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Does Independent Appraisal Provide Added Value?

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Abstract. *It has been suggested that one of the reasons for the persistence of the NAV discount phenomenon is that investors simply do not trust the disclosed property values of listed real estate companies. The purpose of the study is to find out whether investors trust reported fair values of investment properties more when the valuations have been provided by third party appraisers and not by the management of the company. A sample of 97 European publicly listed real estate companies is used to conduct the empirical study. The study is based on a regression model which analyses the relationships between the disclosed amount of investment properties and the market value of equity. Data on the amount of investment properties held by the sample companies is collected from annual reports for fiscal year 2012. The study utilizes disclosures mandated by International Financial Reporting Standard IAS 40 which requires companies to disclose the methodology used to value investment properties. Additional data needed for the regression model is collected from the Thomson Datastream and Thomson Worldscope databases. Results of the empirical study support the research hypothesis, i.e. that investment properties that are valued by third party appraisers are perceived by financial markets as more value relevant than properties which have been valued internally by the company.*

Keywords: *Investment property, property appraisal, fair value, IAS 40, REIT, real estate investment trust, NAV discount, net asset value discount, external appraisal, value relevance.*

1 Introduction

A clear problem for publicly listed real estate operating companies (REOCs) and real estate investment trusts (REITs) has been the fact that their market values are often significantly below the book values of their equity. The observation holds true even when properties are reported at fair value. This net asset value (NAV) discount has been very persistent even though the size of it has differed between markets and fluctuated over time.

The NAV discount is contradictory to intuition as one could expect that due to several commonly acknowledged positive aspects; such as the more liquid nature, better price formation, smaller lot size and lower transaction costs;

publicly traded indirect real estate vehicles would trade at a premium to similar direct real estate assets (Bendetto & Morri, 2009). Previous research has provided several suggestions to explain the widespread phenomenon of NAV discounts. However, no consensus has yet been reached and the results of research have often been contradictory. Some of the most cited arguments are that NAV discounts are caused by the low level of trust that investors place in reported property values (e.g. Baum et al. 2003), the costs caused by the management of property companies (e.g. Ingersoll, 1976) and by agent-principal problems such as moral hazard and adverse selection (e.g. Adams & Venmore-Rowland, 1989).

Even though companies are able to provide exact estimates of the value of properties on their balance sheets, financial markets seem to have a different view of the worth of these assets. Whether there is something that management can do in order to increase trust in the reported property values has been an empirical question that previous research has not been able to answer comprehensively.

The objective of this paper will be to shed more light on the factors affecting the NAV discount. Our approach to studying these factors is based on the concept of *value relevance*. Various academics have tried to define the term *value relevance* in different ways (e.g. Barth et al. 2001; Fen et al. 2010; Brown et al. 1999) but the central idea common to all of these definitions is that a reported balance sheet item is deemed to be value relevant if it has a statistically significant association with the market value of equity.

The goal of our study will be to find out whether the value relevance of investment property is different for companies that value their properties internally compared to companies that use external appraisers. Our expectation is that independent appraisers provide a more objective estimate of property values and thus decrease information asymmetries between investors and management. Furthermore, this increased trust in the reported valuations lead to more value relevant property values. A multiple linear regression model will be constructed to test this assumption.

Disclosures mandated by International Financial Reporting Standard (IFRS) IAS 40 provide a fruitful starting point for our empirical research as the standard requires extensive information to be given about investment properties and their valuation methods. One of the required disclosures is whether properties have been valued internally or externally. Other required disclosures relate, for example, to the valuation methodology used and to changes in property values. This information required by IAS 40 allows us to conduct meaningful and reliable research on the subject. Research conducted prior to IAS 40 has been forced to rely on randomly disclosed information that has often been provided in very different formats. This disparity between disclosure practices has forced researchers to use very small sample sizes and reliable inferences have therefore been difficult to form.

The research contributes to the value relevance literature and to the debate about the reliability of fair value estimates of investment properties. The study also provides insights into the possible benefits of different accounting standard approaches concerning investment properties and may therefore help standard setting bodies in their work. The results will also be of interest to the management

of REOCs and REITs as they will gain more understanding on the measures and disclosures which could help them in decreasing the NAV discounts of their companies. The interest in the results will be further strengthened due to the fact that the sample consists of large European real estate companies that are currently under a high level of public and regulatory scrutiny.

The remainder of the study is organized as follows. Chapter 2 provides an overview of the problems that are inherent for property appraisal. Chapter 3 describes previous research on the subject of the paper. Most of this chapter is used to review the research on the reasons for NAV discounts. Consideration is also given to studies comparing the quality of internal and external property appraisal. This chapter also develops the research hypothesis that is going to be tested in the empirical portion of the paper. Chapter 4 describes the sample selection process and the research methodology in more detail. Limitations of the research are also addressed. Chapter 5 presents the results of the empirical study. The final chapter develops conclusions and discusses possibilities for future research.

2 Problems of Property Appraisal

The heterogeneity of real estate and the absence of continuously traded securitized markets makes the work performed by commercial property appraisers a vital part of the property market. Property appraisal is a central requirement for reliable financial reporting, performance measurement and for the smooth functioning of the real estate market as a whole. However, both professionals and academics acknowledge that the process of property appraisal is prone to uncertainty and bias, and that indices based on appraisals fail to capture the true underlying volatility in the real estate market. It is also commonly accepted that these indices lag the underlying performance of the asset market. (Baum et al. 2003)

The most common method to value commercial property relies on data from actual sales transactions of comparable properties. It has been argued that this reliance on historical data causes valuation to become backward-looking process which results in smoothed property values which do not fully reflect all market information available at the time of the appraisal. (Brown & Matysiak, 2000) Others have argued that this methodology which results in lagging and smoothed values is in fact the most optimal way of valuing real estate in a thinly traded market (Quan & Quigley, 1991).

Behavioral real estate research has also shed some light on the question of the reliability of real estate appraisal. Appraisers have been found to be prone to anchoring, i.e. changes in values are under-estimated because the appraiser uses agreed sales prices or estimates of other appraisers as a reference point for the valuation process (Baum et al, 2003; Diaz, 1997). Appraisers can also be afraid of litigation and thus avoid proposing drastic changes to fair values in the absence of large amounts of transactional evidence. In the worst case such behavior can force appraisers into not utilizing currently available information and relying on scarce and out of date historical transactions. (Crosby et al. 1998) These aforementioned behavioral aspects contribute further into appraisal smoothing and under-estimation of the true variance of real estate values.

There is also some evidence which suggest that companies purchasing appraisal services are able to influence the outcome of the appraisal process (Gallimore & Wolverton, 2000). Appraisers are obviously keen to maintain a good relationship with their clients which can threaten the independence of the appraiser. If a sharp decline in property values has negative effects on the compensation of client management appraisers might take this into consideration when valuing the properties. Appraisers might not to report such declines in property values in fear of losing the client.

In addition to the previously described inherent problems of the property appraisal process, sometimes the appraisers simply do not have the necessary knowledge on how investment property should be valued according to IAS 40 (Huschke, 2007). The definition of fair value by IAS 40 is not always identical to the definitions of commonly applied property valuation frameworks. There are also significant differences between the methodological guidance offered by real estate sector institutions which leads to different valuation methodologies being applied in different European countries (Huschke, 2007; McParland et al. 2002). IVSC is the most prominent of the organizations promoting harmonization of appraisal techniques but there are also several other institutions which issue guidance on estimating fair values, e.g. The European Group of Valuers' Associations, The Royal Institute of Chartered Surveyors and the European Public Real Estate Association (Nelssen & Zuelch, 2011).

In conclusion it can be stated that the fair values of investment properties are far from objective truths but rather a result of combining complex valuation methodologies with subjective estimates, lagging historical transaction prices and behavioral biases of human nature. It is therefore logical that financial markets do not take these valuations at face value but apply their own judgment in assessing the properties in question. This unavoidably leads to differences between the reported property values and the value estimates provided by the financial markets. Such differences are often reflected in the observed NAV discounts.

3 Literature Review and Hypothesis Development

3.1 Internal Versus External Valuation

According to our understanding only two previous studies have analyzed the relationship between appraiser objectivity and the accuracy of investment property valuations. Both of these studies have been done before the application of IFRS standards became mandatory for European companies and the results are therefore not directly comparable to our study. Dietrich et al. (2001) studied UK property companies during 1988–1996 and found that valuations made by external appraisers are generally more accurate than valuations conducted internally. The authors reached this conclusion by comparing sales prices of individual properties to their previous balance sheet values (the lower the difference the more accurate the balance sheet valuation).

Muller and Riedl (2002) analyzed the objectivity of property appraisers by using bid-ask spreads of share prices as a proxy for the accuracy of property

valuations. They used a sample 255 firm-year observations over the period 1990–1999 and compared the spreads of companies conducting valuations internally to the spreads of companies using external appraisers. Their results showed that markets trust fair values based on external appraisal more than values based on internal appraisal. This fact was reflected in lower bid-ask spreads for companies using external valuations.

3.2 NAV Discounts

The literature on NAV discounts is also relevant for our study as this strain of research is closely linked to the discussion about the reliability of reported property values. Academics have for decades tried to provide reasons for this anomaly but no common understanding has yet been reached. However, the research has been able to generate a long list of company specific factors which might affect, and partially explain, the discount.

Leverage is one of the variables that have been researched extensively in connection with the NAV discount. However, the theoretical relationship is two-folded. On one hand, an increased leverage ratio could be seen as a disciplinary mechanism which provides management with an incentive to act diligently. This point of view would support the conclusion that increasing debt levels decrease NAV discounts. On the other hand, an increased leverage ratio also makes the possibility of a default more probable. This viewpoint supports the argument that an increased leverage ratio should increase the NAV discount. (Bendetto & Morri, 2009) Previous literature has in large part supported the latter argument (i.e. debt is positively correlated with the NAV discount). For example, Barkham and Ward (1999) found that the relation between debt and NAV discount is positive. Bond and Shilling (2004) and Brounen and Laak (2005) have also found evidence that supports this strain of thought.

The size of listed real estate companies and closed-end funds has also received a lot of interest. Many authors claim that larger companies have better access to capital markets, they are able to take part in larger and possibly more lucrative deals, their shares often have better liquidity, and they are able to profit from economies of scale. Also, size is often used as a proxy for risk (i.e. the larger the company, the smaller the risk). This line of reasoning would suggest that the larger the company, the smaller the NAV discount should be. Previous literature has also supported this logic. Allen and Sirmans (1987) were able to show that announcements of REIT mergers decreased NAV discounts and the authors argued that this was due to the increased size of the merged company. Capozza and Lee (1995) studied REITs during 1985–1992 and found strong evidence that smaller REITs trade at a discount compared to large REITs. Similar results were also achieved by Brounen and Laak (2005) and Clayton and McKinnon (2001). Contradictory results were found by Barkham and Ward (1999) and Bond and Shilling (2004) but the results of these studies were not statistically significant.

Diversification is a third factor (in addition to leverage and size) which can be argued to act as a proxy for risk. Diversification goes often hand-in-hand with size but it has also been studied separately. However, these studies have not found

any conclusive evidence on the matter. Bond and Shilling (2004) used the level of unsystematic risk as a proxy for diversification and found that the NAV discount decreases when diversification increases. Brounen and Laak (2005) used another proxy for diversification, namely geographical spread of investments. They found no statistically significant relation between diversification and the NAV discount. Capozza and Lee (1995) used a diversification index (HHI) in their research setting and their results showed that the relationship between diversification and NAV discount is dependent on the property type that the company concentrates on. In conclusion it can be stated that the results on the subject of diversification are very mixed.

Barkham and Ward (1999) argued in their research that insider ownership would align the interest of management with the interests of owners. This would lead to lower NAV discounts as investors would not have to worry about management making decisions that are not in their best interest (e.g. payments of unjustified bonuses or acquisitions that destroy value). This strain of thought is also very common to a wide variety of corporate governance literature (e.g. Warfield & Wild, 1995) and is based on the idea that management with conflicts of interest destroy shareholder value and thus justify a larger NAV discount. Malkiel (1995) on the other hand argued that investors are normally able to make a quick one-off profit by liquidating a company which is selling at a discount, but if management has a significant ownership in the company this will not necessarily be possible. According to Malkiel's argument insider ownership would lead to larger NAV discounts. However, Malkiel's logic does not provide a reason for the existence of the initial NAV discount; it only explains the longevity of these discounts. Barkham and Ward (1999) did an empirical study on the subject but found no statistically significant relation between insider ownership and NAV discount. Clayton and McKinnon (2001) also studied the subject but were unable to find significant results. Therefore, even though the logic behind Barkham and Ward's (1999) argument is widely accepted, empirical research has not been able to confirm it.

Another variable that has been widely studied is reputation. The logic for the relation between NAV discount and reputation is much the same as and with NAV discount and insider ownership. Good management is more likely to increase than to destroy shareholder value and the assets owned by the company are therefore more likely to be valued at par or even at a premium. Also, the reputation of good management usually makes funds and companies more popular among investors, which leads to higher valuation multiples, and thus to a lower NAV discount. The main problem in this approach is to find suitable proxies for management reputation. The most common proxy used in research is the performance of the share price. This approach was adopted by Barkham and Ward (1999) and they found that increased management reputation leads to a decreased NAV discount. Similar findings were made by Brounen and Laak (2005). Morri et al. (2005) used a different approach by forming a proxy for reputation from the relation of management bonuses to total salaries. They also found supportive evidence for the arguments presented earlier.

Nelssen and Zuelch (2011) studied the relationship between the reliability of fair values and the NAV discount. They used bid-ask spreads as a proxy for the reliability of reported fair values (i.e. the lower the spread the more reliable the reported values). The authors relied on a sample of 179 firm years representing 76 European property companies that reported valuations according to IFRS 40. The results confirmed the authors' initial assumption that lower bid-ask spreads are associated with lower NAV discounts.

Research has also been conducted on the relationships between NAV discounts and unrealized capital gains tax liabilities (e.g. Adams & Venmore-Rowland 1989 and Barkham & Ward, 1999), liquidity (e.g. Capozza & Seguin, 1999), management expenses (e.g. Malkiel, 1995; Barkham & Ward, 1999), institutional ownership (e.g. Clayton & McKinnon, 2001; Morri et al. 2005) and performance (e.g. Morri et al. 2005; Morri, 2006). However, the results of these studies do not provide any additional value for this paper.

3.3 Hypothesis Development

The results of the research described in chapters 3.1 and 3.2 can be summed up by three words: risk, uncertainty and trust. Even though there are some conflicting results most of the research clearly indicates that value relevance increases when the risk and uncertainty associated with a company decreases. Similarly, as the trust that financial markets place in the management of a company increases, value relevance increases.

Our hypothesis is based on these aforementioned principles. We assume that the use of a third party appraiser increases the trust that investors place in reported property values and this translates into increased value relevance for investment property disclosed in the balance sheet. Based on the surveyed literature the following hypothesis is formed (stated in the alternative form):

The positive relationship between the fair value of investment property and market value of equity is lower for companies valuing properties internally in comparison to companies that value properties by using third party appraisers.

4 Data and Methodology

4.1 Sample Selection

A sample of European publicly listed real estate companies was selected in order to test the hypothesis of the study. European real estate companies were selected due to the fact that EU legislation requires all publicly listed companies to apply a common accounting framework, i.e. International Financial Reporting Standards (IFRS). This makes the publicly disclosed data more comparable and consistent across companies. If companies applying different accounting frameworks would have been included in the sample the results of the study might have been less reliable.

The sample used in the study consists of companies that have been classified according to the Global Industry Classification Standard (GICS) to the *Real Estate* industry group. The *Real Estate* industry group is codified in this taxonomy

by sub-code 4040. This industry group is further divided into the following sub-industries which are all included in the sample:

- 40402010 – Diversified REIT's
- 40402020 – Industrial REIT's
- 40402030 – Mortgage REIT's
- 40402040 – Office REIT's
- 40402050 – Residential REIT's
- 40402060 – Retail REIT's
- 40402070 – Specialized REIT's
- 40403010 – Diversified Real Estate Activities
- 40403020 – Real Estate Operating Companies
- 40403030 – Real Estate Development
- 40403040 – Real Estate Services

An initial sample is extracted from the *Thomson Financial Datastream* and *Thomson Financial Worldscope* databases. This definition yields a sample of 363 companies.

Companies for which all inputs needed in the regression models are not provided by the *Thomson Financial Datastream* or *Thomson Financial Worldscope* databases are eliminated from the sample. Companies that do not value properties at fair value are also eliminated. Additionally, companies that do not provide financial statement information for fiscal year 2012 in English, Finnish, Swedish, Danish or Norwegian are eliminated from the sample. This is done due to the limited language skills of the author.

In the next step companies that do not have a fiscal year that is equal to the calendar year are eliminated from the sample. This is done in order to not allow general market movements to distort the found associations between observed variables. Additionally, companies that do not comply with the disclosure requirements of IAS 40, or do not provide the required information in a clear and understandable manner, are also eliminated from the sample.

Finally, companies with price to book ratios below 0.2 and companies for which investment property represents below 15 percent of total assets are eliminated from the sample. Price to book ratios below 0.2 indicate that investors have completely lost trust in the reported balance sheet figures or alternatively the company is in liquidation. Neither of these situations is normal to financial markets and the inclusion of these companies in the sample would distort the results of the analysis. Companies with low levels of investment property are eliminated because we are looking for associations between investment property and market value, and for these companies investment properties are not a significant source of value. Both of these thresholds have been subjectively determined by the authors based on judgment.

After conducting all of the previously described steps the methodology yields a final sample of 97 companies. Table 1 illustrates the sample selection process.

Data on the amount of investment properties held by sample companies is collected manually from the annual reports for fiscal year 2012. All other variables needed for the regression models are collected from the *Thomson Financial*

Table 1: Sample selection.

Step	Change	Observations
All companies with GICS code 4040 (initial sample)	+363	363
Eliminated due to lack of regression inputs from databases	-64	299
Eliminated due to not using fair values	-15	284
Eliminated due to not disclosing the exact mix of fair values and cost based values	-4	280
Eliminate due to lack of financial statement information in English, Finnish, Danish, Swedish or Norwegian	-125	155
Eliminated due to unconventional fiscal year	-37	118
Eliminated due to insufficient IAS 40 disclosures	-11	107
Eliminated due to investment property representing below 15% of total assets	-4	103
Eliminated due to P/B-ratio being below 0.2	-6	97
Final sample		97

Datastream and *Thomson Financial Worldscope* databases. All of the collected data is converted into Euros based on the exchange rates provided by the European Central Bank for the date 31.12.2012. The geographical distribution of the countries of domicile for the final sample companies are depicted in Appendix 1.

4.2 Research Methodology

The regression model that is used to answer the research hypothesis is based on previous value relevance literature by Barth and Clinch (1998), Lourenco and Curto (2008), Kolev (2008) and Song et al. (2008). All of the aforementioned authors use similar regression models to analyze the value relevance of specific balance sheet items. The regression models are based on the same basic principle which is presented by the following regression equation:

$$Price = \alpha + \beta_1 * BalanceSheetItem + \beta_2 * NetBookEquity + \beta_3 * Controls + \varepsilon \quad (1)$$

The dependent variable is the quoted market price of the company's shares. Factor α represents the regression constant and ε represents the error term (i.e. the variance in the dependent variable that is not predicted by the regression equation). The equation includes two independent variables: The balance sheet item(s) which are of interest (*BalanceSheetItem*) and net book equity (*NetBookEquity*). Net book equity is defined as book value of equity subtracted by the balance sheet item(s). The control variables included in the equation differ between researchers but all of the authors included some measure of profitability as one of the control variables. Net income is chosen as the control variable for our study as well. Return on equity and other control variables were also tested in preliminary runs of the regression model but these variables did not provide the model with any significant additional explanatory power.

In our research the balance sheet items to be studied are properties. We define properties as assets that have been classified according to IFRS-standards to *Investment Property* (IAS 40) or *Non-current Assets Held for Sale and Discontinued Operations* (IFRS 5). Both of these categories have similar valuation requirements and are therefore treated equally in our analysis. Properties classified to *Property Plant and Equipment* (IAS 16) or *Inventory* (IAS 2) are not included in our definition of property as they are valued differently from investment property.

The regression model used to answer the research hypothesis divides fair value properties into two different variables: internally valued properties (*InternalProperties*) and properties valued by third party appraisers (*ExternalProperties*). The regression model is presented below.

$$Price = \alpha + \beta_1 * ExternalProperties + \beta_2 * InternalProperties + \beta_3 * NetBookEquity + \beta_4 * NetIncome + \varepsilon \quad (2)$$

Where:

<i>Price</i>	Market value of company shares on March 31 st 2013
α	Intercept
$\beta_1 - \beta_4$	Regression coefficients
<i>ExternalProperties</i>	Book value of properties valued by 3rd party appraisers
<i>InternalProperties</i>	Book value of properties valued internally by the company
<i>NetBookEquity</i>	Book value of equity subtracted by <i>ExternalProperties</i> and <i>InternalProperties</i>
<i>NetIncome</i>	Net income
ε	Residual

As stated above, the market value of the companies' shares is based on the share price on March 31st 2013. This is done in order for markets to have time to effectively transfer the information included in the annual report into the share price. A similar approach has also been used by previous authors (see e.g. Biddle et al. 1997, Beaver et al. 2007, Entwistle et al. 2010 and Barth et al. 1998). Appendix 2 provides descriptive statistics on the variables collected for the final sample of 97 companies.

4.3 Limitations

The sample selection methodology suffers from the possibility that some companies might be subsidiaries of other sample companies. This might lead to the same assets being accounted for twice which could distort the results of the regression models. The problem is not seen as too severe to significantly decrease the reliability of the results. Furthermore, because the sample is restricted to companies which provide financial reports in English, Finnish, Swedish, Norwegian or Danish; some countries can be underrepresented in the sample compared to the relative size of

the country's real estate sector. This applies especially to France because French companies often publish annual reports only in French. The UK is also expected to be underrepresented in the sample because companies with unconventional fiscal years (i.e. fiscal years not equal to the calendar year) were eliminated from the sample. Such fiscal years are a common practice in the UK.

It should also be noted that differences in the subsamples that are compared to each other (*InternalProperties* vs. *ExternalProperties*) have to be taken into account when the results of the regression models are evaluated. It might, for example, be that companies that use external appraisers have a common characteristic that is not present in companies which value properties internally. This characteristic might affect found value relevance indicators and thus distort results if it is not taken into account in the regression model.

The time frame of the study is confined to only one year which might limit the generalizability of the results. It is not known if the ongoing sovereign debt crisis has an effect on the found associations or whether the results of the regression model would have been different if the sample data was collected in a more stable economic environment. The small sample size also creates its limitations for the generalizability of the results. Another factor worth considering is the limited industry coverage of the study. While real estate investment companies are the main holders of investment property, this limitation in the sample creates uncertainty about the possibilities of generalizing results into other industries.

There are also two additional limitations which are common to equity value regressions. One is that the tests cannot distinguish between relevance and reliability. If no statistically significant association is found between the fair values of certain assets and the market value of equity, does this indicate that the financial markets do not find the fair values in question relevant, or are the reported values not reliable? The models used in the current research, and in similar studies, are not able to make a distinction between these two possibilities. Another common weakness in value relevance studies is that the assets which represent the core economic value of firms may not be balance sheet items making it difficult to control for their effect on equity values. Possible omitted off-balance-sheet items that are correlated with the reported fair values will bias the estimated relation between market equity values and the reported fair values. (O'Brien, 2005)

5 Results

Tables 2 and 3 present Pearson and Spearman correlation coefficients for the variables used in the regression model. Two-tailed testing is used because relationships between tested variables can exist in both directions. Only one statistically significant strong correlation (i.e. $r > 0.70$ or $r < -0.70$) is found between independent variables (Linneman, 2011; Willoughby, 2015). Such a correlation is found between *ExternalProperties* and *NetBookEquity*. This strong relation is supported only by the Pearson correlation statistic while the Spearman correlation for this relation is moderate (Pearson -0.841 ; Spearman -0.526). Because *NetBookEquity* is defined as book equity subtracted with properties, it is logical that the variables have a strong negative correlation.

Moderate correlations (i.e. $0.30 < r < 0.70$ or $-0.30 > r > -0.70$) and weak correlations (i.e. $0.00 < r < 0.30$ or $0.00 > r > -0.30$) can be found between several independent variables (Linneman, 2011; Willoughby, 2015). The correlations between these variables are logical in nature. For example, the variables *InternalProperties* and *ExternalProperties* have a moderate negative correlation (Pearson not significant; Spearman -0.603) which is understandable as in most cases all of the properties of an individual company have been valued either externally or internally. Because one valuation method usually excludes the use of the other method, a negative correlation is a logical outcome.

We do not expect multicollinearity to be a severe problem because there was only one instance of strong correlation between the independent variables and this correlation had a logical explanation. This conclusion is also supported by the collinearity statistics in table 4 which will be examined more closely in later paragraphs.

When we examine the correlations between the dependent variable (*Price*) and the independent variables we find preliminary supportive evidence for our hypothesis. A statistically significant strong correlation can be found between *Price* and *ExternalProperties* (Pearson 0.894; Spearman 0.561) while no statistically significant correlation can be found between *InternalProperties* and *Price*. This clearly indicates that properties valued externally are more value relevant than internally valued properties. *NetIncome* and *NetBookEquity* also have statistically significant correlations with *Price*. The positive correlation between *NetIncome* and *Price* indicates that our control variable has explanatory power. The negative correlation between *Price* and *NetBookEquity* is explained by the formula for the calculation of the latter variable (i.e. book value subtracted by properties). All of the statistically significant correlations found are significant at the 0.01 confidence level.

Table 4 presents the collinearity statistics for the regression model. As the values for the condition index are significantly smaller than the critical value

Table 2. Pearson correlations for the variables of regression model.

		Price	Net- Income	External- Properties	Internal- Properties	NetBook- Equity
Price	Correlation	1				
	Sig. (2-tailed)					
NetIncome	Correlation	.695**	1			
	Sig. (2-tailed)	.000				
ExternalProperties	Correlation	.894**	.520**	1		
	Sig. (2-tailed)	.000	.000			
InternalProperties	Correlation	.159	.079	-.160	1	
	Sig. (2-tailed)	.120	.440	.117		
NetBookEquity	Correlation	-.836**	-.395**	-.841**	-.327**	1
	Sig. (2-tailed)	.000	.000	.000	.001	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 3: Spearman correlations for the variables of regression model.

		Price	Net- Income	External- Properties	Internal- Properties	NetBook- Equity
Price	Correlation Sig. (2-tailed)	1				
NetIncome	Correlation Sig. (2-tailed)	.503** .000	1			
ExternalProperties	Correlation Sig. (2-tailed)	.561** .000	.120 .243	1		
InternalProperties	Correlation Sig. (2-tailed)	.077 .455	.132 .198	-.603** .000	1	
NetBookEquity	Correlation Sig. (2-tailed)	-.815** .000	-.317** .002	-.526** .000	-.181 .076	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4. Collinearity statistics for regression model.

Dimen- sions	Eigen- value	Condition Index	Variance Proportions				
			(Con- stant)	NetIn- come	Internal- properties	External- Properties	NetBook- Equity
1	2.666	1.000	.04	.03	.00	.00	.00
2	1.088	1.565	.07	.08	.08	.00	.00
3	.750	1.886	.24	.28	.05	.00	.00
4	.478	2.361	.60	.25	.01	.01	.02
5	.017	12.377	.05	.36	.86	.98	.98

of 30 (serious multicollinearity) we find supportive evidence for our previous inference that there are no significant problems with multicollinearity in the regression model. Because all the values for the condition index are also below the critical value of 15 (possible multicollinearity) we can be confident that no multicollinearity exists in our regression model.

We check the homoscedasticity and normality of residuals for the regression model by plotting a p-p plot of standardized residuals and predicted values. The results are presented in Figure 1. The plot indicates that our regression model includes some tendency in the error terms. The plot of residuals fits the expected pattern well enough to support a conclusion that the residuals are to a large extent normally distributed. However, moderate tendency in error terms might be present. This does not invalidate our regression model but it should be taken into account when interpreting the results.

When heteroscedasticity is present the standard errors might be biased which could lead to bias in test statistics and confidence intervals. However, if heteroscedasticity is not significant, OLS significance tests should be unaffected. (Asteriou & Hall, 2007) We therefore believe that our results can be used without concern of serious distortion.

Table 5 provides the model summary for the regression model. Based on the R-square value the regression model is able to predict 95.6 percent of the

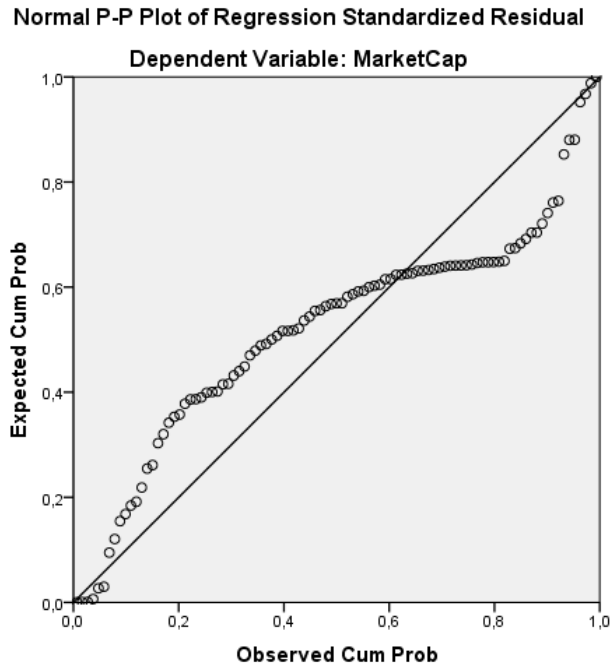


Figure 1. Normal P-P Plot of standardized residuals and predicted values.

Table 5. Model summary for regression model.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.978	.956	.954	409 088 646.40	1.969

total variance in the market value of equity. The adjusted R-square value (0.954) is only 0.2 percentage points smaller than the unadjusted value which indicates that the sample is representative of the total population. The Durbin-Watson statistic (1.969) is between the thresholds of 1.5 and 2.5 which suggests that there is no significant linear autocorrelation in the model. In fact the Durbin-Watson statistic for model 2 is very close to optimal value of 2.0 which indicates that autocorrelation is almost nonexistent in our model.

Table 6 provides the regression coefficients for the regression model. The p-values show that all of the coefficients are statistically significant at the 0.01 confidence level. The unstandardized regression coefficients show that a one Euro change in the value of *ExternalProperties* leads to a 0.796 Euro change in the value of *Price*, while a similar change in *InternalProperties* only leads to a 0.704 Euro change in *Price*. The effect of *External properties* is larger (13.1 percent), which supports our hypothesis (i.e. the value relevance of externally valued properties is higher than the value relevance of internally valued properties). The results are consistent with previous literature which has indicated that financial markets place more trust in external property valuations compared to internally valued properties (Muller & Riedl, 2002; Dietrich et al. 2011).

Table 6. Regression coefficients for regression model.

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	155041112.240	51320377.923		-3.021	.003
NetIncome	1.473	.280	.161	5.268	.000
ExternalProperties	.796	.058	1.368	13.789	.000
InternalProperties	.704	.068	.548	10.409	.000
NetBookEquity	.522	.089	.558	5.888	.000

The unstandardized coefficient of *NetBookEquity* (0.522) is smaller than the coefficients of the property variables. This means that changes in non-property assets have a smaller impact on market value compared to equally large changes in property assets. We assume that this is caused by the uncertainty in the valuation of many of these non-property assets (e.g. intangible assets and goodwill). Similar results were also found by previous research (Lourenco & Curto, 2008).

The standardized regression coefficients provide a similar picture on the effects of external valuation. The results show that a one standard deviation change in the value of *ExternalProperties* leads to a 1.368 standard deviation change in *Price*, while a similar change in *InternalProperties* only leads to a 0.548 standard deviation change in *Price*. The effect of *ExternalProperties* is thus over two times as large, which is clear evidence in support of our hypothesis (i.e. the value relevance of externally valued properties is larger than the value relevance of internally valued properties).

6 Conclusions

The purpose of the study was to find out whether financial markets perceive reported values of internally valued properties as less trustworthy than values of properties that have been valued by external appraisers. This question is of central importance both to the work of standard setting bodies and to the management of companies who want financial markets to fully reflect the underlying fundamental values of their assets.

A regression model used to compare the value relevance of internally valued properties to externally valued properties. The results provided supportive evidence for the research hypothesis as the regression coefficients of externally valued properties were larger than the coefficients of internally valued properties. We thus concluded that the objectivity of the appraiser clearly seems to have an effect on the trust that markets place on reported valuations.

The results are consistent with previous literature which has indicated that increased uncertainty, risk and management bias weaken the positive relationship between reported property values and the market value of equity. Based on the results it could be argued that if companies in the real estate sector want to minimize their NAV discount they should use a certified external property appraiser.

At a more general level the findings of the study suggest that the use of

objective inputs, in contrast to subjective management estimates, should be maximized in the valuation models of investment properties in order to increase the relevance of the disclosed valuations. Currently IAS 40 states explicitly that external appraisal is the preferred methodology for investment property valuation but it also provides companies with the option of valuing properties internally. Our findings suggest that IASB should consider converting this recommendation into a requirement.

During the data collection phase of our research we noticed that it is possible to comply with the requirements of IAS 40 by presenting information in several different formats. The standard does not mandate any specific format for the provision of the required disclosures and this creates problems with the comparability of the provided information. Consequently, a need for further harmonization in the application of the standard still exists. This could be achieved by companies voluntarily adopting similar reporting conventions or by introducing additional requirements to the standard.

We find several possibilities for further research on the subject. The results of our study could be questioned based on the relatively small sample size. For this reason, it would be beneficial to conduct similar studies with larger sample sizes. The sample could also be widened to encompass other industries besides real estate.

The findings imply that more detailed information on the valuation methodology, and on the inputs used in the models, should be provided to financial markets. Risk and uncertainty is reduced when financial markets have more information on the caveats of valuation models, which results in markets placing more trust into the values generated by these models. Further research could be conducted in order to find out whether additional voluntary disclosures increase the value relevance of investment property.

The reliability of our findings could be increased if additional analysis was performed with different research approaches. Regression models could be constructed based on interaction terms instead of simply dividing investment properties into two different variables. The statistical significance of the differences in regression coefficients could also be explored further.

The relationship between the quality of corporate governance and the value relevance of investment property could also be analyzed. Such analysis has been conducted in the context of the value relevance of financial instruments (e.g. Song et al. 2008) but it would be interesting to know whether the findings also apply to real estate assets.

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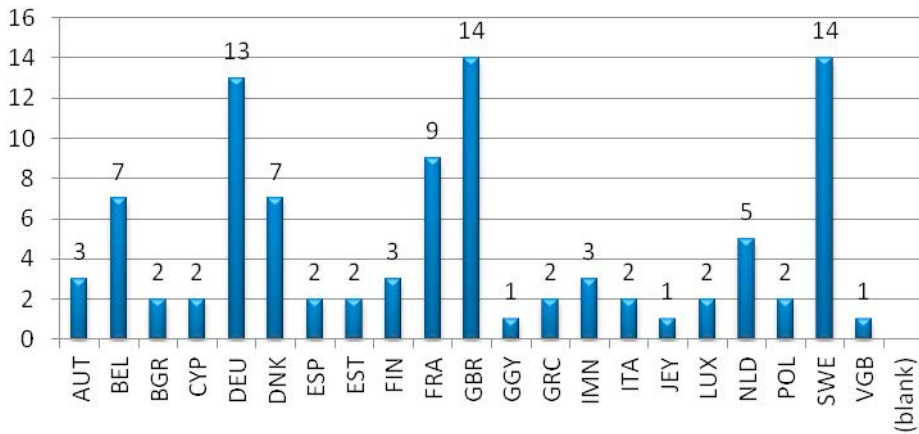
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APPENDIX 1: Countries of domicile for sample companies

Frequency, country of domicile



APPENDIX 2: Descriptive Statistics

Descriptive Statistics of Sample Companies

	N	Mean	Std. Deviation	Minimum	Maximum	25 percentile	50 percentile	75 percentile
Market-Cap	97	924,052,790	1,905,316,589	614,796	16,782,509,414	87,959,882	341,658,508	1,074,864,110
NetIncome	97	34,054,606	203,001,089	-1,129,005,000	1,458,700,000	-4,965,979	10,124,952	55,534,750
External-Properties	97	1,662,800,669	3,289,032,880	0	26,658,400,000	17,782,471	523,318,224	2,413,355,127
Internal-Properties	97	519,050,380	1,487,719,468	0	11,380,759,000	0	0	99,227,094
NetBook-Equity	97	-1,244,673,078	2,019,183,886	-13,755,900,000	84,905,019	-1,702,716,436	-530,338,149	-80,109,216