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THE IMPACT OF IFRS 15 ON ANALYSTS' FORECAST ACCURACY

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Abstract			
<p>The purpose of this research is to examine the impact of IFRS 15 on analysts' forecast accuracy. IFRS 15 'Revenue from Contracts with Customers' came into effect 1 January 2018.</p> <p>The five-step model of revenue recognition required by the new accounting standard will likely change the timing and amount of revenue to be recognized from customer contracts that contain multiple performance obligations and where revenue is recognized over time. This change in accounting practices for revenue has the potential to affect the accuracy of analysts' earnings per share (EPS) and sales forecasts.</p> <p>The impact of IFRS 15 will be most clearly observable in industries that commonly engage in bundled contracts and long-term projects as these types of contracts are likely candidates for change in their accounting treatment. This research focuses on the changes in forecast accuracy for companies operating in such industries.</p> <p>The research findings show that IFRS 15 has no impact on the accuracy of analysts' EPS forecasts. However, for the sales forecasts the research results show that IFRS 15 increases forecast errors for the sample group of companies. The findings suggest that the implementation of a new accounting standard causes a temporary decrease in analysts' forecast accuracy.</p>			
Keywords International Financial Reporting Standards, IFRS 15, analysts' forecasts, forecast error			

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1 INTRODUCTION

1.1 Background

During the last few decades corporations and capital markets have rapidly become more international. Many domestic companies have expanded to foreign operations or are considering them, or they can be owned by foreign parent companies. Banks, creditors and insurance companies have also expanded to serve foreign client companies. As investing in foreign markets has become more accessible and straightforward through technology and removal of barriers, capital markets and investors are increasingly seeking investment opportunities abroad. (Räty & Virkkunen 2002: 19.)

According to an estimate by Organization for Economic Co-operation and Development (the OECD) the worldwide Foreign Direct Investment (FDI) outflows in 2015 were \$1.6 trillion and cross-border ownership of stocks and bonds amounted to many trillions of US dollars. In 2015 foreign ownership of US equities and bonds amounted to over \$17 trillion and US investors held nearly \$10 trillion in foreign stocks and bonds. (Pacter 2017: 23.)

To reliably assess the risks and returns of global investment opportunities, investors and lenders require financial information that is relevant, reliable and comparable across borders. The many national Financial Accounting Standards (FAS) differ from each other in such a way that financial information is often not comparable between companies operating in different countries. As foreign investments are likely only to increase, so is the demand for a single-set of high-quality accounting standards to improve the comparability and transparency of financial information. This in turn enables the capital market participants to receive higher quality information and make better decisions. (Haaramo 2012: 27–28, Pacter 2017: 23.)

Now there are two leading accounting standards for financial reporting used by the world capital markets: International Financial Reporting Standards (IFRS) and United States Generally Accepted Accounting Principles (US GAAP). The many differences between US GAAP and IFRS can result in significant discrepancies in reported

numbers. Therefore, the elimination of these differences is critical. The major difference between IFRS and US GAAP is the general approach of these systems. IFRS is principle based with limited guidance and US GAAP is rules based with precise application guidance. As neither EU or US cannot go alone in developing international standards, the standard setting bodies of these systems International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB), have recognized that for international capital markets to function properly there is a need for convergence between the two systems. (Bohusova & Nerudova 2009.)

Revenue is essentially always the single largest element reported in a company's financial statement. It is not only significant in purely monetary terms but also in its relevance to investors' decision-making process. Changes and growth in company's revenue are considered important metrics of the company's past performance and future prospects. Revenue recognition has also been one of the most important issues confronting standard setters. (Turner 2001, Zhang 2005.)

As revenue is an important key performance metric used by investors and other stakeholders in assessing companies' performance, accounting for revenue is one of the most critical challenges that companies face. Revenue recognition under US GAAP has been criticized for being complex and its industry or transaction specific guidance can result in different accounting for economically similar transactions. IFRS on the other hand has been criticized as being difficult to understand and to apply to more complex transactions. Additionally, disclosures on revenue required by both standards have been seen lacking and conflicting with the disclosures of other items in the financial statements. Therefore, there is demand for improvement and developing high quality common accounting standards for use in the world's capital markets. (Bohusova & Nerudova 2009, Jones & Pagach 2013.)

IASB and FASB released a Memorandum of Understanding (The Norwalk Agreement) in 2002 in which they committed to the convergence of IFRS and US GAAP. One of the main focuses of the joint task force was the task of issuing a converged revenue recognition standard. The goal was to develop a more robust and consistent framework for revenue recognition, and to increase the comparability of

revenue recognition practices across countries and industries. The joint project was finalized in May 2014 when IFRS 15 ‘Revenue from Contracts with Customers’ was issued. The new standard has an effective date of 1 January 2018. (Haaramo, Palmuaro & Peill 2005, Streaser, Jialin Sun, Perez Zaldivar & Zhang 2014.)

1.2 Research question and hypothesis development

The goal of IFRS according to its conceptual framework is to provide financial information about companies that is useful to investors, lenders and other creditors in their decision-making process about providing resources to said companies. These decisions may involve buying, selling or holding equity and debt instruments, and providing loans and other forms of credit. The decisions to provide resources are based on their assessments of the amount, timing and uncertainty of future cash inflows to the companies. (International Accounting Standards Board 2013: 41.)

The new IFRS 15 ‘Revenue from Contracts with Customers’ addresses the weaknesses and shortcomings of the previous revenue recognition standards regarding inconsistencies in application and unsatisfactory disclosure requirements. The new standard establishes a single comprehensive framework for the amount and timing of revenue recognition applicable to all customer contracts across industries. Its goal is to provide useful high-quality information about the nature, timing, and uncertainty of revenue and cash flows for financial statement users. (International Accounting Standards Board 2014: 7, BDO 2018: 5.)

Based on this, financial reporting under the new standard should be more informative due to revised revenue recognition method and disclosure requirements. Previous studies have found that countries’ adoption and implementation of IFRS leads to higher accounting information quality and more efficient capital markets (Ahmed, Chalmers & Hichem 2013, Costa Lourenco & Mota de Almeida Delgado Castelo Branco 2015). Additionally, studies have found that revised or updated IFRS standards further improve the information content of financial reporting (Aboud, Roberts & Zalata 2018).

Investors and especially analysts are among the primary users of financial accounting information. Analysts are sophisticated users who have an important role as information intermediaries in the capital markets as they collect, process, and distribute financial information for investors. They can be considered as representative of investors in general and their forecasts can be seen as proxies for market's expectations. (Schipper 1991.) The earnings forecasts of analysts are important inputs for determining company's value and their stock recommendations, reports, and forecasts all have an effect on share price formation (Asquith, Mikhail & Au 2005). The company's reported earnings are one of the most important items used by analysts when formulating their forecasts (Barker & Imam 2008). Hence, higher quality accounting information proposed by the new standard should lead to better (more accurate) forecasts.

Therefore, the purpose of this research is to find out whether the implementation of the new revenue recognition standard IFRS 15 has an impact on the accuracy of analysts' forecasts. A commonly used metric in studies to evaluate the accuracy of forecasts is analysts' forecast error. The forecast error is computed as the difference between the forecasted and actual values. The smaller the error (i.e. the closer the forecast is to the actual realized value), the more accurate the forecast. (Schipper 1991, Rees 1995: 131.)

The research question is:

- Does IFRS 15 impact the accuracy of analysts' forecasts?

To form the research hypotheses previous studies are used as basis. The efficient market hypothesis is one of the most influential modern financial theories. Developed by Fama (1970) the efficient market hypothesis states that the financial markets incorporate all available information when valuing stocks and that security prices at any point in time fully reflect all public and private information. As new information is instantly assimilated, analysis of historical and present data cannot help investors predict the future. (Naseer & Tariq 2015.) Then, assuming an efficient market the supposedly new information provided by IFRS 15 should not affect the accuracy of analysts' forecasts.

Acker, Horton & Tonks (2002) studied the impact of a new financial reporting standard issued in 1992 in the United Kingdom on the analysts' ability to predict companies' future earnings per share. The new standard required companies to publish more comprehensive information than before, to better help users assess companies' current and future performance. They found that in the first year after implementation analysts' forecast errors increased, but in the following years the additional information required by the standard increased the accuracy of forecasts. This evidence suggests that the implementation of IFRS 15 could lead to increased errors in analysts' forecasts during the first year.

Aboud et al. (2018) studied the impact of IFRS 8 'Operating Segments', which replaced the previous IAS 14 'Segment Reporting' standard, on financial analysts' earnings forecast errors. By examining the accuracy of analysts' forecasts for a sample of largest companies in Europe pre- and post-IFRS 8, the study found that the revised segment information requirements of the new standard resulted in more accurate earnings forecasts. The subject of this research is similar to the setting of the referenced study in that they both examine the effect on analysts' forecast accuracy when a new IFRS standard replaces a previous one. The findings of the study suggest that the implementation of IFRS 15 could result in more accurate earnings forecasts.

Thus, based on these previous studies the hypotheses are as follow:

H_0 : Analysts' forecast error (2018) = Analysts' forecast error (2017)

H_1 : Analysts' forecast error (2018) > Analysts' forecast error (2017)

H_2 : Analysts' forecast error (2018) < Analysts' forecast error (2017)

As IFRS 15 came into effect starting 1 January 2018 the analysts' forecast errors are examined and compared before and after its introduction. Based on the efficient market hypothesis, H_0 is that the forecast errors remain unchanged. Based on the other two studies their evidence is conflicting. As the forecast errors could either increase or decrease, H_1 will be that the errors have increased and H_2 that the errors have decreased.

1.3 Research method and structure

The empirical part of this research aims to find an answer to the research question: Does IFRS 15 impact the accuracy of analysts' forecasts? The method employed is statistical research. Quantitative or statistical research is used to solve questions related to numbers and percentages. It is often used to investigate dependencies between research objects or changes that have occurred in the object of interest. The results gained from the study sample can be generalized to a larger population. (Heikkilä 2014: 15.)

The accuracy of analysts' forecasts will be studied and compared between two time periods: 2017, the year before IFRS 15 came into effect and 2018, after it was mandatory to implement. As the financial statements of 2018 are not yet available at the time of research, quarterly forecasts will be used, that is Q1 ending in March and Q2 ending in June. Two types of forecasts will be studied, earnings per share (EPS) and sales or revenue. The method to measure forecast accuracy is derived from a study by Capstaff, Paudyal & Rees (2001). The error metric used is analysts' forecast error (AFE) where the forecasts are contrasted with actual earnings. The forecast errors will be compared between the years to observe any possible changes. A regression analysis will then be carried out to determine whether the possible changes are statistically significant.

The adoption of the new standard will not impact all industries to the same extent. IFRS 15 brings a new five step model to revenue recognition where the idea is that based on the contract with a customer the seller has a performance obligation (or several) to do something for the buyer, and as the obligations are fulfilled, the seller is entitled to recognize revenue. The impact is likely to be most significant in industries where there is widespread use of bundled contracts (e.g. a combination of a physical product and recurring services) and where revenue is recognized over time (e.g. long-term projects or licensing intellectual property). The implementation of IFRS 15 on these types of contracts will likely result in changes to the amount and timing of revenue recognition compared to the accounting treatment under the previous standards.

In order to clearly identify the possible impact of the standard, the study will focus on those industries that are most likely to see changes in their revenue recognition. Ciesielski & Weirich (2011, 2015) identify three key sectors technology, telecommunications and health care as likely candidates for significant changes. These sectors regularly employ bundled contracts, long-term contracts, and technology and health care sectors often transfer their intellectual property through licensing arrangements. Other industries that could see changes are construction, engineering and management consulting as they engage in long-term contracts and customization of products or services.

Instead of analyzing the effect of the new standard on a single industry, multiple industries are chosen for the study to increase the sample size for the robustness of the statistical research. The industries chosen for the research are: telecommunications, construction, software, engineering, management consulting, and pharmaceuticals.

To control for other possible effects on forecast accuracy the sample group is compared to a control group. The control group consists of industries where the new standard will not likely affect the existing revenue recognition practices. According to Ciesielski & Weirich (2011, 2015) industries not likely to see changes are those that regularly use short-term contracts without bundled products or services or customization to customer specifics. Industries chosen for the control group are: retail, hospitality, transportation, wholesale, chemicals, and consumer products.

Theoretical framework is constructed by reviewing literature relevant to the research topic, defining material concepts and analyzing previous studies and findings. The purpose of the theoretical framework is to guide the empirical research and to connect the empirical and theoretical parts of the thesis together. (Heikkilä 2014: 24.)

The thesis is structured as follows. Chapters two through four form the theoretical framework of the thesis. Chapter two introduces and examines International Financial Reporting Standards, their background, goals and their conceptual framework. Previous research about IFRS is also examined. Chapter three gives an overview of the previous revenue recognition standards under IFRS and discusses the criticisms and need for a revised standard. This overview is followed by an in-depth look at the

new IFRS 15 standard. Chapter four examines the role of analysts and the properties and implications of their forecasts. Chapter five forms the empirical part of the thesis. It presents the data, the statistical methods used, research results and analysis of the results. Chapter six summarizes the findings and concludes the thesis.

2 INTERNATIONAL FINANCIAL REPORTING

This chapter begins by introducing the background and goals of IFRS. After this the structure and conceptual framework of the standards are examined. Conceptual framework defines the concepts that form the basis of IFRS standards. Lastly, previous research about the effects of IFRS adoption is reviewed.

2.1 The background and goals of international financial reporting

As covered in the previous chapter in an ever-internationalizing world there is a need for common international accounting standards. For capital markets to function effectively and to facilitate cross-borders investments the financial reporting needs to be transparent and comparable globally. This enables capital market participants to receive high quality information and make better decisions. As capital market participants can allocate funds more effectively due to improved information the companies can achieve lower cost of capital. (Pacter 2017: 23.)

The predecessor of current IFRS standard setting body, International Accounting Standards Committee (IASC), was founded in 1973 by organizations representing auditors in nine countries (Australia, Canada, France, Germany, Japan, Mexico, the Netherlands, UK and Ireland, and USA). This committee began to publish International Accounting Standards (IAS). The regulation structure was to publish one standard for each separate item on the financial statement. To enhance the standard setting process and to strengthen its governance the standard setting body underwent an organizational restructuring in 2000. The restructuring was necessary also, as it was a prerequisite for the approval of IFRS standards by the European Union to be applied for listed companies in its member countries. IASC was replaced by IFRS Foundation under which the standard setting work continues by International Accounting Standards Board (IASB) and under IASB the interpretative body IFRS Interpretation Committee (IC). The new organization develops and publishes IFRS standards, and their interpretations in supporting the utilization of IFRS standards. (Haaramo et al. 2005.)

The goal of IFRS Foundation is to develop, in the public interest, a single set of high-quality financial reporting standards and to advance their global adoption. The board of directors of the foundation called the Trustees appoints the members of IASB and IFRS Interpretation Committee. To highlight the global nature of the standards the trustees are chosen from different world regions; four from Europe, North-America and Asia, one from Africa and one from an unspecified region. (Haaramo et al. 2005, Pacter 2017: 9.)

IASB, which consists of 13 full-time members from a variety of professional backgrounds, approves the final IFRS standards, their revisions and interpretations. The role of IFRS Interpretation Committee is to give interpretation statements on matters where the IFRS standards do not give clear guidance or answer. The organization is also supported by IFRS Advisory Council which instructs IASB. It also evaluates IASB's work plan and suggests new possible projects. Additionally, IASB is assisted by work groups set up for specific purposes as needed, for instance work groups helping with the implementation of new standard when a new standard has been announced such as IFRS 15. To enhance public accountability IFRS Foundation is overseen by Monitoring Board. The Monitoring Board consists of public capital market authorities such as the European Commission (EC) and US Securities and Exchange Commission (SEC). (Haaramo et al. 2005, Pacter 2017: 15.)

The thoroughness and transparency of the standard setting process, and the standards' global acceptance have enabled many emerging economies to adopt IFRS standards as such to use as their national financial accounting standards. This relieves them from committing resources to standard setting work as they can utilize the work of IASB. To understand how and to what extent the IFRS standards are being applied around the world, IFRS Foundation has conducted studies of 150 countries regarding the adoption of standards. At the moment 126 of the jurisdictions require the use of IFRS standards for all or most listed companies. Of the remaining 24 countries, twelve jurisdictions permit instead of requiring IFRS standards and the rest are in the process of deliberation, convergence and adoption of the standards. (Haaramo et al. 2005, Pacter 2017: 24–25.)

2.2 Framework of IFRS standards

IFRS standards is a comprehensive aggregate regulating financial statement information. It consists of three parts, the conceptual framework which determines the basic principles regarding the compiling and presenting of financial statements, the actual IFRS and IAS standards which determine the treatment of specific elements in financial statements, and IFRIC and SIC interpretations which give guidance in applying the standards in specific situations. The International Accounting Standards (IAS) are standards developed and issued by the predecessor of IASB, the IASC, during its term 1973-2000. IFRIC interpretations are guidelines given by the IFRS Interpretation Committee (IC), and SIC interpretations are guidelines given by the previous Standing Interpretations Committee (SIC) which was replaced by the current IFRS IC. (Haaramo et al. 2005.)

Many of the earlier IAS standards and SIC interpretations are still in effect. The standards and interpretations are periodically amended, and replaced by newly issued standards, such as IFRS 15 replacing the previous revenue recognition standards IAS 11 and IAS 18. At the moment there are 41 IAS standards of which 28 are still in effect and four of these will be replaced during 2018-2019, 33 SIC interpretations of which 8 are still in effect, 16 IFRS standards, and 19 IFRIC interpretations. (Haaramo et al. 2005, International Accounting Standards Board 2013: 17–24.)

An updated conceptual framework was issued in 2010 and it replaced the previous framework developed by IASC in 1989. The conceptual framework assists IASB in its standard setting process when developing future IFRS standards and reviewing existing ones. Additionally, it can assist companies applying the IFRS standards in situations where there are no existing standards or interpretations, auditors when estimating the compliance of financial statements to IFRS, and users of financial statements in interpreting information. The conceptual framework itself is not a standard but rather a guiding structure to help when developing accounting policy in the absence of a standard or interpretation. At times there may be a conflict between the conceptual framework and an IFRS standard. In those cases, the requirements of the individual standard will prevail over the framework. As IASB is guided by the conceptual framework in developing and reviewing standards, the number of

conflicting cases will decrease. Moreover, IASB will revise the conceptual framework periodically. (International Accounting Standards Board 2013: 31–32, 39.)

The conceptual framework presents the principles IFRS standards are based on. These are the objective of financial reporting, the qualitative characteristics of useful financial information, the definition, recognition and measurement of financial statement items, and the concepts of capital and capital maintenance. (International Accounting Standards Board 2013: 39.)

The objective of financial reporting is to provide useful information about the financial position, performance and changes in financial position of the reporting company. The information needs to be useful in making decisions about providing resources to the company, such as buying or selling equity or providing credit. The primary users to whom the financial reports are directed are investors. However, the aim is to provide information for as many different users as possible, and by focusing on the information needs of investors, most of the other users' information needs are also satisfied. (Räty & Virkkunen 2004: 72–73, International Accounting Standards Board 2013: 41–42.)

For financial information to be useful for users it needs to have certain fundamental and enhancing characteristics. It needs to be relevant and faithfully represented. Relevance is defined as being capable of making a difference in users' decisions. Faithful representation requires that the financial information accurately and without bias describes the item it intends to present. In addition to these fundamental characteristics there are characteristics that enhance the value of information that is relevant and faithfully presented. These are comparability, verifiability, timeliness and understandability. Comparability aids in decision making when choosing between alternatives, so the information needs to be comparable between different companies. Verification helps assure users that the information is faithfully presented. Timeliness requires the information to be available in time to influence decisions. Information is understandable when it is clearly and concisely presented. (International Accounting Standards Board 2013: 46–51.)

The main underlying assumptions in IFRS standards are accrual accounting and going concern. According to accrual accounting the effects of transactions, such as purchases

and sales, and other events are reported in the periods where they occur, even if the payments are made in a different period. Going concern assumes that the company will stay in business in the future and is not planning to end or significantly cut its operations. (Räty & Virkkunen 2004: 73.)

The basic elements of financial statements which present the financial position of the company are assets, liabilities and equity. The elements which measure the performance of the company are income and expenses in the income statement. For an item to be recognized in the balance sheet or income statement it needs to meet two criterions. First, it is probable that the economic benefit associated with the item will transfer to the company or from the company, and second, the item has a cost or value that can be measured reliably. (International Accounting Standards Board 2013: 54–60.)

2.3 Previous research on IFRS

As stated before the goal of IFRS is to create high-quality global accounting standards that provide relevant, transparent and comparable information. As IFRS is increasingly gaining in global acceptance, understandably it is of great interest to researchers. Studying the economic consequences of IFRS adoption is relevant not only for investors and other market participants but to regulators and policymakers as well. The mandatory adoption of IFRS in a country or a world region provides researchers valuable opportunities to study the effects of accounting regime change. The many studies on the topic differ in analysis period, jurisdictional setting, and research design, and the reported findings vary. (Ahmed, Chalmers & Hichem 2013.)

Ahmed et al. (2013) investigated financial reporting effects by conducting a meta-analysis of 57 papers on IFRS adoption. Meta-analysis is a statistical technique that accumulates statistical findings of previous research papers aiming to make quantitative generalizations based on a large number of studies. They presented the benefits of IFRS adoption cited in previous literature including reducing information asymmetry, enhancing capital market efficiency, and greater transparency and consistency. To study these benefits the research focuses on value relevance and earnings transparency and the quality of analysts' earnings forecasts. Value relevance

means the ability of financial reporting to explain stock market values. The study finds that the value relevance of earnings has increased, and analysts' forecast accuracy has improved significantly post-IFRS adoption. However, value relevance is moderated by the level of enforcement of IFRS. Financial statements prepared under IFRS standards seem to provide analysts with more relevant and useful information about the reporting companies and this in turn has led to more accurate forecasts.

Similarly, Costa Lourenco & Mota de Almeida Delgado Castelo Branco (2015) conducted a literary review of 67 studies on the effects of IFRS adoption published in the most prestigious scientific journals. Literary review analyzes published articles on the topic of interest and aims to summarize the various results into a coherent body of knowledge. Most of the analyzed studies have investigated the effects of IFRS adoption on information quality and the capital market. They find that, generally IFRS adoption has a positive effect on information quality, the capital market, analysts' ability to predict, comparability, and information use. But, the effect is dependent on country and company characteristics. Especially the level of IFRS enforcement by the national authorities.

Ball (2006) examines the benefits and concerns of IFRS for investors. The potential benefits include higher quality information, increased comparability, increased market efficiency, and reduced information costs and information risk. The main concern that should be recognized is that uniform standards do not equal uniform quality. The existence of high-quality standards does not guarantee how they are implemented in practice. When comparing developed and developing countries there are vast differences in the quality of their institutions such as audit profession, court systems, and shareholder litigation rules. It is inevitable that there will also be international discrepancies in the financial reporting quality. By adopting the IFRS 'brand name' on paper, lower-quality reporting regimes can signal that they are of high quality, even when their monitoring and enforcement of the application of standards is severely lacking. The concern is that investors will be misled into believing that companies from different countries, all reporting under IFRS, will have the same quality of financial reporting. While, in reality the level of adherence to the standards could be radically different between the countries. The risk is that with the increasing adoption of IFRS around the globe these differences could be concealed by the apparent

uniformity. Costa Lourenco & Mota de Almeida Delgado Castelo Branco (2015) also detected in their review that the IFRS adoption effects were not as favorable in studies that included countries from various continents compared to studies that only included countries in the European Union.

In a survey of 187 fund managers across Europe, PricewaterhouseCoopers (2006) investigated the investors' view of impacts of IFRS adoption in the EU. 79% of the respondents believed the adoption of IFRS to be a significant development for financial reporting. Most also agreed that the reporting was clear (76%) and useful (79%). More than half (59%) estimated that IFRS provided a good basis for looking at companies' historical financial performance. Majority of the fund managers also felt that IFRS gave better insights into financial risk (76%) and operational risk (66%) of companies. It also had at least some impact in most investors' view of companies' value (73%) and had influenced their investment decisions (52%). According to the respondents the key benefits of IFRS were improved transparency and management information, and increased comparability and consistency between countries and industries.

Trabelsi (2018) studied the impact of IFRS 15 on real estate companies in Dubai. The companies were early adopters of the standard. The findings show that the adoption of IFRS 15 has significantly positive effects on earnings and equity. Applying the five-step model of revenue recognition in the customer contracts, the companies were able to recognize revenue over time as opposed to at a point in time and to capitalize the contract costs rather than expense them. This enabled them to accelerate revenue recognition and delay the recognition of expenses.

3 IFRS 15 ‘REVENUE FROM CONTRACTS WITH CUSTOMERS’

The beginning of this chapter details the joint revenue recognition project of IASB and FASB, the shortcomings of previous standards on revenue recognition and the need for a new standard and its aim. After this, IFRS 15 ‘Revenue from Contracts with Customers’ is examined in more detail and the standard’s five-step model for revenue recognition is reviewed.

3.1 Convergence and the need for improvement

The IASB and FASB have been working together to achieve greater convergence between IFRS and US GAAP since 2002. One of their most significant challenges has been the issue of revenue recognition. The US GAAP standards on revenue recognition are rules-based, containing more than 200 specific requirements issued over the years. The requirements are specific and separate to different types of transactions and different industries. There is a lack of guiding principles or comprehensive framework on revenue recognition. The IFRS revenue recognition standards on the other hand are a complete opposite. In IFRS the revenue recognition standards detail the principles but there is little guidance on the specifics. The two standards, IAS 11 ‘Construction Contracts’ and IAS 18 ‘Revenue’ are not complementary. IAS 11 focuses solely on the accounting of long-term projects and IAS 18 is a broad overview of revenue recognition, criticized of being unclear and vague, and lacking guidance on practical application, especially on significant topics such as contracts with multiple elements. Additionally, existing disclosure requirements for both US GAAP and IFRS were not sufficient, as the information disclosed did not help financial statement users to clearly understand the sources of revenue and the judgments and estimates used in its recognition. (Ciesielski & Weirich 2011, Bloom & Kamm 2014, BDO 2018: 7.)

To further highlight the importance of revenue recognition, in addition to revenue being the single largest item in the financial statements, it is also a major source of audit risk (Zhang 2005, Jones & Pagach 2013). Revenue recognition errors are one of the leading causes of financial statement restatements, and historically revenue overstatements have been involved in more than 50 percent of accounting frauds (Turner & Weirich 2006). For restatements resulting from revenue recognition, Wilson

(2008) found that investors' mistrust for subsequent information content of earnings lasts longer than for restatements for other reasons. According to Palmrose & Scholz (2004) in their sample of 492 public U.S. companies that announced restatements from 1995 to 1999, revenue represented the most frequent cause of restatements, being the reason for 37 percent of the sample companies. Of these, more than half resulted from problems in the timing of revenue recognition, and the rest from fraudulent reporting of revenue.

Rather than trying to eliminate the numerous differences between IFRS and US GAAP, IASB and FASB determined that it would be more beneficial to develop a new common standard that improves the financial information reported to investors (Holzmann & Munter 2015). The most significant improvement from the FASB and US GAAP perspective would be a set of comprehensive revenue recognition principles that would not require constant updating and maintenance. From the IASB and IFRS perspective, the most significant improvement would be more consistent principles and more guidance to specific revenue recognition situations. The revenue recognition joint project gave both boards an opportunity to develop a new standard that would address the weaknesses inherent in both IFRS and US GAAP. The basic objectives of the new standard are to remove the inconsistencies and weaknesses of the previous standards, to provide a more comprehensive framework to confront revenue recognition issues, to improve comparability of practices across companies, industries and capital markets, and to simplify the preparation of financial statements. (Ciesielski & Weirich 2011.)

In 2008 IASB and FASB issued a joint discussion paper on revenue recognition, 'Preliminary Views on Revenue Recognition in Contracts with Customers'. In the paper they introduced a preliminary view of a new contract-based revenue recognition model as a replacement for the previous revenue recognition models. The new model focused on the contracts between a company and its customers and was based on the concept of rights and obligations arising from the contract. The paper was open for comments from all interested parties. (Henry & Holzmann 2009.) After reviewing the comments, the boards' issued an exposure draft of the new standard in 2010. The exposure draft received a considerable amount of attention and comments that indicated a need for further modifications. In 2011 the boards' issued a revised draft

based on the received comments. The final converged standard IFRS 15 'Revenue from Contracts with Customers' was issued in 2014. Its aim is to provide a comprehensive principles-based model on revenue recognition to be applied to all contracts with customers, across all industries, borders, and capital markets. (Jones & Pagach 2013, Bloom & Kamm 2014.)

The key difference in the new revenue recognition model compared to previous ones is its focus on the customer contracts. The basic unit of interest is a contract, and no two contracts will always be alike. Based on this, two companies operating in the same industry could account for a similar transaction differently depending on their contractual obligations. Thus, contract terms and related performance obligations are crucial to revenue recognition. When considering which industries will be most affected by the new revenue recognition standard, the focus should not be the particular industry but rather the particular contracts. The industries most likely to be significantly affected are the ones which deal with contracts that might be accounted for differently under the new standard. Industries with short-term contracts and simple transactions, such as retail and consumer goods, are unlikely to see changes in their accounting treatment. Whereas industries with long-term contracts, complex transactions containing multiple elements, and possibly requiring customization of the provided products and services, will be likely candidates for significant changes. (Ciesielski & Weirich 2011.)

In the future revenue recognition will be regulated by one standard, IFRS 15 'Revenue from Contracts with Customers'. The standard institutes the principles for reporting useful information to investors about the nature, amount, timing and uncertainty of revenue and cash flows arising from company's contracts with customers. It replaces previous standards IAS 11 'Construction Contracts' and IAS 18 'Revenue', as well as previous revenue recognition related interpretations IFRIC 13, IFRIC 15, IFRIC 18 and SIC-31. The standard will be applied to all contracts with customers except for following: lease contracts within the scope of IAS 17 (to be replaced by IFRS 16 'Leases' on 1 January 2019), financial instruments and other contractual rights or obligations within the scope of IFRS 9, IFRS 10, IFRS 11, IAS 27 and IAS 28, insurance contracts within the scope of IFRS 4, and non-monetary exchanges between companies in the same field to facilitate sales to customers or potential customers. In

some cases, the accounting for customer contracts may involve implementing more than one standard if the contract contains parts that fall under the scope of another standard. In such cases other standards are applied first and the remaining part is accounted according to IFRS 15. If the other standards do not specify how to separate or measure parts of the contract, then IFRS 15 will be applied to the whole contract. (Haaramo et al. 2005, International Accounting Standards Board 2014: 7–8, 57.)

The original effective date 1 January 2017 was deferred to 1 January 2018 by FASB and IASB on 2015, as financial statement preparers raised concerns about the sufficiency of time required to implement the standard. In contrast to the previous standards, IFRS 15 details guidance on practical application and offers illustrative examples. The new standard also significantly enhances the much-needed disclosure requirements for revenue recognition. The financial statement preparers need to provide detailed information about their contracts with customers, significant judgments made in applying IFRS 15 to those contracts and assets recognized regarding the costs of obtaining and fulfilling contracts. The objective of disclosures is to provide investors sufficient information, so they can better understand the nature, amount, timing and uncertainty of revenue and cash flows arising from company's contracts with customers. Although the disclosure requirements are comprehensive and require disaggregating revenue into appropriate categories, the purpose is not to obscure the usefulness of the information with a large amount of trivial details. The company needs to consider the amount of detail to present in order to fulfill the objective of disclosures. (Rutledge, Karin & Kim 2016, BDO 2018: 5, 118.)

3.2 The five-step model

The core principle of IFRS 15 is that a company should recognize revenue in a way that accurately represents the transfer of promised goods and services to customers. The amount to be recognized should reflect the remuneration the company expects to be entitled to in exchange of provided goods and services. To achieve this core principle, IFRS 15 presents a five-step model that companies must apply. First step is to identify the contract with a customer. A contract depicts what has been agreed upon between the company and the customer and it must create enforceable rights and obligations. Second step is to identify the performance obligations in the contract.

Performance obligations are the promised goods and services included in the contract. If the performance obligations are distinct, then they are accounted for separately. Third step is to determine the transaction price. Transaction price is the consideration a company expects to receive from the contract identified in step one. Fourth step is to allocate the transaction price to the performance obligations in the contract. The transaction price of the contract is allocated to each of the performance obligations identified in step two. Fifth step is to recognize revenue when or as the company satisfies a performance obligation. As the company satisfies its performance obligations identified in the contract, it can recognize the amount of revenue that was allocated to the performance obligation in step four. The performance obligation is considered satisfied when the customer obtains control of the goods and services. (Haaramo et al. 2005, BDO 2018: 7–8.)

3.2.1 Identify the contract with a customer

A customer contract is an agreement between two or more parties that creates enforceable rights and obligations. The form of the contract can be written, oral or implied by a company's business practices. Regardless of the form the enforceability of the contract is defined by law. For a contract to be recognized under IFRS 15 it also needs to meet the following criteria: the parties of the contract have approved the contract, each party's rights to the transferrable goods and services can be identified, payment terms have been determined, the contract has commercial substance, and it is probable that the consideration the company is entitled to will be collected. (Haaramo et al. 2005, International Accounting Standards Board 2014: 8–9.)

The commercial substance means that the future cash flows of the company are expected to change as result of the contract i.e. it has economic value. When evaluating the collectability of the contract, the company needs to consider the customer's ability and intention to pay the consideration when it is due. This goes beyond the contract terms and requires the company to assess the credit risk of the customer. In practice, when there is more than 50 percent likelihood of collection, it is considered probable. In cases where the abovementioned criteria are not met, the revenue will be recognized only after the contractual performance obligations have been fulfilled and the payment

has been received. (Haaramo et al. 2005, International Accounting Standards Board 2014: 9–10.)

The standard is applied to individual contracts but at times it requires companies to combine contracts to better represent the nature of the business transaction. When more than one contract is formed with the same customer within a short period of time, the contracts are combined and accounted for as if they were a single contract if one of the following criteria is fulfilled: the contracts are negotiated as a package with a single commercial goal, the transaction price of one contract depend on the prices or performance of other contracts, and the goods and services promised in the contracts form a single performance obligation. Additionally, the standard permits companies to group contracts with similar characteristics into portfolios, as long as it will not materially affect the accounting figures compared to accounting the contracts separately. This is helpful when the company has a large amount of similar customer contracts and it is more useful to examine the contracts as a whole instead of individually. (Haaramo et al. 2005, BDO 2018: 8, 15.)

Often the contracts may be modified afterwards. A contract modification is a change in the scope or price (or both) of the contract that is approved by the contract parties. The company needs to evaluate whether this is a modification to the original contract or whether it creates a new separate contract. The modification is accounted for as a separate contract when additional distinct goods and services are promised, and the contract price increases by an amount that reflects the products' stand-alone selling prices. Therefore, the original contract remains unchanged as a new contract has been made for additional goods or services at conventional prices. On the other hand, if the pricing of additional goods or services is not independent of the original contract and they are not distinct, then the original contract will continue as modified. This would be the case when a discount is given for additional products or the scope of the contract changes, for example there are new specifications in a construction project and the additional work required cannot be separated from the service already provided or it is not distinct. These modifications will be treated as if they were a part of the original contract from the beginning. Therefore, the company will need to adjust the revenue recognized prior to the contract modification to match the transaction price of the

modified contract. (Haaramo et al. 2005, International Accounting Standards Board 2014: 10–12, BDO 2018: 16–17.)

3.2.2 Identify the performance obligations in the contract

Performance obligations are the promised goods or services that are distinct, or a series of distinct goods or services contained in the contract. A series of goods or services are considered as a single performance obligation when they are essentially the same and are transferred to the customer in the same manner. A contract can have one or more performance obligations and they are accounted for separately. The key to determining whether the contract has multiple performance obligations is to determine whether the goods or services are distinct. Goods or services are considered distinct when the customer can benefit from them on their own or together with readily available resources. Readily available resources are those the customer either already possesses or can easily acquire from the company or from a third party. Additionally, the goods or services must be separately identifiable or distinct compared to the other promises in the contract. (Haaramo et al. 2005, International Accounting Standards Board 2014: 12–14, BDO 2018: 21–22.)

To evaluate whether a promise to transfer a good or service is distinct from the other promises in the context of the contract, the company should consider the following questions: is the good or service in question integrated to other goods or services promised in the contract? Does it modify or is it dependent with the other goods or services? A positive answer indicates that the good or service is not distinct and does not form a separate performance obligation. If the company determines that a good or service is not distinct, then they must combine them with the other promises in the contract until a bundle of separately identifiable goods or services is found. This may result in an outcome where the whole contract is accounted for as a single performance obligation. For example, a company sells construction materials and various construction services separately. The company enters into a contract to construct a building and to provide materials. Addition to the materials the contract contains many different services such as project management, site clearance, foundations and construction. In the context of the contract the sales of the materials and the different services are not distinct as they are all used as inputs for the promised product, a

building. Therefore, the contract has only one performance obligation. (International Accounting Standards Board 2014: 14, BDO 2018: 21–31.)

3.2.3 Determine the transaction price of the contract

Transaction price is the payment the company expects to be entitled to for the promised goods or services provided. In addition to the contract terms, the company needs to consider its customary business practices when determining the transaction price. The expected transaction price might be affected by the business practices such as the company's policy in giving discounts. The transaction price of the contract may include fixed amounts, variable amounts, or both. (Haaramo et al. 2005, International Accounting Standards Board 2014: 18–19.)

The variable amount may result from many different reasons such as discounts, refunds, performance bonuses and penalties among others. If there is a possibility that the received payment will differ from the initial estimate, then this must be considered in the transaction price. Additionally, the promised payment is variable also if it is dependent on some future event. For example, if the customer has a right to return the product. When a contract has a variable portion, IFRS 15 requires the company to estimate the most likely amount it expects to receive from the contract. As the estimate introduces an element of uncertainty to the revenue, the variable amount can only be included in the initial transaction price if it is highly probable that it will not have to be reversed in the future. This constrains the amount of revenue that can be recognized under uncertainty. The variable amount may change in future reporting dates as there is more information and a greater certainty of the likely outcome. (Haaramo et al. 2005, International Accounting Standards Board 2014: 18–20, BDO 2018: 35–37.)

The contracts may also include a significant financing component. This can be the case when the timing of the payment differs significantly from the transfer of promised goods or services, such as when the customer pays a substantial advance payment, or the company grants very long payment terms to their customer. The long time period between the payment and the transfer of goods or services is essentially granting financing to the other party. The effect of this component needs to be considered and adjusted in the transaction price. The adjustment should reflect the price the customer

would have paid if the goods or services would have been transferred at the time of payment. As a practical expedient, the effects of a financing component do not need to be considered if the payment terms are 12 months or less. (Haaramo et al. 2005, BDO 2018: 42–43.)

3.2.4 Allocate the transaction price to the performance obligations

After the company has determined the performance obligations included in the contract and the transaction price of the contract, the transaction price needs to be allocated to the separate performance obligations. The allocation amount to each performance obligation (i.e. distinct good or service) must represent the amount that the company expects to receive from that specific good or service. This is done by using the stand-alone selling price of the good or service. The stand-alone selling price is the price at which the company would sell the product separately in similar circumstances to a similar customer. A challenge arises when the goods or services promised in the contract are not sold individually and they therefore do not have a stand-alone selling price or list price. When the stand-alone selling price is not directly observable, the company will need to estimate it. (Haaramo et al. 2005, International Accounting Standards Board 2014: 24.)

Purpose of the estimation is to find the appropriate share of the transaction price to allocate that reflects the value of the specific good or service. In their estimation the company will need to consider all available information such as market conditions, company-specific factors and customer characteristics. Methods that can be used in estimation are adjusted market assessment, expected cost plus margin, and residual, or a combination of those. Adjusted market assessment estimates the current market price and can use the prices of competitors as a reference. Expected cost plus margin estimates the costs of providing the good or service and adds a suitable margin. Residual method deducts the stand-alone selling prices of other goods or services in the contract from the transaction price and allocates the remaining amount to the performance obligation in question. This is only applicable when there are observable stand-alone selling prices for the other goods and services. (International Accounting Standards Board 2014: 24–25, BDO 2018: 55.)

The transaction price of the contract can also include discounts or variable considerations. If the sum of stand-alone selling prices of the goods or services exceeds the transaction price a discount exists. The discount needs to be allocated proportionally to all performance obligations, unless there is evidence that the discount relates to only some specific goods or services. Variable consideration can also be attributable to the entire contract or to specific performance obligations. The variable amount can be allocated to a performance obligation if the terms of the variable payment relate specifically to the said obligation and this allocation accurately reflects the expected remuneration for fulfilling that obligation. (International Accounting Standards Board 2014: 26–27, BDO 2018: 57–58.)

3.2.5 Recognize revenue when performance obligations are satisfied

The company recognizes revenue when or as it satisfies performance obligations identified in the contract. Performance obligation is considered satisfied when the control of the promised good or service (i.e. an asset) is transferred to the customer. Control is determined as the customer's ability to obtain the benefits and direct the use of an asset. It also includes the ability to prevent others from obtaining the benefits and directing the use of an asset. The benefits refer to the potential cash flows arising from the asset by using, selling, or holding it. Each performance obligation can be satisfied (i.e. the control transferred) either over time or at a point in time. (International Accounting Standards Board 2014: 15, BDO 2018: 60.)

Performance obligations are satisfied, and revenue recognized over time if one of the following criteria is met: the customer simultaneously receives and consumes the benefits provided by the company's performance, the company's performance creates or enhances an asset the customer controls, or the asset created has no alternative use for the company and the company has an enforceable right to payment for performance completed to date. An example of simultaneous receipt and consumption of the benefits could be all manner of services, such as cleaning. An example of the second criterion could be when the company constructs a building on the customer's land. The third criterion has two conditions which consider the alternative use of the asset and the enforceable right to payment. The company has no alternative use for the asset if they are restricted by either contract terms or practical factors in directing it to another

use. For instance, a building constructed according to customer's specifications could not be modified for another purpose without significant costs. The assessment of alternative use is made at the contract inception. The company must also have an enforceable right to payment for performance completed to date in case of contract termination (except when the contract is terminated due to the company's inability to perform its duties). The right to payment needs to be enforceable throughout the contract term to the amount that at least compensates the performance to date. The enforceability is determined by the contract terms and laws and regulations related to the contract. (International Accounting Standards Board 2014: 15–16, BDO 2018: 61–64.)

When performance obligations are satisfied over time, the company recognizes revenue by measuring the progress towards the completion of those performance obligations. The degree of completion can be measured by using output methods or input methods. Output methods recognize revenue based on the value of goods and services transferred to date relative to the value of all goods and services included in the contract. These can include measurements such as milestones reached, and units produced or delivered. If the information needed to use output methods is not readily available, then input methods are used. Input methods recognize revenue based on the company's efforts or inputs towards the satisfaction of a performance obligation. These could be for example resources consumed, labor hours expended, or costs incurred. The company needs to consider the nature of the good or service to determine the appropriate method to be used for accurate measurement. Once a method is chosen, the company is required to use the same method consistently for similar performance obligations and in similar circumstances. There may be situations where the company lacks reliable information and is unable to reasonably measure the progress towards satisfaction of a performance obligation, but they expect to recover the costs incurred. In this case the company can recognize revenue only to the extent of costs incurred to date. When reliable information becomes available the company may use appropriate measurement method to recognize revenue. (Haaramo et al. 2005, International Accounting Standards Board 2014: 17–18, 41, BDO 2018: 67–69).

If the criteria for the satisfaction of a performance obligation over time is not met, then it is satisfied at a point in time. The revenue is then recognized when the control of

goods and services is transferred to the customer. In order to determine the point in time when the customer obtains the control of the asset, the company can consider the following factors which indicate the transfer of control: the customer is presently obliged to pay for the goods and services provided, the customer has legal title to the asset, customer has the physical possession of an asset, customer has the significant risks and rewards of ownership of the asset, and the customer has accepted the asset. (International Accounting Standards Board 2014: 16–17, BDO 2018: 72.)

4 ANALYSTS

This chapter will examine the role of analysts in capital markets, what is the value of their forecasts and recommendations, what information they use when making forecasts and recommendations, what factors affect the accuracy of the forecasts, and how forecasts are made and evaluated.

4.1 The role of analysts

Financial analysis is relevant for all the different stakeholders who require information about the economic situation of a company. Investors evaluate the company's financial performance and analyze its potential as an investment opportunity. Banks inspect the company in their decision to grant a loan. Suppliers and customers are interested in the financial security of the company and competitors monitor the company's performance for benchmarking. For some, the importance of the financial analysis in decision making is of such importance that they conduct it themselves, such as banks. For others, it is preferable to use financial analysis reports prepared by different analyst services. These could be credit rating reports for suppliers and customers and equity research reports for investors. (Rees 1995: 4–8, Penman 2004: 12, Kallunki 2014: 15–20.)

Professional financial analysts can be divided into buy-side analysts and sell-side analysts. Buy-side analysts work for large investment funds and pension funds. They evaluate potential securities suitable for their funds and make buy or sell recommendations. Sell-side analysts work for brokerage firms. They follow specific stocks and industries, and produce reports and make buy, hold, and sell recommendations for the brokerage firm's clients. The analysts' research reports contain quantitative data such as earnings forecasts and target prices, as well as qualitative information about the company's business, market conditions and competition, and other relevant topics. The clients include both individual investors and buy-side analysts working for institutional investors. (Soffer & Soffer 2003: 3–4, Huang, Lehavy, Zang & Zheng 2018.) This research focuses on the forecasts of sell-side analysts.

Financial analysts play an important role in the capital markets as information intermediaries. They collect information about companies and distribute it to investors, thus linking the information producers and consumers (Soffer & Soffer 2003: 5). Huang et al. (2018) present in their study, that analysts bring value to investors through information discovery and information interpretation. Analysts conduct their own research using multiple sources, both public and private, and combine the information to produce a comprehensive analysis of the company. Through their analysis and by using their expertise they generate or discover new information that is otherwise not readily available such as firm valuations, earnings forecasts and long-term growth rates. Analysts serve the role of information interpreters when they examine information that has already been presented in recent corporate disclosures. They can direct the attention of investors to the topics that they consider most relevant and important. Analysts can clarify and explain the disclosures by using their own words and by offering their opinions. They can also assess the management's estimates and statements using calculations. Additionally, as analysts are seen as independent agents, they can improve the reliability of management's statements. In their role analysts reduce information asymmetry in the capital markets. The researchers find that both information discovery and interpretation activities of analysts trigger market reactions that suggests that these functions bring value to investors.

As to the value of analysts for companies, Demiroglu & Ryngaert (2010) studied the effect of initiation of analyst coverage on "neglected" stocks. Their sample consisted of 549 stocks that were publicly traded for at least one year without analyst following. Their results show that commencement of analyst coverage results in large positive stock returns and improves the liquidity of stocks. They also observe that after the initiation, institutional investors that did not previously own the stocks, increase their holdings. Kelly & Ljungqvist (2012) on the other hand studied the effect of termination of analyst coverage on stocks. Their sample consisted of 43 brokerage firm closures that provided coverage of a total of 2180 unique stocks. Their results find that the decrease in analyst following, caused by the firms' closures, increases information asymmetry, reduces share prices and liquidity, and decreases retail investors' demand for the stocks.

Chen, Harford & Chen (2013) studied the relevance of analyst following for corporate governance. They examined the effects on firms in situations where analyst coverage decreases or is terminated because of broker closures or mergers. Their sample consists of 46 brokerage exits covering a total of 1340 unique firms. The researchers propose that analysts can serve as an external governance mechanism by providing direct monitoring by regularly interacting with the firms' management and examining the financial statements. Additionally, they provide indirect monitoring by distributing information through research reports to investors. Their close monitoring of companies can help investors detect managerial misbehaviors. The researchers find that with decreased analyst coverage firms' cash holdings contribute less to shareholder value, the firms' CEOs receive higher excess compensation and the management is more likely to make value-destroying acquisitions and engage in earnings management. This suggests that analysts perform a monitoring function and analyst coverage mitigates the agency conflict between managers and owners.

Based on previous research Li & Haifeng (2015) investigated three potential channels of analyst value creation: improving fundamental performance through monitoring, reducing information asymmetry, and increasing investor recognition. According to the equity valuation theory the value of a company equals the present value of its expected future cash flows. Therefore, the researches infer that for analysts to create value for companies, their coverage should either help to increase future cash flows or reduce the cost of capital, or both. They study each potential channel's market reactions in situations where analysts have initiated firm coverage and terminated coverage due to brokerage mergers or closures. Their sample for initiation of coverage consists of recommendations from 7805 unique analysts for 8825 unique firms. Their sample for termination of coverage consists of 32 mergers and 22 closures of brokerages resulting in a total of 6549 coverage terminations. The researchers found that out of these three potential channels only changes in investor recognition have significant explanatory power for the market reactions in initiation and termination situations. The results suggest that from the capital market perspective analysts create value by improving investor recognition of the firms they cover (as investors can only invest in firms they know), rather than reducing information asymmetry or improving performance through monitoring.

4.2 Analysts' information sources

In order to produce forecasts and research reports analysts require significant amounts of data. They employ both quantitative and qualitative data, as well as financial and non-financial data. Analysts' main source of information is the company's annual report and related disclosures. The financial statements contained in the annual report provide quantitative financial data in the income statement, balance sheet, and statement of cash flows, and qualitative data in the form of management commentaries and accounting policies used. The accompanied disclosures and notes provide a more detailed breakdown of the information. Annual report serves as a basis for their forecasts, but analysts use numerous other sources as well. Analysts follow the companies' press releases and interim reports and articles in newspapers and magazines. They can also directly interact with the company's management and customers. They examine firm-specific stock market information, generic market data, and information about competitors. Also, they employ other analysts' reports and forecasts. In addition to information specific to a company, analysts consider the economic data in various government statistics, and industry reports on market conditions and trends. (Rees 1995: 27–33, Soffer & Soffer 2003: 3–5.)

Several studies have examined what information affects the development of analysts' earnings forecasts and recommendations. Previts, Bricker, Robinson, and Young (1994) examined the content of 479 sell-side analyst reports to determine the information needs of analysts. The researchers found that analysts base their recommendations primarily on company income and earnings-related information. Analysts disaggregate segments and product lines into a finer set of operating units than presented in the annual reports. Analysts modify reported earnings to identify recurring core earnings and remove non-recurring items. They also assess substantial amounts of non-financial information, including company risks, anticipated changes, competitive position, management, and strategy.

Rogers & Grant (1997) also conducted a content analysis of 187 sell-side analyst reports. In addition to examining the content of reports they aimed to identify the potential sources of this information. The researchers found that financial statements (income statement, balance sheet and cash flow statement) provide only 26% of the

content in analyst reports. The narrative sections of annual reports provide an additional 26% of the content, with management discussion and analysis (MD&A) being the most important section. The remaining 48% of the content comes from external information sources other than the annual report. These findings suggest that analysts use significant amounts of non-financial information both from annual reports and outside sources.

Epstein & Palepu (1999) surveyed 140 sell-side analysts to find out what information they want. The surveyed analysts reported that their two primary sources of information are private contacts and analyst meetings, with annual reports ranked as third. In the annual reports the management discussion and analysis (MD&A) was considered an important source of information. Segment information and the financial statements were considered as the most useful data for investment decisions, except for the balance sheet which was seen as insignificant because of its dependence on historical costs and inconsistent write-offs of intangible assets. The analysts would like more information about the company's risks and uncertainties, competitive strategy at both business unit and corporate level, and more comprehensive disclosures on product lines and segments.

4.3 Factors affecting forecasts

As can be seen analysts use a variety of information sources in their work. Previous research shows that the information analysts need for their security analyses may not be available in the annual reports and financial statements, and thus it must be found from outside sources. Also, the information that is available in the financial reports may not be presented in a suitable format for analysis and will need to be reorganized and adjusted. Nonetheless, financial statements provide important information for forecasts. (Soffer & Soffer 2003: 13.)

In order to make forecasts and valuations for companies, analysts need forward looking information. To determine the value of a company today, analysts need to be able to estimate its prospects in the future. The financial statements are limited in this aspect as they present information about the past financial performance and mostly rely on historical costs. The information content of the financial statements is also

dependent on the accounting quality. The accounting quality is affected by the quality of accounting standards and their application, audit quality, the timing of revenue and expenses, and the quality of disclosures. Disclosures give more detailed information about relevant aspects of the company's business. They can be found in the financial statements, footnotes, and management discussion and analysis. The four most important types of disclosures for analysts are: disclosures that distinguish operating items from financial items, distinguish core profitability from unusual items, reveal the drivers of core profitability, and explain the accounting methods used. Higher quality accounting and disclosures improve the information content of financial statements as they lead to a better understanding of the company's core earnings and enable better forecasts. (Soffer & Soffer 2003: 13–14, Penman 2004: 604–605.)

Lang & Lundholm (1996) studied the effect of firms' disclosure practices on analyst following and earnings forecasts. They found that firms that voluntarily provide additional information, relative to minimum requirements set by regulations, and more informative disclosures have larger analyst following, more accurate earnings forecasts, less dispersion among individual forecasts, and less volatility in forecast revisions. This suggests that more forthcoming disclosures decrease information asymmetry, increase consensus among analysts, and lead to better forecasts.

Similarly, Hope (2003) examined the relations between forecast accuracy and the firm-level disclosures, as well as between forecast accuracy and enforcement of accounting standards in 22 countries. The findings document that forecast accuracy increases with higher quality disclosures and with stronger enforcement of accounting standards. These findings suggest that disclosures provide useful information for analysts' forecasts and enforcement of accounting standards increases the reliability of accounting and reduces analysts' uncertainty about future earnings.

Jiao, Koning, Mertens & Roosenboom (2012) studied the effect of mandatory IFRS adoption in the EU on analysts' forecasts. The researchers were interested whether IFRS affected the analysts' ability to translate accounting information into forward looking information or forecasts. They compared the accuracy and dispersion of forecasts before and after the adoption year. They found that IFRS adoption increased analysts' forecast accuracy and decreased the dispersion of forecasts hence increasing

the consensus among analysts. The results indicate that IFRS improves the quality of financial reporting and the quality or informativeness of earnings.

Aboud et al. (2018) investigated the effect of IFRS 8, a new standard on segment reporting, on analysts' earnings forecasts. The new standard requires operating segments to be classified in the financial statements in the same manner as they are identified in the company's internal reports. Their sample consists of 255 largest firms in the EU across 18 countries. The researchers found that the quality and quantity of segment information under the new standard leads to more accurate earnings forecasts. They also find that the forecast accuracy is better in countries with stronger accounting standards enforcement. The results suggest that providing more relevant and disaggregated information in financial statements leads to improved forecasting accuracy.

In addition to accounting quality, research has also found that the complexity of the firm's business environment affects forecasting accuracy. Duru & Reeb (2002) studied the relation between firms' international diversification and the accuracy and bias of analysts' earnings forecasts. They found that earnings forecasts are less accurate and more optimistic with greater international diversification of business operations, as geographic diversification increases the complexity of the forecasting task. Plumlee (2003) studied the effect of information complexity on analysts' use of that information. The researcher investigated the relation between six tax-law changes and accuracy of analysts' effective tax rate forecasts. The results show that the forecasts include information from the less complex tax-law changes but fail to incorporate the effects of the more complex tax-law changes. The results suggest that increased complexity of information reduces the accuracy of forecasts based on that information. This could be because of a lack of ability in understanding more complex information or because the costs of using the information outweigh the benefits.

Forecasting accuracy is also affected by macroeconomic conditions. Chopra (1998) investigated the relation between the state of the economy, proxied by industrial production growth, and analysts' earnings forecasts. The results show that the forecasts are most accurate during a time of continuous strong economic growth, and the least accurate when the economic growth is either accelerating or decelerating. According

to the researcher the reason for this is that analysts' forecasts tend to be very optimistic and in a time of strong economic growth the actual earnings move closer to the optimistic forecasts, thus reducing the forecast errors. If the economic growth accelerates even further the actual earnings surpass the forecasted earnings and if the economy slows down the actual earnings decline and move further from the optimistic forecasts. Both situations increase the gap between the actual and forecasted earnings and decrease the forecast accuracy.

Studies have also investigated the connection between forecast accuracy and analyst characteristics. Clement (1999) studied how the analyst's ability, resources and portfolio complexity affect their forecast accuracy. The results show that forecast accuracy increases with experience and the size of the employer and decreases with larger number of firms and industries followed. This suggests that more experienced analysts are able to provide more accurate forecasts, larger employers enable access to greater resources, and larger and more diverse portfolios increase the complexity of forecasting.

To summarize, according to studies the factors affecting forecasts are the quality of accounting and the quality of financial statements. Other factors are the complexity of the forecasting task and business environment, the state of the economy, and also analyst-specific characteristics.

4.4 Forecasting

The security analysis of analysts can be divided into four phases: business analysis, financial statement analysis, forecasting, and valuation. The first phase is the business analysis. To accurately forecast a firm's future performance and determine its value, analysts need to have a thorough understanding of the business. They need understanding of both internal and external environment of the firm. Knowledge of internal environment includes issues such as the firm's products and services, its marketing and manufacturing methods, distribution processes, business model and strategy. External environment consists of matters such as industry economics, competitive environment and the firm's competitive advantage, customers, and legal,

regulatory and political environment. The goal is to understand the key business drivers and risks. (Soffer & Soffer 2003: 14–15, Penman 2004: 512.)

Second phase is the financial statement analysis. In this phase the analyst examines the financial statements to find out about the firm's current and historical profitability, growth, and resource needs. The analyst aims to understand the connections between the different financial variables and the firm's activities, and how these might change in the future. The analyst also considers the firm's accounting policies and choices and how these affect the reported numbers. As accounting standards give management some freedom of choice on accounting methods, the analyst must adjust for any distortions. Therefore, analysts often modify the financial statements into a more suitable format for analysis, excluding non-recurring items and possibly including others. The financial statement analysis translates the observations made in the business analysis phase into concrete measurements. For example, if the firm has a competitive advantage it can be seen in high margins, and on the other hand if it faces increased competition this can be perceived in decreasing margins. When analyzing profitability and growth the analyst evaluates whether current earnings and historical growth are a good indicator of future earnings. With the understanding of firm's historical and present performance, the analyst can then begin to forecast the future. (Soffer & Soffer 2003: 15, Penman 2004: 382–382, 512.)

The third phase is forecasting. By employing information gathered in the business and financial statement analysis, the analyst makes predictions about the firm's future financial performance. Forecasting approaches can be divided into mechanical and non-mechanical approaches. Both approaches can employ either a single variable (univariate approach) or multiple variables (multivariate approach). (Foster 1986: 262–263, Soffer & Soffer 2003: 16.)

In the mechanical approach, forecasting data is combined in a prespecified way so that using the same data and forecasting model will always yield the same result. An example of univariate mechanical approach would be a model that calculates next year's earnings to be the weighted average of past five year's earnings. The model has a single variable, earnings, and the earnings are forecasted by using historical earnings as input data. An example of multivariate mechanical approach would be a regression

model that uses two or more variables to forecast earnings, such as data about economy and industry. In a non-mechanical approach, the data is not combined in a prespecified way, so depending on the forecaster the same data inputs could lead to different forecast results. An example of univariate non-mechanical approach would be to observe a visual earnings curve or plot and to subjectively extrapolate and estimate the future earnings. Multivariate non-mechanical approach is the one typically used by analysts. The approach employs the many different information sources discussed in this chapter, such as financial statements, economy and industry data, and information about competitors and customers. The analyst may use different models to produce a simple forecast utilizing only financial statements but then incorporates all the available information from other sources to make educated speculations about future earnings and to produce a full-information forecast. The weights given to different information sources may vary from forecast to forecast and there is rarely a clearly observable link between the data inputs and the forecast results. (Foster 1986: 262–264, Penman 2004: 501–502, 510.)

Numerous studies have compared the accuracy of earnings forecasts between analysts and univariate mechanical models. The findings show that analysts produce superior forecasts to those of mechanical models. Brown, Griffin, Hagermann & Zmijewski (1984) compared the accuracy of analysts' forecasts and three different univariate models at different forecasting horizons. The results show that analysts' forecasts were more accurate than any of the models at all time horizons, and analysts accuracy improved closer to the forecasting period. Potential explanations for this are that analysts have an information advantage over time-series models as they can react to new information immediately. Analysts can also use information from various outside sources as opposed to only financial statement information. (Brown et al. 1984 via Foster 1986: 276–280, Foster 1986: 276–280.)

The fourth phase is valuation. In this phase the analysts use the forecast and a valuation method to determine the firm's value. There are several different valuation methods but not all of them require forecasting. Methods involving forecasting are the ones based on discounted cash flow models. Common techniques of these are dividend discount model, free cash flow model, and residual income model. These calculate the firm value as the present value of expected (forecasted) inputs (dividends, cash flows,

or earnings). A method that does not involve forecasting is multiples valuation. The firm's stock is valued by comparing its price multiples (stock price divided by financial statement numbers such as earnings) to those of other comparable firms. The choice of valuation method is affected by its costs and benefits. Simpler methods are faster, but they can ignore important elements, whereas more complex methods can provide a more reliable valuation, but they are more time-consuming. (Soffer & Soffer 2003: 16, Penman 2004: 17–18, Kallunki & Niemelä 2004: 102–103.)

Block (1999) surveyed 297 financial analysts to find out what valuation techniques they use in their work. 46% of the respondents said that present value techniques are not part of their normal procedures. Projecting future earnings, dividends, and stock price and determining appropriate discount rate may be very difficult and uncertain for companies with significant growth opportunities. This uncertainty may limit the usefulness of discounted cash flow models in valuation. The survey also found that analysts consider earnings and cash flow more important in valuation than dividends and book value.

Loh & Mian (2006) investigated the relation between analyst forecast accuracy and profitability of stock recommendations. The researchers found that analysts who issue more accurate earnings forecasts also issue significantly more profitable investment recommendations compared to analysts issuing inferior forecasts. The results suggest that in an imperfectly efficient market the costly activity of information gathering to provide superior forecasts leads to better valuations and thus higher returns. The findings also provide support for valuation models emphasizing future earnings and indicate the usefulness of fundamental accounting analysis in investment decisions. Therefore, it seems that expending time and resources on forecasting is rewarded with more accurate and profitable valuations.

4.5 Accuracy and evaluation of forecasts

The accuracy of analysts' forecasts is commonly evaluated by measuring the error. The error is defined as the difference between the forecasted value and the subsequent actual value. The smaller the difference between the forecasted and actual value, the more accurate the forecast is. Two common error measurements are mean absolute

error and mean square error. In the following formulas A equals the actual value, F equals forecasted value, N is the number of forecasts, and X is the deflator. The deflator is used to standardize the results between different companies. The value of A is often used as the deflator X, but other measures can be used as well, such as the firm's stock price at the time of the forecast. (Foster 1986: 266–267, Rees 1995: 131–132.)

$$MAE = \frac{\sum_1^n \left| \frac{A_i - F_i}{X_i} \right|}{N} \quad (1)$$

Mean absolute error measures the average of all the errors in the sample and gives equal weighting to each unit or error.

$$MSE = \frac{\sum_1^n \left[\frac{A_i - F_i}{X_i} \right]^2}{N} \quad (2)$$

Mean square error is the same as mean absolute error but it gives greater weighing to high error values than to low values. (Rees 1995: 131.)

Elton, Gruber & Gultekin (1984) analyzed the errors and their sources in analysts' earnings forecasts. They found that majority of forecast errors are due to analysts' incorrect estimates of industry and company performance, and errors due to economy are marginal. Misestimating company performance was a greater source of errors relative to industry performance. They also found that some companies are more difficult to forecast than others. If analysts provided a poor forecast for a firm in any year, they would likely provide a poor forecast for the same firm in the subsequent year.

Forecasts are important products of analysts' work and valued by the capital markets. Forecasts are useful for investors as they can be used as direct inputs in many valuation models. More accurate forecasts lead to more accurate firm valuations and better investment decisions. To improve the accuracy of forecasts, individual forecasts can be aggregated into consensus forecasts. Most of the publicly available analysts' forecasts are in the form of consensus forecasts. Consensus forecasts combine the forecasts of independent analysts to produce the average of analysts' estimates. The consensus forecasts are more accurate than any individual analyst's forecast as the errors (under and overestimates) made by individual analysts tend to cancel each other out when combined. The consensus forecasts are also useful as a benchmark when assessing individual analyst's skill and accuracy. Additionally, the distribution of the independent forecasts contained in the consensus can be used to measure the perceived risk of the forecasted firm and the factor of uncertainty in the forecasts. It should be noted that although consensus forecasts provide a good overview of analysts' general opinion, they do not include all the individual forecasts available from different organizations, and do not necessarily include the most recent ones. Also, there are challenges how to weight the individual forecasts when combining them into consensus and whether the forecasts are truly independent as analysts also make use of other analysts' forecasts. (Foster 1986: 285, Rees 1995: 134.)

5 DATA AND METHODOLOGY

This chapter will study whether IFRS 15 has an impact on analysts' forecasts. The chapter will first present the data used in the research and introduce the research method. After this the research part will be presented and lastly the findings examined.

5.1 Data

The impact of IFRS 15 on analysts' forecasts will be studied in Europe. Europe is chosen as the region has a history of using IFRS, and reporting under IFRS has been mandatory for listed companies in the EU since 2005. The region as a whole has a high level of accounting standard enforcement and monitoring.

The sample was collected from Institutional Brokers' Estimate System (IBES) database and consists of data about European listed companies. The sample consists of company and forecast data for the years 2017 and 2018. More specifically the data consists of analysts' forecasts for earnings per share (EPS) and sales for first quarter (Q1 from January to March) and second quarter (Q2 from April to June) as well as actual realized EPS and sales figures during this time. The forecasts used are analysts' consensus forecasts as they will give more accurate estimation than individual forecasts. To ensure that at the time of forecasting analysts had the most information available, the final consensus forecasts before quarterly earnings announcements will be used, that is for Q1 the forecasts made on 1. April and for Q2 forecasts made on 1. July.

The Q1 and Q2 were chosen as they were the most recent information available at the time of research. One of the major changes in IFRS 15 compared to previous standards is the new disclosure requirements regarding revenue and its recognition. Interim reports do not require these disclosures and they are only reported in the annual report and financial statements. Therefore, at the time of research the analysts are not yet able to make use of the full disclosure information provided by the new standard. Nonetheless, companies are required to estimate the impact of IFRS 15 in their 2017 annual reports, so this will provide guidance for analysts. Still, this needs to be considered as it may mitigate the effects of the standard.

EPS and sales were chosen as they are commonly forecasted variables. EPS forecasts are the actual earnings forecasts. EPS forecasts require analysts not only to estimate the revenue or sales but also the expenses to determine the earnings for the period. Sales forecasts estimate only the revenue and not the expenses. IFRS 15 changes the manner on how costs related to the acquisition of revenue can be expensed or capitalized. So, through the capitalization of costs the standard could affect the expenses as well.

To clearly identify the impact of IFRS 15 the companies chosen for the sample are from industries where the standard will most likely result in changes in revenue recognition practices. The industries were collected using Standard Industry Classification (SIC-codes). Based on Ciesielski & Weirich (2011, 2015) the industries chosen for the sample are telecommunications, construction, software, engineering, management consulting, and pharmaceuticals. Common for these industries is their prevalence in using long-term contracts and bundled contracts as well as licensing arrangements. These types of contracts are most likely to experience changes in their accounting treatment for revenue recognition under the new standard.

To control for other possible factors affecting forecast accuracy, such as macroeconomic conditions, a control group is used. The control group consists of companies from industries where the new standard will not likely result in changes in revenue recognition practices. Again, based on Ciesielski & Weirich (2011, 2015) industries unlikely to experience changes in revenue recognition are retail, hospitality, transportation, wholesale, chemicals, and consumer products.

The research data consists of 213 individual European listed companies in total. In the sample group there are 116 individual companies and in the control group there are 97 individual companies. Total number of observations for EPS and sales forecasts and actual values for these companies equal 661.

5.2 Research method

The research will study the accuracy of analysts' forecasts by measuring forecast error. Forecast error is the difference between the forecasted and the actual realized value, in

this study the difference between forecasted EPS and sales, and the realized figures of EPS and sales.

To compute the analysts' forecast error from the sample data a following equation is used:

$$AFE = \left| \frac{F_i - A_i}{A_i} \right| \quad (3)$$

Where, AFE = Analysts' forecast error, F_i = forecasted values (EPS and sales) of firm i , and A_i = Actual realized values (EPS and sales) of firm i .

The deflator used is the actual realized values of EPS and sales. Using the actual values as the deflator will help to standardize the errors across companies of different sizes. It will also present how many percent the error differs from the actual value. So, for example a mean value of 0.23 would tell us that the average forecast error was 23% of the actual realized value of EPS or sales.

When using actual values as the deflator it should be considered that if the value of the deflator is close to zero it will result in high value of the AFE variable and thus the creation of outliers. For example, forecasted value of 0.01 for EPS deflated with the actual value of 0.001 would result in forecast error of 10 or 1000%. Comparing this to a forecast of 1.5 for EPS when the actual value was 2.0 would result in forecast error of 0.75 or 75%. But the absolute error in the first case would be less than 0.01 and in second case 0.5. Therefore, forecast errors that were more than 200% were eliminated as outliers as per Capstaff et al. (2001).

The mean and median of the error variable AFE will be compared between the two time periods 2018 (after the implementation of IFRS 15) and 2017 (before the implementation of IFRS 15) to see whether there are changes in the level of errors i.e. the accuracy of forecasts.

To test whether the possible changes in the forecast accuracy are statistically significant a regression analysis is used. Regression analysis is performed on the whole data and the regressions are run for forecast errors for both EPS and sales separately. The following regression formula is used:

$$AFE(EP\text{S or sales}) = \beta_0 + \beta_1 LOG(SIZE) + \beta_2 GROUP + \beta_3 IFRS + \beta_4 IFRS*GROUP \quad (4)$$

Where AFE = analysts forecast error for EPS or sales for the whole data,

β_0 = constant term or intercept,

$LOG(SIZE)$ = natural logarithm of sales to control for the size of the company,

$GROUP$ = dummy variable for groups, gains the value 1 for sample group and value 0 for control group,

$IFRS$ = dummy variable for IFRS 15, gains the value 1 for forecast error observations in 2018 and value 0 for observations in 2017, and

$IFRS*GROUP$ = interaction variable to examine the effect of IFRS 15 for the sample group. Gains value 1 when $GROUP = 1$ and $IFRS = 1$, and value 0 otherwise.

The regression analysis aims to explain the dependent variable AFE using independent variables to see whether these factors have a statistically significant effect on the forecast errors.

5.3 Research

First the forecast errors are calculated for the whole data and examined between the two time periods.

Table 1. Descriptive statistics for forecast errors for the whole data.

Forecast error for EPS	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.300	0.143	2.00	0.00	0.407
Post-IFRS 15 (2018)	0.258	0.111	2.00	0.00	0.353
Forecast error for sales	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.077	0.029	1.98	0.00	0.188
Post-IFRS 15 (2018)	0.058	0.028	1.00	0.00	0.109

Table 1. presents the descriptive statistics for forecast errors for the whole data between the years 2017 and 2018 for both EPS and sales forecasts. Both mean and median forecast errors for EPS and sales seem to have decreased from 2017 to 2018. The standard deviation has also decreased for both which could indicate decreased dispersion of forecasts.

For EPS the average forecast errors have decreased from 30 percent to 25.8 percent and the median forecast errors have decreased from 14.3 percent to 11.1 percent. For sales the average forecast errors have decreased from 7.7 percent to 5.8 percent and the median errors from 2.9 percent to 2.8 percent. Based on the initial observation of the descriptive statistics for the whole data the forecast errors seem to have decreased on average.

Next, possible differences in the forecast errors between the two groups, the sample and the control group, will be examined.

Table 2. Descriptive statistics for forecast errors for the sample and the control group.

SAMPLE GROUP					
Forecast error for EPS	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.311	0.165	2.00	0.00	0.389
Post-IFRS 15 (2018)	0.262	0.126	1.70	0.00	0.336
Forecast error for Sales	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.078	0.031	1.31	0.00	0.172
Post-IFRS 15 (2018)	0.073	0.034	1.00	0.001	0.136
CONTROL GROUP					
Forecast error for EPS	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.280	0.112	2.00	0.00	0.431
Post-IFRS 15 (2018)	0.253	0.111	2.00	0.00	0.377
Forecast error for Sales	Mean	Median	Max	Min	Std.dev.
Pre-IFRS 15 (2017)	0.076	0.027	1.98	0.00	0.209
Post-IFRS 15 (2018)	0.037	0.022	0.294	0.00	0.043

Table 2. presents the descriptive statistics for forecast errors separately for the sample group and the control group. For the sample group the average forecast error for EPS has decreased from 31.1 percent to 26.2 percent and the median error from 16.5 percent to 12.6 percent. For the sample group it seems that forecast errors regarding EPS have generally decreased. For the sales forecasts the average error has decreased from 7.8 percent to 7.3 percent but the median error has increased from 3.1 percent to 3.4 percent. This could mean that while on the average the errors have decreased there is a greater number of large forecast errors in the year 2018. The standard deviation for both types of forecasts has decreased indicating less dispersion in forecasts.

For the control group the average forecast error for EPS has decreased from 28.0 percent to 25.3 percent while the median error has remained about the same. Interestingly, for the sales forecasts the average error has been halved from 7.6 percent to 3.7 percent and the median error has decreased from 2.7 percent to 2.2 percent. The

standard deviation for both forecasts has also decreased, with the sales forecast error showing a large decline from 0.209 to 0.043.

There seems to be a difference between the forecast error for sales between the sample and the control groups. For both the average error has decreased but for the control group the decrease is more dramatic. This is interesting as the control group was chosen specifically as IFRS 15 is unlikely to have an impact on the control group's revenue recognition practices and thus presumably forecast accuracy. This could mean that the economic conditions in 2018 Q1 and Q2 have been such that forecasting has generally been easier than the year before and the improved accuracy is not due to IFRS 15. If this is the case then the same economic conditions should influence the sample group as well, but it seems that the influence is not there, at least not to the same degree. Also, while the median error for the control group has decreased, for the sample group it has increased suggesting there is a greater amount of larger errors. If the economic conditions have been beneficial for forecasting in 2018 and the forecasts would have been more accurate regardless of IFRS 15 then it could be that the implementation of IFRS 15 has lessened the effect of the favorable forecasting conditions and in fact decreased the forecast accuracy for the sample group.

To test whether these observed changes in forecast errors are statistically significant a regression analysis is used.

Table 3. Regression results for forecast errors for EPS and sales.

Variables	AFE (EPS)	AFE (Sales)
LOG(SIZE)	-0.138*** (0.030)	-0.0153*** (0.004)
IFRS	0.069 (0.140)	-0.039** (0.019)
GROUP	0.248 (0.223)	-0.006 (0.021)
IFRS*GROUP	-0.323 (0.278)	0.035 (0.024)
Observations	637	651
R-squared	0.025	0.051

Standard errors in parentheses; ** significant at 5%; *** significant at 1%, 2-sided.

Examining the regression results it can be observed that for the forecast errors in EPS the firm size has the greatest influence on forecast accuracy. The firm size is statistically significant at 1% level and the sign of the coefficient is negative, indicating that increase in firm size decreases the forecast error. Possible explanation for this could be that larger companies are followed by more analysts and these companies release more information than smaller companies. Larger analyst following, and increased amount of information could lead to more accurate consensus forecasts. Regarding the other variables for the forecast errors in EPS they are not statistically significant and therefore not meaningfully associated in the change in forecast errors. For the errors in EPS forecasts it seems that IFRS 15 does not have a statistically significant effect.

For the forecast errors in sales it can be observed that firm size is again the greatest determinant in forecast accuracy. But for the sales forecasts IFRS 15 gains a statistically significant p-value at 5% level and the sign of the coefficient is negative indicating a decrease in forecast errors. Based on this regression result it can be stated with 95% certainty that there is a statistically significant difference in the level of forecast errors between the years 2017 and 2018 for the whole data. Interestingly, the interaction term IFRS*GROUP gains a positive sign which would mean that for the sample group IFRS 15 in fact increases forecast errors. The p-value of the interaction term is not statistically significant, so this would mean that for the sample group the forecast errors between the years 2017 and 2018 are not significantly different. But the significance of the IFRS variable indicates that for the whole data forecast errors on average have significantly decreased between the years and yet this effect cannot clearly be observed in the sample group. It seems that for the sample group IFRS 15 decreases the accuracy of sales forecasts.

5.4 Results

Based on the descriptive statistics for the calculated forecast errors it could be observed that the forecast errors for both EPS and sales had decreased from 2017 to 2018. Further examination of the forecast errors between the groups showed that for both the

sample and the control group forecast errors and standard deviation regarding EPS had decreased. To test whether the changes in the level of errors were statistically significant a regression analysis was used. The regression results showed that the level of forecast errors was not systematically different between the years. Therefore, it can be determined that the implementation of IFRS 15 does not impact the accuracy of EPS forecasts between the years 2017 and 2018. This result is logical as EPS forecasts require analysts to estimate not only the sales for the period but the expenses and investments as well. For an analyst to progress from sales to earnings, numerous steps and estimates are required. The estimation of expenses could then conceal the possible changes in the accuracy of estimating revenue. Thus, a better indicator of the possible impact of IFRS 15 would be the sales forecasts.

This result also supports the efficient market theory. Changes in accounting practices and accruals do not confuse the stock market as this information is already incorporated by the market. Stock values are determined by the long-term prospects of the companies and not by accounting practices.

The descriptive statistics for the forecast errors regarding sales for the whole data showed that the level of errors had decreased from 2017 to 2018. However, further examination of the errors between the two groups showed that while the average error for both groups had decreased, the main source of this improved accuracy seemed to be the control group. This was interesting as IFRS 15 should be unlikely to affect the revenue recognition practices of the control group. Therefore, it is more likely that the improved forecast accuracy for the control group was not the result of IFRS 15 but rather economic conditions at the time that enabled more accurate forecasts.

The results of the regression analysis showed that there was a statistically significant decrease in the level of sales forecast errors between the years 2017 and 2018 at the 5% significance level for the whole data. They also showed that specifically for the sample group the difference in the forecast errors between the years was not statistically significant and the positive sign of the interaction term coefficient suggested an increase in the level of errors. This means that while on average the forecast errors had decreased, this improved accuracy did not apply to the sample

group to the same extent as to the control group. Based on this it can be determined that IFRS 15 has in fact decreased the forecast accuracy for the sample group.

To better understand the possible macroeconomic factors affecting the forecast accuracy economic conditions present during the time periods of the research will be examined more closely.

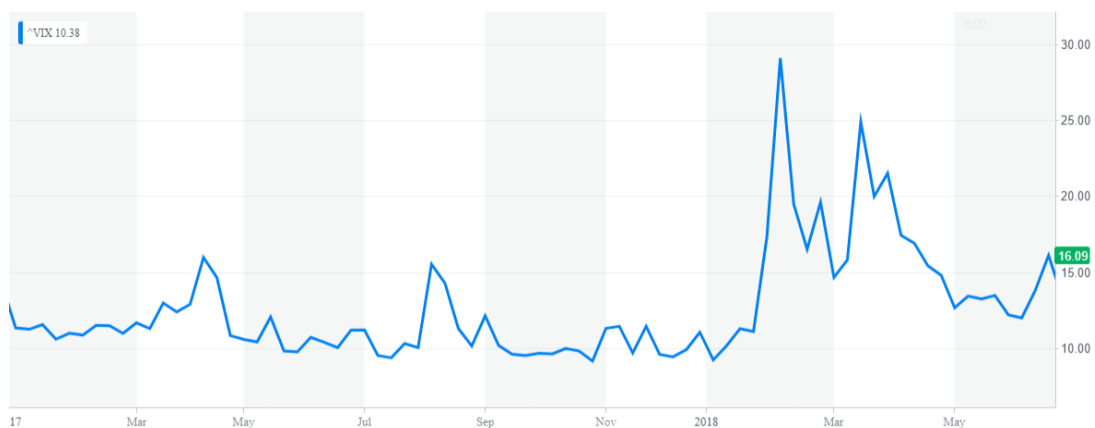


Figure 1. CBOE Volatility index (VIX) 1.1.2017 – 30.6.2018. (Yahoo Finance).

The CBOE Volatility index (VIX) measures the stock market's expectation of future volatility. It can be used as a proxy to macroeconomic uncertainty and the stock market's uncertainty of the future. In their study Kim, Pandit & Wasley (2016) measured the effect of macroeconomic uncertainty on management earnings forecasts measuring the dispersion in GDP forecasts and VIX. They found that during high macroeconomic uncertainty firms are less likely to issue management forecasts and the forecasts that are issued are more neutral as opposed to either positive or negative as this uncertainty makes it more difficult to estimate future earnings reliably. Therefore, higher volatility and uncertainty is likely to have an adverse effect in the accuracy of analysts' forecasts. Chopra (1998) also documented the effect of macroeconomic conditions on analysts' forecast accuracy.

Figure 1. presents the CBOE Volatility index for the time period 1.1.2017 – 30.6.2018, that is Q1 and Q2 for 2017 and 2018. Starting from the left side of the figure it can be observed that for the Q1 2017 from January to March the VIX line has remained stable. For the Q2 2017 from March to June a spike can be seen around April indicating an

increase in the market volatility and macroeconomic uncertainty. After this the line remains stable to the end of Q2 in June. The first two quarters of 2017 seem to have been relatively low on macroeconomic uncertainty.

Observing the Q1 2018 a substantial spike can be seen starting from the middle of January followed by sharp decline and another considerable spike in the middle of March. The first quarter of 2018 seems to have been a significantly volatile and uncertain time. After this the VIX line declines steadily before experiencing a spike again in June. Even with the decline the level of uncertainty remains higher than in 2017. Comparing these two time periods, 2017 and 2018, the level of macroeconomic uncertainty has been quite different between the two observation terms. The greater volatility and uncertainty in 2018 suggest that the forecasting conditions during this time would likely have been more challenging than in 2017 and thus more likely resulted in less accurate forecasts or at least greater standard error i.e. dispersion of forecasts.

Yet, the forecast errors have decreased between the years and the results of the regression analysis show that the decrease in sales forecast errors is statistically significant. Despite the increased future uncertainty and volatility analysts have been able to produce more accurate forecasts. It could be that this uncertainty has moderated analysts' typically optimistic forecasts closer to firms' actual performance. Regardless of the market volatility companies have continued their operations as usual and the effect of macroeconomic uncertainty does not show in the company financials in the short-term.

6 CONCLUSIONS

The purpose of this research was to investigate whether the implementation of IFRS 15 'Revenue from Contracts with Customers' has an impact on the accuracy of analysts' forecasts. Based on financial theory and previous research findings the hypotheses were that the standard would not affect the accuracy or that it could either increase or decrease the accuracy.

The research results show that IFRS 15 does not have an impact on the forecast accuracy of EPS forecasts. In addition to estimating sales or revenue, EPS forecasting requires the estimation of expenses as well. Any possible changes in revenue brought by the new revenue recognition standard are not significant enough to show in the bottom line and to influence the accuracy of analysts' EPS forecasts. This result also gives support to H_0 and the efficient market theory. As the market incorporates all available information and the stock prices are determined by expectations of the companies' future performance, changes in accounting practices do not materially affect these expectations.

However, for the sales forecasts the research results show that IFRS 15 has decreased the accuracy of forecasts. It is coherent that the effect of changes in revenue recognition practices is more clearly observed in the revenue rather than in the profit for the period. It seems that IFRS 15 has negatively impacted the analysts' ability to forecast revenue for companies that are most likely to experience changes in revenue recognition under the new standard. This is logical as the changes to previous revenue recognition practices can be quite significant for the industries and types of customer contracts employed in the sample group. The analysts require studying and familiarizing themselves with the new standard as well as experience before they can correctly estimate the effects of IFRS 15 on sales. This result gives support to H_1 that the forecast errors are greater in 2018 than in 2017. Based on this result hypothesis H_2 , that the forecast errors have decreased, can be discarded. With these results the research has contributed new information about the impact of IFRS 15 on analysts' forecasts.

The research result of this study is consistent with the previous findings of Acker et al. (2002) who found that after a change in accounting standards analysts' forecast errors temporarily increase in the first year after implementation. The results differ from the findings of Aboud et al. (2018) who found that a revised IFRS standard (IFRS 8) improves the analysts' forecast accuracy. But it should be noted that this research examined a time period of only six months for both years, whereas Aboud et al. (2018) examined the impact of the standard over a period of two years before and after the implementation. It is possible that the initial decrease in accuracy is corrected during the last half of the year.

The total sample of this study was 213 individual European listed companies in total. The time period of the research included two quarters from 2017 and 2018. The sample size is large enough that the results of this study can be generalized to other European companies and similar observations can likely be expected for the first half-year. Generalizing these results outside of Europe should be approached with caution as the effects of accounting standards are strongly dependent on the level of national standard enforcement (Costa Lourenco & Mota de Almeida Delgado Castelo Branco 2015).

When estimating the reliability and restrictions of the research we should consider that the research only covered a period of six months. It is a short time frame to assert with certainty that IFRS 15 has an impact on analysts' forecast accuracy. But this was inevitable as at the time of the research this was the most recent data available. Still, as mentioned it is possible that the decrease in accuracy will be corrected by the year-end. Likewise, it is possible that the results obtained could be due to random factors that happened to manifest during the short time period. The regression model is simple as it contains only four regressors and the explanatory power of the model or R-squared is low at around five percent. Comparing this model to the one used by Aboud et al. (2018) their model had 14 regressors and R-squared of 21,5%. The statistical significance of the IFRS variable in the regression is at 5% level as opposed to a highly significant 1%. This presents a small possibility of falsely rejecting the null hypothesis and claiming that IFRS 15 had an impact on the forecast accuracy when it in fact did not. The companies were divided into the sample and the control groups based on the deliberation of the potential effects by Ciesielski & Weirich (2011, 2015). In their discussions they pondered the likely, but not certain, effects of the standard on

different industries, therefore there is a risk that the sample selection and division to groups could be misguided. Nonetheless, with its restrictions this research is a preliminary examination of the possible impact of IFRS 15 on the analysts' forecast accuracy with results consistent with prior findings (Acker et al. 2002).

Potential further topics for research arising from this study could be to perform the research again later when there is more data available, preferably two years before and after the implementation date, to find more evidence of the impact of IFRS 15. The research could also be performed in a world region other than Europe such as in the emerging economies to find out how the level of accounting standard enforcement affects the results. Another interesting question would be to study how long the temporary decrease in analysts' sales forecast accuracy lasts and whether it will be corrected during the first year.

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