



Did the Adoption of IFRS-13 Improve the Value Relevancy of Listed European Bank Financial Statements?

Master Thesis Accounting and Auditing 2020-2021

Author: Hugo van der Meer

Student Number: 431802

Supervisor: Yijun Li

Second Assessor: Ferdinand Elfers

Date: 14-09-2021

The content of this thesis is the sole responsibility of the author and does not reflect the view of either the supervisor, second assessor, Erasmus School of Economics or Erasmus University

Abstract.

International Financial Reporting Standards 13 – Fair Value Measurement (IFRS 13) became effective for annual periods beginning on or after 1 January 2013. It provides a three-level framework with the goal to help users of financial statements to better assess fair value valuations. Standard setters have been advocating fair value measurement for some time. However, studies have been published with conflicting conclusions in regard to increases of value relevancy as a result of fair value measurement. This research examines the changes in value relevancy as a result of the introduction from an investor's point of view. European listed banks, who have to adhere to IFRS, provide a setting in which to examine the effect of the introduction of IFRS on the value relevancy of bank financial statements. This research finds the explanatory power (adj. R^2) of European bank financial statements to decrease after the introduction of IFRS 13.

Keywords: IFRS 13, fair value valuation, European listed banks, value relevance

Table of Contents

1. INTRODUCTION	1
2. THEORETICAL BACKGROUND AND PRIOR LITERATURE.....	3
2.1. Structure.....	3
2.2. Background and history on IFRS 13.....	3
2.3. Prior literature and theoretical constructs	4
2.3.1. Fair value measurement and historical cost accounting	4
2.3.2. Agency Problem.....	6
2.4. Value relevancy research	6
2.5. The Ohlson (1995) model	7
2.6. European bank financial statements.....	8
2.7. Theoretical constructs and hypothesis development.....	8
2.8. Summary and implications	10
3. RESEARCH DESIGN	10
3.1. Structure.....	10
3.2. Research design and use of the Ohlson (1996) framework	11
3.3. Sample selection	12
3.3.1. Bank financial statement data	12
3.3.2. Data sources and data preparations.....	12
4. EMPIRICAL RESULTS AND ANALYSIS	14
4.1. Structure.....	14
4.2. Descriptive statistics	15
4.3. Main test and results.	17
4.4. Additional Testing	18
4.4.1. Analyzing buy and hold returns.....	18
4.4.2. Alternative measure of explanatory power.....	21
4.5. Summary.....	22

5. CONCLUSION.....	22
5.1. Structure.....	22
5.2. Conclusion	22
5.3. Limitations.....	23
5.4. Implications and future research.....	24
REFERENCE LIST	25
APPENDIX A.....	28
APPENDIX B.....	29

1. INTRODUCTION

International Financial Reporting Standards 13 – Fair Value Measurement (IFRS 13) became effective for annual periods beginning on or after 1 January 2013. This standard establishes a framework for measuring fair value and requires significant disclosures relating to fair value measurement. “The International Accounting Standards Board (IASB) wanted to enhance disclosures for fair value in order that users could better assess the valuation techniques and inputs that are used to measure fair value” (FASB 2011).

There has been conflicting evidence from prior literature on the value relevance of fair value measurement. Some literature agrees with standard setters, who argue fair value provides more relevant valuations (FASB 2006). Barth et al. (1996) examines the effect of fair value disclosures under SFAS No. 107. They found fair value disclosures to be more value relevant in relation to the market value of equity. This was examined in three out of the five largest asset and liabilities categories compared to the historical cost value of these categories. However, literature which argues against using fair value valuations has been published as well. Eccher et al. (1996) and Nelson (1996) examined the same SFAS 107 disclosures as Barth et al. (1996), but found contradicting results. Their results indicating little to no added value relevance of the fair value disclosures or only an increase in value relevance for specific securities. Additionally, the combined value relevance of book value of equity and income was found to be higher under historical cost valuation than under fair value disclosures for bank financial statements (McInnis et al. 2018).

These conflicting results raises questions about the introduction of standards which advocate or promote the use of fair value valuations. The goal of this research is to provide an examination of changes in the value relevance of financial statements due to the introduction of IFRS 13. Value relevancy studies can serve as the starting point of an evaluation of regulatory changes (Barth et al. 2001). This leads to the following research question: Did the value relevancy of bank financial statements from banks listed on EU regulated exchanges improve after the adoption of IFRS 13?

Changes in the value relevance of financial statements from banks, which are listed on European Union regulated markets, will be the focus of this research. Assets and liabilities on bank financial statements are mostly comprised out of financial instruments. This provides a setting that allows to compare changes in financial statements value relevance due to regulatory changes (McInnis et al. 2018). The sample includes observations from 1,504 bank financial statements from 184 different listed European banks that report under IFRS from 2008-2017. This includes 673 years of bank financial statements from the pre-IFRS 13 period (fiscal years 2008-2012), and 831 years of bank financial statements from the post-IFRS 13 period (fiscal years 2013-2017).

The Ohlson (1995) framework is used to evaluate the changes in value relevancy as a result of the IFRS 13 adaptation. In this framework the explanatory power (adjusted R^2) of variables in two periods are compared. The market value of equity (share price) is a linear function of income and the book value of equity.

All variables will be per share data in euros, as this has been shown to combat scale effects most effectively in the Ohlson (1995) framework (Barth and Clinch 2009). The equations used in this research are controlled for year and country fixed effects. However, an overview of coefficients when not controlling for year and country fixed effects will be given.

Both the combined and individual value relevancy of equity and income will be examined before and after the implementation of IFRS 13. This research will help to examine if the goals set by IASB for IFRS 13 have been accomplished. These goals are to enhance disclosures for fair value in order that users could better assess the valuation techniques and inputs that are used to measure fair value (FASB 2011). The increase in the relative value relevance of bank financial statements would provide evidence in support of the accomplishment of this goal.

This study finds a decrease in value relevancy of listed European bank financial statements in the period after the introduction of IFRS 13. The combined value relevancy of equity and income decreases after this introduction. The individual value relevancy of equity and income decreases as well. The decrease in explanatory power is larger when only looking at the book value of equity, compared to income. These results suggest the goals of enhancing disclosures for fair value in order that users could better assess the valuation techniques and inputs that are used to measure fair value have not been achieved. However, the decrease in the adjusted R^2 is only small. A further evaluation of this goal is required to draw more decisive conclusions. This is in line with expectations when performing value relevancy studies, which often serve as a first step when evaluating accounting policy changes.

This research is related to McInnis et al. (2018) and Barth et al. (1996), which both examined the relation between value relevance of bank financial statements under Generally Accepted Accounting Principles (GAAP) and under fair value reporting. This study would contribute to the literature on fair value accounting especially the literature relating to financial instruments by examining the relative value relevance of banks' financial statements pre and post IFRS 13. Additionally, this research extends the literature on value relevancy and the Ohlson (1995) framework. Value relevancy studies provide a good starting point when examining the economic effects of accounting policy changes (Barth et al. 2001).

This research can contribute to the evaluation of the adoption of IFRS 13 and the effect this has had on the value relevancy of European bank financial statements. This examination can contribute standard setters and regulatory bodies with future accounting policies and standards on fair value valuations.

The thesis is structured as follows. Chapter two examines the theoretical constructs used in this research, the background of IFRS 13 and prior literature examining this subject. Chapter three will explain the methodology and sample used in this thesis. This chapter will also examine the equations used in the Ohlson (1995) framework used in this research. Chapter four will describe the results found in this research and explore their implications. Chapter five concludes options for future research and possible limitations of this thesis.

2. THEORETICAL BACKGROUND AND PRIOR LITERATURE

2.1. Structure

This chapter will start with section 2.2, which will provide the history of IFRS 13. Subsequently section 2.3 and its subsections give an overview of prior literature on fair value measurements and the theoretical constructs which influence this measurement. Section 2.4 discusses value relevancy studies and the use of the Ohlson (1995) model. Section 2.5 explains why banks and specifically listed European banks serve as a good setting to explore the value relevancy changes as a result of IFRS 13. Finally, section 2.6 will summarize the theoretical background and discussed prior literature.

2.2. Background and history on IFRS 13

In 2005 fair value measurement was added to the agenda of the IASB, which resulted in a discussion paper (IASB 2006) on fair value measurements on the 30th of November 2006. This paper was the result of a collaborative effort between the IASB and the FASB. They announced this discussion paper as part of their joint project on fair value measurement. The discussion paper had two objectives: (a) establish a single source of guidance for all fair value measurements required by IFRSs, and (b) clarify the definition of fair value and related guidance to communicate the measurement objective (IASB 2006) more clearly.

The discussion paper is linked to the earlier announcement of SFAS 157 Fair Value Measurements, by the FSAB. The IASB invited comments on the discussion paper, with plans in place to publish an exposure draft in 2008. This led to the issue of IFRS 13 on the 12th of May 2011, which became effective for annual periods beginning on or after 1 January 2013 (FASB 2011). IFRS 13 has three objectives: (a) defines fair value; (b) sets out in a single IFRS a framework for measuring fair value; and (c) requires disclosures about fair value measurements. There where previous standards on fair value reporting from various standard setters, such as the SFAS No. 107. IFRS 13 provides a hierarchal framework of three different levels of input, which can be used to determine the fair value of certain assets and liabilities (IFRS 13:73). This framework is intended to provide a more comparable and more consistent approach to fair value valuations (FASB 2011b).

The Financial Accounting Standards Board (FASB) defines 'fair value' as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date' (FASB 2006). The FASB has been providing standards on fair value disclosures before IFRS 13. An example would be SFAS No. 107, which was introduced as standard to extent the disclosure standards of financial instruments (FASB 1991). Section 5 of SFAS No. 107. provides a definition for fair value. It defined fair value of a financial instrument as the current market price of the instrument when it would be sold in normal economic circumstances. It excluded situations where market price was determined by forced or liquidation sales.

The Securities and Exchange Commission (SEC) has been an advocate of this measurement, which they highlighted in a document that was prepared for a senate hearing (SEC 2005). The SEC argues the measurement fully captures the value of an asset or liability and is therefore a more informative measurement compared to historical cost.

2.3. Prior literature and theoretical constructs

2.3.1. Fair value measurement and historical cost accounting

Although fair value measurement has received support from standard setters, it is not without criticism. Both historical cost accounting and fair value accounting provide accurate valuations when used in ideal theoretical circumstances. The discussion surrounding fair value is comparable to the tension between reliability and relevance. This trade-off is often found in accounting conflicts and also present in the fair value debate. An example of this tension is most prominent when the deviation from standards is required. Examples of necessary deviation from standards of fair value accounting can be found in the financial crisis of 2008. Financial markets found heavy distress during this time. A well-functioning active market is essential to determine fair value of different financial instruments (IFRS 13:2). The necessity of a well-function active market results in two different instruments which are particularly hard to value at fair value: instruments for which this active market is not present or a non-market traded instrument.

Proponents cite the possibility of corrective action and increased transparency in reporting which would capture the current economic reality better. This increase of transparency is debated by ones who oppose fair value accounting. Where deviating from the standards would provide a better valuation, but this deviation is hard under US GAAP and IFRS standards (Laux and Leuz 2009). The overview of arguments, relating to the role of fair value in the financial crisis provided by Laux and Leuz (2009), highlights arguments of both proponents and opponents of fair value accounting.

These arguments show discussion whether exit value-based fair value or historical cost-based accounting provides more value-relevant financial statements during the 2008 financial crisis. A well-functioning active market was not present during the 2008 crisis. Financial markets crashed and the market prices of financial instruments clearly dropped below the intrinsic value of these instruments (Korf et al. 2014). This crisis highlighted some of the possible shortcomings of fair value measurements.

Both measurements supply information for valuation through either the balance sheet or the income statement when they are used in their ideal theoretical scenarios. Fair value can produce a balance sheet where accounting equity equals market value of equity. This would make the income statement unnecessary for valuation (Landsman 1995). Contrarily, historical cost valuation can yield a 'permanent' income, the capitalized value of which equals market value, thus making the balance sheet unnecessary for valuation (Nissim and Penman 2008). These scenarios are not present in the practicing field, with both valuation methods having pros and cons.

The IASB (IASB, 2001, p. 24) qualified relevance as one of the most important aspects of financial statements and the accounting standards these financial statements adhere to. This signals the importance of evaluating relevancy changes as results of differing accounting policies, such as SFAS No. 107 and IFRS 13. SFAS No. 107, which was introduced as standard to extent the disclosure standards of financial instruments (FASB 1991). Barth et al. (1996) studied the influence of this standard on disclosures value relevance. It tried to use the difference between valuation methods, as an explanatory variable for differences in the total value of shares. The results of the study indicate a significant improvement of value relevance for three out of the five major asset and liability categories, when using fair value compared to historical cost (Barth et al. 1996). Eccher et al. (1996) and Nelson (1996) studied the same construct and same standard, although finding contrasting results. Bank financial statement disclosures from 1992 and 1993, where sampled by all three of the 1996 papers.

McInnis et al. (2018) examined the relative value relevance of using fair value valuations compared to historical cost accounting. It examined changes in relative value relevance on bank financial statements of US regulated banks, like Barth et al. (1996), Eccher et al. (1996) and Nelson (1996). However, the sample period was longer (1996-2013) and the research design differed from the three 1996 papers. McInnis et al. (2018) used the Ohlson (1995) framework to examine the changes in value relevance. The paper compared the value relevance of bank financial statements under historical cost accounting and fair value using this framework. The results found indicating historical coast accounting to have a higher value relevance in explaining changes in the market value of equity. Although the timeframe and design of the research differs, the evaluation used is made possible by the mandatory SFAS 107 fair value disclosures. The disclosures were used to determine the fair value of financial instruments.

McInnis et al. (2018) examined the explanatory power of the different valuations in three different aspects of financial statements. The combined value relevance and individual value relevance of both equity and income under the two different valuations where examined. The results found fair value to provide less or an even amount of value relevance in all three cases. Thus, contradicting the preference of the FASB, who see fair value as more relevant for investors (FASB 2006). McInnis et al. (2018) finds measurement errors in estimates and exit values to lower the value relevance of fair value.

Both Eccher et al. (1996) and Nelson (1996) found results indicating no significant improvement in the explanatory power of changes in the market value of equity. These results imply value relevancy improvements are not present, when using fair valuation methods as dictated by SFAS No. 107. The 1996 papers all examined a similar sample, but interestingly found different results. Barth et al. (1996) examined reasons why the results might differ, given the similarity of the sample. It cited a difference in research design and share price date. All three studies used different share price dates for their sample data. This shows an important research design implication to consider.

2.3.2. Agency Problem

The IFRS 13 standards uses a hierarchical framework of three-level inputs to determine fair value. This hierarchical framework is hard to diverge from even when this might provide a more informative measurement. The framework rigidity combats problems which can be found in the Agency theory. The Agency theory describes problems which might arise from the relationship between principal and agents. The agent in this case would be management, the principal being the shareholders of the entity. The agency theory describes how the agent might leverage information asymmetry in an outcome which favors his interest over the interest of the principal. Managerial judgment is used in level three estimates in the framework provided by IFRS 13.

This highlights one of the weaknesses of determining fair value (Laux and Leuz 2009). Managers have more information than investors about the value of certain financial instruments. This information asymmetry might be leveraged into valuations which would suit the motives of managers. Standard setters have made deviating from fair value standards difficult. This makes it harder for managers to leverage this information asymmetry for their own benefit, but also for the benefit of investors. When the situation of crashing market values below the intrinsic value of instruments is present, managers need deviations to report the correct fair value. An example of the managers leveraging the information asymmetry can be observed on write-downs. Managers might be reluctant to take write-downs on financial instruments, even though there might be clear evidence of considerable impairment of these instruments. Evidence can be found in the estimations of banks loan losses, which often go beyond the write downs banks had taken (IMF 2009).

2.4. Value relevancy research

Value relevance research is often the first step in evaluating effects of new accounting standards in accounting research. It is mainly intended to be used by other academic researchers. This means it can be used as the first step in the examination of a relation between an accounting standard and equity values (Bart et al. 2001). This ties in with research stemming from Ball and Brown (1968). Who assessed the usefulness of accounting information by examining stock market reactions to net income announcements. Showing that net income numbers contain useful information for investors.

The IASB (IASB, 2001, p.24) defined the word “relevance” as the principal qualitative characteristic that financial statements should have in order to be useful in decision making. An accounting figure is considered to be reliable if it states the value it is intended to capture, according to the Statements of Financial Accounting Concepts Nos. 1-7. (FASB 1984). Value relevance studies examine the combined relevance and reliability of certain accounting measure (Barth et al. 2001). Thereby, also providing a construct to compare differing accounting measures, such as pre and post IFRS 13 financial instruments valuation.

A criticism of this body of research was provided by Holthausen and Watts (2001). It concluded value relevance studies to be neither necessary nor sufficient for standard setters' decision making. This criticism is partly true. Research into the value relevancy of accounting measures, which is measured by changes in the market value of equity, is not adequate for standard setting. However, it is not intended to be adequate evidence for standard setting. Value relevance research provides standard setters with information on certain accounting measures. This information can be used to review or revise the beliefs how accounting measures are captured in the market value of equity (Barth et al. 2001). Beisland (2009) performed a review of value relevancy literature. The examination showed major interest from standard setters into value relevancy. The examination expected value relevancy studies to be particularly capable of assisting in fair value measurement debates.

2.5. The Ohlson (1995) model

The Ohlson (1995) framework provides the opportunity to examine how accounting data relates to the valuation of equity. The original framework has been cited 90 times since its publication, according to the Social Sciences Citation Index (SCCI) at the time of writing. This accumulates to an average annual SCCI of 3.46, which would qualify as a near classic paper according to Brown (1996). The model was refined in multiple following studies (e.g., Feltham and Ohlson, 1995, 1996; Ohlson, 1999, 2000) which have been cited numerous throughout value relevancy studies. A review of empirical evidence relating to value relevancy studies found the Ohlson (1995) model to be used in the majority of value relevancy studies examined (Bhatia and Mulenga 2019). One of the main benefits of the Ohlson (1995) framework is its application in studies relating to accounting policies. "The Ohlson model has stimulated a growing body of 'policy-relevant' work examining the link between firms' equity market values and amounts recognized and/or disclosed in financial statements" (the Coopers & Lybrand Accounting Advisory Committee 1997).

The model is based in the clean surplus relation. This relation dictates the change in the book value of equity to equal earnings minus any outflow of earnings, for example dividends. This model can be considered a starting point to conceptualize how changes in accounting measures, change valuations through earnings, book values and dividends. The framework relies on three assumptions. Firstly, the net present value of dividends can be used to determine market value of the traded security. Secondly, the clean surplus relation holds for changes in owners' equity. This means dividends paid reduce owners' equity, but do not affect the earnings in the current fiscal year. Finally, abnormal earnings are assumed to behave like a stochastic timeseries event and captured in that way (Ohlson 1995). The actual earnings for the current year minus the cost of capital define the abnormal earnings. The cost of capital is the risk-free rate multiplied with the book value of equity in the prior fiscal year. The model captures abnormal earnings and the book value of equity as a linear function for the market value of equity (Feltham and Ohlson 1996). Markets are expected to show behavior expected from perfect capital markets. However, it has been shown to work with imperfect markets if the years examined are not infinite (Barth et al. 2001). Another criticism of the Ohlson (1995) framework is the influence of scale effects (Kin and Lys 2000).

This criticism can be addressed by scaling the using per share numbers for variables used in the equations (Barth and Clinch 2009). The Ohlson (1995) framework used in McInnis et al. (2018) defined the market value of equity as a linear function of the book value of equity and net income. Additionally, it examined buy and hold returns as a linear function of the book value of equity and net income. The two models examined the information content of the balance sheet through the book value of equity and the information content from the income statement through the net income.

2.6. European bank financial statements

The focus of this research is bank financial statements which have to adhere to the IFRS 13 standard. Listed European banks provide a setting in which the effect of the adopted standard will be observable. European Union law mandates the use of IFRS as a reporting standard for companies which are listed on stock exchanges regulated by the European Union. Regulation No. 1606/2002 was passed by the European Commission and applies since the 1st of January 2005 (European commission 2002). Banks, which are listed on European Union stock exchanges, will have to prepare their financial statements in accordance with IFRS regulations. Thus, a change in the IFRS will result in a changed preparation of financial statements from listed companies whose securities are traded on EU regulated markets.

The financial statements of banks or financial institutions differ from other industries. A bank's assets and liabilities are almost exclusively comprised out of financial instruments. An average of 93 percent of assets and 97 percent of liabilities were composed of financial instrument, in the sample financial statement used in Bart et al. (1996). As the value of financial instruments is most influenced by fair value valuation (McInnes et al. 2018), banks provide a good setting to examine the effects of IFRS 13.

Eccher et al. (1996) used share prices at the fiscal year end to determine the market value of equity. This share price date could be questioned given the publication date of banks financial statements will happen after the fiscal year end. Nelson (1996) uses March 31 as the sample share price date, while Barth et al. (1996) used April 30 as their share price sample date. The three 1996 studies use US bank financial statements in their sample. European listed companies who are traded on an EU regulated market, have to publish within four months after the end of the fiscal year (AFM 2009). Given the European rules with regards to the publication of financial statements, this research will use the share price four months after fiscal year end as the market value of equity.

2.7. Theoretical constructs and hypothesis development

The goal of this research is to examine the influence of the adoption of IFRS 13 on the value relevancy of listed European bank financial statements. The independent construct therefore is the influence of IFRS 13 and the framework it provides to measure financial instruments at fair value. The changes in value relevancy are split into two categories. The change in value relevancy of the balance sheet, which is operationalized as the book value of equity.

The second being the value relevancy of the income statement, which is operationalized as net income. The dependent construct is the value relevancy of the financial statements, which is operationalized as the share price. This operationalization of the theoretical constructs is in line with prior literature specifically McInnis et al (2018). The Libby boxes (Libby 1981) illustrating the conceptual and operational framework are shown in table 1.

Prior literature has shown conflicting results when comparing the value relevance of historical cost accounting and fair value measurements (Barth et al 1996, Echer et al. 1996, Nelson 1996 and McInnis et al. 2018). However, this research focusses on the change in value relevancy as a result of the three-level framework to measure at fair value introduced by IFRS 13. Given the conceptual constructs explored in prior literature and the theoretical construct which influence the construct explored in this research, I do not expect the value relevancy of listed European bank financial statements to improve as a result of the introduction of IFRS 13. This leads to the following hypothesis:

H1a: The value relevancy of bank financial statements does improve as a result of IFRS 13.

H1b: The value relevancy of bank financial statements does not improve as a result of IFRS 13

TABLE 1

Libby Boxes Hypothesis 1

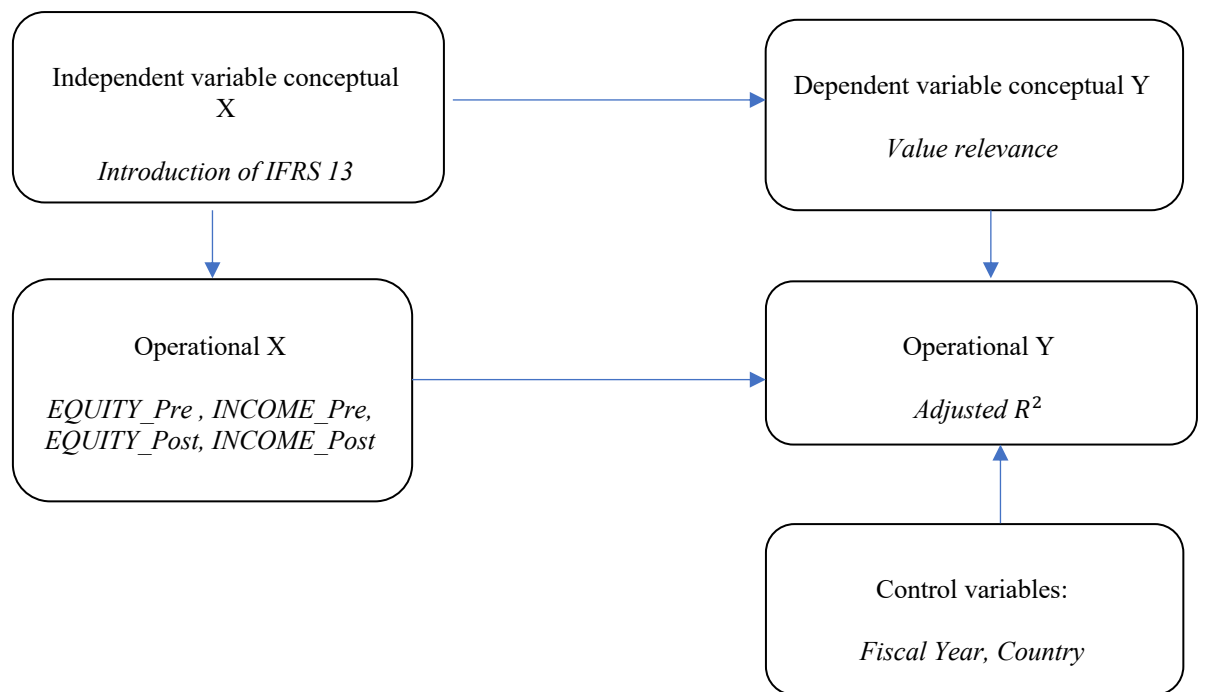


Table 1 shows the Libby Boxes, which represent the conceptual framework used in this research. The dependent variable used in the framework is the value relevancy of bank financial statement. The independent variable is the adoption of IFRS 13. These constructs are operationalized by using the Ohlson (1995) framework, where the stock price is a linear function of the book value of equity and income. The linear function includes controls for year and country fixed effects.

2.8. Summary and implications

The goals of IFRS 13 should contribute to an increase in the value relevance of financial statements. Barth et al (1996), Echer et al. (1996), Nelson (1996) and McNinnis et al. (2018) have shown banks to be an ideal setting to examine the effects of fair value measurements on the relative value relevance of financial statements. This thesis draws inspiration from these papers in their examination technique and setting. A similar approach in sample period will be taken as Lennox (2016). This sample period approach is used to examine if the adoption of IFRS 13 has accomplished its goals. This paper has provided a pre-post examination of the introduction of the restrictions of the PCAOB on auditors' tax services. Lennox (2016) is not related to fair value measurement. However, it provides a structure when examining the effectiveness of newly introduced standards. This pre-post introduction framework will be used to examine if IFRS 13 has contributed to enhancing disclosures for fair value in order that users could better assess the valuation techniques and inputs that are used to measure fair value, as it set out to do (FASB 2011).

This research aims to add to the discussion around fair value measurements by examining if the value relevancy of bank financial statements changes as a result of IFRS 13. However, this research differs from Barth et al (1996), Echer et al. (1996), Nelson (1996) and McNinnis et al. (2018) papers on an important level. The papers compared changes in value relevance when using fair value measurement in comparison to historical cost reporting. The difference between these measurements can be expected to be substantial as their valuation techniques differ completely. This research does not focus on historical cost accounting compared to fair value measurement. It focusses on the changes in relative value relevance as a result of the three goals set by the IASB in IFRS 13 and tries to provide a step in the evaluation of these goals. Value relevancy studies received criticism from the Holthausen and Watts (2001) paper, but have been shown to assist standard setters review or revise the beliefs how accounting measures are captured in the market value of equity (Barth et al 2001).

3. RESEARCH DESIGN

3.1. Structure

This chapter will discuss the research design used in this thesis. The research design and specific use of the Ohlson (1995) framework will be discussed in section 3.2. additionally, the section 3.3 will explore the specific equations and controls used in this research. The sample selected to perform this research will be discussed in section 3.4 of this chapter.

3.2. Research design and use of the Ohlson (1996) framework

This research draws strong inspiration from prior literature, specifically Barth et al. (1996) and McInnes et al. (2018). The Ohlson (1995) framework is used in the later to compare value relevancy of historical cost accounting and fair value accounting. The framework provides a fundamental analysis of how accounting data relates to firm value (Bernard 1995). This relation is at the heart of the discussion surrounding fair value. As much of the discussion around valuation is driven by the relevancy to the users of financial statements.

The market value of equity is found in the share price data of listed entities. The framework provides the opportunity to compare the explanatory power of different measures of accounting data. The framework developed by Ohlson (1995) will be used to test the hypothesis by evaluating changes in value relevance of banks financial statements after the adoption of IFRS 13. As it provides the opportunity to compare the explanatory power of accounting measures before and after the mandatory adoption of IFRS 13. McInnis et al. (2018) uses a similar approach to examine value relevancy changes due to reporting standards. In this framework, market equity can be expressed as a linear function of book value of equity and income. The linear models used in the two periods is as follows:

$$PRICE = b_0 + b_1EQUITY_Pre + b_2INCOME_Pre + e \quad (1)$$

$$PRICE = b_0 + b_1EQUITY_Post + b_2INCOME_Post + e \quad (2)$$

PRICE is the market price per share four months after fiscal year-end. This share price date is chosen due to the European rules on the publication of financial statements (AFM 2021). The framework used in this research will include year and country fixed effects and cluster standard errors by banks in all regression analysis. The fixed effects are included to combat issues of internal validity within the framework. Internal validity issues arise when there is uncertainty to which extent the variables used in the model have a cause-and-effect relationship with the dependent variable. There could be omitted variables which cause some of the variance within the model assumed to be caused by the variables in the model. Fixed effects could be used to combat issues relating to internal validity. The year and country fixed effects used in this model control for time and location specific characteristics. Using these controls improves confidence in the relationship between the dependent and independent variables used in the model. An overview of the regression coefficients and explanatory power of the model without using fixed effects are given in appendix B to illustrate their effect.

The Ohlson (1995) framework is known to suffer from scaling effects. Barth and Clinch (2009) showed per-share data combats this issue most effectively. Therefore, all data used in the framework will be per-share data. Dechow (1994) has provided a method to compare the value relevance of both equations, thus providing an examination of the effects of IFRS 13. The explanatory power of both equations will be calculated and compared according to the Vuong (1989) tests. The method provides a three-step comparison of the pre and post IFRS 13 period.

The explanatory power (adjusted R^2) for both equations will be calculated in three different situations. First, the combined value relevance of equity and income will be computed. Afterwards there will be an examination of both individual value relevance components in the pre and post period. Additionally, a similar analysis will be performed with the buy and hold return as the dependent variable. The explanatory power will serve to compare the changes in value relevance which the adoption of IFRS 13 might cause and draw conclusions on the test of the hypothesis.

The *EQUITY* data used in the model will be extracted from the balance sheet. The earnings per share excluding extraordinary items from the consolidated financial statements will be used as the measure for *INCOME*. These measures are consistent with prior examined research (Barth and Clinch 1998; Hann et al. 2007; Song et al. 2010; McInnis et al. 2018). The computed explanatory power will serve to compare the changes in value relevance which the adoption of IFRS 13 might have caused.

3.3. Sample selection

3.3.1. Bank financial statement data

The hypothesis will be tested using financial statements from banks which have to adhere to the IFRS 13 standard. The listed European banks provide a setting in which the effect of the adopted standard will be compared using the Ohlson (1995) framework. There are 227 banks traded on EU regulated markets, which include 26 Swiss banks (The Banks 2021). Banks listed on markets regulated by European Union law mandate the use of IFRS as a reporting standard. The Swiss banks that use IFRS as a reporting standard are included because they operate within the European market. Additionally, the changes in reporting caused by IFRS 13 will have to be adhered to by these banks.

The use of IFRS by European and Swiss listed companies is mandatory from fiscal years starting on or after January 2005 (IAS 2021). Regulation No. 1606/2002 was passed by the European Commission and applies since the 1st of January 2005 (European commission 2002). Banks, which are listed on European Union and Swiss stock exchanges, will have to prepare their financial statements in accordance with IFRS regulations. Thus, a change in the IFRS will result in a change the preparation of financial statements from listed companies whose securities are traded on EU regulated markets and listed Swiss banks.

3.3.2. Data sources and data preparations

The sample period will be 5 years pre and 5 years post mandatory IFRS 13 adoption. The pre-post framework has been shown to be an effective window to examine the effects of accounting policy changes (Lennox 2016). It showed how a regulatory accounting policy change can be explored effectively in a pre and post framework.

The exploration of a regulatory shock in this framework has been shown to combat internal validity concerns. This sample period will give insight in the short-term and long-term changes in relative value relevance as a result of IFRS 13. The data from bank financial statements of entities which have to adhere to IFRS standards will be used in the Ohlson (1995) framework to examine the changes in value relevance.

The Financial statement data and share price data was retrieved through the Wharton Research Data Services (WRDS). The financial statement data of the 184 banks were retrieved from the Compustat Global database. The number of banks used in the sample of this research paper is smaller than the 227 total listed European and Swiss banks. The amount used is smaller due to two different reasons. The first being data availability in the Compustat Global database. The second is related to the legal nature of dual listing. Some banks have a dual listing on multiple stock exchanges. This means they might have to adhere to multiple reporting standards. To assist companies with a dual-listing, European law allows to report under a different reporting standard when dually listed, if this reporting standard is judged to be of equal quality to the users of financial statements. Some listed European and Swiss banks with a double listing therefore report under a different reporting standard than IFRS. Additionally, some other legal reasons exist to deviate from reporting under IFRS. Therefore, the listed European and Swiss companies, which do not report under IFRS, are excluded from the sample used in this research.

This ensured IFRS standards were applied during the sample period. If listed entities did not use IFRS standards during a reporting year, the sample year was excluded. This resulted in 673 years of bank financial statements from the pre-IFRS 13 period (fiscal years 2008-2012) and 831 years of bank financial statements from the post-IFRS 13 period (fiscal years 2013-2017), making a total of 1,504 unique years of bank financial statement information.

The information needed for the Ohlson (1995) framework used in this research contains four elements. Firstly, the net income per share, excluding extraordinary items. Secondly, the book value of equity, which is scaled per share using the same amount of shares used to calculate the net income per share. The third variable needed is the market value of equity. The market value of equity is represented by the share price at day end data, four months after the end of the fiscal year. This date ensures the financial statement information has been publicized as is mandatory by European law (AFM 2009). The final variable used is the buy and hold return. This is the return when holding a share of an entity during the fiscal year. Additionally, markers for the fiscal year, currency used and accounting standard were retrieved. All of the information used in this research, was retrieved through the Compustat Global database available through WRDS. All variables have been calculated in euros per share.

TABLE 2
Amount of Financial Statement Years Per Currency

Currency	Observations
<i>BGN</i>	28
<i>CHF</i>	221
<i>CZK</i>	12
<i>DKK</i>	204
<i>EUR</i>	671
<i>GBP</i>	39
<i>GEL</i>	2
<i>HRK</i>	63
<i>HUF</i>	20
<i>ISK</i>	5
<i>LTL</i>	7
<i>NOK</i>	7
<i>PLN</i>	106
<i>RON</i>	29
<i>RSD</i>	17
<i>SEK</i>	43
<i>USD</i>	30

Table 2 reports the amount of financial statement years used in the sample and the currency in which they were retrieved from the Compustat Global database. Subsequently, all financial statement years are calculated in euro's using the exchange rate at four months after the end of the fiscal year.

An overview of the financial statement information years and the currency in which they were retrieved from the Compustat Global database is provided in table 2. The exchange rate at four months after the end of the fiscal year was used to measure all variables in the same currency. All variables are scaled using the amount of shares used to calculate the net income per share, excluding extraordinary items. Barth and Clinch (2009) shows that per-share data combats scaling issues in the Ohlson (1995) framework most effectively.

These measures are consistent with prior examined research (Barth and Clinch 1998; Hann et al. 2007; Song et al. 2010; McInnis et al. 2018). The data used in this research was exported from the Compustat Global database to excel. R-studio was used to construct the linear models and perform all calculations. Definitions for all variables used in this thesis can be found in Appendix A.

4. EMPIRICAL RESULTS AND ANALYSIS

4.1. Structure

Chapter 4 will discuss the results of the analysis performed in this research and discuss their implications in relation to the hypothesis. Section 4.2 will discuss the descriptive statistics of the sample used to test the hypothesis. Section 4.3 will show and evaluate the main findings of the tests performed. Section 4.4 will provide additional analysis of the value relevancy changes due to IFRS 13. Lastly, section 4.5 will provide a summary of all results.

4.2. Descriptive statistics

Table 3 shows the descriptive statistics of the sample used to examine the hypothesis tested in this research. The sample includes 1,504 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share. The variables are winsorized at the 2 and 98 percent level to combat the influence of outliers. However, outliers are still present in the sample. This is illustrated by the difference between the median and mean of all variables used in the models used for testing.

Winsorization at a larger level could eliminate the effect of outliers, but would hurt the external validity of the data used in the sample. Both truncation and different levels of winsorization have been explored. However, other measures to combat the outliers persistent in the sample had undesired effects. Hence, a winsorization at the 2 percent level is used in the sample. Table 3 shows significant differences in the mean and median of the independent variables in the pre and post period. This difference can be attributed to the changes in the economic climate during the sampling period, particularly given the 2008 financial crisis. However, including financial crisis years in the sampling period is necessary and important. As the measuring framework provided by IFRS 13 should combat issues arising from the breakdown of economic markets to a certain degree.

TABLE 3
Descriptive Statistics

Variable Name	N	Mean	Median	Std. Dev.	Min	P25.	P75.	Max
<i>PRICE</i>	1,504	87.15	12.04	249.88	0.11	3.28	43.05	1,447.10
<i>EQUITY_Pre</i>	673	70.79	13.70	163.66	0.12	3.97	46.61	850.22
<i>EQUITY_Post</i>	831	151.37	14.45	571.79	0.18	4.06	55.02	3,771.87
<i>INCOME_Pre</i>	673	5.85	0.63	19.59	-7.27	0.09	2.54	122.10
<i>INCOME_Post</i>	831	7.74	0.80	24.56	-3.28	0.09	3.69	155.97

Table 3 reports the descriptive statistics of all variables used in equation (1) and (2). The information used in the sample is derived from the Compustat Global Database. The Sample includes 1,504 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. A list of all variables definitions is given in Appendix A.

TABLE 4
Correlations in Pre-Period

Variable Name	(1)	(2)	(3)
(1) <i>PRICE_Pre</i>		0.95	0.94
(2) <i>EQUITY_Pre</i>	0.95		0.90
(3) <i>INCOME_Pre</i>	0.94	0.90	

Table 4 present the correlation between all variables in equation (1), which are all significant at the 1 percent level. The pre period includes information from 673 years of bank financial statements from 2008-2012. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. A list of all variables definitions is given in Appendix A.

TABLE 5
Correlations in Post-Period

Variable Name	(1)	(2)	(3)
(1)PRICE_Post		0.88	0.92
(2)EQUITY_Post	0.88		0.90
(3)INCOME_Post	0.92	0.90	

Table 5 present the correlation between all variables in equation (2), which are all significant at the 1 percent level. The pre period includes information from 831 years of bank financial statements from 2013-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. A list of all variables definitions is given in Appendix A.

Table 4 and table 5 show the correlations between the independent and dependent variables in the pre and post period. The correlations between *EQUITY_Pre* and *PRICE_Pre* is similar to the correlation between *EQUITY_Post* and *PRICE_Post* (0.95 vs 0.88), but decreased in the post period. A similar decrease can be observed when the correlation between *INCOME_Pre* and *PRICE_Pre* is compared to the correlation between *INCOME_Post* and *PRICE_Post* (0.94 vs 0.92). Conversely, a similar correlation can be observed when the correlation between *EQUITY_Pre* and *INCOME_Pre* is compared to the correlation between *EQUITY_Post* and *INCOME_Post* (0.90 vs 0.90). The overall decrease of correlation between the independent and dependent variables in the post period, signals a decrease in value relevance of financials statements in the post period. The value relevancy of both income and equity seems to be decreasing in the post period, with a larger decrease in the value relevancy of income.

TABLE 6
Relative Combined Value Relevance of Bank Financial Statements Pre-Period versus Post-Period

$$PRICE = b_0 + b_1EQUITY_Pre + b_2INCOME_Pre + e \quad (1)$$

$$PRICE = b_0 + b_1EQUITY_Post + b_2INCOME_Post + e \quad (2)$$

	Coefficients		
	Equity	Income	Adj. R ²
Pre Period	0.86*** (0.03)	4.47*** (0.30)	0.95
Post Period	0.12*** (0.01)	6.55*** (0.31)	0.90
Difference	-0.74 (0.00)	2.08 (0.00)	-0.05 (0.00)

Table 6 reports the coefficients and explanatory power of equations (1) and (2). The standard error is specified in the parentheses. The level of statistical significance is given as: *p<0.1, **p<0.05, ***p<0.01. The explanatory power illustrates the value relevance as it shows how the independent variables in the equations influence the variance of the dependent variable. The sample used consisted of 1,504 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. The model included year and country fixed effects, these have been omitted for brevity. A similar test has been performed without the controls for fixed effects, it is shown in Appendix B. The Vuong test (1989) will be used the test the differences in value relevance in the pre and post period. See appendix A for a complete list of variables used.

4.3. Main test and results.

The main results of this research are shown in table 6 and table 7. Table 6 compares the combined value relevance of European bank financial statements in the pre and post IFRS period. The adjusted R^2 is the explanatory power of the independent variables in the linear model used. An increase in the adjusted R^2 indicates an increase in the amount of variance of the dependent variable that is explained by the independent variables in the model. The adjusted R^2 is an indication of the value relevancy of the variables used in the Ohlson (1996) framework. Table 7 compares the individual explanatory power of the book value of equity and net income in the pre and post IFRS 13 period. The table shows changes in the value relevancy of the equation (4 to 6) as a result of the adoption of IFRS 13.

TABLE 7
Relative individual Value Relevance Equity and Income in the Pre and Post Period

$$PRICE = b_0 + b_1EQUITY_Pre + e \quad (3)$$

$$PRICE = b_0 + b_1EQUITY_Post + e \quad (4)$$

$$PRICE = b_0 + b_1INCOME_Pre + e \quad (5)$$

$$PRICE = b_0 + b_1INCOME_Post + e \quad (6)$$

Coefficients

	Equity	Income	Adj. R^2
Income-Only			
Pre Period		10.46*** (0.21)	0.90
Post Period		8.98*** (0.16)	0.89
Difference		2.48 (0.00)	-0.01 (0.00)
Equity-Only			
Pre Period	1.32*** (0.02)		0.93
Post Period	0.36*** (0.01)		0.85
Difference	-0.96 (0.00)		-0.08 (0.00)

Table 7 reports the coefficients and explanatory power of equations (3 to 6). The standard error is specified in the parentheses. The level of statistical significance is given as: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The explanatory power illustrates the value relevance as it shows how the independent variables in the equations influence the variance of the dependent variable. The sample used consisted of 1,504 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. The model included year and country fixed effects, these have been omitted for brevity. The Vuong test (1989) will be used to test the differences in value relevance in the pre and post period. See appendix A for a complete list of variables used

Table 6 compares the adjusted R^2 and coefficients of equations (1) and (2). It shows a decrease in the adjusted R^2 of 0.05 (0.95 to 0.90, $p < 0.01$). The explanatory of *EQUITY_Post* and *INCOME_Post* is larger compared to *EQUITY_Pre* and *INCOME_Pre*. This results in a decrease of the value relevance of bank financial statements in the post IFRS 13 period from an investors perspective. This is illustrated by the decrease in explanatory power of the independent variables in this period compared to the pre IFRS 13. A similar result can be observed in table 7. This table shows the changes in individual value relevance of the independent variables used in equations (3 to 6).

When comparing the individual value relevance of the independent variables, the adjusted R^2 of equity is found to be smaller than the individual adjusted R^2 of income in the post period. The explanatory power of the individual variables is smaller in both the pre and post period. The individual value relevance of both equity and income decreases in the post period compared to the pre period. The adjusted R^2 of income decreases from 0.90 to 0.89 ($p < 0.01$). The adjusted R^2 of equity decreases from 0.93 to 0.85 ($p < 0.01$). The individual value relevance of both independent variables decreases after the adaptation of IFRS 13. The explanatory power of income decreases only slightly, but the explanatory power of equity decreases by a larger amount.

4.4. Additional Testing

4.4.1. Analyzing buy and hold returns

The main results found in section 4.3 indicate IFRS 13 has a negative impact on the value relevancy of financial statements from listed European banks. Section 4.4 will provide additional testing to further explore the impact of IFRS 13. Firstly, the test and equations which provided results in section 4.3 will be repeated with a different dependent variable.

$$RETURNS = b_0 + b_1EQUITY_Pre + b_2INCOME_Pre + e \quad (1^*)$$

$$RETURNS = b_0 + b_1EQUITY_Post + b_2INCOME_Post + e \quad (2^*)$$

RETURNS is defined as the returns when buying a stock and holding it during a fiscal year. The sample used to examine equations (1 to 6) will be used to examine equations (1* to 6*). The sample uses the same data as previous tests but has less observations due to data availability (1,320 vs 1,504). The descriptive statistics of the data used is given in table 8. All variables are again winsorized at the 2 and 98 percent level to combat outliers. The mean and median of all independent variables show an increase in the post period.

TABLE 8
Descriptive Statistics

Variable Name	N	Mean	Median	Std. Dev.	Min	P25.	P75.	Max
<i>RETURNS</i>	1,320	3.52	0.14	19.29	-38.20	-1.12	3.29	100.34
<i>EQUITY_Pre</i>	527	70.82	13.64	165.10	0.07	3.94	46.93	846.77
<i>EQUITY_Post</i>	793	150.07	14.18	565.15	0.19	4.08	53.53	3,731.21
<i>INCOME_Pre</i>	527	5.34	0.61	16.80	-5.41	0.06	2.53	102.21
<i>INCOME_Post</i>	793	7.43	0.78	22.72	-3.31	0.08	3.64	140.77

Table 8 reports the descriptive statistics of all variables used in equation (1*) and (2*). The information used in the sample is derived from the Compustat Global Database. The Sample includes 1,320 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. A list of all variables definitions is given in Appendix A.

Table 9 shows the explanatory power equity and income in equations (1* to 6*) to be lower when explaining the variance of returns compared to share price. The results show the explanatory power to decrease after the mandatory adoption of IFRS 13 in both the combined and individual settings. The adjusted R^2 in the combined setting decreased from 0.28 to 0.25 ($p < 0.01$). When comparing the adjusted R^2 of income in the individual setting, the explanatory power decreased from 0.26 tot 0.24 ($p < 0.01$). A larger decrease can be observed in the equity only setting when, where the adjusted R^2 decreased from 0.28 to 0.20 ($p < 0.01$). The additional testing performed on the value relevance of financial statements from European listed banks shows a decrease in relevance when explaining buy and hold return on the stocks of these banks after the adoption of IFRS 13. The results indicate a decrease in value relevancy in both the combined and individual settings of income and equity.

TABLE 9
Value Relevance of Bank Financial Statements Pre-Period versus Post-Period

$$RETURNS = b_0 + b_1EQUITY_Pre + b_2INCOME_Pre + e \quad (1^*)$$

$$RETURNS = b_0 + b_1EQUITY_Post + b_2INCOME_Post + e \quad (2^*)$$

	Coefficients		Adj. R^2
	Equity	Income	
<i>Combined</i>			
Pre Period	0.05*** (0.03)	0.01*** (0.00)	0.28
Post Period	0.11** (0.12)	0.46*** (0.07)	0.25
Difference	0.06 (0.00)	0.45 (0.00)	-0.03 (0.00)
<i>Income-Only</i>			
Pre Period		0.31*** (0.06)	0.26
Post Period		0.34*** (0.03)	0.24
Difference		0.03 (0.00)	-0.02 (0.00)
<i>Equity-Only</i>			
Pre Period	0.04*** (0.01)		0.28
Post Period	0.01*** (0.00)		0.20
Difference	-0.03 (0.00)		-0.08 (0.00)

Table 9 reports the coefficients and explanatory power of equations (1* to 6*). The standard error is specified in the parentheses. The level of statistical significance is given as: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The explanatory power illustrates the value relevance as it shows how the independent variables in the equations influence the variance of the dependent variable. The sample used consisted of 1,320 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. The model included year and country fixed effects, these have been omitted for brevity. The Vuong test (1989) will be used to test the differences in value relevance in the pre and post period. See appendix A for a complete list of variables used.

4.4.2. Alternative measure of explanatory power

The adjusted R^2 is a measurement of explanatory power. However, alternative measures of explanatory power are available. The Bayesian information criterion (BIC) is a measurement used to compare the explanatory power of different models explaining the same dependent variable. The model with the lower BIC score is considered to have a better explanatory power compared to the other models examined (Claeskins and Hkort 2008). The BIC score of the equation (1 to 6) and (1* to 6*) are computed to further examine the value relevancy changes after the adoption of IFRS 13.

Table 9 shows the computed BIC scores for all equations examined. The results indicate a decrease of value relevancy after the adoption of IFRS 13. The BIC score from the pre period is lower in all examined models compared to the post period. The BIC score is lower in the combined, income-only and equity-only comparisons. These results indicate a decrease in the value relevancy of financial statements from European listed banks after the adoption of IFRS 13. These results are in line with the results found in section 4.3. and 4.4.1.

TABLE 10
Bayesian Information Criterion Score

	<i>PRICE</i>	<i>RETURNS</i>
<i>Combined</i>		
Pre-Period	7571.80	4635.14
Post-Period	9988.28	6962.82
<i>Income-Only</i>		
Pre-Period	7769.66	4659.79
Post-Period	10350.18	6962.82
<i>Equity-Only</i>		
Pre-Period	7988.50	4646.16
Post-Period	10062.40	6960.60

Table 10 reports the BIC score of equation (1 to 6) and (1* to 6*). When examining the same dependent variable, a models lower BIC score indicates a larger explanatory power. The sample used consisted of 1,504 observations examining *PRICE* as a dependent variable and 1,320 observations examining *RETURNS*. All sample data used bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers. The model included year and country fixed effects, these have been omitted for brevity.

4.5. Summary

This research used a sample of 1,504 observations of European listed bank financial statements. These observations are from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share. The variables were winsorized at the 2 and 98 percent level. The Ohlson (1995) framework was used to evaluate the value relevancy of financial statements when explaining share prices of these listed banks. The results found in table 6 and 7 provide a preliminary evaluation of the effects of IFRS 13 on the value relevance of European bank financial statements. It shows a decrease in the value relevance of income and equity on both a combined and individual level when adhering to the framework provided by IFRS 13.

Subsequently, a subsample of 1,320 observations is used to examine value relevancy changes regarding buy and hold returns. This examination uses the Ohlson (1995) framework but had returns as the dependent variable. The results in table 9 show a decrease in value relevancy on both a combined and individual level after the adoption of IFRS 13.

Both examinations used the adjusted R^2 as a measurement of explanatory power. A decrease in adjusted R^2 signals a decrease in the value relevancy of the independent variables. The BIC score is an alternative measurement of explanatory power. Table 10 presents the BIC scores of all settings examined using the Ohlson (1995) framework. It shows an increase in BIC scores when examining the post IFRS 13 setting for all examined settings. This increase in BIC score indicates a decrease in explanatory power due to the adoption of IFRS 13.

5. CONCLUSION

5.1. Structure

Section 5.2 will provide a conclusion based on the results found in this study. Subsequently, section 5.3 will evaluate the possible limitations of the research performed in this thesis and discuss possible future research expanding on this topic. Section 5.4 discusses the possible implications of this study for the academic world, standard setters and practicing field. Additionally, it will discuss this research in regard to possible future research.

5.2. Conclusion

A first step in the examination of the goals set out by the IASB for IFRS 13 is performed in this thesis. The results found in chapter 4 are used to evaluate these goals as hypothesized in H1a and H1b. The results found in this thesis reject hypothesis H1a and confirm H1b. This research finds the value relevancy of financial statements from listed European banks to decrease due to the adherence to IFRS 13. These results were found using the Ohlson (1995) framework, where the market value of equity is a linear function of the book value of equity and net income. Additionally, the Ohlson (1995) framework was used to examine returns as a linear function of equity and income. The explanatory power of both frameworks decreased in the post IFRS 13 period. This reduction was observed on a combined and individual level of the independent variables.

The change in value relevancy on an individual level differs between equity and income. The explanatory power of equity is larger before the introduction of IFRS 13. However, the results indicate the individual explanatory power of income to be larger compared to the individual explanatory power of the book value of equity after the adoption of IFRS 13.

Although the difference between the value relevance of bank financial statements in the post and pre period was significantly different, the difference in adjusted R^2 was relatively small compared to prior literature. Specifically comparing the results of McInnis et al. (2018) with the results found in this study. However, there are two reasons why this relatively small difference is to be expected. Firstly, the combined and individual explanatory power of income and equity explaining variance in market value of equity in both periods is high compared to prior literature. A large difference, such as McInnis et al. (2018) found, is therefore unlikely or even impossible. Secondly, the setting of this research differs from most value relevancy studies exploring fair value accounting. Most prior literature exploring this topic examined historical cost accounting vs fair value accounting (Barth et al 1996, Echer et al. 1996, Nelson 1996 and McInnis et al. 2018). Large differences in value relevance are more likely in these settings as they compare the use of two completely different accounting policies as measurements. This research explores the effect of IFRS 13 and the three-level framework it introduces on fair value measurement. Thus, the differences in accounting measures in the pre and post period are expected to be smaller compared to prior literature.

An alternative measurement of explanatory power is used to provide additional analysis of value relevancy changes due to the adoption of IFRS 13. The BIC score was computed for all individual and combined settings pre and post IFRS 13. The BIC scores show the value relevancy of income and equity to decrease both in a combined and individual setting when explaining the variance of the market value of equity. Additionally, The BIC scores show the value relevancy of income and equity to decrease both in a combined and individual setting when explaining the variance of buy and hold returns. The computed BIC scores indicate a decrease in the value relevancy of financial statements from listed European banks after the adoption of IFRS 13. The results from the BIC scores are similar to the computed explanatory power though the adjusted R^2 .

5.3.Limitations

The Ohlson (1995) model used in this research suffers from some limitations. The framework suffers from scaling issues (Kin and Lys 2000). This limitation is addressed by scaling the variables, using per share numbers (Barth and Clinch, 2009). Additionally, the model is based on some economic assumptions which are not always present. It takes a somewhat simplistic approach when examining the value relevance of accounting information. However, it has been shown to work with imperfect markets if the years examined are not infinite (Barth et al. 2001).

The limitations of the Ohlson (1995) are known, but the main benefits of the Ohlson (1995) framework is its application in studies relating to accounting policies. Value relevancy studies are limited in their ability to be sufficient for standard setters' decision making (Holthausen

and Watts 2001). Even though this body of research is limited in this ability, Beisland (2009) found this type of research to be particularly capable of assisting in fair value measurement debates. This limitation of value relevancy studies, particularly when using the Ohlson (1995) model, should be noted when examining the results of this study.

The sample used in this research is limited in two ways. Firstly, the effect of outliers is still present in the sample used. The effect of these outliers is minimized by winsorizing all variables at the 2 and 98 percent level. Table 2 indicates outliers are still present in the sample and the data used to be left skewed. Both truncation and different levels of winsorization have been explored. However, other measures to combat the outliers, persistent in the sample, had undesired effects. The remaining outliers were not winsorized to a larger level, because of external validity concerns. The second limitation is the scope of the sample used. Only European bank financial statements from 2008-2017 were examined in this research. This means the effect of the 2008 financial crisis is included in the sample. This can be seen as a limitation. However, the framework introduced by IFRS 13 tries to combat some of the problems associated with fair value measurements when economic markets break down. These limitations should be noted when examining the results of this study.

5.4. Implications and future research

This research provides a starting point to evaluate the possible effects of IFRS 13 and the success of IFRS 13 in achieving the goals set out by the IASB. The results indicate a decrease in the value relevancy of bank financial statements due to the adherence to IFRS 13 accounting policies. This research can be used by future academic research to help in their evaluation of IFRS 13. Standard setters can use this research and future research it might aid, to evaluate IFRS 13 and assist when setting future standards on fair value measurement.

Prior literature has shown results both in support of fair value measurements and results cautioning against the use of fair value measurements. This research finds the fair value framework introduced by IFRS 13 to decrease the value relevancy of bank financial statements. Future research with a different scope examining the effects of IFRS, could use this research as a starting point. IFRS standards are used throughout the world. Future research could examine different countries or time frames to compare changes in the value relevancy to the results of this thesis. Additionally, a setting where the effects of fair value measures could be compared to the setting and results of this research. Banks provide a setting where the effects of fair value measurement is examined by prior research. Future research could examine different industry data for comparison.

A limitation of this paper is the inclusion of 2008 financial crisis data in the sample. The framework provided by IFRS 13 tried to combat some issues with fair value measurements, which were examined during the 2008 financial crisis. Given the economic crisis possibly stemming from the Covid-19 pandemic. Research examining the effects of IFRS 13 during years of economic crisis, could provide additional examination if the goals of IFRS 13 were accomplished.

REFERENCE LIST

- Autoriteit Financiële Markten (AFM). (2009). *Publication and filing of financial reporting | Issuers of securities | AFM Professionals*. AFM.
<https://www.afm.nl/en/professionals/doelgroepen/effectenuitgevendeondernemingen/financieel-e-verslaggeving/verkrijgbaar-stellen-deponeren>
- Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159–178.
- Barth, M. E. (1994). Fair value accounting: evidence from investment securities and the market valuation of banks. *The Accounting Review*, 69(1), 1–25.
- Barth, M. E., Beaver, W. H., & Landsman, W. R. (1996). Value-relevance of banks' fair value disclosures under sfas no. 107. *The Accounting Review*, 71(4), 513–537.
- Barth, M. E., & G. Clinch. (1998). Revalued financial, tangible, and intangible assets: Associations with share prices and non-market- based value estimates. *Journal of Accounting Research* 36: 199–233. <https://doi.org/10.2307/2491314>
- Barth, M. E., & G. Clinch. (2009). Scale effects in capital markets-based accounting research. *Journal of Business Finance and Accounting* 36 (3/4), 253–288.
<https://doi.org/10.1111/j.1468-5957.2009.02133.x>
- Beisland, L. A. (2009). A review of the value relevance literature. *The Open Business Journal*, 2, 7–27.
- Bernard, V. L. (1995). The feltham-ohlson framework: implications for empiricists. *Contemporary Accounting Research*, 11(2), 733–733.
- Bhatia, M., & Mulenga, M. (2019). Value Relevance of Accounting Information: Comparative Study of Indian Public and Private Sector Banks. *International Journal of Indian Culture and Business Management*, 18(1),12–33
- Brown, L.D. 1996. “Influential accounting articles, individuals, Ph.D. granting institutions and faculties: A citational analysis.” *Accounting, Organizations & Society* 21, 723-754.
- Claeskens, G., & Hkort, N. (2008). *Model Selection and Model Averaging (Cambridge Series in Statistical and Probabilistic Mathematics) 1st Edition*. Cambridge University Press.
- Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics* 18 (1), 3–42.
[https://doi.org/10.1016/0165-4101\(94\)90016-7](https://doi.org/10.1016/0165-4101(94)90016-7)

European Commission. (2002). Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards.

Eccher, E. A., Ramesh, K., & Thiagarajan, S. R. (1996). Fair value disclosures by bank holding companies. *Journal of Accounting & Economics*, 22(1-3), 79–117.

Feltham, G.A., & Ohlson, J.A., (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research* 11, 689–732

Feltham, G.A., & Ohlson, J.A., (1996). Uncertainty resolution and the theory of depreciation measurement. *Journal of Accounting Research* 34, 209–234.

Financial Accounting Standards Board (FASB). (1991). Disclosures about Fair Value of Financial Instruments. Statement of Financial Accounting Standards No. 107. Norwalk, CT.

Financial Accounting Standards Board (FASB). (2006). Statement of Financial Accounting Standards No. 1.57, Fair Value Measurements. Financial Accounting Standards Board: Nonwalk, Connecticut.

Financial Accounting Standards Board (FASB). (2011a). IASB and FASB issue common fair value measurement and disclosure requirements [Press release]. Retrieved from <http://archive.ifrs.org.eur.idm.oclc.org/News/Press-Releases/Documents/PRfairvaluemeasurmentMay2011.pdf>

Financial Accounting Standards Board (FASB). (2011b). IFRS 13 Fair Value Measurement. Retrieved from: <https://www.ifrs.org/issued-standards/list-of-standards/ifrs-13-fair-value-measurement.html/content/dam/ifrs/publications/html-standards/english/2021/issued/ifrs13/>

Hann, R. N., F. Heflin., & K. R. Subramanyam. (2007). Fair-value pension accounting. *Journal of Accounting and Economics* 44 (3), 328–358. <https://doi.org/10.1016/j.jacceco.2007.04.001>

IAS. (2021). Financial Reporting Framework in Switzerland. IAS PLUS. <https://www.iasplus.com/en/jurisdictions/europe/switzerland>

IASB. (2006). IASB publishes Discussion Paper on fair value measurements [Press release]. Retrieved from <https://www.iasplus.com/en/binary/pressrel/0611fairvaluedppr.pdf>

IASB. (2001). International Accounting Standard Boards, framework for the preparation and presentation of financial statement. London: IASB.

IMF. (2009). Global financial stability report. Responding to the financial crisis and measuring systemic risks. April 2009.

- Kin, L., & Lys, T. (2000). The Ohlson model: contribution to valuation theory, limitations, and empirical applications. *Journal of Accounting, Auditing & Finance*, 15(3).
- Kuiper, I., & ter Hoeven, R. (2014). Toepassing IFRS 13 Fair Value Measurement door Corporates. *Maandblad voor Accountancy en Bedrijfseconomie*, 88(12), 518-529.
- Korf, D., & van der Lof, M. (2014). Fair value-waardering bij banken. *Maandblad Voor Accountancy En Bedrijfseconomie*, 88(12), 530–542. <https://doi.org/10.5117/mab.88.31212>
- Landsman, W. R. (2007). Is fair value accounting information relevant and reliable? evidence from capital market research. *Accounting and Business Research*, 37, 19–19.
- Lennox, C. S. (2016). Did the pcaob's restrictions on auditors' tax services improve audit quality? *The Accounting Review*, 91(5), 1493–1493.
- Libby, R. (1981). *Accounting and human information processing: Theory and applications*. Prentice Hall.
- McInnis, J. M., Yu, Y., & Yust, C. G. (2018). Does fair value accounting provide more useful financial statements than current gaap for banks? *The Accounting Review*, 93(6), 257–257. <https://doi.org/10.2308/accr-52007>
- Nelson, K. (1996). Fair value accounting for commercial banks: An empirical analysis of SFAS No. *Accounting Review* 71 (April), 161-182.
- Nissim, D., & S. H. Penman. (2008). *Principles for the Application of Fair Value Accounting*. Center for Excellence in Accounting and Security Analysis: Occasional Paper Series, Columbia Business School.
- Ohlson, J., (1995). Earnings, book values and dividends in security valuation. *Contemporary Accounting Research* 11, 661–687.
- Ohlson, J., (1999). On transitory earnings. *Review of Accounting Studies* 4, 145–162.
- Ohlson, J., (2000). Residual income valuation: The problems. Working paper, New York University.
- Song, C. J., W. B. Thomas, & H. Yi. (2010). Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms. *The Accounting Review* 85 (4), 1375–1410. <https://doi.org/10.2308/accr.2010.85.4.1375>
- SEC. (2005). Report and Recommendations Pursuant to Section 401(c) of the Sarbanes-Oxley Act of 2002 On Arrangements with Off-Balance Sheet Implications, Special Purpose Entities, and Transparency of Filings by Issuers. United States Securities and Exchange Commission.

The Banks EU. (2021). List of publicly traded European banks.

<https://www.thebanks.eu/traded-banks>

Vuong, Q. H. (1989). Likelihood ratio tests for model selection and non-nested hypotheses.

Econometrica 57 (2): 307–333. <https://doi.org/10.2307/1912557>

APPENDIX A

Explanation of All Variables Used

Variable	Name	Description
Share Price	<i>PRICE</i>	Market value of equity, resembled by the share price at day end four months after end of the fiscal year
Equity Pre IFRS 13	<i>EQUITY_Pre</i>	Book value of equity in the pre IFRS 13 sample years, retrieved from the balance sheet in the financial statements. Calculated on a per share level by dividing by the same amount of shares used to calculate net income per share.
Equity Post IFRS 13	<i>EQUITY_Post</i>	Book value of equity in the post IFRS 13 sample years, retrieved from the balance sheet in the financial statements. Calculated on a per share level by dividing by the same amount of shares used to calculate net income per share.
Income Pre IFRS 13	<i>INCOME_Pre</i>	Net income per share, excluding extraordinary items in the pre IFRS 13 sample years, retrieved from the income statement in the financial statements. Calculated on a per share level by dividing by the same amount of shares used to calculate book value of equity per share.
Income Post IFRS 13	<i>INCOME_Post</i>	Net income per share, excluding extraordinary items in the post IFRS 13 sample years, retrieved from the income statement in the financial statements. Calculated on a per share level by dividing by the same amount of shares used to calculate book value of equity per share.
Buy and hold one year return	<i>RETURNS</i>	The return when buying a share and holding it through the entirety of the fiscal year.
Year Fixed Effect	<i>YEAR</i>	Dummy variable, representing year fixed effects
Country Fixed Effect	<i>COUNTRY</i>	Dummy variable, representing country fixed effects.

APPENDIX B

TABLE 8

Relative Value Relevance of Bank Financial Statements Pre-Period versus Post-Period Without Year and Country Fixed Effects

$$PRICE = b_0 + b_1EQUITY_Pre + b_2INCOME_Pre + e \quad (1)$$

$$PRICE = b_0 + b_1EQUITY_Post + b_2INCOME_Post + e \quad (2)$$

	Coefficients		
	Equity	Income	Adj. R^2
Pre-Period	0.81*** (0.03)	5.30*** (0.28)	0.94
Post-Period	0.11*** (0.01)	7.44*** (0.31)	0.87
Difference	-0.70	-12.19	0.07

Table 8 reports the coefficients and explanatory power of equations (1) and (2). The standard error is specified in the parentheses. The explanatory power illustrates the value relevance as it shows how the independent variables in the equations influence the variance of the dependent variable. The sample used consisted of 1,504 years of bank financial statement information from 184 different listed European banks that report under IFRS from 2008-2017. All variables are measured in euros per share and are winsorized at the 2 and 98 percent level to combat the influence of outliers.