



ISSN: 2723-9535

Available online at [www.HighTechJournal.org](http://www.HighTechJournal.org)

# HighTech and Innovation Journal

Vol. 4, No. 3, September, 2023



## European Real Estate Properties Valuation: Ten Years After Adopting IFRS 13

Miroslav Škoda <sup>1</sup>, Kateřina Bočková <sup>1\*</sup>, Viera Guzoňová <sup>1</sup>

<sup>1</sup> Department of Management and Economics, DTI University, Sládkovičova 553/20, 018 41 Dubnica nad Váhom, Slovakia.

Received 06 June 2023; Revised 30 July 2023; Accepted 07 August 2023; Published 01 September 2023

### Abstract

IFRS 13 had its mandatory implementation on January 1<sup>st</sup>, 2013. The new accounting standard, which represents one step closer to harmonization between U.S. GAAP and IFRS, aims to eliminate inconsistencies in fair value measurement and its related disclosures through the introduction of new reporting requirements, specifically for assets and liabilities with no active markets. Although these demands also encompass information concerning financial instruments, our focus was on the disclosure changes related to the fair value of investment properties, previously regulated solely by IAS 40. As investment properties comprise the majority of assets in the real estate industry, this sector was further examined. Through a statistical analysis of the sample companies' annual reports for the periods immediately before and after the implementation of IFRS 13, the purpose of our descriptor-explanatory study was to investigate the level of compliance with IFRS 13 fair value disclosure requirements for investment properties in real estate companies in Europe. In order to answer this question, we first scrutinized the level of compliance with the new disclosure requirements brought up by the standard and then, intermediated by an adaptation of the model developed by Beretta & Bozzolan (2008), measured the disclosure quality for both periods considered. After data collection and analysis, our findings reveal that IFRS 13 does affect the disclosure quality of investment properties in real estate companies in Europe. Overall compliance is very high, while disclosure quality has increased since the implementation of IFRS 13. As a way to further broaden the research related to the more extensive disclosure requirements under IFRS 13, we suggest additional studies be undertaken where the point of view of the real estate companies could be explored. Moreover, it would be interesting to investigate whether the increased number of disclosures, both in relation to quantity and quality, is relevant from an analyst's standpoint.

*Keywords:* Accounting; IFRS 13; U.S. GAAP; Real Estate; Quality; Disclosure; Statistical Analysis.

### 1. Introduction

IFRS 13 had its mandatory implementation on January 1<sup>st</sup>, 2013. The new accounting standard, which represents one step closer to harmonization between U.S. GAAP and IFRS, aims to eliminate inconsistencies in fair value measurement and its related disclosures through the introduction of new reporting requirements, specifically for assets and liabilities with no active markets. Although these demands also encompass information concerning financial instruments, our focus was on the disclosure changes related to the fair value of investment properties, previously regulated solely by IAS 40. As investment properties comprise the majority of assets in the real estate industry, this sector was further examined.

In connection with our research, a company can be said to pertain to the real estate industry if it is publicly traded and derives at least 75% of its EBITDA from so-called relevant real estate activities, i.e., “(...) *the ownership, trading, and development of income-producing real estate*” [1].

\* Corresponding author: [bockova@dti.sk](mailto:bockova@dti.sk)

<http://dx.doi.org/10.28991/HIJ-2023-04-03-04>

➤ This is an open access article under the CC-BY license (<https://creativecommons.org/licenses/by/4.0/>).

© Authors retain all copyrights.

In order to obtain a more general understanding of IFRS 13 and its implications on fair value disclosures of investment properties in real estate companies, we have decided to expand our research across borders by taking into consideration real estate firms listed in Europe. According to IFRS [2], a total of 138 jurisdictions (countries) in the world require the application of accounting standards provided by IFRS. Of those, the majority (31%) are located in Europe, where IFRS has the force of law [2]. Therefore, we considered this geographic area to be homogenous enough to be analyzed as a unit.

Through a statistical analysis of the sample companies' annual reports for the periods immediately before and after the implementation of IFRS 13, the purpose of our descriptor-explanatory study was to investigate if IFRS 13 affects the disclosure quality for investment properties in real estate companies in Europe. In order to answer this question, we first scrutinized the level of compliance with the new disclosure requirements brought up by the standard and then, intermediated by an adaptation of the model developed by Beretta and Bozzolan (2008) [3], measured the disclosure quality for both periods considered.

After data collection and analysis, our findings reveal that IFRS 13 does affect the disclosure quality of investment properties in real estate companies in Europe. Overall compliance is very high, while disclosure quality has increased since the implementation of IFRS 13. Moreover, it would be interesting to investigate whether the increased number of disclosures, both in relation to quantity and quality, is relevant from an analyst's standpoint.

We emphasize that this is a unique study, both from a geographical point of view, when we carried out the evaluation across Europe, and from a scientific research point of view, since such an evaluation has not been carried out only in Europe so far. This fact is evidenced by the fact that it is not possible to find valid research and investigation outputs in the relevant information sources or databases, which we could subsequently compare with our outputs and express progressive conclusions based on the comparison of verified data. We therefore assume that the results of our research will slowly begin to fill the gap created by this lack of scientific research resources.

## 2. Literature Review

In a continuous effort towards the convergence of the two biggest set of accounting standards in the world, US GAAP and IFRS, the International Accounting Standards Board (IASB) released a new standard in 2011 which aimed at eliminating inconsistencies in the rules regarding fair value measurement and disclosures [4]. The so-called IFRS 13 entitled "Fair Value Measurement", which came into full effect in January 2013, aggregates all rules and regulations concerning fair value and substituted some related paragraphs in other standards, as IAS 40 "Investment Properties" [5] and IFRS 7 "Financial Instruments: disclosures" [4], for example.

There has been much research completed within the area of fair value measurement, e.g., [6, 7]. However, as this standard is quite new, the amount of research is extremely limited, and the majority of the published information regarding IFRS 13 has been compiled by various accounting and auditing firms. Nonetheless, that material has been based mostly on speculation about what implications IFRS 13 might have. No information has been published regarding the actual effects of the new standard. In working research by Sundgren et al. [8], which highlights disclosure quality in the real estate industry, they state that their study is "one of the first of its kind within this area" [8]. Though in their paper, they focus their attention on the old regulations (IAS 40).

Although IFRS 13 does not include significant changes concerning the methods of fair value measurement, it extensively develops the requirements for disclosures about measurement uncertainty [4]. This can be seen as a big change, especially in contrast to IAS 40, which only included rudimentary instructions about mandatory disclosures relative to the appraisal of the fair value of investment properties [8].

Concerning our research, the focal point will be the new disclosure requirements for the fair value of investment properties, which can be defined, in this context, as "*properties (land and/or building) held by the owner with the purpose of earning rent and/or for capital appreciation*" [9]. Therefore, any regulatory impact on the fair value disclosures related to financial instruments will be disregarded. The reason for such a choice is that, before the implementation of IFRS 13, some studies, e.g., [8, 10, 11], showed a great degree of variability in disclosure extent and quality regarding investment properties in countries where IFRS is applied. However, previous research published by Quagli & Avallone [12] emphasized mostly the discussion of the appropriateness of fair value appraisals in comparison to the cost model alternative or on the possible relationship between financial instruments measured at fair value and the financial crisis of 2008, as seen in Fahnstock & Bostwick [13]. Moreover, as there are no active markets for investment properties, the valuation process is not as straightforward as for, e.g., financial instruments, therefore making this an interesting area.

Leaving aside the merits and risks associated with fair value measurements, if we focus on the changes in disclosure requirements brought up by the new standard, it seems reasonable to assume that a more detailed-oriented regulation of fair value-related information would alter the number of financial statement disclosures by companies that comply at least partly with IFRS 13. Though the new standard might increase the number of disclosures, an interesting aspect to investigate is whether the quality of the disclosures improves thereafter.

In this context, we intend to construct our own quality measuring index, based on models previously developed in the literature, in order to investigate if the implementation of IFRS 13 affects fair value disclosure quality for investment properties.

Before IFRS 13 was developed and issued, a fair value hierarchy only existed for financial instruments; the new standard was accompanied by a new hierarchy that was now to be used for non-financial items [14].

The hierarchy is based on three different levels that use different inputs in order to determine fair value [2]:

- Level 1 is the level that is given the highest priority; the inputs used here are directly quoted prices that are possible to retrieve from an active market [2]. This level is often used for financial instruments because of the existence of active stock markets, but for many assets and liabilities, it could be extremely difficult or even impossible to identify these types of inputs, and this is where levels 2 and 3 are used instead.
- Level 2 excludes the inputs from an active market and takes into account other observable data that is either retrieved directly or indirectly. Within this level of the hierarchy, it is possible to examine the quoted prices for similar assets or liabilities [2]. For example, when valuing investment properties, this could involve scrutinizing properties that have been bought or sold in the last few years and that are located in a similar area.
- Though if significant adjustments had to be made to the level 2 inputs, they would clearly be classified as level 3 instead [15].

Level 1 includes not only adjusted level 2 inputs but also unobservable ones [2]. These could be generated from within the entity itself; however, when performing these types of valuations, they are often made based on many judgments and assumptions, prone to much subjectivity.

### 3. Material and Methods

#### 3.1. Research Questions and Hypothesis

From what is presented above, there is a definite shortage of research about IFRS 13 and how it has affected the mandatory disclosures and whether or not there have been any significant changes when it comes to the quality of the disclosures regarding investment properties. In this research context, we will apply the concept of quality developed by Beretta & Bozzolan [3], in which high-quality disclosures are said to help users make informed economic decisions and provide analysts with useful information for the preparation of more accurate and less dispersed estimates. Based on this starting point, our research question is: For real estate companies in Europe, what is the level of compliance with IFRS 13 fair value disclosure requirements for investment properties?

The purpose of this research is to investigate the impact of IFRS 13 on the disclosure quality of investment properties in Europe. The new standard has been accompanied by more elaborate disclosure requirements, especially when using unobservable data as the basis for fair value measurement. The IASB stated in a 2011 report that this standard would be able to reduce the inconsistencies that existed prior. However, though the mandatory disclosures have increased, another aspect of this has to be studied: the quality of the information provided. We intend to investigate whether there are other determinants than quantity that can determine the quality of disclosures.

The main preconception pervading our research is that the implementation of IFRS 13 by real estate companies indeed changed/affected their disclosure policies starting from the 2020–2021 reporting period. Such an idea is the result of the fact that IFRS 13 became mandatory for public companies in Europe from 2013 and forward; consequently, the failure to implement the alterations predicted by the new standard could result in sanctions from market regulators, which, in turn, could negatively affect market confidence in the punished firm. However, it is also expected that not all companies were equally diligent in applying the new rules; therefore, some compliance and quality variation are also believed to be present in our results.

Our research question has the aim of examining how real estate companies in Europe have responded to the disclosure demands brought up by IFRS 13. In order to determine if IFRS 13 has influenced the quality of disclosures in our investigation context, we first need to scrutinize if the new disclosure rules are actually being followed by the companies in our sample. Otherwise, any quality variation before and after the implementation of this standard could not be directly connected with IFRS 13.

Disclosures can take different shapes, both in the form of mandatory and voluntary disclosures. Though, when we examine compliance, we refer to the mandatory disclosures that real estate companies are obliged to provide in accordance with the laws and regulations that exist within this particular area. Moreover, we believe that compliance is an important aspect to study in this context, as the quality of the disclosures partially depends on how companies decide to apply the regulatory disclosure requirements [16].

In this setting we present the following hypothesis:

**H<sub>0</sub>:** The average compliance level of real estate companies in Europe to IFRS 13 disclosure requirements for investment properties ( $\mu_c$ ) = 75 %.

**H<sub>a1</sub>:** The average compliance level of real estate companies in Europe to IFRS 13 disclosure requirements for investment properties ( $\mu_c$ ) > 75 %.

**H<sub>a2</sub>:** The average compliance level of real estate companies in Europe to IFRS 13 disclosure requirements for investment properties ( $\mu_c$ ) < 75 %.

The choice of 75% as our benchmark originates from the fact that it can be expected that the compliance level is relatively high as this regulation has the force of law in this region. Though leeway is given, seeing that it is the first year of implementation and some real estate companies might have a longer transition period. We believe that 75% represents a very high compliance level, and, when testing the hypothesis, it will be our task to examine the compliance levels across real estate companies in Europe. If the collected average compliance level is equal to 75%, the null hypothesis can be accepted. On the other hand, if we fail to reject the null hypothesis, further analysis will be performed in order to determine if the average compliance level exceeds ( $H_{a1}$ ) or is inferior to 75% ( $H_{a2}$ ).

In this research, we used a quantitative strategy. In this case, quantitative research refers to the systematic collection and investigation in which a person doing the research collects data from different respondents that is based on numerical figures, and the data obtained is then analyzed for obtaining the results using different mathematical, statistical, and computational tools. The quantitative research design allows the researcher to find averages and patterns.

In this concrete study, inclusion criteria comprise the characteristics or attributes that prospective research participants must have in order to be included in the study. Common inclusion criteria can be demographic, clinical, or geographic in nature. Therefore, exclusion criteria comprise characteristics used to identify potential research participants who should not be included in a study. These can also include those that lead to participants withdrawing from a research study after being initially included. In other words, individuals who meet the inclusion criteria may also possess additional characteristics that can interfere with the outcome of the study. For this reason, they must be excluded.

In this case, 958 companies from 4 different countries, from 2 different legal environments were taken into account. Data spreads from state statistical evidence (accounting and tax evidence) in concrete countries.

### 3.2. Sampling Process

The choice of investment properties came naturally to us, as the real estate market is quite large and properties like these that are valued at fair value often use unobservable data inputs. Therefore, they automatically become subject to the more extensive disclosure requirements. Consequently, it can be assumed that there should be a significant difference in the number of disclosures and their detailed descriptions. EPRA [15] further states that IFRS 13 was not developed with only investment properties in mind but instead with a much greater focus on financial instruments. Having this in mind, our choice of industry seems relevant, and hopefully we will be able to provide a better understanding of how IFRS 13 has impacted this particular sector when it comes to disclosures and the quality of those.

In this research, we analyze the information related to fair value disclosures for investment properties present in the annual reports of real estate companies in Europe for the years immediately before and after the implementation of IFRS 13, i.e., 2019–2020 and 2020–2021. The reason for not simply stating that we will examine the annual reports for 2019 and 2020 can be explained by the fact that a part of our sample exercise split financial years. To be able to cover companies that prepare their annual reports by fiscal year and split financial year, we will, going forward, use the denotations 2019–2020 and 2020–2021. However, this has no impact on the research as IFRS 13 has effect from January 1<sup>st</sup>, 2013 or periods that start thereafter.

In order to select our sample, we turned our attention to an index constructed by FTSE in cooperation with both EPRA and NAREIT called the FTSE EPRA/NAREIT Global Real Estate Index Series. Such an index *“is designed to reflect the stock performance of companies engaged in specific aspects of the major real estate markets/regions of the world—the Americas, EMEA (Europe, the Middle East, and Africa), and Asia”* [1]. Further, one of the main reasons that motivated our choice to use this index as our starting point is the rigorous criteria to which real estate companies are subject in order to become a part of it. In this context, some of the main criteria utilized in the construction of this global index include: being listed on selected stock exchanges; providing audited annual reports in English; and deriving at least 75% of its EBITDA from the so-called relevant real estate activities, i.e., *“...the ownership, trading, and development of income-producing real estate”* [1]. Besides, the use of this index for sampling purposes was already established in peer-reviewed literature pertinent to financial reporting practices within the real estate sector [10].

Moreover, considering that our area of interest in this research is to study only real estate companies in Europe, we then focused on a regional index called the FTSE EPRA/NAREIT Europe index, which is part of the FTSE

EPRA/NAREIT Global Real Estate Index Series and is constituted by 94 companies in 16 countries (information updated in 2021). In this context, as our intention is to answer questions about both compliance with the IFRS 13 new disclosure requirements for investment properties and disclosure quality in comparison with the previous regulation (IAS 40), our next step was to check if all the constituents of the European index reported exclusively based on IFRS, i.e., without a mix with local rules, both in 2019–2020 and in 2020–2021. This criterion excluded three companies based in Turkey and one in Slovakia.

It was also possible to detect a number of companies that use the cost model as their main valuation tool for investment properties, as well as a few companies that were not publicly listed in both years, making them subject to exclusion as well. Furthermore, the remaining companies were also checked for possible early adoption of IFRS 13, which could bring heterogeneity to the sample, but none were found, leaving us with a sample composed of 77 companies from 13 countries. A summary of the performed sampling process is detailed in Figure 1.

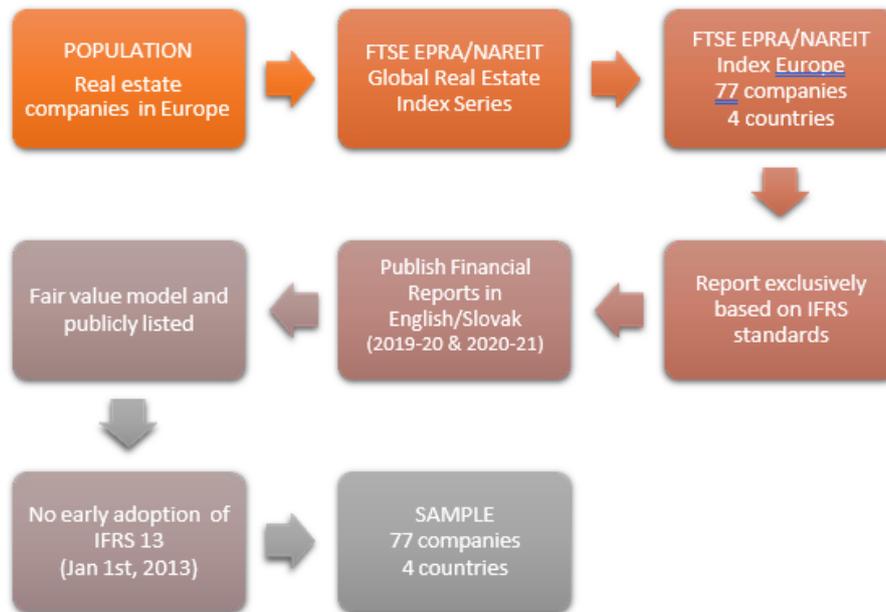


Figure 1. Sampling process

The choice of examining these specific items reflects the disclosure requirements present in IAS 40 until the end of 2012, i.e., before the mandatory implementation of IFRS 13 (Table 1).

Table 1. Mandatory and voluntary disclosures for 2012-13

Mandatory items	Voluntary items
<ul style="list-style-type: none"> <li>• Method is given</li> <li>• Assumptions, factors and/or support influencing the valuation is explained</li> <li>• Reconciliation between opening and closing balances for investment properties is given</li> <li>• Information about the use of independent appraisers is given</li> </ul>	<ul style="list-style-type: none"> <li>• Vacancy/occupancy rate is given</li> <li>• Inflation rate is given</li> <li>• Real estate yield/return is given</li> <li>• Trend in rental income</li> <li>• Fair value breakdown into geographical regions and/or segments</li> </ul>

We believe that the mandatory items laid out above are the ones that could have the greatest impact on the quality of the disclosures presented in the annual reports for 2019–2020 for several reasons. Firstly, information regarding methods and assumptions is essential to being able to understand how a company manages its investment properties, and it increases transparency between the company and outside parties. Secondly, the reconciliation between opening and closing balances in fair value allows stakeholders to better comprehend where the changes in fair value for investment properties originate (e.g., acquisitions, disposals, revaluations, etc.), and thirdly, providing information about whether the company has used an independent appraiser or not may enhance the perception of credibility regarding the values reported. A mandatory item that we decided not to include, however, was ‘highest and best use’ as information regarding this criterion is only required when the use of the property is not its highest and best, therefore it is extremely difficult to measure.

The voluntary items, on the other hand, were determined using previous literature and through analyzing a few annual reports in order to find out what information that can be disclosed in relation to valuation of investment properties. The

first three voluntary items and the final one was taken directly from Sundgren et al. [8]. We found them relevant as the inflation rate, yield and vacancy/occupancy rate have the possibility to affect the fair value and the parameters that ultimately are parts of the fair value calculations. A sensitivity analysis could, furthermore, be a good way of understanding how sensitive the fair value is in relation to specific assumptions used in the calculations.

The other two voluntary items concerning trends and fair value breakdowns were found in some annual reports, and we do believe that this type of information could be useful for investors in assessing the future prospects of a particular company. In this context, we have defined “trend” as showing rental income/expenses for at least three consecutive years, either historically or as expected rental income/expenses for the future. It could also be of interest to understand, either geographically or by segment, what areas are the ones that are contributing the most to the fair value of the investment properties.

After the implementation of IFRS 13, the mandatory disclosure requirements have changed, and the examined items have, therefore, also been altered, though the voluntary items are basically the same with only a few variations. This can be seen in Table 2.

**Table 2. Mandatory and voluntary disclosures for 2020-2021**

Mandatory items	Voluntary items
<ul style="list-style-type: none"> <li>• Mention hierarchy level</li> <li>• Mention valuation technique</li> <li>• Show reconciliation between opening and closing balances</li> <li>• Mention inputs used</li> <li>• Level 3: Explain valuation process</li> </ul>	<ul style="list-style-type: none"> <li>• Vacancy/occupancy rate is given</li> <li>• Inflation rate</li> <li>• Real estate yield/return is given</li> <li>• Trend in rental income is given</li> <li>• Fair value breakdown into geographical regions and/or segments</li> </ul>

As stated before, a major implication of the implementation of IFRS 13 was the introduction of a fair value hierarchy. As this was the most extreme change, the new and extended mandatory disclosure requirements are mostly related to this hierarchy. Several disclosure requirements usually only apply to level 3; however, as level 2 is sometimes also used, we have determined the mandatory items by examining IFRS 13 and having both levels in mind. Moreover, even though there are some clear differences between the mandatory items for 2019–2020 and 2020–2021, the emphasis is still on the method(s) used and the information given about the valuation process, with only small variations. Considering the voluntary items, we have decided to examine the same items as for 2012–2013; however, as a sensitivity analysis is mandatory under IFRS 13, this requirement is now located under mandatory items instead of voluntary items.

When studying coverage for each company in our sample, our objective will be to observe if the real estate companies have mentioned any type of information in relation to the topics above. For each topic that has been covered, a 1 will be given; otherwise, 0. The total score that can be reached is 5 for IAS 40 and 7 for IFRS 13.

Finally, the last topic concerns the information provided on rental income/expenses (topic 5A), as this factor tends to be one of the main inputs in the fair value calculation. In this context, we mostly observed disclosures related to future expectations and tenant composition. Furthermore, details regarding the tenants become especially important when a few tenants represent a major part of a company’s rental income, and, therefore, information in this regard could allow the reader a better understanding of how the loss of an important tenant could affect the revenues in the company and, ultimately, the fair value of investment properties.

Regarding the subtopics for 2020–2021, only a few changes have been made in comparison to 2019–2020. Topic 1A is substituted by topics 1B, 2B, and 3B (see Table 3), which directly relate to the new disclosure requirements brought up by IFRS 13 concerning hierarchy levels, valuation technique, inputs, and the valuation process. Under these circumstances, although companies are only obliged to point out which hierarchy levels their investment properties belong to, many firms chose to provide a definition of the IFRS 13 hierarchy, which we suppose was due to the novelty of this classification to the users of financial statements. Therefore, such clarification of the levels’ meanings as well as an explanation on why the valued properties were considered to pertain to the reported level were included as subtopics to topic 1B.

Based on the same reasoning that this information could provide a better understanding of fair value determination, similar subtopics regarding the definition of the used valuation techniques and the reason why specific techniques were chosen are part of topic 2B. Furthermore, topic 3B related to the use of inputs and the valuation process encompasses the possible presentation of common inputs used in the fair value calculations, the explanation of how these inputs influence the valuation (positively/negatively) and the rendition of how the valuation model used is constructed. Topic 4B (reconciliation of OB and CB), on its turn, remains unaltered in comparison to topic 4A.

**Table 3. Subtopics for 2020-2021 under IFRS 13**

Topic 1B: Hierarchy Level	<ul style="list-style-type: none"> <li>• Subtopic 1B.1: Definition of the levels</li> <li>• Subtopic 1B.2: Reason why they chose a certain level</li> </ul>
Topic 2B: Valuation	<ul style="list-style-type: none"> <li>• Subtopic 2B.1: Define/explain the valuation technique</li> <li>• Subtopic 2B.2: Reason why they chose or did not chose a certain approach</li> </ul>
Topic 3B: Inputs and valuation	<ul style="list-style-type: none"> <li>• Subtopic 3B.1: Price per square meter or long-term net operating income margin (Level 2) and/or discount rate (Level 3)</li> <li>• Subtopic 3B.2: how such factors/assumptions influence the valuation</li> <li>• Subtopic 3B.3: how the valuation model is constructed</li> </ul>
Topic 4B: Reconciliation	<ul style="list-style-type: none"> <li>• Subtopic 4B.1: Changes in fair value for more than 2 periods</li> </ul>
Topic 5B: Use of appraiser	<ul style="list-style-type: none"> <li>• Subtopic 5B.1: How often a valuation is made</li> <li>• Subtopic 5B.2: Use of an external appraiser</li> <li>• Subtopic 5B.3: External appraiser report</li> <li>• Subtopic 5B.4: Name of external appraiser</li> <li>• Subtopic 5B.5: More than 1 external appraiser</li> </ul>
Topic 6B: Sensitivity Analysis	<ul style="list-style-type: none"> <li>• Subtopic 6B.1: At least two scenarios are given</li> <li>• Subtopic 6B.2: Four or more scenarios are given</li> <li>• Subtopic 6B.3: Table format</li> <li>• Subtopic 6B.4: Other input than discount rate is given</li> </ul>
Topic 7B: Income/expenses	<ul style="list-style-type: none"> <li>• Subtopic 7B.1: Changes in fair value for more than 2 periods</li> </ul>

Similarly, in regards to topic 6B (sensitivity analysis), another subtopic has been added: whether any other input than the most common one (discount rate) is given.

For the subtopics for both 2019-2020 and 2020-2021, it is possible to receive two points for each subtopic fulfilled if the description is done extremely well; otherwise, one point is given, and if no information is provided, a zero is denoted.

### 3.3. Statistical Evaluation

In order to answer our research question, a number of statistical tests are applied.

Applied to assess if the normality assumption was satisfied in this context. Though there are several other tests within the same area, Shapiro-Wilk’s test has proven to be superior when it comes to testing for normality, as it is highly sensitive for non-normality, as confirmed by Shapiro et al. [17]. There are three different ways in which central tendency can be measured (mean, median, and mode), though the mean is the one that is mostly used. Our hypotheses reflect that fact, and therefore, in order to assess them, some specific tests are performed [18]. As we are investigating how the average value of the compliance scores in the sample behaves against a pre-established value of 75% and the standard deviation of the population is unknown, a one-sample t-test is used to test the hypothesis.

A one-sample t-test has its best use when the researcher wants to compare the sample mean to a certain test value, which, in our case, is equal to 75% [19]. Furthermore, although it is very similar to a Z-test, the t-test does not assume that the standard deviation of the population is known [19], which makes it ideal to test the hypothesis.

Matthews & Kostelis [20] recommend the use of a paired-sample t-test when “*examining differences between two conditions when the same participants are measured twice in a repeated-measures research design*”. In our research, the “conditions” are the quality scores for 2019–2020 and 2020–2021, and the “participants” are the real estate companies being analyzed. As the composition of the sample is exactly the same for both periods, we are basically comparing the results obtained by the companies before and after the implementation of IFRS 13 in a repeated-measures design manner. The interpretation of this test’s results is very similar to the one previously described for the one-sample t-test. However, a low p-value in this case signals that the difference in disclosure quality scores is statistically relevant.

Furthermore, this test utilizes the so-called F-statistic, which is a result of the variance between groups divided by the variance within groups [21]. The product of this calculation is associated with a corresponding p-value, which, similarly to a t-test, will represent a significant difference between means only when lower than the adopted significance level.

### 3.4. Research Limits

As for the limitations, time constraints do limit our research in some ways. If we had had more time, it could have been interesting to explore other industries as well; this could have made our study broader.

The limited sample size of one industry makes our results hard to generalize to other industries and sectors. Furthermore, in this research, we will only utilize and analyze annual reports, disregarding other information that real estate firms may distribute to internal as well as external parties. This choice originates from the fact that annual reports have a more rigid structure and are less sensitive to short-term changes in incentives to disclose due to their long-term orientation, which should result in less disclosure quality volatility than press releases [22]. Moreover, we will examine the annual reports from 2013, but as they are the first annual reports published implementing IFRS 13, some firms might not have adopted the new standard completely, as there is always a transition period.

Concerning our target audience, we aim towards educated parties that possess prior knowledge within the areas of accounting and fair value measurement. This becomes a limitation, as it will be difficult for parties without this knowledge to follow our way of reasoning. We also want to highlight that in this study we will focus our attention on investment properties that are held by the owner, i.e., the real estate companies, hence disregarding investment properties held under financial leases.

Finally, quality is hard to measure, and as there are no direct quantitative measures, we will develop proxies in order to measure quality; however, this means that there will be subjectivity involved to a certain extent as we develop the proxies ourselves with some guidance from previous research.

## 4. Results

Below, we will present the descriptive and summary statistics, where the compliance scores as well as the quality scores will be analyzed in relation to firm size, leverage, and profitability.

In order to obtain a broader perspective on our sample, composed of a total real estate company, general data concerning firm size, leverage, profitability, and chosen audit firm was collected with the help of DataStream and the companies' annual reports. As previously discussed, these firm-level factors are often considered to have a great impact on firms' disclosures, especially concerning the amount of corporate information made public [23–25]. Therefore, we became interested in examining the relationship between such variables and compliance with IFRS 13 disclosure requirements and, also, overall disclosure quality. The descriptive statistics for the measures of firm size, leverage, and profitability can be seen in Table 4.

**Table 4. Descriptive Statistics (Firm Size, Leverage and Profitability)**

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Firm Size in 2019-2020	77	ME163,35	ME16.782,50	ME1.579,09	ME2.266,32	5136212.51
Debt-to-equity ratio in 2019-2020	77	13.23	256.57	113.66	61.78	3817.26
ROE in 2019-2020	77	-14.88	36.82	6.01	9.13	83.37
Firm Size in 2020-2021	77	ME242,19	ME18.110,96	ME1.774,72	ME2.498,64	6243205.76
Debt-to-equity ratio in 2020-2021	77	19.87	236.91	104.39	56.99	3248.10
ROE in 2020-2021	77	-21.85	39.36	9.25	9.13	83.34
Valid N (list wise)	77	-	-	-	-	-

Firm size is, in this context, represented by the market capitalization of the company, the amount of leverage by the corporate debt-to-equity ratio, and profitability by return on equity. Under these circumstances, by analyzing the frequencies of the first variable for both the period immediately before the implementation of IFRS 13 and the first year of mandatory adoption of such a standard, it's possible to observe that our sample includes a wide range of firm sizes (from ME163,35 to ME16.782,50 in 2019-2020 and from ME242,19 to ME18.110,96 in 2020-2021), displaying a large spread of values around the mean [26], as its standard deviation reached ME2.266,32 in 2019-2020 and was even higher in 2020-2021.

Although such statistics might seem undesirable at first glance, the variability in firm sizes serves the purpose of our study, as we are trying to draw a picture of an entire industry. Besides, as demonstrated in Tables 5 to 7, no significant correlation was found between market capitalization and disclosure compliance (p-value = 0.725), nor between this measure of firm size and the disclosure quality scores (p-value IAS40 = 0.524 & p-value IFRS13 = 0.257) obtained in both observed periods and, therefore, will not impact the variability of these measurements.

**Table 5. Correlation between Compliance Levels and firm-level factors**

	Compliancelevels	Debt-to-equity ratio in 2020-21	Return on equity in 2020-21	Firm Size in 2020-21
Pearson Correlation	1	0.160	-0.070	0.041
Sig. (2-tailed)	-	0.165	0.543	0.725
Levels	-	-	77	77
N	77	77	-	-

**Table 6. Correlation between Quality Scores (IAS 40) and firm-level factors**

	Quality score IAS40	Debt-to-equity ratio in 2019-20	Return on Equity in 2019-20	Firm Size in 2019-2
Pearson Correlation	1	0.311**	-0.044	0.074
Sig. (2-tailed)		0.006	0.705	0.524
N	77	77	77	77

**Table 7. Correlation between Quality Scores (IFRS 13) and firm-level factors**

	Quality score IFRS 13	Debt-to-equity ratio in 2020-21	Return on equity in 2020-21	Firm Size in 2020-21
Pearson Correlation	1	0.267	-0.051	-0.131
Sig. (2-tailed)		0.019	0.660	0.257
N	77	77	77	77

Additionally, in spite of the fact that the lack of relationship, especially between firm size and disclosure quality, seems to negate the previous findings of Ahmed & Courtis (1999) [25], which connected larger firms with a greater quantity of disclosures, it's vital to remember that our measurement of quality takes into consideration more than just the absolute amount of disclosures and considers only information pertinent to the guidelines of IFRS 13 on the fair value of investment properties.

Concerning the debt-to-equity ratios obtained in the sample, a slight decrease in the average corporate leverage can be seen (from  $\mu_1 = 113.66$  in 2012–13 to  $\mu_2 = 104.38$  in 2020–21), which could possibly indicate that some companies raised more equity during the period, for example. In this context, a significant positive correlation ( $r_{IAS40} (75) = 0.311$ ,  $p\text{-value} = 0.006$  and  $r_{IFRS13} (75) = 0.267$ ,  $p\text{-value} = 0.019$ ) can be found between this leverage measure and the quality scores both before and after IFRS 13, as tested by Tables 7 and 8, which could be interpreted as an increase in leverage being connected with an increase in disclosure quality, although such a relation is weak (both correlations are under 0.4). Therefore, this positive relationship falls in line with existing literature [27], which associates better disclosures with high-leveraged firms as a way to decrease information asymmetry with creditors.

In regards to the profitability measure based on the return on equity ratios, our sample companies achieved a better average profitability in 2020–2021 than in the year before ( $\mu_1 = 6.01$  to  $\mu_2 = 9.25$ ) based on a slightly lower spread (see Table 5). On the other hand, no significant correlation was found between profitability and compliance or disclosure quality, as opposed to Lang & Lundholm's [28] findings about more profitable companies disclosing more information. At the same time, besides our quality scores being based on other measures beyond disclosure quantity as previously discussed, Lang & Lundholm [28] also reveal that their results only hold under the condition that a company perceives the information asymmetry between managers and shareholders to be high.

Lastly, information about which audit firm was responsible for the overview of each company's accounts was also collected. Due to the fact that previous studies mainly focused on the possible differences between companies audited by the Big 4 audit firms (PWC, Deloitte, EY, and KPMG) in relation to smaller firms (e.g., [8, 25, 29]), we decided to aggregate our data in a binary fashion, where 1 was assigned to companies that are audited by one of the Big 4 audit firms and 0, to companies that employ other audit firms.

In 2019–2020, only 7.8% of the analyzed companies were audited by smaller audit firms, while in 2020–2021, this percentage fell to 5.2%. Under these circumstances, due to the fact that the great majority of the companies in our sample employed one of the Big 4 audit firms in both of the periods analyzed, a comparison between these two groups could only provide a distorted description of the possible impact different audit firms may have on disclosure quality and compliance. Based on this perception, we refrained from subdividing the sample in that manner for the performance of statistical tests.

After collecting information relative to which of the new disclosure requirements regarding the fair value of

investment properties were effectively applied by the sample companies in their annual reports for 2020–2021, our findings show an average compliance score of 92.42% with a low variance of 0.010 in the first year of mandatory implementation of IFRS 13. Such a result expresses a high overall compliance rate with little variability between the real estate companies, as can be seen in Table 8.

**Table 8. Descriptive Statistics for compliance scores 2020-2021**

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Compliance Valid N	77	0.667	1.000	0.92423	0.099513	0.010
(list wise)	77					

During the analysis of the annual reports for the year in question, it was possible to notice that many companies went to great lengths to make clear which changes were brought up by IFRS 13, some even dedicating a whole note specifically to the disclosure of additional aspects of fair value estimation for investment properties. With very few exceptions, the real estate companies seemed very deliberate in their efforts to satisfy the new requirements, often even quoting parts of the standard. Moreover, 5 of the 6 disclosure requirements examined were satisfied by over 95% of the analyzed firms, with 100% of the reports mentioning which inputs were used in the valuation process for determining investment properties' fair value.

However, the aforementioned good results did not extend themselves to the requirement relative to the presentation of a sensitivity analysis on the quantitative impact the change in input factors has on the fair value of investment properties. In this context, considering that all sample companies had at least some investment properties valued based on level 3 of the IFRS 13 hierarchy, over 30% of the companies failed to fulfill this demand, some of them by bluntly ignoring this part of the standard while others by barely presenting one scenario that could affect fair value. The lack of specifications presented in IFRS 13 regarding what constitutes a sensitivity analysis seems to have confused many companies. The variability in both the format of and the number of scenarios present in this sort of analysis was considerable. Table 9 details the compliance levels achieved in each category investigated.

**Table 9. Percentage results for Compliance with IFRS 13**

Disclosure requirement	Compliance	
	Yes	No
State the hierarchy level (1, 2 or 3)	98.7%	1.3%
Mention the valuation technique	96.1%	3.9%
Show reconciliation between OB and CB	98.7%	1.3%
Mention inputs used	100.0%	---
Level 3 only: describe the valuation process	94.8%	5.2%
Level 3 only: present a sensitivity analysis	66.2%	33.8%

#### 4.1. Hypothesis Evaluation

Our first step in testing hypothesis was to verify if our compliance-related data satisfied the normality assumption associated with parametric tests of means like the t-test, for example [30]. Thus, as it can be seen in Table 10, the result of the Shapiro-Wilk's test points to a non-normal data distribution in the sample, as the p-value was lower than 0.05.

**Table 10. Shapiro-Wilk's Test of compliance levels**

Shapiro-Wilk			
	Statistic	df	Significance
Compliance levels	0.69	77	0.000

Another difficulty with this data set was the fact that it is negatively skewed (-0.941), i.e., presents a bunching of values to the right and a long tail to the left [18]. The main consequence of this asymmetric distribution is that the mean becomes different than the other measure of centrality, the median, and its negative skewness makes the mean lower than the median [30]. Although at first glance, a non-normal and asymmetric sample does not seem like the best candidate for a parametric test, the Central Limit Theorem proclaims that the mean of a large sample ( $n > 40$ ) still follows a normal distribution, nearly even if the raw data is not normal [26]. Therefore, Moore et al. [26] defend the use of t-tests for large samples even when the data is clearly skewed.

After applying a one-sample t-test to the sample against the hypothesized value of 0.75, we found that it's possible

to reject the null hypothesis ( $H_0: \mu_c = 75\%$ ) at a 0.05 significance level, as the p-value (0.000) is lower than  $\alpha$  (0.05). Further, in order to determine which of the alternative hypotheses could be accepted, we looked at the mean difference (0.174). Due to the positive value assumed by this measure, we can accept the  $H_{a1}: \mu_c > 75\%$ . More details on the realized t-test can be found in Table 11.

**Table 11. One-sample t-test for compliance**

Test Value = 0.75						
	t	df	Sig. (2- tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Compliance	15.364	76	0.000	0.174	0.1516	0.1968

Further, in order to verify our results, we also checked the values for the mean and median—a more robust measure of center, according to Tamhane & Dunlop [30]—against the hypothesized value of 0.75. In this context, the sample presents a mean of 0.924 and a median of 1, both values well above 0.75, as well as all quartile values (Table 12). Therefore, the t-test values can be confirmed, and a high compliance level has been established for the first year of mandatory implementation of IFRS 13.

**Table 12. Descriptive statistics II for compliance**

Valid	77	
Missing	0	
Mean	0.9242	
Median	1.0000	
Skewness	-0.941	
Std. Error of Skewness	0.274	
Kurtosis	-0.079	
Std. Error of Kurtosis	0.541	
	25	0.8333
Percentiles	50	1.0000
	75	1.0000

#### 4.2. Level of Compliance with IFRS 13 Fair Value Disclosure Requirements for Real Estate Investments Evaluation

In the presented paper, we address the level of compliance that is exhibited among the real estate companies examined in the years 2020–2021, as it is in our interest to understand how well the mandatory disclosures are fulfilled under IFRS 13. After calculating both the mean and median compliance score, the numbers landed at 92.42% and 100%, respectively.

The fact that the median is the maximum score that could be achieved shows that most companies studied—more exactly 46 companies, as can be seen in Table 13—comply with all the requirements that were examined. The somewhat lower mean indicates that although the overall compliance is very high, there still seems to be some degree of confusion amongst the real estate companies concerning the interpretation of certain requirements of IFRS 13, mainly but not restricted to the presentation of a sensitivity analysis for the fair value of investment properties.

**Table 13. Compliance in % for the sample**

	Frequency	Percent	Valid Percent	Cumulative Percent
0.6667	4	5.2	5.2	5.2
0.8333	27	35.1	35.1	40.3
Valid 1.0000	46	59.7	59.7	100.0
<b>Total</b>	77	100.0	100.0	

What may be seen as surprising is that no relationships were found between the compliance scores and the firm-level factors, namely profitability (return on equity), firm size, and debt-to-equity. These results contradict the previous findings published in Lang & Lundholm [28] or Ahmed & Courtis [25], with the former one stating that higher profitability levels usually increase the number of disclosures, at least when information asymmetry tends to be high, and the latter one pointing out that firm size frequently exhibits a positive correlation with the number of disclosures. Notwithstanding, it is important to clarify that the authors achieved these findings through the analysis of all corporate information made public in annual reports, while our study focused solely on disclosures relative to the fair value of investment properties; consequently, the application of our results should be restricted to this context.

Furthermore, after examining the annual reports and analyzing the results, it is clear that the guidance that IFRS 13 provides still allows for a great amount of leeway concerning how to apply the disclosure requirements present in the standard. This conclusion is aligned with the reasoning stated by Ball [31], as the shown flexibility leads to a somewhat uneven implementation [31]. When conducting this research, the lack of guidance was primarily visible in the area of providing a sensitivity analysis during 2020–2021, where many different interpretations of the meaning of a sensitivity analysis were evident. This forced us as researchers to define, originating from the standard, what a sensitivity analysis in this study would be comprehended as. Even though one of the main objectives of this new accounting standard was to increase the transparency and consistency of disclosures (IASB, 2011), our results reinforce the idea that further improvements are still needed in order to fully reach these goals. This is particularly true when the concept of consistency is taken into consideration, as different interpretations of a standard often lead to different reporting practices, consequently making an objective comparison between information disclosed by different companies very difficult. Such a lack of comparability, in turn, goes against the IFRS Framework's specification of the qualitative characteristics that should permeate corporate disclosures.

Moreover, as previously discussed, research within the area of compliance is very scarce, and, therefore, no uniform theory when it comes to compliance with mandatory disclosure requirements can be found in the literature [32]. As a result, this study becomes quite unique as it contributes to providing a framework for how compliance can be measured and which firm-level factors could influence it.

This paper has studied an interesting aspect of IFRS 13, and by combining this with quality, it has been possible to contribute valuable knowledge. We believe that it is important to evaluate the new accounting standards that have been implemented. Thereby, not restricting disclosures to the quantity of disclosures, as it has been visible that more information does not necessarily mean better or higher quality information. Though quantity can be a means of providing more information, it is crucial to look deeper into the information that is provided and the value of those facts. However, a difference between companies as well as countries is most likely inevitable since IFRS points out that the disclosures depend on what the management deems to be material to the relevant stakeholders. This, by its definition, introduces subjectivism to some degree, which differs between companies.

## 5. Discussion

When conducting research, it is essential that the process and findings are of good quality. There are three main criteria for ensuring this: reliability, validity, and generalizability [33].

In our case, we believe that the reliability can be considered high; however, in order for consistent results to be found, it would be crucial to make an identical study, as the smallest change in items or topics could alter the findings. Furthermore, it is important to remember that this process has required us as researchers to make some interpretations of the regulations studied and the disclosures made by the real estate companies. The interpretations in this case have contributed to a small degree of subjectivity, and if this study were repeated, the interpretations could perhaps differ as different researchers look at things in different ways. Though we have been able to mitigate this issue in our study by continuously discussing how interpretations should be made. Moreover, the clear structure of what to examine has also aided us in making fewer interpretations. It is nonetheless important to keep in mind that other researchers may interpret things differently.

Another important quality criterion is validity, which concerns whether the values used to measure a certain concept in fact measure that particular concept [33]. In order to justify the validity of this study, our research has been based on previous studies made within the same area, and it has been our focus to use as much of the prior knowledge as possible when constructing our own model. This has ensured that the measures we have used are valid, as they have been used before for similar purposes.

The thorough research process has furthermore made us discover that this area of research is very specific, and the peer-viewed articles we have gone through regarding how to measure disclosure quality have therefore been very explicit in their content. This has made it clear that the measures used have been related to the measurement of disclosure quality. Additionally, we have kept a questioning mind when developing and adapting the model used to ensure that the indicators used have in fact measured the concept of disclosure quality.

In relation to the quality of research, an additional important feature is the criteria of generalizability, which implies that it should be possible to generalize the findings to other similar contexts than the one studied [33]. For our research, we have used a sample from a recognized index that represents the real estate industry. What we have been able to find is that there is a broad range of real estate companies in regards to profitability, size, and leverage. This shows that the companies examined are very different in many aspects, and the index represents a variety of real estate companies.

One questionable area could be the size of the sample; the findings based on 77 companies could be debatable when it comes to generalizing the results. Though we believe that the index used represents the industry well and gives a good overall picture of the disclosure quality for the real estate industry in Europe. We can hence conclude that our findings

are generalizable to similar real estate companies like the ones studied i.e., publicly listed real estate companies that adopts IFRS 13 in valuing their investment properties.

When this research was initiated, the intention was to fill a gap that we found to be highly relevant. IFRS 13 was implemented in 2013 and since then no research has been conducted regarding disclosure quality for investment properties. There have been much done in relation to fair value measurement, however the impact of the new standard has been unexploited, although it has meant significantly more extensive disclosure requirements for the lower levels of the fair value hierarchy. It was possible to find various sources of information about the expected impacts though it had not yet been feasible to study the actual impact as no annual reports where IFRS 13 were adopted had been issued yet. This is where we found our research gap, the annual reports after the first year of implementing the new standard had now been released and it would be viable to examine these. Nonetheless, with the intention of investigating if IFRS 13 have had a significant impact on the quality, the decision was made to compare the annual reports for 2019-2020 and 2020-2021, under the old and new regulations.

After a thorough examination of approximately 150 annual reports, it was possible to draw conclusions about our findings. This showed that the overall compliance level with the disclosure requirements under IFRS 13 had a mean and median of 92.4% and 100% respectively. This suggests that the level of compliance is very high though it is only the first year of implementation. Regarding the disclosure quality, we could already notice an improvement while reading the annual reports. It was very apparent that the real estate companies studied showed more commitment to disclosing more information about their investment properties and the related fair values in 2019-2020 than in 2020-2021. The disclosures were furthermore more detailed and extensive under IFRS 13 than IAS 40.

After analyzing our data in SPSS an improvement in disclosure quality was visible and it further showed that the result was significantly different from the prior year. After this result was found, we examined different origins and compared the quality scores between the real estate companies. This gave the result that companies with a Slovak origin tend to outperform companies from the other origins. French and German origin companies are inclined to perform quite evenly when disclosing information about investment properties and fair value. Nonetheless, French origin companies displayed the highest variability in their quality scores in comparison with the other origins. Lastly, English origin real estate companies presented the lowest quality scores.

The main research question can in this context be answered by stating that IFRS 13 have affected the disclosure quality for investment properties in real estate companies in Europe, and the change has been positive as it has improved.

However, as we state in the Introduction of our paper, due to the lack of relevant scientific information sources, we are unable to compare our findings and to identify similarities and differences, and in this context to structure and generalize our conclusions. Only older studies are available [34-37], and here we can state that the findings in these studies basically copy our findings, but we must take into account the time factor, which can have a significant influence on the interpretation of the results.

From newer sources, we can mention [38-40] and [41, 42] as a possible source of comparison, which, however, provide data of a different nature and are not suitable for comparing our findings. However, they fundamentally complement our claims and not only in the European context.

Throughout this research we have kept in mind the ethical aspects. Special consideration has been given to the fact that we have utilized public information and that there are several issues connected with this. As we have used annual reports which have been examined by auditors, we have found the information in these reports to be reliable and we have further only interpreted it in its original context which has been aimed at providing information about the company and its operations to various stakeholders. It is moreover important to point out that we have not had any preconceptions regarding our findings which has ensured the objectivity of this study.

The intention of this research was to be able to contribute to several interested parties in different ways. As intended target audience we focused on academics, legislators, investors and auditors. For academics it was our objective to be able to build upon prior knowledge and research within this area. We have provided new insights into this area by presenting how disclosure quality can be measured for one single standard without having to scrutinize all the content in the annual reports. This opens up the possibility for other academics to study other accounting standards as well as examining the effect of future standards that might be implemented. Secondly, this research was also intended to benefit and contribute to legislators. The idea in this context was to provide information regarding the impact of IFRS 13 and if it has had the desired effects. As stated in previous studies [43-45], IFRS 13 aimed at increasing the transparency of what methods and assumptions that were used. Through this study we have been able to confirm that IFRS 13 has in fact increased the transparency in real estate companies as most of them disclose more detailed information about both methods and assumptions, than what was disclosed prior under IAS 40. Nevertheless, it is apparent that IFRS 13 is still quite unclear and many interpretations are still needed when adopting this standard. This was visible when examining the annual reports, for example, the companies studied had interpret the concept of a sensitivity analysis in very dissimilar ways. Some companies had given information about how different changes in inputs actually would alter the fair values

in numbers while others had only given brief information saying that a change in an input would affect the fair values positively or negatively without presenting actual numbers. These findings indicate that further guidance would most likely be needed for a better consistency between these companies to be reached.

Investors was another group that was addressed in this research. When investing in a real estate company, where investment properties comprise the majority of the assets, it is crucial to understand the fair values and how those have been calculated in order to reduce the risks from an investor's point of view. This study has in a clear manner examined how well these companies have actually disclosed this type of information and emphasized where information might be missing. This could help potential investors' in being more attentive to specific information and in their decision-making.

Finally, we also believed that this study could contribute to auditors. Here the idea was to find out how well real estate companies in general comply with the mandatory disclosure requirements and, through that, be able to shed some light on the areas where incompliance can be seen most frequently and to what areas more attention should be given. By performing this research, it became viable to discover that, in relation to IFRS 13, several companies within this industry do not comply with providing a sensitivity analysis; in fact, almost 34% of the companies in our sample did not provide this information. This is, in other words, an area that auditors should scrutinize more closely.

When conducting this research, the perspective taken was that of the legislators in order to assess the efficacy of the new legislation, though there are other interesting perspectives that could be taken. One idea could be to carry out a qualitative study and investigate the effects of IFRS 13 from the real estate companies' point of view. It would then be possible to examine how these companies have been affected by the new standard and what this has meant for them workwise. Another perspective could be that of an analyst. We have been able to find an increase in disclosure quality; however, it would be interesting to know whether this extra information is relevant from an analyst's standpoint.

## 6. Conclusion

As final remarks, it is essential to point out that this is a unique study, as disclosure quality has been examined by limiting it to a specific standard and area, as well as the whole annual reports, not just the notes. However, it has not been possible to generalize the level of quality found to the entire annual report and the overall quality. We have limited ourselves to drawing conclusions regarding disclosures about fair value and the relationships that exist in relation to that information. A final consideration is that despite using objectivism, we have not constructed new knowledge; we have simply collected data from already existing facts and drawn new conclusions.

With further research within this area, in the shape of the previous suggestions given, it would be feasible to cover more aspects and broaden the research related to the more extensive disclosure requirements under IFRS 13. This could, moreover, lead to additional results and findings from which a more profound evaluation could be performed regarding the usefulness and efficiency of IFRS 13.

## 7. Declarations

### 7.1. Author Contributions

Conceptualization, M.S., V.G., and K.B.; methodology, M.S. and V.G.; investigation, M.S., V.G., and K.B.; resources, K.B.; writing—original draft preparation, M.S., V.G., and K.B.; writing—review and editing, M.S., V.G. and K.B. All authors have read and agreed to the published version of the manuscript.

### 7.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

### 7.3. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

### 7.4. Acknowledgements

The authors gratefully acknowledge DTI University, Slovakia for supporting this work.

### 7.5. Institutional Review Board Statement

Not applicable.

### 7.6. Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

## 7.7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## 8. References

- [1] FTSE Russell (2023). FTSE EPRA Nareit Global Real Estate Index Series. London, United Kingdom. Available online: <http://www.ftse.com/products/indices/epra-nareit> (accessed on May 2023).
- [2] IFRS. (2015). Analysis of the IFRS jurisdiction profiles. The International Financial Reporting Standards Foundation (IFRS), London, United Kingdom. Available online: <https://www.ifrs.org/use-around-the-world/> (accessed on May 2023).
- [3] Beretta, S., & Bozzolan, S. (2008). Quality versus quantity: The case of forward-looking disclosure. *Journal of Accounting, Auditing and Finance*, 23(3), 333–375. doi:10.1177/0148558x0802300304.
- [4] Christian, D., & Lüdenbach, N. (2012). IFRS 13 Fair Value Measurement. *IFRS Essentials*, 513–525, John Wiley & Son, Hoboken, United States. doi:10.1002/9781119207917.ch43.
- [5] EY Global CRS, (2012). IFRS 13 Fair Value Measurement. 21st century real estate values. Implications for the real estate and construction industries. Available online: [https://www.ey.com/en\\_tw/tax/tax-alerts/applying-ifrs-fair-value-measurement](https://www.ey.com/en_tw/tax/tax-alerts/applying-ifrs-fair-value-measurement) (accessed on May 2023).
- [6] Richard Dietrich, J., Harris, M. S., & Muller, K. A. (2000). The reliability of investment property fair value estimates. *Journal of Accounting and Economics*, 30(2), 125–158. doi:10.1016/S0165-4101(01)00002-7.
- [7] Laux, C., & Leuz, C. (2009). The crisis of fair-value accounting: Making sense of the recent debate. *Accounting, Organizations and Society*, 34(6–7), 826–834. doi:10.1016/j.aos.2009.04.003.
- [8] Sundgren, S., MMki, J., & Somoza-Lopez, A. (2015). Cross-Country Differences in Disclosure Quality: A Study of Fair Value Disclosures by European Real Estate Companies. *SSRN Electronic Journal*. doi:10.2139/ssrn.2546747.
- [9] Devalle, A., & Rizzato, F. (2011). Fair value application and disclosure of investment properties (IAS 40). *International Journal on GSTF Business Review*, 1(1), 1-15.
- [10] Edelstein, R., Fortin, S., & Tsang, D. (2012). An International Exploration of Financial Reporting Practices in the Real Estate Industry. *International Real Estate Review*, 15(3), 347–372. doi:10.53383/100161.
- [11] Muller, K. A., Riedl, E. J., & Sellhorn, T. (2011). Mandatory fair value accounting and information asymmetry: Evidence from the european real estate industry. *Management Science*, 57(6), 1138–1153. doi:10.1287/mnsc.1110.1339.
- [12] Quagli, A., & Avallone, F. (2010). Fair value or cost model? Drivers of choice for IAS 40 in the real estate industry. *European Accounting Review*, 19(3), 461–493. doi:10.1080/09638180.2010.496547.
- [13] Fahnstock, R. T., & Bostwick, E. D. (2011). An analysis of the fair value controversy. *Journal of finance and accountancy*, 8, 1-12.
- [14] BDO. (2013). Need to know IFRS 13 Fair Value Measurement. Report, BDO International, Zaventem, Belgium. Available online: <https://www.bdo.global/en-gb/microsites/ifrs/ifrs-accounting-standards/ifrs-faqs/topic108> (accessed on May 2023).
- [15] EPRA. (2013). EPRA position paper on IFRS 13: fair value measurement & illustrative disclosures. European Public Real Estate Association (EPRA), Brussels, Belgium. Available online: [https://www.epra.com/media/EPRA\\_Position\\_Paper\\_on\\_IFRS\\_13\\_February2013\\_1360061211090.pdf](https://www.epra.com/media/EPRA_Position_Paper_on_IFRS_13_February2013_1360061211090.pdf) (accessed on June 2023).
- [16] Kothari, S. P. (2000). The role of financial reporting in reducing financial risks in the market. *Conference Series-Federal Reserve Bank of Boston*, June 2000, Boston, United States.
- [17] Shapiro, S. S., Wilk, M. B., & Chen, H. J. (1968). A Comparative Study of Various Tests for Normality. *Journal of the American Statistical Association*, 63(324), 1343–1372. doi:10.1080/01621459.1968.10480932.
- [18] Saunders, M., Lewis, P. and Thornhill, A. (2012) *Research Methods for Business Students*. Pearson Education Ltd., Harlow, United Kingdom.
- [19] Salkind, N. (2012). *Encyclopedia of Research Design*. In *Encyclopedia of Research Design* (Vol. 1). Sage Publications. doi:10.4135/9781412961288.
- [20] Matthews, T. D., & Kostelis, K. T. (2019). *Designing and Conducting Research in Health and Human Performance*, John Wiley & Son, Hoboken, United States. doi:10.4324/9780429452314.
- [21] Harris, R. J. (2001). *A Primer of Multivariate Statistics*. Psychology Press, London, United Kingdom. doi:10.4324/9781410600455.
- [22] Lang, M. H., & Lundholm, R. J. (2000). Voluntary Disclosure and Equity Offerings: Reducing Information Asymmetry or Hyping the Stock? *Contemporary Accounting Research*, 17(4), 623–662. doi:10.1506/9N45-F0JX-AXVW-LBWJ.

- [23] Cooke, T. E. (1989). Voluntary Corporate Disclosure by Swedish Companies. *Journal of International Financial Management & Accounting*, 1(2), 171–195. doi:10.1111/j.1467-646X.1989.tb00009.x.
- [24] Olusegun Wallace, R. S., Naser, K., & Mora, A. (1994). The Relationship between the Comprehensiveness of Corporate Annual Reports and Firm Characteristics in Spain. *Accounting and Business Research*, 25(97), 41–53. doi:10.1080/00014788.1994.9729927.
- [25] Ahmed, K., & Courtis, J. K. (1999). Associations between corporate characteristics and disclosure levels in annual reports: A meta-analysis. *British Accounting Review*, 31(1), 35–61. doi:10.1006/bare.1998.0082.
- [26] Moore, D. S., McCabe, G. P., Alwan, L. C., & Craig, B. A. (2016). *The practice of statistics for business and economics*. WH Freeman and Company, New York, United States.
- [27] Iatridis, G. E. (2011). Accounting disclosures, accounting quality and conditional and unconditional conservatism. *International Review of Financial Analysis*, 20(2), 88–102. doi:10.1016/j.irfa.2011.02.013.
- [28] Lang, M., & Lundholm, R. (1993). Cross-Sectional Determinants of Analyst Ratings of Corporate Disclosures. *Journal of Accounting Research*, 31(2), 246. doi:10.2307/2491273.
- [29] Patton, J., & Zelenka, I. (1997). An empirical analysis of the determinants of the extent of disclosure in annual reports of joint stock companies in the Czech Republic. *European Accounting Review*, 6(4), 605–626. doi:10.1080/09638189700000003.
- [30] Tamhane, A., & Dunlop, D. (2000). *Statistics and data analysis: from elementary to intermediate*. Pearson, Upper Saddle River, United States.
- [31] Ball, R. (2006). International Financial Reporting Standards (IFRS): pros and cons for investors. *Accounting and Business Research*, 36(sup1), 5–27. doi:10.1080/00014788.2006.9730040.
- [32] Glaum, M., Schmidt, P., Street, D. L., & Vogel, S. (2013). Compliance with IFRS 3-and IAS 36-required disclosures across 17 European countries: Company-and country-level determinants. *Accounting and Business Research*, 43(3), 163–204. doi:10.1080/00014788.2012.711131.
- [33] Bryman, A., & Bell, E. (2011). *Business research methods (3<sup>rd</sup> Ed.)*. Oxford Press, New York, United States.
- [34] Busso, D. (2014). Does IFRS 13 Improve the Disclosure of the Fair Value Measurement? An empirical analysis of the real estate sector in Europe. *GSTF Journal on Business Review (GBR)*, 3(4), 1–7.
- [35] Sundgren, S., Mäki, J., & Somoza-López, A. (2018). Analyst Coverage, Market Liquidity and Disclosure Quality: A Study of Fair-value Disclosures by European Real Estate Companies under IAS 40 and IFRS 13. *International Journal of Accounting*, 53(1), 54–75. doi:10.1016/j.intacc.2018.02.003.
- [36] Muller, K. A., Riedl, E. J., & Sellhorn, T. (2008). Consequences of voluntary and mandatory fair value accounting: Evidence surrounding IFRS adoption in the EU real estate industry. Working paper No. 09-033, Harvard Business School, Boston, United States.
- [37] Alhaj Ahmad, F. B., & Aladwan, M. S. (2015). The Effect of Fair Value Accounting on Jordanian Investment Properties. *International Journal of Financial Research*, 6(4), 99-113. doi:10.5430/ijfr.v6n4p99.
- [38] Patsis, P., Liapis, A., & Christos, G. (2023). A Consistent Implementation of IFRS 13 and IAS 36 for Non-current Assets. *KnE Social Sciences*, 271–297. doi:10.18502/kss.v8i1.12651.
- [39] Feghali, K. A., Jreije, R. M., & Bahnan, N. (2023). Suitability and Relevance of the Fair Value Measurement under IFRS 13 vs. Historical Cost: Application to the Lebanese Banking Sector. *International Journal of Accounting and Business Finance*, 9(1), 1–26. doi:10.4038/ijabf.v9i1.131.
- [40] Tlemsani, I., Mohamed Hashim, M. A., & Matthews, R. (2023). The impact of IFRS adoption on Saudi Arabia. *Journal of Islamic Accounting and Business Research*. doi:10.1108/JIABR-11-2022-0304.
- [41] Mehnaz, L., Rahman, A., & Kabir, H. (2022). Relevance of supplementary fair value disclosures under market uncertainty: effects on audit fees and investors' pricing. *Managerial Auditing Journal*, 37(7), 819–849. doi:10.1108/MAJ-07-2021-3263.
- [42] Henderson, D. (2022). Fair values and compensation contracting: Evidence from real estate firms. *Journal of Business Finance and Accounting*, 49(5–6), 627–657. doi:10.1111/jbfa.12576.
- [43] Agana, J. A., Zamore, S., & Domeher, D. (2023). IFRS adoption: a systematic review of the underlying theories. *Journal of Financial Reporting and Accounting*. doi:10.1108/JFRA-08-2022-0317.
- [44] Gardi, B., Aga, M., & Abdullah, N. N. (2023). Corporate Governance and Financial Reporting Quality: The Mediation Role of IFRS. *Sustainability (Switzerland)*, 15(13), 9869. doi:10.3390/su15139869.
- [45] Elmghaamez, I. K. (2023). The causes and effects of IFRS adoption speed: diffusion of innovation theory perspective. *International Journal of Managerial and Financial Accounting*, 15(2), 135–184. doi:10.1504/IJMFA.2023.129862.