Master thesis Accounting & Auditing

# The impact of IFRS 9 on the Value Relevance of Accounting Information: Evidence from European Union Banks

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**Abstract**

This study investigates the impact that IFRS 9: *financial instruments* on the value relevance of accounting information. IFRS 9 does make some significant changes in how loan losses are accounted for. The IFRS 9 standard is considered a complicated standard and this raises the question whether IFRS 9 does provide more useful information to equity markets. The information disclosed by financial statements summarizes to some degree the firm value. This is called value relevance (Francis and Schipper 1999). In order to investigate the value relevance by using the relationship between stock prices, earnings and equity, I will use the Ohlson model (1995). In this study I investigate the value relevance pre- and post-IFRS 9: *financial instruments* for European Union banks in the timeframe from 2010 until 2019. The main finding of this study is that value relevance have decreased significantly after the introduction of IFRS 9.

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# 1    Introduction

In the aftermath of the financial crisis of 2008, the International Accounting Standards Board (IASB) decided to revise the accounting standards for financial instruments (Bischof and Daske, 2016). The goal of the IASB was to address shortcomings in International Accounting Standard (IAS) 39. The IASB believed that IAS 39, the preceding accounting standard for financial instruments, contributed to the magnitude of the financial crisis in 2008. The view that IAS 39 as applicable accounting standard for financial instruments contributed to the 2008 financial crisis is endorsed by Huain (2012). Replacing IAS 39 gained momentum as the G20 and the Financial Crisis Advisory Group pushed for the recognition of expected credit losses in the financial statements (IASB, 2014). On the 24th of July 2014, the IASB released International Financial Reporting Standard (IFRS) 9: *Financial Instruments*. IFRS 9 was the replacement of IAS 39. As of the first of January 2018 IFRS 9 is the applicable financial reporting standard for financial instruments in the European Union.

The shift from IAS 39 to IFRS 9 is does not mean that only another set of rules is applicable. IAS 39 relied on the basis of rules whereas IFRS 9 is accounting on the basis of principles (Gornjak, 2017). The major difference between IFRS 9 and IAS 39 is the manner in which loan losses are accounted for. Under IAS 39, the standard was applicable until December 31 2017 in the EU, only incurred losses are accounted for. Under IFRS 9, applicable as of January 1 2018, expected future credit losses are accounted for using the expected credit loss model. This means that on a continuous basis an outstanding loan is assessed on creditworthiness. Based on this assessment continuous impairments are made on the loan portfolio. Figure 1 captures the situation described above.
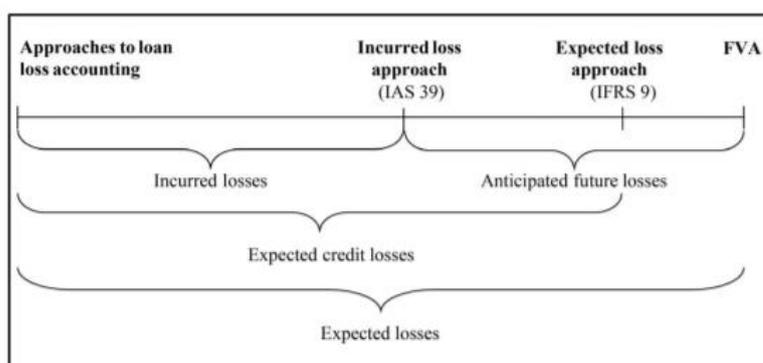


**Figure 1.** Loan loss recognition under alternative accounting regimes. Source: Gebhardt and Novotny-Farkas (2011, p. 296)

By introducing IFRS 9 the International Accounting Standards Board (IASB) aimed to provide better information to investors. Ian Mackintosh, the vice-chairman of the ISAB, said on August 5, 2011 said "IFRSs are primarily aimed at investors and creditors. And we really need to know what you, the primary users of financial statements, want." Therefore it is important to investigate how the financial markets react after the introduction IFRS 9. Do the primary users of financial statements get what they want? Are financial markets getting better and more understandable information under IFRS 9 than it was the case under its predecessor IAS 39? If the IASB reached its goals than the financial markets do get better accounting information under IFRS 9. It is important for policymakers to understand the result of IFRS 9 in order to investigate whether the implementation had the desired outcomes. Especially since IFRS 9 has a really great impact on financial firms since financial firms do have a lot of financial instruments on their balance sheets. The IASB made promises to the financial markets. Ian MacIntosh asked in 2011 specifically asked for the wishes of investors. In this study I will investigate whether IFRS 9 fulfilled its promises to the equity markets and increased the value relevance of accounting information.

This study will be conducted using the Ohlson model (1995). By using this model the relationship between share prices and accounting figures will be explored. The accounting figures that will be used in this study are the earnings per share, representing the income statement and the book value per share, representing the balance sheet. Ultimately, this study examines how well these accounting figures will explain stock prices.  The time period of this study will be 2011 until 2019 and is divided in a pre-IFRS 9 period (2011-2017) and a post-IFRS 9 period (2018-2019). This research finds evidence that the value relevance of accounting information has decreased after the introduction of IFRS 9. The same applies for relevance of the reported book value per share for the year. However, this study finds evidence that under IFRS 9 the earnings per share figure does show an increase in value relevance.

The study contributes in two ways to existing academic literature. First, this is the first study considering all European Union banks and the reaction of equity markets after the introduction of a new accounting standard, IFRS 9 on January 1, 2018. Besides, there are a lot of studies done in the field of value relevance of accounting information announced by non-financial firms. This study is one of the first studies done to value relevance of accounting information and the impact of new accounting standards on the EU banking sector. Secondly, this study provides evidence on the quality of IFRS 9. The goal of the IASB was to provide better accounting information for investors. This study will assess whether this particular new standard provides better accounting information to (international) investors. There is reason to doubt the accomplishments of the IASB on IFRS 9. The reaction of the market in the standard setting process of IFRS 9 was affected by firm specific factors (Onali et al., 2017). As it turns out, Onali et al. (2017) found evidence that lower information asymmetry and higher information quality do have positive effects on market adjusted returns. Onali et al. (2017) findings are contrary to popular belief that the adoption of IFRS 9: *Financial Instruments* will improve accounting quality as a general rule. This is especially true for firms that need better accounting quality. These are small firms with low liquidity and an ownership structure that is very concentrated. The reaction of the capital markets is of interest to the IASB as the result can be helpful in the evaluation of the IFRS 9 standard and the design of prospective accounting standards (European Commission, 2015).

The remainder of this paper is structured as follows. Section 2 is a review of existing literature on the subject. The literature review will cover first of all a summary of IFRS 9. Secondly I will address the general implications of IFRS adoption and prior literature on value relevance of accounting information. Finally I will develop the hypothesis based on the literature review. In the third section I will describe the methodology of my research. In section 4 are the results presented. In section 5 the conclusions of this paper are presented.

## 2      Literature and Hypothesis

In this chapter I will develop the existing theoretical framework about IFRS 9, the introduction of new accounting standards and effects on capital markets, IFRS's in particular. In the second part of this chapter I will investigate what the relation between accounting information is and the value relevance of accounting information.

### 2.1      Overview of International Financial Reporting Standard 9

The goal of IFRS 9: *Financial Instruments* was to change the financial reporting to a standard that operates on the basis of expected credit loss. This form of reporting does force companies to recognize inevitable losses on financial instruments in a timely manner. Particularly for the banking industry was this of importance according to the IASB,s chairman Hans Hoogervorst (Hoogervorst, 2016). IFRS 9 does provide stakeholders a view on financial instruments with an increased credit risk (Marshall, 2015). This does change the reported value of especially debt instruments.

Under IFRS 9 financial assets need to be impaired as a correction to market conditions instead of recording losses as incurred as was the case under IAS 39. IFRS 9 is generally a forward looking and on principals relying accounting standard. The prior standard was only backward looking and IAS 39 relied on rules. Given this facts, there are a couple of implications for the financial statements. First of all, when impairments are being made on the loan portfolio, the book value of the loan portfolio will be worth less. Consequently, this results is a lower value of the equity and thus a lower book value per share. By the same notion, an impairment results in a cost charge in the income statement. The impairment charge will lower the reported net income and so will the earnings per share decrease. Secondly, the reported book value per share and the earnings per share will be closer to the "fair value" since the probability of defaulting loans is accounted for and reported in the financial statements.

IFRS 9: *financial instruments* is considered a very complicated accounting standard. This view is endorsed by Guégan and Rebreanu on behalf of EY L.L.P.. In 2018 Guégan and Rebreanu wrote that the banking sector has to explain to investors why and to what extend certain are made provisions during the transition to IFRS 9. In general can new accounting standards be confusing to investors, financial statements before the transition are less comparable to financial statements after the transition (Dichev et al., 2013). Taking into account the complexity of IFRS 9, investors can also be confused by the implementation of IFRS 9. As already mentioned, the difference between IFRS 9 and IAS 39 is the switch from the incurred loss model to the expected loss model. The expected loss model does require more management estimates and is therefore more susceptible for earnings management. The estimation of losses of future cash flows is more subjective in nature than recording actual losses (Beerbaum 2015). This opens doors for managers to engage in earnings management since the applicable accounting standards do incentivize managers to make subjective judgments regarding loss provisions (Gornjak, 2015).

Despite the increased risk for earnings management, the announcement of IFRS 9 has been generally perceived positively by investors (Onali et al., 2017). As it turns out, investors do view IFRS 9 as an accounting standard which is shareholder-wealth enhancing (Onali and Ginesti, 2015). The study of Onali and Ginesti also founds evidence that the comparability standards of accounting on the European continent is beneficial for international investors. The increased comparability does outweighs the cost of poorer firm-specific information (Onali and Ginesti, 2015).

## 2.2    The introduction of accounting standards and capital markets

In academic literature, there is a constant debating about the implications of International Financial Reporting Standard (IFRS) (Christensen, 2013). On the one hand, the adoption of IFRS reporting can have positive effects on capital markets. The idea is that reporting under one, high quality, accounting standard would increase transparency and comparability between different enterprises, especially in an international setting. Better accounting information does benefit capital markets in several ways. Capital market do

benefit from reducing information asymmetries, increasing liquidity and lowering the cost of capital (Hail et al., 2010). While this is beneficial for capital markets, managers do have discretion in the application of the accounting standards. The introduction of new accounting standards do not alter the pre-existing reporting incentives of managers (Ball et al., 2003; Burgstahler et al. 2006).

IFRS accounting standards became the mandatory reporting standard in the European Union in 2005. The effects of the mandatory IFRS adoption on the European Union banking sector was investigated by Gebhardt and Novotny-Farkas (2011). Particularly they did research to the effects of IAS 39, the predecessor standard of IFRS 9, on commercial EU Banks. Gebhardt and Novotny-Farkas found evidence that under IAS 39 did reduce discretionary behavior. This was measured by observing less income smoothening. More importantly, the effect of mandatory IFRS adoption for EU banks was less in countries with strict supervisory regimes and in countries which do have a more dispersed ownership of banks (Gebhardt and Novotny-Farkas, 2011). The last finding on the effects of IAS 39 on EU banks was that earnings persistence decreases after adoption due to increasing loan loss provisions. This decreased earnings persistence tends to hold in the future (Gebhardt and Novotny-Farkas, 2011). Since IFRS 9 does increases loan loss provisions even further, it can be the case that earnings persistence does also sustainable decrease. This can have an impact on the valuation of EU banks.

Prior research provides evidence on value relevance of accounting information for the implementation of IFRS specifically for the European banking industry. In the European Union IFRS became the mandatory reporting standard since the first of January 2015 (European Union, 2018). As is the case with IFRS 9: *Financial Instruments* the banking sector was also significantly affected by the new accounting standards in 2005 (Agostino et al., 2011). The intention of the study of Agostino et al. was to determine "whether the mandatory application of IFRS increased the value relevance of accounting information to the prices of bank shares in the European Union". The results of this study provides clear evidence of an increased importance of earnings on share prices. On the other hand the

mandatory implementation of IFRS in the European Union tends to make the book values of equity less value relevant and insignificant. The finding that the book value of equity is less value relevant in comparison to earnings per share is not surprising. In 1999 Collins et al. found empirical evidence that the book value of equity is more important only if current earnings are not providing a good proxy for future earnings.

The implementation of new accounting standards can be expensive for investors. The first reason for this statement is that the quality of firm-specific information decreases (Ding et al., 2007). The second reason is the loss of information related to such transitions of accounting standards. Financial statements decrease in comparability before and after the transition. On top of that, transitions to new accounting standards are costly for firms, as they need to understand and implement the required new standards for compliance reasons. However, according Marshall's estimation (2015), benefits will outweigh the incurred cost of implementing IFRS 9. In the end, the equity investors are paying for the transition. However, the adoption of IFRS by European firms show a decrease in cost of capital (Prather-Kinsey et al., 2008). Finally, and maybe most important, investors can get confused (Dichev et al., 2014). Investor confusion is a really important issue to the IASB since it is their mission "to bring transparency, accountability and efficiency to the financial markets" (IFRS Foundation, n.d.).

Existing academic literature is divided on the subject whether new accounting standards do deliver value to investors. In particular in the case of IFRS 9: *Financial instruments*. As already mentioned is this accounting standard viewed as a very complicated standard and therefore it is hard to say whether IFRS 9 does deliver value to investors by increasing value relevance. This raises the question whether IFRS 9 has fulfilled the promises made to the financial markets. Does IFRS 9 provide better and more valuable information to equity markets compared to the predecessor standard IAS 39? In the remainder of this chapter I will investigate what the relation is between accounting information and reactions in the equity market, and concluding in my hypothesis of this research question.

## 2.3 Relation earnings information and equity markets

Reported earnings are very important for equity markets since equity investors and analysts do use this year's earnings in the valuation of the equity of a firm (Dumontier & Labelle, 1998; Beaver, 1998). The theoretical link between earnings and stock returns is developed by Beaver in 1998. The model of Beaver (1998) links current period earnings to the current share price in three steps. The first step include that current period earnings will lead to expected future earnings, since the earnings in the current period do provide information for expected earnings in future periods. Following this logic, the second step connects the expected future earnings to expected future dividends. Future earnings do develop expectations on the wealth a firm is able to accumulate in the future. This wealth the firm potentially accumulates determines the future capacity to pay dividends to shareholders. The third link connects the expected future dividends to the current share price. The current value of the firm is the present value of all expected future dividend payments (Beaver, 1998; Berk & DeMarzo, 2016).

So, following this logic of Beaver, the earnings per share reported by firms should have an significant impact on the current share price. This relation is also found by Nichols and Wahlen in their 2004 paper. In this study Nichols and Wahlen replicate the paper of Ball and Brown (1968) with updated evidence and found evidence that "annual stock returns are significantly related to the sign of annual earnings changes". Also, evidence was found that financial markets react to quarterly earnings surprises (Nichols & Wahlen, 2004). In the same paper, Nichols and Wahlen found a significant differential in stock returns between high and low earnings persistence portfolios. Since, due to IFRS 9, earnings persistence can decrease it is also possible that stock returns for European Union banks will decrease under IFRS 9: *Financial Instruments*.

## 2.4    Value Relevance of Accounting Information

Value relevance of accounting information is defined as the ability of disclosed information by the financial statements to capture and summarize firm value (Francis and Schipper 1999, Karğın, 2013). The degree of the value relevance of accounting information is measured by the statistical relation between accounting information and stock returns. Note that in this paper value relevance of accounting information is used as a proxy for disclosed quality of accounting information.

Prior literature shows that a good method to investigate changing value relevance of accounting information is using the Ohlson model (1995) (Karğın, 2013; Agostino et al., 2015). The Ohlson model does represent the value of a firm as a linear relationship between the present value of expected abnormal earnings and the book value of equity (Agostino et al., 2015).

The Ohlson model uses two inputs in its model. In the Ohlson model the stock price of a firm is explained by earnings per share (EPS) and the Book Value per Share (BVPS). The EPS component of the Ohlson model does represent the side of the income statement. Besides earnings per share, the other input to the Ohlson valuation model is the book value per share, representing the balance sheet side. As it turns out, pricing multiples and the explanatory power of the book value per share tend to increase as financial health decreases (Barth et al., 1998). In their research Barth et al. used a sample of 396 bankrupt firms. Because of the probability of default the firms in the sample faced, liquidation values became more relevant. This means that the equity valuation according to the balance sheet becomes more important and that the importance of the income statement (earnings per share) decreases in importance as the financial health of the firm is worsening (Barth et al., 1998). The opposite is also true according to Barth et al. (1998). The importance of the book value of the equity tends to decrease as financial health is increasing. So, when a firm is not in financial distress, the book value of equity is not that important and the earnings per share are becoming more important. When taking into account the sample used in this research, the most banks are not in financial distress, it is expected that the earnings per share figure will be more value relevant in

comparison to the book value per share, even before the impact of IFRS 9: *Financial Instruments*.

## 2.5   Hypothesis

The introduction of IFRS are considered beneficial for capital markets since IFRS's do provide more comparability, lower information asymmetry and a lower cost of capital (Hail et al., 2010). However, IFRS 9: *Financial Instruments* is considered a complicated standard in the field (Guégan & Rebreanu, 2018). Investors can get confused by the new standard and the decreased comparability. On top of that forecasting will become more difficult since expected credit loans are impairments for many years down the line. The implementation of IFRS 9 does also directly impact the book value per share, since outstanding loans are written of, as well the earnings per share, since impairment is a cost. Earnings per share are now more conservatively estimated than was the case under IAS 39, since under IFRS 9 provisions are made for future losses. On the other hand, IFRS 9 reporting result in a higher degree of fair value accounting. We know that investors perceive IFRS 9 as shareholder value enhancing (Onali and Ginesti, 2015).

I consider the fact that shareholders do view IFRS 9 as a shareholder value enhancing accounting standard (Onali and Ginesti, 2015) important for stating the first and general hypothesis about IFRS 9. Despite the IFRS 9 is considered a complicated accounting standard I expect that the value relevance of the accounting information in general *increases* after the implementation of IFRS 9: *Financial Instruments*.

*H1: Value relevance of accounting information increases post-IFRS 9 implementation*

Due to increased fair value orientation of reported earnings per share and the view of shareholders of IFRS 9 as a whole, I expect that IFRS 9 does increase the value relevance of the earnings per share. On top of that, since earnings are more conservatively estimated, investors will not be surprised in the future when impairments on loans have to been made, which makes the reported earnings more relevant.

*H2 : Value relevance of earnings per share increases post-IFRS 9 implementation.*

IFRS 9 requires banks to make impairment charges on the loan portfolio for credit losses in the future. This does mean the asset side of the balance sheet decreases and so the book value per share (BVPS). In fact, the BVPS is also more fair value oriented under IFRS 9 compared to IAS 39. Since shareholders do view IFRS 9 as value enhancing (Onali and Ginesti, 2015), it stands to reason that the BVPS becomes more value relevant. However, the BVPS does generally increases in value relevance when firms do experience financial distress and vice versa (Barth et al., 1998). There was no evidence to suggest that the EU banking sector does experience severe financial distress during the sample period. In fact, the EU banking sector was generally profitable during the sample period. When taking this into account I do expect that the value relevance will not change for the BVPS after the implementation of IFRS 9.

*H3: Value relevance of the book value per share does not change post-IFRS 9 implementation*

# 3 Methodology

In order to test whether the value relevance of accounting information has increased after the introduction of IFRS 9, I collected data that covers the period from 2010 to 2019. In this timeframe there is a distinction between the pre-IFRS 9 era from 2011 to 2017 and a post-IFRS 9 era from 2018 to 2019. The post-IFRS 9 timeframe is used to determine whether the value relevance of accounting information is significantly changed after the implementation of IFRS 9: *Financial Instruments*. From Orbis BankFocus database are the Book Value per Share (BVPS) and the Earnings per Share (EPS) collected for European Union banks. Note here that the European Union in my sample will exist out of all 27 European Union countries and not only countries that use the Euro as their main currency. Furthermore, banks in the sample are active, are publicly listed and do report under IFRS of course. The stock prices for the individual EU banks are also retrieved from the Orbis BankFocus database. All of these banks were in fact reporting under IFRS 9 as per January 1st, 2018.

## 3.1 Models

Many prior studies conducted to the effect of new accounting standards to the value relevance of accounting information are using the Ohlson model (1995) (Harris et al., 1994; Francis and Schipper, 1999; Ali and Hwang, 2000; Karğin, 2013; Agostino, 2015). In this study I will also make use of the Ohlson model (1995). The reason this research will be conducted using the Ohlson model (1995) is that this model breaks accounting information down in two components. The first component is the net investment equity investors make in the firm, this is also called the book value per share. The second component of a share price is the present value of all the net profits attributable to common shareholders. This two components combined is the "clean surplus" relation of shareholder's equity value. The "clean surplus" relation is described by the formula:

$$BVPS_1 = BVPS_0 + EPS_1 - Dividends_1$$

So, the Book Value per Share (BVPS) on t=1 is the BVPS on t=0 + the Earnings per Share (EPS) on t=1 less any cash disbursements to shareholders, denoted by Dividends on t = 1.

In the valuation process of a publicly listed firm, BVPS and EPS do play a central reference role. How the impact of book value per share and earnings per share on valuations of European Union banks and changes due to the impact of IFRS 9: *Financial Instruments* remains a question to answer.

In the model below I will conduct a  regression of the market value per share on the book value per share and the earnings per share as suggested by Ohlson (1995) and Burgstahler and Dichev (1997). The regression will be on a regular time interval which will be three months after the closing of the year. It is important to test whether the book value per share and the earnings per share in general do have an impact on the stock prices and thus whether accounting information does have value relevance in the first place.

$$MVPS_{i,t+1} = \alpha_0 + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \varepsilon_{i,t} \ (1)$$

In which $MVPS_{i,t}$ represents the market value per Share of firm i at time t+1. Time t is defined as the fiscal period-end. The market value per share is defined as the share price at the date of 3 months after the closing date of the fiscal year (t+1). This period of three months is in the field considered to be sufficient to expect the financial statements and to let the capital markets price in the accounting information (King and Langli, 1998; Kimberly, 2002; Hellström, 2006; Van der Meulen et al., 2007). The coefficient estimates will be made based on Ordinary Least Squares (OLS). On a year to year basis $R^2$ values will be compared in order to detect a changing value relevance of accounting information as a result of the implementation of IFRS 9: *Financial Instruments.* Therefore a distinction in the presentation of value relevance before the implementation of IFRS 9 and after the implementation of IFRS 9.

In BankFocus, the following criteria for the EU banking sector are applied. A bank has to be active. Secondly, the bank has to be publicly listed. Thirdly, the bank has to be based in

one of the 27 EU countries and, last of all the bank has to report under IFRS. The application of these creteria results in 224 individual banks. Of the 224 individual banks, the book value per share, earnings per share and stock data are collected on a yearly basis. Since the Ohlson model (1995) assumes earnings are non-negative, negative earnings will be excluded from the sample. For the same reason, banks with a negative book value will be eliminated from the sample.

# 4    Results

The analysis of publicly listed EU banks from 2011 until 2019 reporting under IFRS results in a sample of  224 individual banks. The Ohlson model (1995) assumes a linear and positive relationship between the variables. Therefore are negative earnings excluded from the sample, as well as negative book values per share. From this 224 individual banks are 1.463 firm years observed. The initial sample is used in order to identify and eliminate observations. The initial sample is not used in the regression models. The second column identifies the observations with positive reported earnings per share and positive bookvalues which are used in the regression models. The sample is also divided in a pre-IFRS 9 and a post-IFRS 9 period since the goal of this study to observe a changing value relevancy of accounting information.

*Table 1 Numbers of EU banks 2011 - 2019*

| Years | Initial Sample | Positive Earnings Reported |
|---|---|---|
| *Pre-IFRS 9* | | |
| 2011 | 120 | 96 |
| 2012 | 112 | 91 |
| 2013 | 149 | 127 |
| 2014 | 154 | 131 |
| 2015 | 173 | 147 |
| 2016 | 184 | 153 |
| 2017 | 188 | 167 |
| *Post-IFRS 9* | | |
| 2018 | 198 | 177 |
| 2019 | 185 | 171 |
| Total | 1463 | 1260 |

The sample used consists of 1.260 firm-year observations collected from 224 different banks, covering the period from 2011 until 2019 (Table 1). The number of observations does increase over the sample period, from 96 observations in 2011 to 171 observations in 2019. A possible explanation for this phenomenon can be twofold. First of all, some banks were nationalized in the financial crash of 2008-2009. Nationalized banks were in some cases returned to a publicly listed status. Secondly, the sample period is in one of the greatest bull markets of all time. Firms tend to plan their initial public offering (IPO) during a bull market, resulting in a higher valuation. These two reasons probably explain the increase in firms.

## 4.1 Regression

The results of the first model are presented in table 2, a yearly cross-sectional regression of share prices on the book value and the earnings per share. The calculation of the coefficient estimates is based on the Ordinary Least-Squares approach. The explanatory power of the model does fluctuate a lot over the year. $R^2$ ranges from 28,2% in 2011 to 95,9% in 2014. When looking to the coefficients of the model, the BVPS is significant, except for the year 2011, 2012 and 2015 (p>0,05). The coefficients for EPS are in each year significant.

*Table 2 Cross-sectional regression of share price on book values and earnings per share*

| $MVPS_{i,t+1} = \alpha_0 + \beta_1 BVPS_{i,t} + \beta_2 EPS_{i,t} + \varepsilon_{i,t}$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Years | $\alpha_0$ | p | $\beta_1$ | p | $\beta_2$ | p | $R^2$ | F-stat | P | VIF |
| 2011 | 16,925 | 0,000 | -0,005 | 0,844 | 0,578 | 0,066 | 0,344 | 24,34 | 0,000 | 17,54 |
| 2012 | 18,415 | 0,000 | -0,155 | 0,564 | 0,983 | 0,049 | 0,189 | 10,26 | 0,000 | 9,65 |
| 2013 | 18,762 | 0,000 | -0,178 | 0,002 | 4,219 | 0,000 | 0,266 | 22,45 | 0,000 | 10,42 |
| 2014 | 21,635 | 0,000 | 0,364 | 0,000 | -4,742 | 0,000 | 0,598 | 95,42 | 0,000 | 5,22 |
| 2015 | 16,770 | 0,000 | 0,015 | 0,529 | 0,709 | 0,000 | 0,341 | 37,21 | 0,000 | 12,72 |
| 2016 | 16,716 | 0,000 | -0,003 | 0,898 | 1,170 | 0,003 | 0,337 | 38,18 | 0,000 | 9,08 |
| 2017 | 16,402 | 0,000 | -0,049 | 0,033 | 2,261 | 0,000 | 0,364 | 46,84 | 0,000 | 9,20 |
| Introduction of IFRS 9: *Financial Instruments* | | | | | | | | | | |
| 2018 | 14,728 | 0,002 | -0,116 | 0,031 | 4,466 | 0,000 | 0,146 | 14,92 | 0,000 | 9,07 |
| 2019 | 10,209 | 0,046 | -0,029 | 0,617 | 3,759 | 0,002 | 0,132 | 12,76 | 0,000 | 3,55 |

However, it is surprising to see that the coefficients are flipping signs for book values and earnings per share. It is very hard to argue why BVPS in some years should be negatively correlated with the share price and positively in other years. The same applies for EPS, the coefficients are positive in some years, but strongly negative in others. The Variance Inflation Factor (VIF) does indicate that multicollinearity (VIF > 10) is a problem. The problem of multicollinearity seems to evaporate after the introduction if IFRS 9. When looking further in multicollinearity, the variables do actually correlate with each other. When pooling all the data, the book value per share at the end of December does correlate moderately with the share price at

the end of March (Table 3). Earnings per share does also correlate moderate positively with share prices. However, earnings per share does correlate strongly with the book value per share, which confirms that multicollinearity is a problem for this model.

*Table 3 Correlation matrix of share price, book value and earnings per share*

|  | PMarch | BVPS | EPS |
|---|---|---|---|
| PMarch | 1,000 | | |
| BVPS | 0,385 | 1,000 | |
| EPS | 0,371 | 0,926 | 1,000 |

Since BVPS and EPS are strongly correlated with each other, I conducted the same cross-sectional regression but with only one independent variable, either book value per share or earnings per share. The results of these regressions are displayed in table 4 and table 5. The coefficients of these regressions are also estimated on the basis of OLS.

*Table 4 Cross-sectional regression of share price on book values*

| $MVPS_{i,t+1} = \alpha_0 + \beta_1 BVPS_{i,t} + \varepsilon_{i,t}$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| Years | $\alpha_0$ | p | $\beta_1$ | p | $R^2$ | F-stat | P |
| 2011 | 16,513 | 0,000 | 0,044 | 0,000 | 0,319 | 44,09 | 0,000 |
| 2012 | 18,824 | 0,000 | 0,035 | 0,000 | 0,152 | 16,00 | 0,000 |
| 2013 | 20,947 | 0,000 | 0,082 | 0,000 | 0,129 | 18,45 | 0,000 |
| 2014 | 18,412 | 0,000 | 0,121 | 0,000 | 0,305 | 56,56 | 0,000 |
| 2015 | 17,452 | 0,000 | 0,057 | 0,000 | 0,326 | 70,06 | 0,000 |
| 2016 | 18,357 | 0,000 | 0,056 | 0,000 | 0,297 | 63,79 | 0,000 |
| 2017 | 19,079 | 0,000 | 0,062 | 0,000 | 0,261 | 58,30 | 0,000 |
| Introduction of IFRS 9: *Financial Instruments* | | | | | | | |
| 2018 | 20,377 | 0,000 | 0,071 | 0,000 | 0,079 | 14,96 | 0,000 |
| 2019 | 14,991 | 0,003 | 0,123 | 0,000 | 0,082 | 15,19 | 0,000 |

In table 4 are the results displayed from a linear regression of share price on the reported book values. Just like the regression as displayed in table 2, the $R^2$ does also fluctuate strongly for the cross-sectional regression of the share price on the BVPS. Furthermore can be concluded that the coefficients estimates for the BVPS are all positive and significant ($p < 0,05$). The conclusion that can be drawn from table 4 is that the BVPS is positively related to the share price. Furthermore does have BVPS significant explanatory power although the explanatory power

decreases after the introduction of IFRS 9. Also is in each year the F statistic is statistically significant.

In table 5 is the other half of the cross-sectional regression displayed. In table 5 is share price regressed on earnings per share. The coefficients of EPS are all positive and all years are statistically significant.

*Table 5 Cross-sectional regression of share prices on positive earnings per share*

| $MVPS_{i,t+1} = \alpha_0 + \beta_1 EPS_{i,t} + \varepsilon_{i,t}$ | | | | | | | |
|---|---|---|---|---|---|---|---|
| Years | $\alpha_0$ | p | $\beta_1$ | p | $R^2$ | F-stat | P |
| 2011 | 16,849 | 0,000 | 0,519 | 0,000 | 0,343 | 49,15 | 0,000 |
| 2012 | 18,365 | 0,000 | 0,712 | 0,000 | 0,186 | 20,33 | 0,000 |
| 2013 | 18,665 | 0,000 | 1,608 | 0,000 | 0,208 | 32,76 | 0,000 |
| 2014 | 24,386 | 0,000 | 0,993 | 0,003 | 0,067 | 9,29 | 0,003 |
| 2015 | 16,660 | 0,000 | 0,946 | 0,000 | 0,339 | 74,33 | 0,000 |
| 2016 | 16,753 | 0,000 | 1,123 | 0,000 | 0,337 | 76,83 | 0,000 |
| 2017 | 17,000 | 0,000 | 1,369 | 0,000 | 0,346 | 87,16 | 0,000 |
| Introduction of IFRS 9: *Financial Instruments* | | | | | | | |
| 2018 | 16,974 | 0,000 | 2,001 | 0,000 | 0,123 | 24,60 | 0,000 |
| 2019 | 10,463 | 0,039 | 3,243 | 0,000 | 0,131 | 25,37 | 0,000 |

This two cross-sectional regressions shows us better the explanatory value of the accounting measures than the combined cross-sectional regressions.

In the regressions made above, negative earnings are eliminated from the sample since the original Ohlson model does assume positive earnings. This could have a negative impact on the regressions since observations are left out the regression. The problem can be mitigated by adding a dummy variable to distinguish between the earning signs (Van der Meulen et al 2007).

In regression model 2 a distinction is made between positive and negative earnings per share. The $\alpha_1$ coefficient captures the pricing effect of the current earnings. The coefficient $\alpha_4$ does reflect the pricing effect of expected future normal earnings. Holthausen and Watts (2001) are using the dummy variable in order to control for growth opportunities firms have. The dummy variable will be zero if earnings are negative and one otherwise. Just as in the first regression model is value relevance measured as the explanatory power of the regression model.

$$MVPS_{i,t} = \alpha_0 + \alpha_1 EPS_{i,t} + \alpha_2 D + \alpha_3 EPS * D + \alpha_4 BVPS_{i,t} \ (2)$$

*Table 6 Cross-sectional regression of share prices on pooled earnings per share and book value*

$$MVPS_{i,t} = \alpha_0 + \alpha_1 EPS_{i,t} + \alpha_2 D + \alpha_3 EPS * D + \alpha_4 BVPS_{i,t}$$

| Years | $\alpha_0$ | p | $\alpha 1$ | p | $\alpha 2$ | p | $\alpha 3$ | P | $\alpha 4$ | p | $R^2$ | F-stat | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2011 | 12,924 | 0,000 | -2,546 | 0,000 | -8,706 | 0,250 | 2,437 | 0,000 | 0,276 | 0,000 | 0,509 | 31,88 | 0,000 |
| 2012 | 17,599 | 0,000 | -3,418 | 0,000 | -0,283 | 0,977 | 3,657 | 0,000 | 0,237 | 0,000 | 0,316 | 13,83 | 0,000 |
| 2013 | 18,704 | 0,000 | 2,662 | 0,000 | -13,154 | 0,270 | -4,189 | 0,000 | -0,072 | 0,075 | 0,228 | 11,90 | 0,000 |
| 2014 | 21,635 | 0,000 | -4,741 | 0,000 | -17,792 | 0,040 | 6,373 | 0,000 | 0,364 | 0,000 | 0,597 | 57,69 | 0,000 |
| 2015 | 16,775 | 0,000 | 0,698 | 0,053 | -15,244 | 0,010 | -2,343 | 0,464 | 0,016 | 0,470 | 0,364 | 25,63 | 0,000 |
| 2016 | 16,782 | 0,000 | 1,088 | 0,003 | -9,997 | 0,056 | -1,172 | 0,013 | 0,002 | 0,918 | 0,335 | 24,02 | 0,000 |
| 2017 | 16,405 | 0,000 | 2,256 | 0,000 | -13,993 | 0,038 | -2,405 | 0,000 | -0,049 | 0,026 | 0,375 | 28,89 | 0,000 |
| Introduction of IFRS 9: *Financial Instruments* | | | | | | | | | | | | | |
| 2018 | 14,736 | 0,001 | 4,457 | 0,000 | -12,105 | 0,432 | -4,809 | 0,620 | -0,116 | 0,024 | 0,141 | 9,04 | 0,000 |
| 2019 | 10,217 | 0,039 | 3,744 | 0,002 | -8,171 | 0,635 | -3,976 | 0,090 | -0,028 | 0,614 | 0,119 | 7,18 | 0,000 |

When looking at table six, it can be noticed that the regression model is statistically significant. In each single year is the p-value for the whole regression model smaller than 5% which means that the model can be interpreted. The explanatory power of the regression model decreased after the introduction of IFRS 9 from approximately 35% to 11% in 2019. This suggests that the value relevance of accounting information decreased after the introduction of IFRS 9. Furthermore there are some differences between the pre-IFRS 9 and post IFRS 9 estimated coefficients for EPS, the dummy variable and BVPS. In order to assess whether these differences are of importance, the Chow test will be conducted. In short, the Chow test tests whether coefficients estimated over the pre-IFRS 9 group are equal to the estimated coefficients of the post IFRS 9 group or that there is a structural break.

To differentiate between the pre-IFRS 9 period and the post-IFRS 9 period a new dummy variable is created in which a "zero" stands for the pre-IFRS 9 period and a "one" for the post-IFRS 9 period. Thereafter a series of interaction variables are created in which the dummy variable interacts with all variables used in regression model 2. Then, a new regression is made with all the original variables and the interaction variables. Eventually, we can test whether the estimated coefficients do differ pre-IFRS 9 and post-IFRS 9 by using the F-statistic. The results of this test are included in the appendix.

*Table 7 Results of chow test for pooled data*

|  | Coefficient | p-value |
|---|---|---|
| $\alpha_0$ | 18,637 | 0,000 |
| EPS | -0,592 | 0,002 |
| DEPS | -10,436 | 0,005 |
| IDEPS | 0,654 | 0,002 |
| DBVPS | 0,104 | 0,000 |
| DIFRS | -5,568 | 0,059 |
| id1 | 4,623 | 0,000 |
| id2 | -0,318 | 0,972 |
| id3 | -5,347 | 0,000 |
| id4 | -0,186 | 0,000 |
| R2 | 0,194 | 0,000 |

*Note: MVPS = EPS + DEPS + IDEPS + BVPS + DIFRS + id1 + id2 + id3 + id4 in which id1 = DIFRS \*EPS, id2 = DIFRS \* DEPS, id3 = DIFRS \* IDEPS, id4 = DIFRS \* BVPS. For this Chow test F is used(5,1461).*

The results of the Chow test show that there is a disparity between the pre-IFRS 9 period and the post-IFRS 9 period. Since the Chow test is statistically significant at the level of 1%, the conclusion can be drawn that the change in value relevance is negative and statistically significant. This is contradictory to hypothesis 1. We can also see this in table 7 that the coefficient for the IFRS period dummy is negative. The value relevance of accounting information decreased for EU banks after the implementation of IFRS 9: *Financial instruments*.

When we take a look at the individual coefficients for the earnings per share and the book values per share, conclusions can be drawn about the changes in value relevance of accounting information for these accounting figures. The earning per share figure has shown an increased value relevance of accounting information. The interaction effect of de dummy variable and the earnings per share figure shows a statistical significant and positive effect. Earnings per share became more value relevant after the introduction of IFRS 9. This finding is consistent with hypothesis 2.

Despite, an increased value relevance of earnings per share, the value relevance of accounting information for book value per share seems to decreased after the introduction of IFRS 9. The interaction effect between the book value per share and the IFRS dummy ,id4, shows a negative coefficient of -0,186. This means that the BVPS has become less value relevant after the introduction of IFRS 9. This finding is not consistent hypothesis 3 which stated that the importance of BVPS will be equal pre-IFRS 9 and post-IFRS 9.

# 5    Conclusion

In this study are the effects of the introduction of IFRS 9: *Financial Instruments* points of interest. Empirical evidence is collected and analyzed in order to assess whether the value relevance of accounting information is improved for EU banks after the introduction of IFRS 9. Since the banking industry has a lot of financial assets and liabilities on their balance sheets the biggest impact is to be expected in the banking sector. On the basis of prior research to IFRS standards in general and research to reactions to be expected on the introduction of IFRS 9, the expectation was a higher value relevance of accounting information under IFRS 9. It was also expected that the reported earnings per share would become more value relevant and that the value relevancy of the book value per share would remain the same.

The conclusion of this study is that the value relevance of accounting information for EU banks has declined after the introduction of IFRS on January, 1 2018. As was the expectation, earnings per share became a more value relevant accounting figure after the introduction. However, the book value per share figure lost relevance.

The implication of this study is that the IASB have not delivered to the equity markets what they promised during the design of IFRS 9. The goal of the IASB was to provide financial markets with more relevant and understandable information. The preliminary conclusion should be that IFRS 9 does not provide better and more understandable information. A possible explanation for the decline in value relevance can be that investors can get confused when new accounting standards are introduced as described by Dichev et al. in 2014. However, this research is done only two years after the introduction of the standard. It can be the case that investors need more time to understand IFRS 9 and that the value relevance of accounting information will increase after some time, even compared to pre-IFRS 9 levels. Follow-up research can be done in order to obtain verification whether this is the case or that the decline of value relevance is permanent.

This study is subject to some limitations. First of all, the time after the introduction of IFRS 9 is relatively short, only two full fiscal years. It is possible that the short time frame does affect the robustness of the conclusions. Secondly, the study does only include EU banks and not all banks subject to IFRS 9. The amount of banks in the sample for this research does fluctuate strongly. At the end of the time frame there are significantly more banks in the sample compared to the starting sample in 2011. Further research can be done to mitigate these limitations, by simply examining a longer time period after the implementation of IFRS 9. This means a longer time period after the introduction of IFRS 9 and the inclusion of other countries which introduced IFRS 9.

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# 7    Appendix

Results chow test.

Id1 = interaction effect DIFRS * EPS

Id2 = interaction effect DIFRS * DEPS

Id3 = interaction effect DIFRS * IDEPS

Id4 = interaction effect DIFRS * BVPS

| Source   | SS         | df    | MS         |
|----------|------------|-------|------------|
| Model    | 663780.252 | 9     | 73753.3613 |
| Residual | 2678250.78 | 1,451 | 1845.79654 |
| Total    | 3342031.03 | 1,460 | 2289.06235 |

| | |
|---|---|
| Number of obs | = 1,461 |
| F(9, 1451) | = 39.96 |
| Prob > F | = 0.0000 |
| R-squared | = 0.1986 |
| Adj R-squared | = 0.1936 |
| Root MSE | = 42.963 |

| PMarch | Coef.      | Std. Err. | t     | P>|t| | [95% Conf. | Interval]  |
|--------|------------|-----------|-------|-------|------------|------------|
| EPS    | -.5922915  | .1935491  | -3.06 | 0.002 | -.9719575  | -.2126255  |
| DEPS   | -10.43636  | 3.704238  | -2.82 | 0.005 | -17.7026   | -3.170131  |
| IDEPS  | .6542927   | .2094052  | 3.12  | 0.002 | .2435234   | 1.065062   |
| BVPS   | .1038911   | .0115715  | 8.98  | 0.000 | .0811925   | .1265897   |
| DIFRS  | -5.568287  | 2.940932  | -1.89 | 0.059 | -11.33722  | .200647    |
| id1    | 4.622999   | .6559711  | 7.05  | 0.000 | 3.336246   | 5.909752   |
| id2    | -.318309   | 8.919333  | -0.04 | 0.972 | -17.81447  | 17.17786   |
| id3    | -5.346706  | 1.512677  | -3.53 | 0.000 | -8.313974  | -2.379438  |
| id4    | -.1858281  | .0307299  | -6.05 | 0.000 | -.2461078  | -.1255483  |
| _cons  | 18.63726   | 1.506446  | 12.37 | 0.000 | 15.68221   | 21.5923    |

. test DIFRS id1 id2 id3 id4

( 1)  DIFRS = 0
( 2)  id1 = 0
( 3)  id2 = 0
( 4)  id3 = 0
( 5)  id4 = 0

      F(  5,  1451) =    10.38
           Prob > F =     0.0000