to the fact that fair value changes must be shown in the income statement and therefore exert a high influence on the earnings figure.

4. CONCLUSIONS

The study results reveal big differences between the decision usefulness of accounting figures for European and US real estate businesses. In comparison to the European approach the accounting rules in the United States do not allow fair value appraisal of real estate properties. Although the alignment of European and US rules concerning investment properties was set forward in the Memorandum of Understanding in 2006, the FASB seems to have dropped the topic from its agenda. This is surprising because the treatment of real estate properties differs

considerably between Europe and the US and therefore leading to huge differences in this industry. An additional analysis in this paper showed that only one out of the 77 companies in the US sample disclosed fair value estimates of real properties in their financial statements. Since disclosure of fair value estimates is not mandatory in US-GAAP this was expected.

Comparing the European and US approach of real estate accounting it is revealed that in terms of value relevance of equity figures the European concept provides investors with more relevant information than the historical cost method applied by US companies. The higher R^2 found for equity numbers of European real estate companies indicate that fair value accounting in this industry is of high importance to investors. The findings indicate that the European trend towards the application of the fair value model over the cost model observed in the last few years provides decision useful information to investors even in times of difficult market surroundings. Although a decline in R^2 was observed in both the European and US sample for the year 2008, the relative drop of the equity figure in terms of value relevance was bigger for US companies. Consequently, it is concluded that the European accounting approach for real estate captures share price movements better than this can be achieved by the conservative US approach.

By further extending the bivariate analysis of the first set of regressions to the inclusion of earnings figures it was found that these can only explain a small additional amount in share prices for the European sample. This result confirms the findings of DANBOLT/REES (2008) who state that "(…) in the presence of changes in FVA balance sheet values, income measures become largely irrelevant." (DANBOLT/REES, 2008, p. 271). The findings are also in line with the asset-liability approach followed by the IASB. The inclusion of income numbers for the US model revealed a slight increase in R^2 which confirms the hypothesis that earnings figures are more important for investors when no fair value figures are available.

Although the trend towards the application of the fair value model in the European real estate industry seems to be superior to the historical cost concept even in times of difficult market surroundings the threat of reporting possibly biased fair values must be considered. The reliability of fair value numbers as calculated by real estate appraisers or companies themselves may be called into question since not all relevant information may have the same degree of reliability. However, value relevance studies are not designed to capture the different portions of accounting information and separate them into the effects of relevance

and reliability. Consequently, the qualitative characteristics of relevance and reliability which must be fulfilled in order to contribute to an accounting figure's decision usefulness were studied jointly in this paper. Therefore, a certain degree of reliability of fair value estimates was assumed.

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APPENDIX 1

List of companies included in the balanced US sample

COMPANY	FYE
Acadia Realty Trust	31.12.
Agree Realty Corp	31.12.
Alexandria Real Estate	31.12.
AMB Property	31.12.
Apartment Investment	31.12.
Ashford Hospitality	31.12.
Associated Estates Realty	31.12.
Avalonbay Communities	31.12.
Boston Properties	31.12.
Brandywine Realty Trust	31.12.
BRE Properties	31.12.
Camden Property Trust	31.12.
CBL & Associates Props	31.12.
Cedar Shopping Centers	31.12.
Colonial Properties	31.12.
Corporate Office Props	31.12.
Corrections Corp of America	31.12.
Cousins Properties	31.12.
Developers Diversified	31.12.
Duke Realty Corp	31.12.
Eastgroup Properties	31.12.
Entertainment Props	31.12.
Equity Lifestyle Properties	31.12.
Equity One Inc	31.12.
Equity Residential Props	31.12.
Essex Property Trust	31.12.
Federal Realty Inv	31.12.
Felcor Lodging Trust	31.12.
First Industrial Realty	31.12.
First Potomac Realty Trust	31.12.
Getty Realty	31.12.
HCP	31.12.
Health Care REIT	31.12.
Healthcare Realty Trust	31.12.
Hersha Hospitality Trust	31.12.
Highwoods Properties	31.12.
Home Props of New York	31.12.
Hospitality Properties	31.12.
Host Hotels & Resorts	31.12.
HRPT Properties Trust	31.12.
Inland Real Estate Corp	31.12.
Kilroy Realty	31.12.
Kimco Realty	31.12.
LaSalle Hotel Properties	31.12.
Liberty Property Trust	31.12.

COMPANY	FYE
LTC Properties	31.12.
The Macerich Company	31.12.
Mack-Cali Realty	31.12.
Mid-America Apartment	31.12.
National Healthcare Corp.	31.12.
National Retail Properties	31.12.
Nationwide Health Props	31.12.
Omega Healthcare Investors	31.12.
Orient Express Hotel	31.12.
Parkway Properties	31.12.
Pennsylvania Real Estate	31.12.
Post Properties	31.12.
Prologis	31.12.
PS Business Parks	31.12.
Public Storage	31.12.
Ramco-Gershenson	31.12.
Realty Income	31.12.
Regency Centers	31.12.
Saul Centers	31.12.
Senior Housing Prop	31.12.
Simon Property Group	31.12.
SL Green Realty	31.12.
Sovran Self Storage	31.12.
Tanger Factory Outlet	31.12.
UDR Inc.	31.12.
Universal Health Realty	31.12.
Ventas	31.12.
Vornado Realty Trust	31.12.
Washington Real Estate	31.12.
Weingarten Realty	31.12.
Winthrop Realty Trust	31.12.

List of companies included in the balanced European sample

COUNTRY	COMPANY	FYE
BELGIUM	Befimmo SCA	30.09.
	Cofinimmo	31.12.
	Intervest Offices	31.12.
	Leasinvest Real Estate	30.06.
	WDP Warehouses De Pauw	31.12.
	Wereldhave Belgium	31.12.
DENMARK	TK Development	31.01.
GERMANY	AIG International Real Estate	31.12.
	Colonia Real Estate	31.12.
	Deutsche Euroshop AG	31.12.
	Deutsche Wohnen AG	31.12.
	DIC Asset AG	31.12.
	IVG Immobilien AG	31.12.
	TAG Immobilien AG	31.12.
FINLAND	Citycon Oyj	31.12.
	Sponda Plc	31.12.
	Technopolis Oyj	31.12.
FRANCE	Acanthe Developpement	31.12.
	Affine	31.12.
	Foncière des Régions	31.12.
	Gecina	31.12.
	Klépierre	31.12.
	Silic SA	31.12.
	Société de la Tour Eiffel	31.12.
	Société Foncière Lyonnaise	31.12.
GREAT BRITAIN	Babis Vovos - International Construction Group	31.12.
	Assura	31.03.*
	Big Yellow Group Plc	31.03.
	British Land Co Plc	31.03.
	Brixton Plc	31.12.
	Capital & Regional Plc	30.12.
	CLS Holdings Plc	31.12.
	Daejan Holdings Plc	31.03.
	Development Securities Plc	31.12.
	Grainger Plc	30.09.
	Great Portland Estates Plc	31.03.
	Hammerson Plc	31.12.
	Helical Bar Plc	31.03.
	ISIS Property Trust	31.12.
	Land Securities Group Plc	31.03.
	Liberty International Plc	31.12.
	London & Associated Properties Plc	31.12.
	McKay Securities Group	31.03.
	Minerva Property Holdings Plc	30.06.
	Mucklow (A & J) Group Plc	30.06.
	Primary Health Properties	31.12.*
	Quintain Estates and Development Plc	31.03.

COUNTRY	COMPANY	FYE
	SEGRO (vormals Slough Estates)	31.12.
	Shaftesbury Plc	30.09.
	St. Modwen Properties Plc	30.11.
	Unite Group Plc	31.12.
	Warner Estate Holdings Plc	31.03.
	Westbury Property Fund/Stobart Group Limited	29.02.*
	Workspace Group Plc	31.03.
ITALY	Aedes SpA	31.12.
	Beni Stabili SpA	31.12.
THE NETHERLANDS	Corio NV	31.12.
	Eurocommercial Properties NV	30.06.
	Nieuwe Steen Investments N.V.	31.12.
	VastNed Offices/Industrial NV	31.12.
	VastNed Retail NV	31.12.
	Wereldhave NV	31.12.
AUSTRIA	CA Immobilien Anlagen AG	31.12.
	Conwert Immobilien Invest AG	31.12.
	Immoeast AG	30.04.
	Immofinanz AG	30.04.
	Sparkassen Immobilien AG	31.12.
SWEDEN	Castellum AB	31.12.
	Fabege AB	31.12.
	Hufvudstaden	31.12.
	Klovern AB	31.12.
	Kungsleden AB	31.12.
SPAIN	Inmobiliaria Colonial S.A.	31.12.
	Metrovacesa	31.12.
	Sacyr Vallehermoso S.A.	31.12.
	TESTA Inmuebles en Renta, S.A.	31.12.
SWITZERLAND	Allreal Holding AG	31.12.
	PSP Swiss Property AG	31.12.
	Swiss Prime Site	31.12.
	Züblin Immobilien Gruppe	31.03.

Note:
Companies for which the financial year end (FYE) is marked with an asterisk changed it during the time period investigated. The FYE given in the table indicates the current financial year end.