



The impact of IFRS 15 implementation on the Value Relevance of Financial Statements and Investors' Perceptions.

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ABSTRACT Nowadays, equity investors are highly interested in the accounting information concerning revenues, to base their investment decisions upon (Zhang, 2005). However, over the years how to recognize revenue has been a controversial issue. Academia have alleged the inconsistencies and weaknesses found in the application of the prior revenue standards, as one of the main reasons of the recurring accounting scandals by means of earnings manipulation. Moreover, the application of the old revenue standards has been materially different across entities and countries leading to distorted financial information, and an overall decrease of earnings' informativeness. Due to the significance of this issue, IASB and FASB, to increase the compatibility of revenue standards and introduced IFRS 15 as the new accounting standard for revenue recognition, in an effort to increase the usefulness of the accounting information, and hence enhance the equity investors' confidence to make informed decisions. The new standard is presumed to generate more reliable and relevant accounting information, as it increases the comparability of the financial reporting across countries, but also establishes higher requirements in recognizing and disclosing revenue. However, IFRS 15 adoption is deemed costly and requires higher professional judgment. That said, the broad objective of this paper is to examine at least from a practical point of view, the effectiveness of IFRS 15 application by empirically testing its effects on the value relevance of the accounting information and investors' perceptions, using the Ohlson (1995) framework power (R-square) and ERC coefficient respectively. The effects are examined for a sample 424 firms encompassing 17 European countries. The findings of this study reveal that implementation of IFRS 15 is perceived as a positive development from investors, however a slight indication but not sufficient evidence is found to corroborate that IFRS 15 improved the value-relevance of financial reporting. The results on investor's perceptions are robust when considering raw returns, a larger event window and binary measures respectively. This study provides researchers and standard setters valuable insights to further examine the effects of IFRS 15 and implies the importance of accounting amendments to the quality of accounting information and its utilitarian role.

Key words: Revenue recognition, IFRS 15, value relevance, investors' perceptions.

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ACKNOWLEDGMENTS

I. INTRODUCTION

1.1. Context and rationale

According to the Conceptual Framework, the general objective of financial reporting is to provide financial information that is “useful to existing and potential investors, lenders and other creditors in making informed decisions relating to providing resources to the entities” (IASB, 2010). Prior research has shown that financial statement information mitigates information asymmetries problems between firms and stock markets (e.g., Lee, Mucklow and Ready, 1993). Referring to the relationship between stock markets and financial statements, the realm in this study will be equity-oriented stakeholders. Not simply the release of accounting information but also its quality affects stock markets. Accurate, reliable and comprehensive, financial reporting is the foundation upon which capital markets are based because false accounting information undermines investors’ confidence and erodes the integrity of the markets. Thriving markets can only exist when investors receive an unvarnished evaluations of a company's financial condition which provide sufficient transparency over the truthfulness of accounting numbers. Among all sort of information disseminated by the reporting entity, equity investors are mostly interested in the information that can be employed in their valuation models, to forecast the entities’ future net cash inflows and market value (e.g., Ball and Brown, 1968; Sloan et al., 2018). As such, the quality of financial information is not only crucial to the integrity of the capital markets, but also to the precision and reliability of the investors’ valuation models that have no control over the principle of “GIGO”¹. Consequently, economic decision-usefulness is typically considered from external users, as one of the most prominent characteristics of publicly available financial information (Francis, LaFond, Olsson and Schipper, 2004). The publicly reported accounting information is only considered as useful, if it consummates the qualitative attributes of being both relevant and faithful². These attributes are considered as crucial in the pursuit of high accounting quality in financial reporting (IASB, FASB, 2010). Concerning the latter, Francis et al., 2004 states that the most important component of accounting quality is the value relevance. It is through value relevance research where academics have studied the relationship between accounting information and the reaction of market prices.

However, three main issues have triggered criticism towards standard-setters over the last decade. To begin with, particular concern among practitioners and academics, has been expressed to the eroded value relevance of financial information, especially a decline of the decision-usefulness of earnings information (e.g., Franic & Schipper, 1999; Lev and Zarowin, 1999; Dichev and Tang, 2008; Donelson, Jennings and McInnis 2011; Bushman, Lerman and Zhang, 2016). The diminished value relevance of earnings is mainly attributed to the problems raised within its components: cash flows, which suffer from timing and matching problems³, and accruals which can be used to misrepresent an entity’s performance. Secondly, the discrepancies between guidelines offered by the International Financial Reporting Standards (IFRS) and the General Accepted Accounting Principles (GAAP), have brought into question the comparability of financial reporting among different economic entities, and the ability of the users of the financial statements to correctly assess entities’ performance (Wüstemann and Kierzek, 2005; Tong, 2015). Lastly, the recurring accounting scandals over the last decade have been a painful reminder of how important reliable information is to markets, investors and regulators and have requested the latter to act upon, and increase their efforts for stricter regulations.

Therefore, one of the main enduring objectives of the IASB and the FASB, is to increase the quality of financial statements, and their usefulness for economic decisions by continuously improving accounting standards. Regulators are constantly making amendments of accounting standards and

¹ Garbage in-Garbage out (GIGO) principle depicts the fact that an analysts’ output for a security valuation can never be of a better quality than the input. This implies that the analysts will always depend on the quality of input, despite any advancements in the computational operations.

² The attribute of faithfulness or alternatively referred to as “reliable” accounting information in the value-relevance studies, indicates the information that is complete and free from error and bias (neutral).

³ Timing is tackled by the revenue recognition principle that generally requires revenues to be recognized when the entity has performed a substantial or all services promised and cash flow is reasonably certain. Whilst, matching is treated by “the matching principle” that requires cash outlays related explicitly with revenues to be expensed in the period of time in which the entity recognized the revenue. Both these principles are not efficiently followed.

working in converged projects, to attain international comparability and enhance accounting quality, so that stakeholders can make more informed decisions (Byard et al., 2011). In this respect, the subject of this study stems from the limelight of the most recent and largest converged standard issued- IFRS 15 *Revenue from Contracts with Customers*, due to its important impact on the above-mentioned issues as it tackles revenue recognition. Concretely, this study attempts to answer the following question:

Does the implementation of IFRS 15 significantly improve the value-relevance of financial reporting?

1.2. Background and motivation

From a broad perspective, revenue is depicted as “[...] one of the most prominent and largest metrics used by equity investors and other stakeholders to measure an entity’s performance, sustainability index and future prospects” (Jones & Pagach, 2013). Nowadays, revenue numbers are attracting more attention from investors as the sales growth suggest a more profitable and sustainable company in the long-run. Moreover, investors commonly use revenue amounts to make relevant comparisons between entities for their decision-making (Zhang, 2005). Considering its importance in financial reporting, how to recognize revenue has been frequently a controversial issue. Over the last few years, the debate on revenue recognition has amplified as a result of the recurring accounting scandals, burst of stock market bubbles, financial crisis of 2008, and the emergence of new business models that generated complex transactions and new customer contracts (Wagenhofer, 2014). Hence, it can be inferred that outdated accounting standards do not respond quickly to the changes in the business environment and might decrease the informativeness of accounting earnings. Additionally, the previous revenue recognition standards between US GAAP and IFRS have been considered as materially different from each other (Wüstemann and Kierzek, 2005). For instance, Ahold, one of the world’s largest food retailers, in 2005, reported under IFRS a *net profit* of €120 mill, concurrently for the same year under US GAAP declared a *net loss* of €20 mill. This indicates that different revenue regulations have a substantial impact on financial reporting. The IASB detected deficiencies also in the disclosure practices which were scant for investors to understand and interpret adequately the firm’s revenue, and estimation done to recognize it (Tong, 2015).

Inconsistencies and weaknesses in the old revenue standards were observed even within IFRS, which generated significant discrepancies in reported accounting numbers across entities and made the process of revenue recognition even more challenging (IASB, 2014). Subsequently, this commenced the discretionary application of the standards, which allowed for manipulation of earnings (Zhang, 2005). Among other investigation areas, the Securities and Exchange Commission (SEC), has publicly stated that revenue recognition is of the highest priority. They assert that the most common financial statement fraud scheme is revenue recognition (38%), followed by manipulation of expenses (12%) and improper disclosures (12%) (SEC, 2003). Types of revenue recognition fraud alleged by SEC include fictitious revenue, premature revenue, channel stuffing, improper timing and valuation of revenue, “bill and hold” etc (.ibid). In response to the proliferation of revenue recognition problems, as part of the ongoing project (Norwalk Agreement) between IASB and FASB, the first converged⁴ model for revenue recognition, namely *Revenue from Contracts with Customers*- was issued as ‘*IFRS 15*’ for the IASB and ‘*Topic 606*’ for the US GAAP. The new standard became mandatory for annual periods starting from 1 January 2018⁵ with the intention to provide clear guidance to entities on how to properly report relevant and reliable information concerning revenue. Convergence can improve the quality and comparability of financial reporting (SEC, 2008; Hail, Leuz, and Wysocki, 2010), thus Russell Golden, the former Chairmen of FASB said that IFRS 15 “denotes a milestone towards more efficient capital markets, globalization and standardization of accounting practices”. Thereby, IFRS 15 supersedes the previous revenue standard- IAS 18-Revenue and IAS 11-Construction Contracts-, and all other revenue recognition requirements in

⁴ Convergence signifies higher compatibility of accounting standards, while preserving a high level of quality (Packer, 2005; Zeff, 2007)

⁵ Officially, the new standard became effective in this date however, earlier application was permitted.

IFRS and US GAAP. The new standard is comprehensive and applies to all entities that enter into contracts with customers, with exception of contracts whose accounting treatments are governed by other standards (IFRS 9 *Financial Instruments*; IFRS 16 *Leases*; IFRS 17 *Insurance Contracts*). This new standard provides a new set of guidelines to follow determining when revenue should be recorded and how it should be measured. IFRS 15 has gained much attention due to the expected impact on the quality and transparency of financial reporting, but also difficulties to implement it (KPMG, 2016). Hepp (2018) on his study regarding implementation challenges of IFRS 15, states that “financial reporting is now entering a period of almost unprecedented change”.

The motivation to investigate this topic lies in the following arguments. Firstly, a study of this nature is timely as capital markets are constantly witnessing accounting scandals stemming from issues with recognizing revenue. Secondly, scientific discussion on various interpretations of implementing IFRS 15, are far from reaching solid evidence on its benefits due to the limited academic research being conducted at a point of the time that only permitted superficial qualitative assessment (early stage) or it was constrained only the investigation of voluntarily adopters. The voluntarily adopters might have specific incentives and different characteristics from others to implement the new standard earlier, thus the effects of IFRS 15 implementation from these firms is endogenous and cannot be generalized for firms that were obliged to implement IFRS 15. In this aspect, the present research investigates only mandatorily adopters. Furthermore, this topic promises interesting findings in many perspectives. Initially, a significant impact on entities’ performance and other accounting information can be expected, since IFRS 15 provides new guidance and requirements that differs substantially from the previous practice, as well as improves cross border comparability and consistency of accounting data, and help investors to better understand the company’s different sorts of contracts with customers. In addition, if amendments in accounting standards generate changes in the way an entity operates, or affect its cash flows, then that specific accounting change has “real effect” which cumulatively across all other entities, results in “economic consequences” (Zeff, 1978). It is also believed that the enhanced scope of disclosure complying to the new requirements, will play a significant role in higher quality of financial statements (Tysiac, 2017). Therefore, the mandatory adoption of IFRS 15 is expected to have a significant impact on the usefulness of financial statements. However, according to the Big-Four, the effects of implementing the new standard on revenue recognition will vary among entities adopters⁶ due to the differences in revenue type, diversity of contracts and the sectors’ specificities (PWC, 2014; Deloitte, 2014; Ernst and Young, 2016; KPMG, 2016).

On the other hand, PwC (2016) reveals that nearly “two thirds of the survey participants do not expect a material impact to their income statements after the implementation of IFRS 15”. This indicates that the comparative figures may not be drastically different for numerous firms. However, the implementation of IFRS 15 requires higher effort as its application is subject to higher complexity and increased level of judgment. Thus, the predefined purposes of IFRS 15 formulated by IASB can be questionable from at least a practical point of view. As the effects of the change in the accounting treatment of revenue seems to still be opaque, an investigation is stimulated primarily on the efficacy and importance of IFRS 15. By using the Ohlson (1995) framework and gauging explanatory powers (Adjusted R^2), the aim of this study is to empirically test whether the new standard has improved the usefulness and informativeness of earnings information and book values. Both levels (price) and changes (returns) of this framework are examined. The sample under investigation comprises of European firms listed in STOXX 600. Next, the investors’ perception on implementation of IFRS 15 is tested for the same sample by means of earnings response coefficient (ERCs). Hereby, the research involves an empirical analysis of financial statements pre-and-post the implementation of IFRS 15, allowing for a higher validity of results contrary to the previous studies. The results obtained reveal little evidence that IFRS 15’s

⁶ For contracts e.g., multiple-arrangements and long-term service, IFRS 15 can result in significant changes either to the amount or timing of revenue recognized by the entity compared to the previous practice. Generally, telecommunication, energy and construction industries are assumed to be the most affected industries (PWC, 2014; Deloitte, 2014; Ernst and Young, 2016; KPMG, 2016). However, IFRS 15 may also affect companies with simple business models as its implementation may be difficult, work-intensive and time-consuming (Dalkilic, 2015).

implementation increased the value-relevance of financial reporting, however the investors' perceptions on it are positive and significant, indicating a higher reliance of financial figures under IFRS 15.

The remainder of the paper is structured as follows: section two provides the conceptual basis of the research, reviews the literature and develops hypothesis; section three discusses the employed research design and method; section four presents and interpret the findings; and lastly, the final section summarizes the conclusions, provides limitations encountered in this study and recommendations for future research.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section creates the foundation for the development of the two main hypotheses of this study. First, the institutional background and the novelty of IFRS 15 is described, which is followed by a discussion on its importance and related effects. Then, a review of value relevance studies and prior research on IFRS 15 is presented. Lastly, summarizing all insights gained from the body of this literature, the hypothesis concerning (1) the value-relevance of financial statements after adoption of IFRS 15 and (2) investor's perceptions on the new standard are derived.

2.1. Institutional background and the novelty of IFRS 15

The past concerns over revenue recognition practices and the economic significance of revenue, underlie the foundation of IFRS 15. Multiple inconsistencies and weaknesses have been detected in the previous regulations for revenue recognition (IASB, 2014). Both the IASB and the FASB have asserted that the state of reporting for revenue was unsatisfactory. These problematic issues are also confirmed by academic research. An investigation conducted by Bierstaker et al. (2016) suggests that 176 financial managers in the US, either misapplied revenue recognition under IFRS or did not understand the requirements of the standard. The root of the problem has been discussed by other studies. Jones and Pagach (2013) elaborates that guidance in the previous IFRS revenue recognition requirements was difficult to understand and to be applied to complex transactions⁷. Moreover, disclosures were insufficient and inconsistent with other standards' requirements. Khamis (2016) reaches similar conclusions, suggesting that previous guidance for complex transactions and disclosure did not provide sufficient transparency in revenue reporting. Moreover, the various revenue definitions and its recognition guidelines have ignited debate on determining what precisely should be the time and conditions that enable entities to report revenue. Definitions of revenue in the previous practices were constrained in terms of income sources exclusion despite their importance (.ibid).

Revenue is generally defined as "the total inflow of benefits that arise in the course of entities' ordinary activities and generate an increase on entity's equity". However, one of the primary problematic issues pertaining to revenue recognition is timing, i.e., the appropriate moment in the sales cycle when revenue has to be recognized (IASB, 2014). According to IFRS, revenue is recognized when the future economic benefits are probable and can be measured reliably; whereas US GAAP suggests that revenue has to be recognized when it is realizable and earned (FASB, 1984). In practice, the timing of revenue recognition is much more complicated, especially nowadays with the emergence of new transactions⁸. Consequently, the benefits and costs of doing business could be often measured in the wrong periods and (or) not matched with each other in the same period. This is recognized as timing and matching problems. With regard to discrepancies in the guidelines for revenue recognition, according to the IFRS 15, "US GAAP had numerous standards related to revenue recognition (well over 100) for particular industries or transactions, but these standards were often inconsistent with one another. On the other hand, IFRS was criticized for having limited guidance in various areas (e.g., only one general standard on revenue

⁷ For instance, a cell phone contract between Vodafone and a customer can include a headset, free minutes of talk time, discount purchasing a new mobile phone if monthly subscriptions contracts are at least two years, data downloads, connection fees etc. Reporting for transactions that include multiple-elements arrangements is much more complicated.

⁸ For e.g., licensing and warranties that can include a service component, are regarded as much more complex and diverse contracts to deal with.

recognition—IAS 18), plus missing on important topics such as revenue recognition for multiple-element arrangements”. Obviously, it was a challenge to exert the old standards to transactions other than straightforward sale of goods or rendering services. Hence, entities that were applying “IFRS referred to the sections of US GAAP to develop an appropriate revenue recognition accounting standard.” In the light of these arguments, there was a considerable diversity in revenue recognition practices across countries, markets and industries. The latter reflected the variety on the nature of sales transactions, and discrepancies in firms’ propensity for conservative or aggressive revenue recognition. For these reasons, establishing robust guidelines for revenue recognition became a top standard-setting priority. IFRS 15 was promoted as a necessary change that hopefully will significantly improve the reporting of revenue transactions (CPA and Deloitte, 2015). Contrarily to the preceding revenue standards, the definition of revenue in IFRS 15 is regarded as simpler, due to the use of key concepts such as “contract-based revenue reporting”⁹ and “performance obligation”¹⁰. The core objective of the new standard is to “establish the principles that an entity shall apply to report useful information to the financial statements’ users about the nature, amount, timing and uncertainty of revenue and cash flows arising from a contract with a customer” (IFRS 15.1). To meet this objective the entity shall “recognize revenue that depict the transfer of promised goods or services to customers, at an amount that reflects the consideration that entity receives or expects to receive in exchange for those goods or services “(IFRS 15.2).

The FASB and IASB decided that concentrating on (a) the recognition and measurement of assets and liabilities and (b) changes in those assets or liabilities over the life of the contract brings more discipline to the revenue measurement, compared to the “risks and rewards” criteria in prior standards (i.e IAS 18). To enable this approach, the Boards established a new one single, comprehensive five-step framework that companies should apply to ensure that revenue is measured and reported correctly. Accordingly, the entity is requested to comply to the following steps: i) Identify the contract with the customer; ii) Identify the performance obligations in the contract; iii) Determine the transaction price; iv) Allocate the transaction price to the performance obligations; v) Recognize revenue when the entity satisfies each performance obligation. The first step indicates that the entity should first determine whether a valid contract with a customer exists. The second step emphasizes the need to account for each distinct¹¹ good or service promised to the customer (i.e., performance obligation). This step involves substantial judgment related to the notion of what should be classified as “distinct” goods and services. In the third step, the determination of the transaction price (fixed or varying) is the consideration amount that a company expects to be entitled in exchange for the promised goods or services. In this step, particular level of judgment and estimate is required especially when a part of the consideration involved in the contract is varying. The fourth step indicated that if a contract contains more than one performance obligation, the transaction price should be allocated to each performance obligation on the basis of the relative “stand-alone selling prices” of each distinct goods or services promised in the contract. If stand-alone selling prices are unobservable, they must be estimated using suggested approaches in the guideline. With respect to the last step, an entity must assess whether it is transferring control at a point in time or over time. For performance obligations satisfied at a point in time, the entity recognizes revenue at that point in time when it transfers the control of goods or services to the customer. Alternatively, for performance obligations satisfied over a period of time, an entity must measure the progress in time towards its satisfaction. Hence, goods and services are transferred when the customer obtains physical and legal possession of the assets, and the revenue is recognized in the accounting period when the performance obligation is satisfied (a.k.a revenue recognition principle).

Not only does IFRS 15 regulate the revenue recognize recognition, but also provides new prescriptive guidance on accounting for all costs related to contracts. These costs are divided in two

⁹ Contract-based revenue reporting means revenue that is recognized based on contracts or activity.

¹⁰ Performance obligation is defined as “a promise in a contract to provide goods or services to the customer in exchange for the consideration.”

¹¹ A good or service is distinct if it is beneficial to the customer in its own or in combination with other resources readily available to the customer.

categories: *incremental costs*¹² of obtaining a contract and *costs to fulfill* a contract. Under IFRS 15, only incremental costs (e.g., sales commission) for which an entity expects to recover, should be recognized as an expense (IFRS 15.94). On the other hand, the contract fulfillment costs (e.g., direct labor and material costs) that are not regulated by the scope of another standard, will generally be capitalized if they meet specific predefined criteria (IFRS 15. 95). Moreover, assets recognized from contract costs fall into a new asset category, which is presented independently of contract assets and contract liabilities when recognizing revenue. Taken together, due to the changes in the pattern of revenue recognition under IFRS 15 framework, an increased volatility of profit margins could be observed in different reporting periods on certain contracts, since under IAS 11 and IAS 16, a broader range of pre-contract costs were permitted to be capitalized. Hence, an entity might want to review the contracts with their customers to identify the performance obligations imposed to them, as under the IFRS 15, the existing terms can result in negative accounting consequences. Consequently, entities might consider to restructure the contract's existing terms¹³ (e.g., for extensive reviews, see Imhoff & Thomas, 1988), and uttermost even modify their business model to shy away from the potential adverse consequences (FRC, 2015). In other words, the implementation of IFRS 15 is quite critical as it might result in 'real-effects'. Nevertheless, the decision over contract costs capitalization presents another area of significant judgment (Grant Thornton, 2017).

Another concern with the contract-based approach is that the recognized income and, hence, performance in each period is a direct consequence of the recognition and measurement of contract assets and liabilities, which may not fully reflect the economics of the contract with the customer (Wagenhofer, 2014). Particularly, profit margins across the periods over which the contract is satisfied may become volatile, which exacerbates the future performance predictability. Lastly, with respect to disclosures, even though economic theory suggest that increased levels of disclosures should lower the information asymmetries and in turn increase the trust of stakeholders in the corporate financial reporting quality, there has been skepticism on the degree of compliance with the new disclosure requirements. Therefore, a peculiar attention is focused on reviewing what kind of information is provided and to what extent certain discretionary and interpretational decisions are depicted in a transparent and comprehensive way for decision makers.

To summarize, the guidance offered by IFRS 15 is more specific than prior standards e.g., on variable consideration, guidance on allocation of the transaction price, repurchase agreements, requirements on disaggregated revenue information in interim reports, and extensive disclosures. However, it also postulates additional professional judgment in its application. This might lead to a change in practice for many entities as they may detect that revenue recognized formerly over time, should now be recognized at a point of time (vice-versa) or expenses that were previously capitalized, should now be expensed (vice-versa). Therefore, not only is there uncertainty whether the new standard is fruitful, but also limited academic research is available on this topic. In this regard, the predefined purposes of IFRS 15 and its aggregate effects are questionable.

2.2. The importance of IFRS 15 and the effects of financial restatements.

Trends and growth in an entity's revenue are the paramount indicators of the company's past performance and future prospects (Zhang, 2005). A survey of 400 chief financial officers (CFOs) notes that revenue ranks as the second most prominent performance indicator reported to outsiders after earnings (Graham et al. 2005). In making investment decisions, nowadays more attention is paid to the company's top-line revenue amounts due to the investors' increased interest on revenue from regular activities (Dechow et al., 2010; Srivastava, 2014). In some cases, strong sales growth is considered as a better indicator of firms'

¹² Incremental costs signify the costs that a firm would have not been incurred if the contract was not obtained.

¹³ For instance, Imhoff & Thomas (1988), show how the new lease standard SFAS No. 13 which required companies to capitalize leases and book the present value of future payments as debt, resulted in firms' efforts to renegotiate the terms of the existing leasing contracts and change the method for the capitalization of leases. In a similar spirit, in terms of IFRS 15, companies might decide to review the existing contract terms to benefit their own and to ensure the new standard will not result in negative disclosure consequences.

profitability in the future compared to the earnings figures.¹⁴ Firms missing their revenue growth targets in interim financial reporting, usually get punished by negative stock price reactions. Moreover, since revenue recognition is usually linked to the recognition of expenses e.g., cost of sales, revenue and earnings are notably associated. Hence, there has been an increased pressure for companies to show a steady or exponential growth and not miss expectations. Not surprisingly, due to its importance as a key performance indicator (KPI) and being considered as the largest earnings component of a firm, revenue has often been subject to manipulations (Stubben, 2010). Companies have been incentivized to use discretion in revenue recognition (e.g., accrued and deferred revenue) to reduce negative earnings surprises and achieve earnings benchmarks (Caylor, 2010). Another reason for fraudulent behavior highlighted by prior research were the persistent ambiguities and complexity on revenue recognition standards and guidance, that allowed room for aggressive interpretations and vague level of professional judgment (Gallistel, Phan, Bartlett, & Dodd, 2012). Consequently, many companies were masking true performance through premature revenue recognition (Zhang, 2005; Stubben, 2010). Companies such as Groupon, Rolls-Royce, Qwest Communications International Inc., Sinovel Wind Group, iGo Corp., all committed fraud through incorrectly recognized revenue. Evidence on increased earnings management through accelerated revenue recognition are also provided by Altamuro, Beatty and Weber (2011).

The SEC, has stated that improper revenue recognition is the most prevalent reason for accounting restatements (SEC, 1999). Turner et al. (2001) discover 381 restatements stemming from revenue recognition issues, occurred during 1997-1999. Similarly, Henry & Holzmann (2009) look at financial restatements in public sector between 1997 and 2002, and find out that 38% of restatements were related to revenue recognition issues, and more than 50% of these restatements resulted from fictitious revenues or timing problem. As a result, a high number of class-action lawsuit were initiated as a reaction to improper revenue recognition (Henry & Holzmann, 2009). These findings are also in line with the remarks of the Committee of Sponsoring Organizations of the Treadway Commission affirming that “more than half of the financial reporting frauds committed by US listed companies from 1987 to 1997, have overstated revenue” (Phillips Jr, Luehlfig & Daily, 2001). Moreover, Plummer and Mest (2001) suggest that firms manage earnings upwards to meet analyst’s expectations by overstating revenue and understating expenses.

The CEO of the Securities and Exchange Commission (SEC) in the US has also argued that improper revenue recognition is “the single largest cause of restatements, the single largest issue in SEC enforcement cases, and the issue that has and continues to result in the greatest losses for investors” (Turner, 2001). Revenue recognition is considered as a significant risk in running a business, because if information disseminated is not reliable and watchdogs fail to notice this, large groups in society may involve in wrong decisions. Consequently, some studies suggest that restatements involving revenue recognition and fraud, receive more negative market reactions (Palmrose et al. 2004; Akighbe et al., 2005). Akighbe et al. (2005) and Wu (2002), state that more abnormal negative returns are related with revenue recognition restatements. Palmrose and Scholz (2004) assert that companies with earnings restatements have higher prevalence of intentional misstatements which proceeds to a long share price slip, delisting or bankruptcy. To illustrate, Wartsila’s consolidated net sales and operating result for annual reports of 2017, decreased by €11 mill and €14 mill respectively, attributed to the restatements performed after adoption of IFRS 15. Ultimately, SEC believes that restatements are clearly a sign of low credibility, and that premature revenue recognition reduce the integrity of financial reporting and earnings quality (SEC, 1999). No wonder, Dalkilic (2015) states that revenue recognition “is the first thing that concerns investors the most in comparison to any other reporting issue”.

The inadequate disclosure requirements in the previous IFRS and US GAAP, also affected the comprehensiveness and clarity of the information disseminated to the intended users of financial statements (FRC, 2018; KPMG, 2019). The demand for financial disclosures arises from agency conflicts

¹⁴ Concerns have been expressed that management can enact strategies to cause increases in the bottom line by engaging low financing or labor costs which in the long run might not be sustainable.

between managers and outside investors, and the existence of information asymmetry (Healy & Palepu, 2001). According to the “lemon problem”, information asymmetry exists in a market where bad ideas “crowd out” good ideas due to the inequality in the quantity of information between buyers and sellers, following a decline of investor’s confidence in that market (Akerlof, 1970). Research demonstrates that high quality accounting standards reduces the information asymmetry among countries (Healy and Palepu, 2001; Barth et al., 2008). Therefore, to overcome “the lemon problem” and allow for a proper functioning of capital markets, financial reporting and corporate disclosures, have a crucial role in essentially disseminating the information that investors and other stakeholders adopt and simultaneously react upon. Inversely, failure to adequately implement standards such as IFRS 15, can lead to profit warnings, sharp fall in security prices, loss of investors’ confidence and qualified audit opinions (BDO, 2018).

Considering the immense impact that a change in the standard that regulates revenue recognition, IFRS 15 requires all adopters to increase the scope of disclosures and report: the impact of IFRS 15 in their financials; all sources of revenue, and provide details on the way they recognize it. The latter is plausible as explaining the application of new standards on line items such as revenues and costs, is challenging (EY, 2017). Specifically, entities are asked to divulge both quantitative and qualitative disclosed information about their contracts with customers. This encompasses of significant judgments¹⁵, changes to the judgments and estimates made in applying the standard to the contracts; performance obligations remaining at the end of the reporting period and any assets recognized from the costs to obtain or fulfil a contract with a customer (IFRS 15, para. 110). Another important requirement to emphasize, is the disaggregation of revenue between contracts with customers, impairment losses associated with receivables or contract assets, and other types of impairment losses into appropriate distinct categories.

To conclude, the call for a new revenue standard was not only prompted by the fact that existing standards reflected weaknesses and provided scanty guidance for entities, but also by dreads that entities would continue to manage their earnings through premature revenue, as confirmed by accounting scandals and irregularities. Therefore, IFRS 15 is deemed as an imperative change to establish the key principles that an entity shall apply to report useful information, reduce potential for earnings managements, and enable interested users to gain better insights about the nature, amount, timing and uncertainty of revenue (and cash flows) arising from contracts with a customer (IFRS 15.1).

2.3. The effects of IFRS 15 on Accounting Information and Investors’ Perceptions.

A change in accounting standards may modify the KPIs and calculations of other essential accounting numbers, through revising the way in which income, expenses, assets and liabilities, are measured and recognized (Imhoff & Thomas, 1988; PwC, 2016). Similarly, the effects of IFRS 15 will result in restated financial statements, as the timing of revenue recognition, amount of revenue to be recognized, accruals, and contract costs, differ substantially from the preceding practice. Therefore, IFRS 15 is expected to affect both income statement and balance sheet items. Since the generation of earnings numbers is guided by revenue recognition and matching principle (Dechow, 1994), earnings will be the main financial information affected by IFRS 15. Stricter rules on revenue recognition denote that revenue will now be accounted for at a later stage. As such, there will be an increased overlap between the income statement and cash flows, following a decline of accruals in the income statement.

Following the latter, different accounting numbers would likely generate different cash flows¹⁶, which are used for contractual and regulatory purposes. Consequently, a modification on the way certain transactions are accounted for and disclosed, might make these transactions appear more, or less attractive

¹⁵ Decision on the extent of level of detail necessary and emphasis on various requirements. Significant judgment on the IFRS 15 scope involve: the timing of revenue recognition and the clarifications on the determination of transaction price, its allocation to distinct performance obligations including assumptions made, and the consideration of financing components.

¹⁶ This is probable unless contracts with customers involve conditions to ignore accounting changes, e.g., as occurred in the “frozen GAAP” (e.g., see Christensen and Nikolaev, 2017).

to external stakeholders, and affect their perception and decisions (.ibid). On the other hand, accounting information is considered as useful for investment decisions, if it reflects predictive values¹⁷. According to Rutledge, Karim, and Kim (2016), timing of revenue recognition directly affects the predictive value of earnings and revenue amounts. Therefore, since the new accounting standard IFRS 15 recognizes revenue at a later stage, the IFRS 15 application will certainly impact the investor's perceptions and its implications will be useful for their decision-making.

Nevertheless, it is yet unclear how equity investors will regard the transition to IFRS 15. It is probable that investors would react positively to changes done in the previous accounting standards, if those result in higher quality of financial reporting and transparency. This view is supported by previous literature which also finds evidence on reduced information risk and cost of capital as result of these changes (e.g., Baiman and Verrecchia, 1996; Leuz and Verrecchia, 2000; Barth et al. 2008). Additionally, market reaction is positively related to the accounting standards that promote convergence benefits (Barth et al. 1999). Ashbaugh and Pincus (2001) find out that the previous convergence efforts undertaken under IAS, reduced the errors in analyst forecasts. Furthermore, Pae, Thornton and Welker (2008) study the effects of the European set of regulations intended to converge financial reporting, and discover that the firm value increases especially for firms with high agency costs. Armstrong et al. (2010), provide robust evidence that investors react incrementally positively to the IFRS convergence adoption events. Similarly, Joos and Leung (2012), find out that investors react more positively and stronger to IFRS adoption events that are expected to result in convergence benefits and improved information quality. All these findings conclude that accounting standards that promote convergence benefits, such as IFRS 15, matter to investors.

Alternatively, investors can also react negatively to the implementation of IFRS 15. Despite benefits, the application of converged standards, may also restrict the space to "consider differences in circumstances among entities or countries" (Zeff, 2007), and might even result in less informative reporting if "one-size-fits-all approach" is used to mask the underlying economic reality, and attributes of firms (Chi, 2009). Other studies elaborate that switching to a new standard is time-consuming, costly and complex (Dalkilic, 2015). Since application of IFRS 15 postulates additional degree of professional judgment (Jones and Pagach, 2013), investors can be concern with the opportunity that companies now have to intentionally apply the new standard inappropriately and manage their earnings. Moreover, the transition to IFRS 15 and adoption of its requirements, obligates firms to restate the accounting information that reflects the old practice. Earlier research indicate that accounting restatements result in the largest market reaction (Turner et al. 2001), and cause a significant loss of firm's market value due to the negative stock return, as investors perceive the prior accounting information as flawed and untrustworthy (Dechow et al. 1996; Palmrose et al. 2004, Akhigbe et al. 2005). As mentioned earlier, restatements related especially to fraud and revenue recognition problems cause higher negative returns and a negative market reaction (.ibid). Nevertheless, even though, accounting restatement can be regarded as "negative" (Wu, 2002; Anderson and Yohn, 2002), they can also be "positive" since restated financial numbers are more efficiently associated to the security prices (Plumee and Yohn, 2010; Bardos, 2011).

2.4. The effects of IFRS 15 implementation on Accounting Quality.

Prior literature demonstrates that changes in accounting quality are connected to the implementation effects of new accounting standards (e.g., Ashbaugh & Pincus, 2001; Barth, Landsman, & Lang, 2008; Soderstrom and Sun, 2007). For instance, Barth et al. (2008) reveal robust evidence that the adoption of International Accounting Standards (IASs) boosts accounting quality. Brochet, Jagolinzer, and Riedl (2013), state that mandatory IFRS adoption is fruitful even to firms where domestic standards do not materially differ from IFRS ones. Also, Ahmed, Neel, and Wang (2013) find out that countries that

¹⁷ The input value used by investors in their analysis to form expectations about the company's future. For instance, with respect to accounting information regarding earnings, 'earnings persistence' depicts the extent to which future earnings are predicted by current earnings.

implemented IFRS, experienced higher accounting information quality and more efficient capital markets. Moreover, Houqe, van Zijl, Dunstan, and Karim (2012) imply that earnings quality is intensified for firms where IFRS is mandatory, particularly for firms where investors' rights are highly protected. In the same spirit, a few studies on the pre-IFRS 15 adoption, focus as well on the expected effects of the new standard on the accounting quality (e.g., Ashbaugh & Pincus, 2001; Barth, Landsman, & Lang, 2008). Rutledge, Karim, and Kim (2016), acknowledge the positive effects of IFRS 15 promoted from the Boards, as they can associate an overall increase of quality of accounting information to the increased comparability and additional guidance offered by IFRS 15. However, they conclude that the earnings quality can be affected both upward and downwards.

Earnings quality should reflect the relevance of information when making a decision, and be related to the informativeness about an entity's measurable financial performance (SFAC No. 1, Dechow, Ge, and Schrand, 2010). As the new standard postulate additional degree of professional judgment and estimations in determining the firm's transaction price, performance obligations and timing when these are fulfilled (Jones and Pagach, 2013), there exists an opportunity that companies can intentionally choose to improperly apply the new standard and manage their earnings. One way to attain the latter, is to increase (decrease) firm's reported revenue, which would automatically impede the usefulness of accounting information and earnings quality (Rutledge, Karim, and Kim, 2016). However, with respect to the required judgment on estimating the transaction prices under IFRS 15, Srivastava (2014) examines the effects of selling-price estimates on revenue recognition, in the context of contracting and informational role of financial reporting under SOP 97-2. She provides support that SOP 97-2 implementation, which removed the flexibility of software's firms to use selling-price estimates when recognizing revenue, did not improve the contracting role of earnings. Therefore, increased professional judgment does not necessarily imply a higher level of discretion.

However, since IFRS 15 can affect the income tax expense and deferred taxes of some firms, this can permit the acceleration of revenue recognition for financial reporting purposes in comparison to tax reporting purposes (.ibid). To shed light on this issue, Campbell (2017) examines tax implications of IFRS 15 for software companies, and indicate possible indirect effects on deferred taxes, due to the expected acceleration of revenues for software contract, which results in higher book tax differences. Furthermore, the implementation of IFRS 15 is assumed to have much higher effects for industries that encompass: aerospace, defense, automotive, construction, retail, health care, insurance, pharmaceuticals, utilities, communications, entertainment, manufacturing, mining, real estate, and technology (PWC, 2014). However, albeit the new standard may not affect all industries in the same way, increased disclosure requirements exert to all industries, and the latter is considered as the key success of IFRS 15 (Rutledge et al., 2016).

2.5. Value Relevance studies

Value relevance is considered as the primary and most essential aspect of the quality of accounting information (Francis et al., 2004) that is disseminated to equity markets' investors, to make rational decisions (Barth, Beaver and Landsman, 2001). Most researchers suggest that an increase in value relevance is an indication of better accounting quality. According to Barth et. al. (2001), "an accounting amount is defined as value relevant if it denotes a predicted association with equity market values¹⁸", and if this amount is measured reliably enough to affect investors' perceptions about the firm's value. Moreover, accounting information can be deemed value relevant if it is capable of making a difference in the decisions made by users. In order to do so, the accounting information must have predictive value (i.e., can be used as an input to predict future outcomes), confirmatory value (i.e., provides feedback about past events) or both (IASB, 2010). Interested users of the disseminated financial information, are interested in the interrelation and effects of these two characteristics in the decision-making process.

¹⁸ Throughout the terms of equity market values and share prices are used interchangeably.

Hence, value relevance studies are association studies¹⁹, derived from a stream of research that investigates the extent to which the publicly available accounting information, satisfies its utilitarian role of being relevant and useful for decision-making (Ball and Brown, 1968, Barth, Beaver and Landsman, 2001). Value relevance as a concept is not a stated criterion of the Conceptual Framework. However, due to the dichotomous nature of relevance and reliability, value-relevance research is typically performed as a joint test of these qualitative characteristics, being viewed by academics as a direct operationalization of decision-usefulness of accounting information from the equity investors' perspective.

Therefore, a considerable part of the value-relevance related studies, is either explicitly or implicitly, prompted from of a broad view in an accounting-standard-setting (particularly with reference to the accounting criterion of relevance and reliability), to measure the effects of accounting standards on the quality of financial reporting (Holthausen and Watts, 2001; Kothari, 2001 and Francis et al., 2004). These authors suggest that the value relevance play a vital role in providing standard setters and other users of financial information, a meaningful understanding of accounting matters. Nonetheless, value-relevance is referred as the ability of the accounting information to capture and explain changes in the entity's stock market value (Ball and Brown, 1968; Barth et al., 2001; Holthausen and Watts, 2001). Stock market measures e.g., share price, the book value of equity, earnings, and firm size, guide investors in the pricing of a firms' shares. As such, the value-relevance models are typically built on, and measured by the explanatory power of regressions on the book value of equity and earnings information (based on either or both of its components: cash flows or accruals), regressed on share prices and/or security returns²⁰. Worth emphasizing is that all value relevance studies carried out based on the underlying hypothesis of efficient markets²¹.

Ball and Brown, (1968), is the first seminal paper to document the existence of a statistically significant and positive association between earnings information and share returns. They established the fact that information is considered value-relevant if the stock price movements can be partly explained by the release of new earnings information, focusing on the pioneering event study²² of earnings announcements. Observing the market reaction to good (bad) news and its timeliness²³, Ball and Brown (1968) find out that firms with unexpected increases (decreases) in accounting earnings lead to an increase (decrease) in the security prices. The rationale behind this argument is that the flow of information when earnings announcements are made, increases, causing security returns to reflect the quality and the content of this information to a greater extent. Put succinctly, the value relevance steam of research is based on the premise that information if useful, will influence the behavior of investors, which in turn causes stock price movements that associated with the release of new information. Numerous studies provide bracketing findings to the Ball and Brown (1968) paper, and support the positive relationship between security prices and earnings information (e.g., Beaver, 1968, Dechow, 1994, Landsman and Maydew,

¹⁹ An association study performs empirical tests on the relationship between publicly reported financial information, typically earnings numbers and/or book values, and stock prices and/or returns mainly over relatively wide windows of one or several years (Kothari, 2001).

²⁰ The main difference between value-relevance studies focusing on price-level and those investigating changes in share prices (i.e., return studies) is that the former is devoted to specify what is reflected in the firm value, whereas the latter is interested in identifying what is reflected in *changes* in the entity's equity value over a certain period of time (Kothari and Zimmermann 1995; Barth et al., 2001).

²¹ The 'Efficient Market Hypothesis' (EMH) asserts that in an efficient market, all available and relevant information about investment securities, such as stocks, is "fully and correctly incorporated" in the prices of those securities. This put forth the idea that it is not possible to consistently "beat the market" meaning that investors cannot always have an edge over the market average. EMH is originally developed by Fama (1970) and it comes in three forms, which respectively represent the assumed levels of market efficiency: weak, semi-strong and strong form (.ibid). The *weak form* suggests that all historical information is incorporated into the security price, however the price may not reflect new information that is not yet publicly available. Thus, the technical analysis cannot provide excess return because past price information cannot predict future prices and the fundamental analysis can only provide excess in the short-term. The *semi-strong* form asserts that stock prices reflect all publicly available information in relation to an entity fundamental information (e.g., earnings forecast, management quality, product line), however neither technical analysis nor fundamental analysis is useful by assuming that the prices adjust quickly to any new public information. The *strong form* implies that the market has all the data incorporated in the stock prices, including both public (historical and new) and private information as well as insider information. Thus, no investor can generate returns over the market as a whole. However, it should be noted that market efficiency does not assume that the capital markets are omniscient nor assume that prices are foreknowing. More over EMH is meticulously discussed in Fama's seminal paper from 1970.

²² An event study is a statistical method to evaluate the impact of an event (e.g., earnings announcement, announcement of a merger between two firms, CEO resignations etc) on a firm's value. These studies examine the extent to which these events deliver new and relevant information to market participants such as equity investors as depicted in changes of stock prices or trading volume over relatively narrow windows such as a few days or weeks (Kothari, 2001).

²³ Timeliness refers to how quickly the stock market reacts to the new released information.

2002, Nichols & Whalen, 2004). Other studies focusing in the value relevance as one of the main dimensions of accounting quality, suggest that firms with higher accounting quality display less earnings manipulation, more timely loss recognition and higher value relevance (e.g., Barth et al., 2008). Barth et al. (2001), describe that firms with higher accounting quality will demonstrate a higher relationship between security prices and earnings because higher accounting quality reflects more accurately the underlying economics of a firm. In the aspect of IFRS, Beneish, Miller and Yohn (2009), in their effort to examine the effects of introduction of IFRS, emphasize that IFRS should lead to higher value relevance of financial information because it aims to improve cross borders comparability. Nevertheless, the effect of IFRS 15 adoption on the value relevance of financial information is a new area of research that offers little empiricism.

2.5.1. Diminishing Value-Relevance of accounting information

Despite apparent findings from early value-relevance studies on the association of earnings information and book values with security returns, since early 1990s until the beginning of the 21st century, practitioners and academics have expressed their concerns that publicly reported information, has dramatically lost its relevance and usefulness to equity investors (e.g., Francic & Schipper, 1999; Lev and Zarowin, 1999; Dichev and Tang, 2008; Donelson, Jennings and McInnis 2011, Bushman, Lerman and Zhang, 2015). Specifically, earnings information and book values are claimed to be less relevant in evaluating the fundamental value of service-oriented and high-tech firms. Potential reasons for this attenuation are speculated to be either stagnant accounting practices and standards while business models have advanced drastically, or because accounting standards have changed in a way that strayed from generating value-relevant information (Francis & Schipper, 1999). In their study, Francis & Schipper (1999), investigate a broad sample of NASDAQ firms over the period 1952-1994 and document a reduction in the relevance of accounting information (both earnings information and book values).

Lev and Zarowin (1999), note similar views, and attribute the deterioration in the usefulness of financial statements, to both failure of financial reporting framework to adapt to the “new economy” firms (i.e., innovative activities), and the increased importance of unreported intangible assets. They state that the impact on new developments on firm’s operations, and economic conditions, are not adequately reflected by the previous accounting system as matching incurred costs with revenues is completely distorted. Additionally, Dichev and Tang (2008), in their study which involves 1000 largest U.S. firms over the period 1967-2003, document a significant decrease of earnings quality, caused by exacerbated earnings persistence and the increased earnings volatility. More concretely, they suggest a decline of the correlation between current-period revenue and current-period expenses, whilst they observe an increase in the correlation between current-period revenue and prior or subsequent period-expenses. These findings imply issues with the “matching” principle in a way that “an increasing expense amount is recognized before and after the period in which it affects revenue”.

Moreover, Dichev and Tang (2008), state that the changes in the value-relevance may arise either from the changes in economic factors or changes in accounting standards, and implicitly find support that the primary cause for the diminished value-relevance are changes in accounting standards. The study of Denelson et al. (2011), which is built on the afore-mentioned research, reveal that the decline in the correlation between revenues and current expenses is attributed to one single income statement item i.e., special items which include restructuring charges, asset impairments, and gains/losses from sale of assets. In addition, Bushman et al. (2016) provide empirical evidence on the substantial decline of the correlation between accruals and cash flows, and assigns this diminished relationship to the surge in the non-timing-related accrual recognition, operationalized by one-time and non-operating items. However, there are also studies (e.g., Collins, Maydew and Weiss, 1997) that provide contrary insights by concluding that they find no support of a diminished value -relevance of earnings information and book values. In lieu, they note a slight increase in value-relevance, especially among book values and other balance sheet related accounting information.

Overall, equity investors seem to rely less on earnings information today than they used to do before. Thus, it should be emphasized that there exists a body of literature which prescribes necessary changes in financial reporting framework to improve the usefulness of the accounting information. Amir and Lev (1996), recommend among various suggestions, that changes in accounting rules that govern income measurement should be prioritized. Also, Lev and Zarowin (1999) propose a systematic restatement of financial statements to account for the uncertainty in the previously issued financial statements due to the precluded revenue recognition.

2.6. Prior Research on IFRS 15

The Big-Four auditors were the first published papers which investigated the expected effects of the new standard (PWC, 2014; Deloitte, 2014; EY, 2016; KPMG, 2016). They claimed that the industries that will be affected the most are: telecommunications, technology, construction, automotive, IT, real estate and pharmaceuticals, but essentially every company reporting under IFRS or US GAAP will be affected to a certain level. The FRC institute (2018) analyzed the interim financial statements of 17 companies operating in aerospace, software, telecommunication and defense, and found out that the initial IFRS 15 adoption has a significant impact in these industries. However, they emphasized that disclosure on some particular areas can be improved. In the same spirit, KPMG (2019) reviewed the impact of the first-time application of IFRS 15 on 69 Dutch listed companies, and concluded that there is a lack of disclosure information for some IFRS 15 specific requirements. Both these institutional investigations, confirm the concerns that companies might not fully abide by the new requirements imposed by IFRS 15. Academic research on IFRS 15 begins with an early investigation of McCarthy (2012) on the implementation effects of the preliminary exposure draft of IFRS 15. The author confirms that managers had difficulties in applying both the new principles-based IFRS 15 and rules-based US GAAP revenue recognition requirements.

Additionally, some researchers examine the compliance with disclosure requirements on the telecommunication and construction industries, since these industries are considered as high-sensitive to the introduction of IFRS 15, and also conclude that companies do not fully comply with the new requirements, and the degree of compliance varies between these two investigated sectors (Boujelblen & Fakhfakh, 2019). Similarly, Trabelsi (2018) examines the impact of IFRS 15's early implementation on the quality of accounting information by analyzing annual reports of listed companies of the real estate sector in Dubai. They suggest an increase in the measurement of financial indicators such as earnings and stockholder's equity. Mattei & Paoloni (2018) also study the effects of IFRS 15 on telecommunication companies in Italy and Spain two years prior to the official implementation of it. They conclude that the companies have already started to provide more extensive disclosures as a response to the new requirements. Khamis (2016) examines the perception of the Egyptian preparers and auditors on IFRS 15. He finds out that entities are yet unfamiliar with the new regulation, and its implementation is complex, costly and goes beyond accounting dimension. Most importantly, Khamis (2016) states that a special focus must be paid to areas where significant judgment is required, as the new method of revenue recognition might lead to misstatements. Therefore, he suggests that the investigation of the impact of IFRS 15 on transparency of financial reporting, should be further examined. The most recent study conducted by Napier and Stadler (2020), based on the annual corporate reports of STOXX Europe 50 companies, comment letters and interviews, provide insights that implementation of IFRS 15 has accounting, information and real effects. However, they claim that the impact of IFRS 15 on the accounting numbers is merely notable in the telecommunication sector and that the disclosure and implementation costs have increased considerably (.ibid). They suggest that it would be informative to evaluate the extent to which IFRS 15 has enhanced users' understanding of entities' overall business model and activities. This suggestion is carried out in this present study.

Lastly, this review on literature depicts that nonetheless the importance of revenue recognition in financial reporting, there is surprisingly little empirical research in examining the new standard. The

aforementioned studies address mainly implementation issues, with respect to the expected effects on firm's profitability and performance, and compliance with the new disclosure requirements. Thus, the existing academic research on IFRS 15 is mainly non-empirical and vague, demonstrating major limitations on early timing, sample size and research design. Therefore, this study addresses for the first time the observed gap in the existing literature and provides empirical evidence on the impact of IFRS 15 on the value-relevance of the accounting information.

2.7. Theoretical Framework and Development of Hypothesis

The previous discussion on the institutional background of IFRS 15, along with the compiled information from related literature review on this topic, form the foundation for the hypothesis development of this study. Over the last decade, the recurring accounting scandals, the financial crisis of 2008, the burst of stock market bubbles, all seemed to have a mutual denominator originating from obscure revenue recognition standards. The explanation for the latter has been attributed to the material discrepancies in the guidance and requirements for revenue recognition between Boards (IFRS & GAAP) and IFRS itself, that not only exacerbated the comparability and consistency of financial reporting across entities (Wustemann and Kierzek, 2005; Tong, 2015), but also allowed room for discretionary application of the standards. Consequently, many companies masked their 'economic reality' through improper revenue recognition (Zhang, 2005; Stubben, 2010), which is considered as the largest cause of financial restatements (SEC, 1999). Additionally, the IASB detected weaknesses in the previous disclosure practices, which were viewed as inadequate for investors to sufficiently understand and interpret the firm's revenue and estimation made to recognize it (IASB, 2014; Tong, 2015).

Since revenue and earnings are interrelated through timing and matching principles, revenue recognition is closely linked to producing earnings numbers that accurately represent an entity's performance. Reasonably, one can link the observed weaknesses and inconsistencies in revenue recognition standards, to the eroded value relevance of financial information, particularly the decline of decision-usefulness of accounting numbers (e.g., Francis & Schipper, 1999, Bushman et al. 2016, Denelson et al. 2011). Alternatively, economic and reporting factors are claimed to play a role in this attenuation. As such, the initial call for a new compliance standard that regulates both revenue and cost recognition, was sorely needed. In response to these concerns, IFRS 15 was proposed to be implemented. The enhanced scope of disclosures required by the new standard is expected to play a significant role in the informativeness of financial statements, since they are substantially more extensive (Tysiac, 2017). IFRS 15 is currently applied consistently under both accounting frameworks, indulging the globalization and international comparability of financial statements. Convergence in accounting standards can lead to proper record keeping, uniformity, higher quality of accounting information, enables comparison of investment opportunities across the global market, and increases the public confidence in financial reporting (McCarthy, 2014). Introduction of IFRS 15 is also supposed to decrease the level of discretion and the potential to manage earnings (IASB, 2014). Referring to the Agency Theory, once the information asymmetries are reduced, the level of quality of information between parties should increase. Moreover, passing stricter revenue recognition requirements, accruals in the balance sheet will be considered as safer (more probable to result in cash transaction). Changes in the key ratios, and revenue (or net income) in the post- IFRS 15 adoption, will influence the valuation of the security prices, as a response to the degree that the new financial information is regarded as value-relevant (Ball and Brown, 1968). The changes in the share prices are explained by the EMH (see also footnote 18). Thus, considering a highly efficient market there will be a quick and complete reaction when new earnings-related information is disseminated.

In sum, the main prediction of this study is that a stringent revenue recognition model, involving a comprehensive five-steps framework, requirements for disaggregated revenue information, increased cross borders comparability and substantially higher scope of disclosure, should lead to higher value-relevant income and book equity measurements. Hereby, the main hypothesis of this study is stated in an alternative form as follows:

Hypothesis₁: There is a significant positive change in the value-relevance of financial statements in the post- implementation of IFRS 15 in the adopting entities.

On the other hand, a modification on the way certain transactions are accounted and disclosed will appear as more or less compelling to equity investors. The new requirements in the timing of revenue recognition will affect investors' perceptions in at least two ways. The announcement of the restatements due revenue recognition problems should change investors' perceptions of firm's current and future profitability and therefore alter the investors' expectations of firm value. Secondly, the existence of restatement may result in uncertainty in the market related to the reliability of firm' financial reporting which may remain persist for longer period of time and cause lower returns. Especially because restatements stemming from revenue recognition can be perceived by to be intentionally conducted to mislead investors. Therefore, given the nature of the changes brought by IFRS 15, the equity investors' perceptions on the quality of financial reporting will certainly be influenced. However, it is unclear how equity investors will regard the transition to IFRS 15. It is probable that investors would react positively to the changes done in the scope of IFRS 15, if it results in higher quality of financial reporting, comparability and transparency, thereby reducing information risk and cost of capital (Baiman and Verrecchia, 1996; Leuz and Verrecchia, 2000; Barth et al. 2008). Also, the increased scope of disclosure under IFRS 15 can provide more useful information to investors which positively influences their reliance on the disseminated accounting information. Moreover, previous research suggests a positive and stronger market reaction to accounting standards that promote convergence (e.g., Barth, Clinch and Shibano, 1999; Ashbaugh and Pincus 2001; Pae et al. 2007; Joos and Leung, 2012). Hence, since IFRS 15 is the first converged revenue standard, it is expected that investors will react positively to its implementation.

Inversely, the usefulness of IFRS 15 might be as well perceived as less due to increased professional judgment and complexity. Despite of their benefits, converged standards may also not allow space to "consider differences in circumstances among entities or countries" (Zeff, 2007), and might even result in less informative reporting if "one-size-fits-all approach" is used to mask the underlying economic reality and attributes of firms (Chi, 2009). Moreover, IFRS 15 implementation impacts entities' profitability and performance, as the timing of revenue recognition, amount of revenue, contract costs and the new requirements on disclosure might differ substantially from the preceding practice (Ballarin, 2017). This leads to restatements of accounting information, which are considered as a new information release incorporated into unexpected earnings. According to CAPM, equity securities will earn the expected return (risk-free rate) and an incremental firm-specific return associated with the firm's unexpected earnings (see footnote 19). Earlier research indicate that accounting restatements result in the largest market reaction (Turner et al. 2001) and cause a significant loss in the companies' market value due to the negative stock returns (Dechow et al. 1996; Palmrose et al. 2004, Akhigbe et al. 2005). Restatements are usually considered as 'bad news' since they clearly signal lower credibility and transparency of firm's prior financial information (Wu, 2002; Anderson and Yohn, 2002). Nevertheless, restatements are not necessarily "bad" if they rectify past errors and convey confidence in the reported accounting information, which result in financial numbers being more efficiently associated to the security prices (Plumee and Yohn, 2010; Bardos, 2011).

To conclude, investors' perceptions about the reliability of the accounting information post-implementation of IFRS 15 will depend on the aggregate market reaction (the direction of abnormal returns). Collectively, since adoption of IFRS 15 can be viewed as having beneficial or detrimental effects on investors' perceptions, the second hypothesis is stated in the null form as follows:

Hypothesis_{2a}: The implementation of IFRS 15 is not associated with investors' perceptions of the change in the usefulness of accounting earnings in the adopting entities.

III. DATA AND RESEARCH DESIGN

This section, unfolds the methodology and the research design employed in carrying out this study. First, the data gathering and sampling are described. Next, the regression models are presented, proceeding by a discussion on the approach followed to statistically test the above-mentioned hypotheses, i.e., “Impact on the Value relevance” and “Investors’ perceptions” in the scope of IFRS 15 adoption.

3.1. Data Gathering and Sampling

Since the subject of this study is IFRS 15, only European listed-companies where the application of the IFRS framework is mandatory, are selected. To increase the generalizability of this study and make inferences for the entire population of companies using IFRS in Europe, the data should be representative of the majority of the European market among different size of firms, industries and different countries. Contrary to the preliminary studies on IFRS 15, in this investigation there is no discrimination among various industries, simply because the focus of investigation is the value-relevance and investors’ perceptions post-IFRS 15 implementation and not quantitative effects. In turn, this choice allows for a bigger sample selection and increases the statistical robustness of the conclusions. Therefore, the sample selected for examination is retrieved from the STOXX Europe 600, which covers 600 components of large, mid and small capitalization companies across 17 countries of the European region namely Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the United Kingdom. A full list of companies listed on STOXX 600, together with the sector they belong to, is extracted from EIKON- THOMSON REUTERS (DATASTREAM).

Another reason for selecting this index, is that it represents approximately 90% of the free-float market capitalization of the European stock market (STOXX600, 2017). The best fit of reporting frequency for this study are quarterly data, as the effect of changes in revenue recognition are more salient over shorter reporting cycles (Zhang, 2005). Additionally, Ball and Brown (1968) highlight the fact that quarterly earnings tend to supersede the accounting information communicated in annual reports as the majority of information regarding annual earnings and book values is already anticipated by the market participants. Kothari (2001) advocates the view of Ball and Brown (1968) and adds that in today’s capital markets, equity investors prefer to use more timely information. All companies in this sample set report quarterly data even though under IFRS is not mandatory. Regardless of the above assessments, additional analyses are conducted using annual data as well, to provide a complete view over the changes of the value relevance of accounting information under IFRS 15 over time. Hence, two measurement intervals are considered in this study: quarterly data, and annual data. Firms are required to have accessible data over the period 2017-2018 and 2018-2020 (see rationale for this in 3.2. and 3.2.1). Data engaged in performing this study is required from several sources. First, financial statement data and daily stock prices of firms listed in STOXX 600 are extracted from COMPUSTAT. Furthermore, other data incorporated to test the second hypothesis such as DJ STOXX 1800 index used as a market adjustment to calculate the Cumulative Abnormal Returns (CAR), is obtained from Global Financial Data (GFD). The dates for the quarterly and annually report announcement were also collected from COMPUSTAT. In case the market was closed during the earnings release (i.e weekends; holidays), the following date when the market was open again was used in the analysis (i.e., only trading days considered). Several observations are eliminated from the original sample set. Initially, the first company excluded is ABB (Switzerland), because their accounting information is reported under US GAAP, and the non-GAAP measures are considered as supplementary and not substitutional. Afterwards, companies belonging to the financial sector (i.e, ‘Insurance, investment services, banks etc) are excluded from the sample as this industry is subject to different regulatory framework and unique operating characteristics (Fields, Fraser and Wilkins, 2004). Then, companies that voluntarily adopted-IFRS 15 earlier than the mandatory date, are excluded from the sample to make sure only exogenous effects are examined and to prevent sample-

selection bias. Also, companies with negative book value of equity and (or) negative earnings after tax are excluded from the sample, as prior studies find a difference in the association between negative and positive earnings with security prices (e.g., Collins, Pincus and Xie, 1999). Next, it is required that the firms have daily stock prices data available from the COMPUSTAT Security Daily database during the sample period. Ten other companies were dropped as well due to missing stock prices data. Given the above limitations, the final sample results in 424 firms (see Table 1) and 1351 annually observations.

Out of this sample, a subsample of firms that restated the accounting information of the financial year 2017 due to the introduction of IFRS 15, is also extracted. Firms could choose between applying either the retrospective or the modified method to complete their transition to the new standard IFRS 15. The full retrospective approach requires entities to fully restate all accounting figures conducted in accordance with the previous standards, whereas under the modified retrospective approach, an entity is allowed to recognize the cumulative effect of IFRS 15, at the date of the preliminary application as an adjustment to retained earnings, without restatement of comparative figures. According to auditors, the first transition method is more informative to the analyst and investors community (BDO, 2019), however the FRC (2018) asserts that the preparers of the financial statements perceive the second approach as more appealing due to its simplicity. For the above-mentioned reasons, the companies that only restated retrospectively are selected. Since restatement data for European firms is not available in COMPUSTAT, the released annual reports of each firm belonging to STOXX 600 for the financial year (FY) 2018 are examined. If the firm restated the accounting information for FY 2017 (i.e., earnings and book value of equity), due to IFRS 15 effects as specified in firm's disclosures, then these data are manually extracted. The subsample initially results in 94 companies. Then, the companies that disclosed no significant impact from IFRS 15 restatements in their financial statements, and firms that restated retrospectively their figures to reflect adoption of IFRS 15 for the financial year 2018 on annual reports of 2019, are also excluded from the sample. As such, the final subsample includes 64 firms (see Panel B), for which restatements due to IFRS 15 introduction were claimed to be significant.

Table 1: Sample Selection

| Panel A: Sample Selection for the Investors' perceptions Hypothesis | |
|---|------------|
| All firms included in STOXX 600 index | 600 |
| Less: | |
| Firms that report under US GAAP | (1) |
| Firms operating in the financial sector | (100) |
| Firms that adopted IFRS 15 earlier than the mandatory adoption date | (13) |
| Firms with a negative book value of equity | (15) |
| Firms with negative earnings after tax | (37) |
| Firms with missing information (e.g., daily stock prices or book value of equity) | (10) |
| Total of the main sample used for the Investors' perceptions Hypothesis | 424 |
| Panel B: Sample Selection for the Value-Relevance Hypothesis | |
| Total of the main sample used for the Investors' perceptions Hypothesis | 424 |
| Less: | |
| Firms that applied the modified method to adopt IFRS 15 | (330) |
| Firms that disclose no significant impact from adoption of IFRS 15 | (7) |
| Firms that restated retrospectively on annual reports of 2019 for the FY 2018 | (23) |
| Total of the subsample used for the Value-Relevance Hypothesis | 64 |

Notes: The main sample for the Investors' Perceptions Hypothesis used for Equation 3 and 4 is presented in Panel A.

Several observations were excluded from the sample due to various reasons as mentioned above. The main sample results in 424 firms.

Panel B, depicts the subsample used to test for the Value-Relevance Hypothesis (Equations 1 and 2). The total of the subsample after excluding several observations is 64 firms that will capture unbiasedly the effect of IFRS 15.

3.1.1. Data adjustments

Consistent with other value-relevance studies, the adjusted explanatory power of the coefficient of determination (hereafter Adj. R^2) is used as the main metric to proxy for the changes in the value relevance of accounting information by implementing the Ohlson (1955) framework, where market equity is regressed on book value of equity (balance sheet) and accounting earnings (income statement). However, this framework has been viewed in some scenarios as misleading and biased. Therefore, emphasis is stressed on the potential modifications to improve the reliability of the explanatory power (Adj. R^2) derived from this model²⁴ (e.g., Brown, Lo and Lys, 1999; Barth and Clinch, 2009). In line with these papers, this study applies a share deflation (total outstanding shares) and firms' total market value of equity at the beginning of year t as a deflator, respectively for the independent variables used to test Equation (1) and (2) (see below), to mitigate problems associated with heteroscedasticity²⁵ (which include the scale effects present in the Ohlson model) and improve the validity of the findings. Moreover, due to the considerable large sample size, most of the observations are winsorized at 5% high only, to mitigate potential noise from the outliers. Since firms operate in different countries in Europe at functional currency, all variables are converted and measured in Euros per share to ease the interpretation of results and avoid any inconsistency caused by differences on exchange rates. Conversion is performed using foreign exchange rate at year-end balance sheet date for the book value of equity, and the average rate of currency throughout the year for earnings figures. All foreign exchange rates are retrieved from the Currency Converter-Oanda. Also, with respect to the manual extraction of the data for the subsample, the financial information was converted to millions, for firms that reported in thousands. Merging stock data with financial data, as well as all other tests are executed through STATA-programming language using ISIN codes (i.e., the company identifiers).

3.1.2. Event study and window

Initially, this study aims to assess the informativeness of financial reporting before and after the implementation of IFRS 15. Secondly, the focus shifts to the changes on the equity investors' perceptions over the new earnings information released in the scope of the implementation of new revenue standard. To test for the latter, an event study methodology is employed consistent with the common methods proposed in other event studies related research (e.g., Ball and Brown, 1968; Kothari, 2001, Palmore et al. 2004). The main purpose in event studies is to infer whether a short-term impact of an event i.e., new earnings announcement (in this setting the earnings announcement after IFRS 15 implementation) causes investors to revise their decisions as revealed by changes on firm's value around this event. Hence, event studies are apt to quantifying the effects of abnormal returns disseminated from companies. Prior research states that choosing an exact date for an event study provides higher statistical validity (e.g., Brown and Warner, 1985; Rao & Sreejith, 2014). Nevertheless, other studies conclude that not only the event date is interesting but also days around the new announcement of information (e.g., Ball and Brown, 1968; Nichols and Wahlen, 2004). Consequently, the time span examined in this event is a short three-days window, as short period of time in event studies is preferable to control for the risk of time series dependence (Binder, 1998). The notion of "short-term window" is also recommended by previous research, where a one-day window (Kothari, 2001) or a short three-day window $[-1, +1]$, consisting of the day 0 being the actual date where the event took place, $[t-1]$ controlling for any information leak, and

²⁴ Barth and Clinch (2009) suggest that the Ohlson (1955) framework, suffers from "scaling effects" which refer to the size of the company. Large (small) firms will have a large (small) market capitalization and running a cross-sectional regression of market capitalization on book values of equity and earnings will capture 'not more' than the 'scale' (size) of the companies. Moreover, Brown et al. (1999), suggest that possible noise can be inherited in the data employed in the Ohlson-model especially for companies that conduct stock splits affecting their earnings per share. For instance, if a company decided to do a 2:1 stock split, automatically both stock price and earnings are half of their values in the previous period. Therefore, regression of stock price to an entity's earnings will generate a higher R^2 , which in turn accounts for increased value relevance.

²⁵ Heteroskedasticity is a statistical problem which results in an unequal distribution of the residuals (error term). Since the specified regression is estimated using observations from a sample of firms in cross-section and over time (Barth and Clinch, 2009, heteroskedasticity is a potential problem in this paper that must be avoided.

[$t+1$] controlling for any late response (Palmore et al. 2004), are sufficient to make inferences upon, considering the underlying assumption of efficient markets²⁶.

Hence, market reaction (how equity investors perceive IFRS 15 adoption) is observed annually over 2018-2021. This timeframe includes the first-year implementation of IFRS 15's reaction, and the following years 2019-2021 are included in the analysis to examine the potential changes on investor's perceptions once the new accounting standard for revenue recognition becomes fully embedded into firm's reporting. For completeness of evidence and generalizability of the findings, robustness tests are conducted using raw abnormal returns and a longer event-window of five-days [-2;+2].

3.2. Regression models specifications

3.2.1. Operationalizing the Value- relevance in Financial Statements

Considering that earnings and book value of equity are the paramount summary measures in accounting, prior literature demonstrates how well these two constructs explain firm market value (e.g., Ball and Brown, 1968; Dechow, 1994; Barth et al. 1998; Francis and Schipper, 1999, Nicholas and Wahlen, 2004). As mentioned earlier, in these seminal papers the value relevance is typically tested following the Ohlson (1995) framework where stock performance is exhibited as a linear function of earnings (the income statement) and book value of equity (the balance sheet). This model suits this study the best, since earnings are expected to be influenced by IFRS 15. Also, this method carries out the benefits of the Ordinary Least Squares Regression (OLS) as it celebrates the BLUE (Best, linear, unbiased, estimate) properties of the population parameters (Koop, 2005). Inferring the prior research, to evaluate the usefulness and informativeness of accounting information under IFRS 15 versus previous practice (e.g., IAS 18), the value-relevance is measured and tested only through levels (price) regression model specification (see footnote 20), as it suits better this study's research question. Hence, to test for the first hypothesis of this study, the levels (price) specification is as follows:

$$P_{it} = \beta_0 + \beta_1 EARN_{pre-IFRS15} + \beta_2 BVEQ_{pre-IFRS15} + \epsilon_{it} \quad (1)$$

$$P_{it} = \beta_0 + \beta_1 EARN_{post-IFRS15} + \beta_2 BVEQ_{post-IFRS15} + \epsilon_{it} \quad (2),$$

where P_{it} is the security price of firm i two months after fiscal year $end t$, $EARN$ is the firm's net income before extraordinary items only attributable to shareholders per share pre-IFRS 15 (post-IFRS 15), $BVEQ$ is the firm's book value of equity per share pre-IFRS 15 (post-IFRS 15), and ϵ is the error term of firm i in year t . The stock price is chosen as a proxy for the dependent variable (stock performance). The independent variables are straightforward reported summary measures of the firm's financial status. Initially, to track the effect of the transition to IFRS 15, the accounting information under the previous revenue recognition practice is directly compared with that under IFRS 15, for the same sample of companies and for the same year. Under IFRS, all firms that adopt the accounting standards of IASB for the first time, should republish their financial statements of the previous year under IFRS 15, for comparability reasons. Therefore, the vast majority of the companies listed in STOXX 600, that applied IFRS 15 for the first time on 2018, were obliged to adjust and restate the financial statements of 2017. As such, the year 2017 is the unique financial year that financial information is provided simultaneously under both the old and new revenue recognition standard. For Equation (1), the earnings and book value of equity data are extracted from the firms' annual financial statements of 2017 under the old revenue standard (pre-IFRS15). Regarding Equation (2), the restated earnings number and book value of equity

²⁶ Based on the assumption of EMH, the market efficiency of the countries included in the sample selection is adequate to ensure that information related to IFRS 15 adoption will be unbiasedly reflected in security prices during the event window. The size and liquidity of the European market indicates that this can be a plausible assumption. Therefore, one day before controls for any leak of information, and one day after awaits the late response.

are extracted manually from the annual republished financial data of 2017 that are released in annual report of FY 2018 under the new revenue standard (post-IFRS15). Therefore the initial tested period is 2017-2018 tested for in annually intervals for 64 firms. For completeness purposes, the latter is also tested using quarterly intervals including the full sample. Nevertheless, it should be emphasized that quarterly data does not distinctly reflect IFRS 15 effects, since adjustments on FY 2017 financials are not published in interim reports. Also, industry fixed effects are included to wave out any differences stemming from different industries' characteristics in the sample.

The underlying assumption in performing this research design is that markets are efficient and stock prices unbiasedly reflect all publicly accounting information relevant for the firm value (EMH). After both equations are executed, similar to Dechow (1994), the generated explanatory power from equation (1) and (2) (adjs. R^2) are compared to see which accounting earnings number is more strongly associated with the stock price performance and conclude whether implementation of IFRS 15 has led to more useful financial information, hence more value-relevant financial reporting. The difference in the explanatory powers among the timeframes of this study is tested using the Young's (1989) tests²⁷. Further, to test the value relevance of IFRS 15 versus old revenue standards income, the explanatory power of the income-only version of these regressions (i.e., equation (1) and (2) including only earnings as the independent variable) is tested. Similarly, to test the value relevance of IFRS 15 versus old practice book value, the explanatory powers of the equity-only version of these regressions are compared.

3.2.2. Operationalizing the Investor's Perceptions on IFRS 15

Given the nature of changes brought by new regulation, the second hypothesis attempts to examine whether the implementation of IFRS 15 affects the investors' perceptions of the financial reporting quality by implementing an event study as discussed in section 3.2. Prior research in the capital markets area have investigated the degree to which stock price reaction to earnings surprises is associated to the quality of reported earnings (i.e., the extent to which numbers reflect more accurately the firm's true economic value). In case decision useful information would be provided by earning surprises, the investors would react to the news and this would be reflected in stock prices and returns. For this purpose, the Earnings Response Coefficient (ERC) is commonly used in prior studies as a measure to which unexpected (new) earnings information is capitalized in the stock price. Hence, investors' perceptions are typically operationalized through the ERCs. For instance, Teoh & Wong (1993) use ERCs to measure perceived auditor quality. They interpret the higher ERCs results observed in the sample of Big Eight audit firms' clients as a reflection of the investors' valuation over the role of audit firms' size and reputation on the enhanced credibility of the earnings report that they audit. Hence, similarly to previous studies (e.g., Teoh & Wong, 1993; Francis and Ke, 2006; Ghosh et al. 2009), in this study ERC is used as a proxy to estimate the investors' perceptions on the quality of financial reporting after IFRS 15 implementation. Therefore, if ERCs differ after the implementation of IFRS 15, it can be concluded that capital market participants perceived a deterioration (improvement) of the quality of earnings' report.

Because ERC is the multiple that correlates the abnormal changes in market return in response to the unexpected earnings of a firm, the dependent variable used in this study is the Cumulative Abnormal Returns (CAR). There are several approaches suggested by prior studies to compute the Cumulative Abnormal Return around a particular event. In this paper, the market-adjusted model is applied. Following the prior literature (e.g., Palmore et al. 2004; Larcker et al. 2011), the abnormal returns are calculated as the difference between the daily individual stock return centered on the event date, and the return of DJ_STOXX 1800 value-weighted market index²⁸ of each day in the event window [-1, +1], in an effort to adjust for other contemporaneous economic news. Despite the fact that the selected market index is comprised of publicly listed companies not only trading in Europe, but also in the U.S., and Asia/Pacific

²⁷ Following the paper of Dechow (1994), when calculating the Young's (1989) statistics, independent and identically distributed error terms are assumed. This assumption is particularly valid in this setting since the data used is derived from different industries.

²⁸ In the market-adjusted models, the value-weighted market indices are representative of the market return.

regions, this adjustment factor could still be irrelevant and raises endogeneity concerns²⁹. Hence, the abnormal returns (AR) are computed in line with prior research (e.g., Palmore et al., 2004; Larcker et al., 2011) for each firm in the short- three days [-1, +1] window³⁰ using DJ STOXX 1800 index, excluding American firms as the market adjustment for testing this hypothesis. The above is expressed in the function as follows:

$$CAR_{ij} = \sum_{t=-1}^1 AR_j = \sum_{t=-1}^1 (RET_{jt} - DJ_STOXX\ 1800_t) \quad (5)$$

where AR stands for Abnormal Return (Earnings Surprise), RET is the daily individual stock return of firm j on day t , and $DJ_STOXX\ 1800$ is the market index return on the specific day t over the event window [-1, +1]. Hence, CAR_{ij} is the Cumulative Abnormal Return of each firm j on the event date, calculated as the sum of all the Abnormal Returns of each firm around the event window [-1, +1], as indicated in Equation 5. Next relevant control variables are considered. Current evidence suggests that ERC_s varies across factors such as the degree of earnings persistence, earnings predictability, growth opportunities, firm size and risk (e.g., Kormendi and Lipe, 1987; Lipe, 1990, Biddle and Seow; Nichols and Whalen, 2004). Other than that, ERC can also differ among firms in different industries due to the different nature of the transaction and the way firms account for them. Noise stemming from the latter variations is particularly important to control for in this model, as IFRS 15 implementation varies across industries. Hence, to control for the potential effects of the various influential factors, a set of control variables is included. The final model proposed to capture the investors' perceptions includes, is tested as follows:

$$CAR_{ij} = \beta_0 + \beta_1 UE_{jt} + \beta_2 MB + \beta_3 LTA + \beta_4 LEV + \beta_5 ROA + \beta_6 BIG4 \\ + Industry + Year + \epsilon_{it} \quad (6)$$

where CAR_{ij} is the Cumulative Abnormal Return as the dependent variable, β_1 is the coefficient of interest representing the Earnings Response Coefficient (ERC), and UE_{jt} is the Unexpected Earnings that incorporates the new information communicated by earnings (earnings surprise), and ϵ_{it} is the error term normally distributed. To isolate the new earnings information, the residual between the actual reported earnings and the earnings that (hypothetically efficient) market expected to be is assessed. Academia prefers to use the I/B/E/S analyst consensus (median) earnings forecasts as better proxies for expected earnings (e.g., Teoh and Wong, 1993; e.g., Brown et al., 1985, Nichols and Wahlen, 2004). However, in this paper since the analysts' consensus are not available, a time-series model of earnings following the naïve model proposed by Ball and Brown (1968) is used. The latter presumes that the prior-period earnings often serve as the best unbiased estimate of the current expected earnings. This view is also corroborated in the study of Nichols and Wahlen (2004), where they introduce the term of 'earnings persistence' explaining that is plausible and expected that firms' earnings level will recur in future periods and that current period earnings data provide information that equity investors can use to predict future earnings (Link 1, ibid). Then following Kormendi and Lipe (1987), who indicate that price is the proper scaling factor based on the theoretical derivation of ERC, the stock price at the fiscal-year end, is employed as a scaling factor for unexpected earnings.

In similar vein of previous literature (e.g., Teoh and Wong, 1993; Joss and Leung, 2013), the control variables incorporated in the above regression, are proxies of the aforementioned differences in ERC,

²⁹ As adoption of IFRS 15 will affect all listed companies in STOXX 600, it is inappropriate to adjust returns with a European-based index, since the index itself contains the returns on firm j , hence it might reflect the overall market reaction to IFRS 15 (correlated to the residual). The same is applicable also for the part of this index that represents the American firms, as the new revenue recognition (IFRS 15, *aka Topic 606* under US GAAP) standard became mandatory in the same date. Moreover, its application would be seen as positive, as it can affect the comparability of the financial reporting between these regions. Lastly, the index adjustment might also not be relevant for the components related to the Asia/Pacific region, due to dissimilarities across countries.

³⁰ Since the chosen event-window concurs with public holidays (e.g., New Year) during which the market is closed, the event window is adapted to three business/trading days.

firm's information environment and possible information asymmetry among investors. *MB* is the Market-to-Book value of equity at the beginning of each year value to proxy for earnings growth and persistence. It is plausible that ERC is affected by *MB*, as investors' responsiveness is positive for earnings disclosures of companies that are perceived to have higher growth opportunities (low *MB*) and greater future profits (e.g., Teoh and Wong, 1993). Next, *LTA* is the natural logarithm of the firm's total assets at the end of the fiscal year to operationalize the firm's size. Investor's focus are generally large firms which have also higher information content to report, hence creating a higher and positive market response for such firms. On the other hand, *LEV* is the leverage (debt to equity ratio) to proxy for firm risk. Investors would react less to companies that have higher leverage as creditors have priority on earnings. *ROA* is the ratio of firm's earnings and total assets, serving as a proxy for firm's profitability which has a positive influence on the market response. Furthermore, *BIG4* is a dummy variable which equals 1 if the firm is a BIG4 client and 0 otherwise, which is seen as an indicator of increased confidence, hence positively influence investors' response if the company of interest is audited by Big4 firms (e.g., Teoh and Wong, 1993). In addition, an important aspect to consider and control for are the changes in the volatility of market returns. Failing to account for this, especially in the approach chosen, would provide biased results and alter the interpretation of the findings. The market volatility in STOXX 600, has remained reasonably constant since late 2011 (ValueTrust, 2018; KPMG, 2019). However, this inference has to be treated cautiously as it does not account for the volatility of the market during Corona outbreak. Therefore to control for it year fixed effects are included in the model. Lastly, industry fixed effects are included as well to reduce the noise stemming from the difference on IFRS 15's application on transactions of different nature considering the variety of industry sectors. Further details on variables used in the study, their measurement and data sources are enclosed in the Appendix B. For generalizability of results, robustness checks are performed in Appendix A, testing for a longer event-window of five-days to account for investor's late response, taking raw returns for both event windows, and also implementing binary measures to mitigate nonlinearity issues.

IV. Empirical Results

4.1. Summary Statistics For Testing the First Hypothesis

Table 2 provides descriptive statistics for the annual and quarterly data respectively, for testing the hypothesis pertaining to the value relevance of financial reporting. To minimize the influence of outliers, all variables are winsorized at 5% at high only. Table 2 Panel A displays the firms' descriptive statistics pre and post adoption of IFRS 15 on annually basis. As mentioned earlier, for the annual observations, only firms that retrospectively restated their financial information on the FY 2018 reports to reflect the adjusted number for FY 2017 due to IFRS 15 mandatory application, are chosen. Hence, the effect of IFRS 15 is mainly captured from the annually observations over 2017-2018. The descriptive statistics for the first hypothesis on Table 2 Panel A, indicate already the expected effects of IFRS 15 application to change earnings and book value numbers, based on results for 64 firms. For the balance sheet, the mean of the variable book value of equity pre- IFRS 15 and under IFRS 15 is €16.78 and €15.278 respectively, indicating a difference of about 9%. For the income statement, the mean earnings per share pre-IFRS 15 and under IFRS 15 is €2.453 and €2.186 respectively, indicating a difference of about 11%. With respect to the stock market reaction, the stock price per share drops from €40.73 on average to €37.093, indicating a negative response of approximately 9%. In general, these results indicate that the implementation of IFRS 15 leads to an overall negative response from the market over 2017-2018, and a worse-off financial position of the sample firms. The results are line with prior research (Dechow et al. 1996; Palmrose et al. 2004, Akhigbe et al. 2005), that indicate that restatement cause losses in the companies' market value and a negative market response.

Table 2 Panel B, shows the firms' descriptive statistics pre and after adoption of IFRS 15 on quarterly basis for 424 firms. The mean of the book value of equity pre- IFRS 15 and under IFRS 15 is €14.565 and €15.72 respectively, indicating an increase of about 8%. Whereas the earnings per share pre-IFRS 15 and under IFRS 15 is €0.521 and € 0.526 respectively, indicating a difference of about 0,1%. The change on earnings is not considerable. Additionally, the stock price per share P_{it} increases from €41.764 on average to €44.226, indicating an increase approximately 6%. These results are dissimilar to the ones obtained for the annually (manually) extracted observations likely because they represent data for period 2017-2018, excluding the effect of restatements for 2017, hence quarterly data captures the effects of IFRS 15 deficiently. Table 2, Panel C provides the distribution of the overall sample per industry. Noticeable, the majority of companies belong to the industrials, financials, and consumer discretionary industries. However, as previously mentioned, the observations representing the financials industry are omitted from this sample as this industry is subject to different regulatory framework and unique operating characteristics (Fields, Fraser and Wilkins, 2004).

Table 2: Descriptive Statistics

| Panel A: Annual Observations for testing the Value Relevance Hypthesis | | | | | | |
|---|--------------|--------|-----------------|--------|-------|--------|
| Variable Name | N | Mean | Median | Std. | Min | Max |
| P_{it} (pre) | 64 | 40.73 | 34.458 | 34.017 | 1.609 | 98.34 |
| P_{it} (post) | 64 | 37.093 | 26.989 | 30.901 | 1.401 | 85.78 |
| BVEQ _{pre-IFRS15} | 64 | 16.78 | 11.552 | 15.335 | .205 | 46.463 |
| EARN _{pre-IFRS15} | 64 | 2.453 | 1.583 | 2.257 | .067 | 6.727 |
| BVEQ _{post-IFRS15} | 64 | 15.278 | 10.733 | 13.836 | .206 | 40.324 |
| EARN _{post-IFRS15} | 64 | 2.186 | 1.693 | 1.896 | .047 | 5.085 |
| Panel B: Quarterly Observations for testing the Value Relevance Hypothesis | | | | | | |
| Variable Name | N | Mean | Median | Std. | Min | Max |
| P_{it} (pre) | 1589 | 41.764 | 31.455 | 31.813 | .282 | 92.62 |
| P_{it} (post) | 1589 | 44.226 | 31.537 | 34.68 | .555 | 100.8 |
| BVEQ _{pre-IFRS15} | 1589 | 14.565 | 9.713 | 12.608 | .007 | 36.118 |
| EARN _{pre-IFRS15} | 1589 | 0.521 | .383 | .434 | 0 | 1.242 |
| BVEQ _{post-IFRS15} | 1589 | 15.72 | 10.256 | 13.892 | .005 | 39.685 |
| EARN _{post-IFRS15} | 1589 | 0.526 | .397 | .437 | 0 | 1.242 |
| Panel C: Distribution of the sample per industry | | | | | | |
| Industry | Observations | | Relative Weight | | | |
| Basic Materials | 40 | | 7% | | | |
| Consumer Discretionary | 88 | | 15% | | | |
| Consumer Staples | 50 | | 8% | | | |
| Energy | 21 | | 4% | | | |
| Financials | 100 | | 17% | | | |
| Health Care | 56 | | 9% | | | |
| Industrials | 121 | | 20% | | | |
| Real Estate | 39 | | 7% | | | |
| Technology | 37 | | 6% | | | |
| Telecommunications | 20 | | 3% | | | |
| Utilities | 28 | | 5% | | | |
| Total | 600 | | 100% | | | |

Notes: This table indicates the descriptive statistics for the variables in the price regressions (Equation (1) and (2)). The sample includes 64 firms for the annually data (Panel A) and 424 firms for the quarterly data (Panel B) over 2017-2018. All variables are measured in euro per share and winsorized at 5% high only. Panel C displays the sample composition by industry. The sample includes 11 different industries, and the most predominant industries represented in this sample are: Industrials, Financials and Consumer Discretionary. All variable definitions are provided in Appendix D.

Table 3 provides the Pearson correlation matrix of the variables used in the first regression for both annually and quarterly date on Panel A and B respectively. The matrix indicates a strong positive linear correlation (i.e., exceeding |0.700|) and all correlations are significant at the 10 percent level. Potential multicollinearity issues are ruled out since in this regression only two variables are included. For the annually data, the correlation between P_{it} and BVEQ pre IFRS-15 and that between P_{it} and BVEQ post IFRS-15 seems to reduce (0.827 versus 0.774), perhaps due to the decrease on firm's value after the restatements were published. Whereas, for the income statement, the P_{it} is slightly more strongly correlated with the EARN after IFRS 15-implementation (0,865) than with EARN pre-IFRS 15 (0.878) implementation, likely because earnings figures come closer to the 'true' levels. For the quarterly data, the correlation between P_{it} and BVEQ seems to also reduce as well from pre to post IFRS 15 (0.775 versus 0.745). The same it is observed with the correlation between P_{it} and EARN from pre to post IFRS

15 (0.809 vs 0.775). Even though, from descriptive statistics it was observed that the P_{it} increased from pre-to-after IFRS 15 implementation, correlation statistics show that the relationship between price and earnings actually decreased. In general, correlation statistics show the initial effects of IFRS 15's implementation, as it is observed that once the book value of equity and earnings decrease, the relationship with the price becomes weaker. However, correlation statistics are limited in their inferential ability and do not necessarily suggest causality. Regression analysis are more suitable in this perspective.

Table 3: Pearson Correlation Matrix

| Panel A: Annual Observations Correlations | | | | | | |
|--|--------|-------|-------|--------|--------|-------|
| Variable Name | (1) | (2) | (3) | (4) | (5) | (6) |
| (1) P_{it} -pre | 1.000 | | | | | |
| (2) $BVEQ_{pre-IFRS15}$ | 0.827* | 1.000 | | | | |
| (3) $EARN_{pre-IFRS15}$ | 0.865* | 1.000 | 1.000 | | | |
| (4) P_{it} -post | | | | 1.000 | | |
| (5) $BVEQ_{post-IFRS15}$ | | | | 0.774* | 1.000 | |
| (6) $EARN_{post-IFRS15}$ | | | | 0.878* | 0.852* | 1.000 |

| Panel B: Quarterly Observations Correlations | | | | | | |
|---|--------|--------|-------|--------|--------|-------|
| Variable Name | (1) | (2) | (3) | (4) | (5) | (6) |
| (1) P_{it} -pre | 1.000 | | | | | |
| (2) $BVEQ_{pre-IFRS15}$ | 0.775* | 1.000 | | | | |
| (3) $EARN_{pre-IFRS15}$ | 0.809* | 0.819* | 1.000 | | | |
| (4) P_{it} -post | | | | 1.000 | | |
| (5) $BVEQ_{post-IFRS15}$ | | | | 0.745* | 1.000 | |
| (6) $EARN_{post-IFRS15}$ | | | | 0.775* | 0.804* | 1.000 |

Notes: This table presents the correlations among the variables in the price (levels) regressions (namely equation (1) and (2)). The sample on Panel A contains 64 firms, whereas the sample on Panel B contains 424 firms for years 2017-2018. All correlations are significant at the 1 percent level and all variables are winsorized at 5% at high only. For a detailed description of variable definitions see Appendix B.

4.2. Summary Statistics For Testing the First Hypothesis

Table 4 presents summary statistics for the variables included in testing the Investors' Perceptions on implementation of IFRS 15 for 424 firms over the period 2018-2021. Panel A, shows the descriptive statistics for the all continuous variables, excluding Big 4. The results show that the dependent variable cumulative abnormal return (CAR) in the short 3-days window around the earnings announcement date is on average 0.3%, whereas the unexpected earnings is on average approximately -0.2%. These results and the results of other control variables are in line with prior research (e.g., Teoh and Wong). Panel B reports the Pearson correlation matrix for the dependent variable CAR, the variable of interest UE, and other controls variables. It is noteworthy, that all control variables, except LTA are significantly correlated at the 10 percent level with UE, which is in line with prior literature (e.g., Teoh and Wong, 1993; Joss and Leung, 2013), advocating influences in ERC from these variables. Also, Big4 and UE are significantly positively correlated to the dependent variable. In addition, most variables have a low correlation (i.e., correlation |0.400|), implying that potential collinearity issues have been ruled out.

Table 4: Summary Statistics

| Panel A: Observations for testing the Investor's Peceptions Hypothesis | | | | | | |
|---|------|-------|--------|-------|--------|--------|
| Variable Name | N | Mean | Median | Std. | Min | Max |
| CAR | 1351 | .003 | .001 | .022 | -.227 | .245 |
| LTA | 1351 | 9.328 | 9.28 | 1.495 | 4.154 | 13.178 |
| LEV | 1351 | .297 | .292 | .166 | 0 | .635 |
| MB | 1351 | .405 | .332 | .287 | .003 | .954 |
| UE | 1351 | -.017 | .03 | .552 | -1.004 | .896 |
| ROA | 1351 | .055 | .048 | .074 | 0.71 | .327 |

| Panel B: Pearson Correlation Matrix | | | | | | | |
|--|--------|---------|---------|---------|---------|--------|-------|
| Variable Name | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| (1) CAR | 1.000 | | | | | | |
| (2) LTA | 0.011 | 1.000 | | | | | |
| (3) LEV | -0.030 | 0.208* | 1.000 | | | | |
| (4) Big4 | 0.080* | -0.033 | 0.023 | 1.000 | | | |
| (5) MB | -0.004 | 0.447* | -0.066* | -0.062* | 1.000 | | |
| (6) UE | 0.102* | -0.135* | -0.080* | -0.048 | -0.184* | 1.000 | |
| (7) ROA | 0.013 | -0.281* | -0.247* | 0.021 | -0.273* | 0.311* | 1.000 |

Notes: This table reports the descriptive statistic for the variables included in the multiple regression to test the second hypothesis of this paper (Equations (3)). The sample includes 1351 observations for 424 firms over 2018-2021.

Panel A presents the descriptive statistics only for the continuous measures used in testing while the non-binary measures statistics are left out since they take values of 1 and 0. All variables are measured in EUR and winsorized at 5% high only

The matrix indicates moderate linear correlation, significant at 10 percent level. See Appendix D for variable definitions.

4.2. Main Tests

4.3.1 First Hypothesis Results

Table 5 shows results of estimating Equations (1) and (2) on both annual and quarterly basis to compare the value relevance of firms' financial information before and after implementation of IFRS 15. In general, a higher explanatory power is considered as evidence of more reliable and relevant accounting information transmitted to equity investor. The combined financial information before IFRS 15 implementation (i.e. book value of equity and earnings together) have an Adjusted Adj. R^2 (hereafter, Adj. R^2) of 0.84 compared to 0.85 for the combined financial data after IFRS 15-implementation. The magnitude of the Adj. R^2 difference is quite small and insignificant. Consequently, the obtained results reveal that financial statements under IFRS 15 are neither more or less value-relevant than the financial statements conducted under prior revenue standards. Moreover, for the book value of equity only regressions, the model with the higher Adj. R^2 is the one before IFRS 15- implementation and the magnitude of Adj. R^2 difference (0.70 versus 0.62) is small and insignificant. Whereas, for the earnings only model, the results indicate that the magnitude of explanatory powers (Adj. R^2) reduces insignificantly when IFRS 15 is applied (0.86 vs 0.85). The latter indicates similar results to the combined model. Hence, based on the goodness of fit coefficient, the earnings figures post-IFRS 15 are not more strongly associated with the stock price performance.

On the other hand, the coefficient on earnings both on the combined and on the earnings-only model are statistically higher under IFRS 15 (11.117 vs 12.931; 15.055 vs 15.689 respectively). This indicates that when earnings per share increase by 1€, the stock prices will increase by 12.931€ instead of 11.117 €. This means that the capital markets react stronger to the earnings under IFRS 15 than to earnings figures under prior standards, regardless of the fact from the descriptive statistics firms had a decrease on earnings figures by 11%. All coefficients on earnings are highly significant at 1% significance level. Meanwhile, the coefficient on book value of equity both on the combined and equity-only method are statistically

lower under IFRS 15 (0.575 vs 0.390), whereas for equity-only (1.943 vs 1.793). Additionally, both coefficients on the equity-only model are significantly larger than their theoretical value of 1 (at significance level of 1%), however the coefficient on book value of equity post-IFRS 15 is closer to 1. Consistent with Barth, 1991, the latter implies slightly higher representational faithfulness than the book value of equity under other revenue standards. In general, regardless the fact that the explanatory powers have a limited indicative ability to determine whether IFRS 15 leads to financial statements of higher quality, the coefficients of the variables of interest, triggers preliminary evidence that financial information can be slightly more informative after IFRS 15 adoption. The effect of IFRS 15 is chiefly dominant on the earnings figures. Hence, post-IFRS 15 earnings figures reflect financial information that is deemed slightly more relevant and reliable from capital markets perspective.

With respect to the quarterly data, the same regression is tested for 424 firms over 2017-2018. All coefficients are significant at 1% level of significance. The Adj. R^2 in the combined model seems to reduce from 0.77 to 0.73 after implementation of IFRS 15. However, the difference is small and not significant. The latter leads to the same conclusion as on the annual intervals that implementation of IFRS 15 neither improves or deteriorates the value-relevance of financial reporting. Nevertheless, the coefficient of earnings both on the combined and on the earnings-only model are again statistically higher under IFRS 15, indicating that earnings figures after implementation of IFRS 15 are more associated to price movements. Both equity-only and earnings-only model, results are consistent and similar with the annual ones.

Based on the above, there is little evidence that IFRS 15 generates only slightly more informative financial information. Hence, due to the limited indicative power of the Adj. R^2 to corroborate that implementation of IFRS 15 has significantly improved the value-relevance of financial reporting and enhanced users' understanding of entities' overall business model and activities, the first hypothesis is rejected. A potential reason for this outcome, is that markets might believe that IFRS 15 indeed improves the usefulness of information through its stringent requirements on recognizing revenue and extensive disclosures, however the effects might still be undersized and not fully captured due to first-time deficient application. IFRS 15 postulates higher complexity, hence prepares could still have a low level of familiarity with the new standard and find difficulties in implementing it.

Moreover, IFRS 15 requires higher professional judgment. As such, the financial transparency over the truthfulness of accounting numbers in FY 2018 is still questionable from a practical point of view since the increased areas of significant judgment might also lead to misstatements when applying the new revenue recognition method. Moreover, concern has been expressed particularly on the level of compliance with the new disclosure requirements (FRC, 2018; KPMG, 2019), making information disseminated on annual reports not as useful as expected. It is probable that the efficiency and 'real' effects of IFRS 15 will be more noticeable and dominant in the following years, as prepares develop a deeper understanding of it.

Table 5: Value Relevance of Financial Statements Using Price (Levels) Specification

| | Coefficients | | Adj. R ² |
|-----------------------------|----------------------|----------------------|---------------------|
| | Equity | Earnings | |
| <i><u>Annually</u></i> | | | |
| <i><u>Combined</u></i> | | | |
| pre-IFRS 15 | 0.575** (2.35) | 11.117*** (6.68) | 0.84 |
| post- IFRS 15 | 0.390* (1.81) | 12.931*** (8.23) | 0.85 |
| Difference | 0.185 | -1.82 | -0.01 |
| <i><u>Equity-Only</u></i> | | | |
| pre-IFRS 15 | 1.943*** (11.71) | | 0.70 |
| post- IFRS 15 | 1.793*** (9.93) | | 0.62 |
| Difference | 0.15 | | 0.08 |
| <i><u>Earnings-Only</u></i> | | | |
| pre-IFRS 15 | | 15.055*** (19.33) | 0.86 |
| post- IFRS 15 | | 15.689*** (18.62) | 0.85 |
| Difference | | -0.634 | 0.01 |
| <i><u>Quarterly</u></i> | | | |
| <i><u>Combined</u></i> | | | |
| pre-IFRS 15 | 1.013*** (13.27) | 29.402*** (12.77) | 0.77 |
| post- IFRS 15 | 0.927*** (12.48) | 33.446*** (13.61) | 0.73 |
| Difference | 0,086 | -4,044 | 0.04 |
| <i><u>Equity-Only</u></i> | | | |
| pre-IFRS 15 | 1.816*** (48.28) | | 0.73 |
| post- IFRS 15 | 1.753*** (44.08) | | |
| Difference | 0.063 | | |
| <i><u>Earnings-Only</u></i> | | | |
| pre-IFRS 15 | 53.428*** (43.06) | | 0,69 |
| post- IFRS 15 | 56.745*** (41.01) | | 0.72 |
| Difference | -3.317 | | -0,03 |

Notes: In this table, the price (levels) specification is used to generate adjusted R-square for Equations (1) and (2). Then, a comparison between explanatory power for prices of financial statements's information pre and after IFRS 15 implementation, is reported. Young's (1989) Z-statistic are employed to test the significance of the difference to test whether the difference between the Adj. R-sq on models before and under IFRS 15. To examine whether each coefficients is significantly different from 0, t-statistics are used. Whereas the magnitude of the difference between the coefficients of the combined model pre and under IFRS 15, as well as on the equity and earnings-only models are significantly different from 1, F-statistics are used. The sample includes 64 firms over 2017-2018. Industry fixed effects are included. Variables are winsorized at 5 % high only. Statistical significance (two-tailed) is indicated at * $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$. See Appendix B for variable definitions.

4.3.2 Second Hypothesis Results

In table 6, the results of the multivariate cross-sectional to test investor's perception on adoption of IFRS 15, are reported on annually basis for 424 firms on a three-day event window. The regression is tested on each individual year to examine investor's response to every past annual earnings announcement, but also on aggregate level over 2018-2021.

For year 2018, the coefficient of interest is quite small, but positive and highly significant at 1% significance level (0.0001), indicating that a 10% increase in unexpected earnings, would generate an increase of 0.01% in cumulative abnormal return. Even though this result is statistically significant, it is important to determine whether this effect has some important implications economically. The magnitude of the proposed findings is relatively small, hence the economic significance of this result is not noteworthy especially for large companies. However, it can still be of a little importance for smaller-sized firms. With respect to other variables, only ROA has a significant (at 5% significance level) and positive effect on the cumulative abnormal return. For year 2019, the coefficient of interest is negative (-0.002) but insignificant. This can probably be an indication of skepticism towards IFRS 15, as many firms did not fully understand how to apply IFRS 15 properly, neither comply fully with the IFRS 15 additional requirements. Additionally, increased professional judgment perceived arising from the new standard, can also be perceived, as more room to errors and misstatements. Nevertheless, as the coefficient is not significant, no important economic effect can be concluded. Other variables' coefficients are not significant besides LEV at 10% significance level (-0.022) which suggest that an increase of 1% on leverage ratio, would lead to 2% decrease on cumulative abnormal return. This result is logical and confirming to prior research.

In regards to year 2020, the results indicate again a positive market response to unexpected earnings. The coefficient in unexpected return resembles the one in year 2018, significant at 10% and quite small. Other variables such as LTA, MB, and ROA are also significant, indicating influence on abnormal returns in directions in line with prior research. Generally, it seems like investors have instilled again the perceptions that financial statements treated under IFRS 15 are of a higher quality and more useful for investors' decisions. On FY 2021, the earnings coefficient response is spotted. The coefficient is positive (0.007) and significant at 10% level, suggesting that for 10% increase on earnings, the abnormal returns would increase by 7%. The result is economically significant as the result is probable to happen in normal market condition, but also has a real impact on firm's returns. Interestingly, the investors' response on earnings under IFRS 15 has been positive in the last two years, regardless of the impact of Coronavirus outbreak. Lastly, the coefficient of interest for the aggregate result over 4 years period of time, is significant at 10% level of significance and positive (0.002). This means that a 10 % increase in the unexpected earnings leads to an increase of 0.2% in cumulative abnormal return. The result is statistically and economically significant since a 10% in unexpected earnings is quite doable to happen. Based on the latter, it is suggested that implementation of IFRS 15 have increased investors' perceptions of financial reporting quality. Caveats were raised earlier on the suitability of the market adjustment used (see note 30). The results are mostly all significant using this market index adjustments. However, the selection of a more appropriate market adjustment would lead to even better and more significant results.

To conclude, based on the results above, in year 2018 investors deemed the first-time application of IFRS 15 as a positive development. This is in line with prior research, suggesting that investors would react positive to changes in accounting standards that result in higher quality of financial reporting and transparency (e.g., Leuz and Verrecchia, 2000; Barth et al. 2008). In addition, prior literature has found robust evidence that investors react positively to accounting standards alike IFRS 15 that promote convergence benefits (e.g., increased comparability, reduced agency costs, less errors in analyst forecasts etc) (Barth et al. 1999; Armstrong et al. 2010; Joos and Leung, 2012). Then, in 2019, earnings response decreased probably due to unfamiliarity with the new standards and skepticism, yet insignificant. Nonetheless, over 2020-2021, the earnings response coefficient recovers at a higher speed and magnitude. The latter suggest that investors' confidence in earnings under IFRS 15 is instilled to be meaningful as

the new standard gets better embedded into corporate reporting. Hence, capital markets tend to rely more on earnings after IFRS 15- implementation as earnings information is perceived as more faithful to reality.

Table 6: Investors's Perceptions over IFRS 15 captured by ERC

| | 2018 | 2019 | 2020 | 2021 | Aggregate |
|---------------------|---------------------|-------------------|---------------------|-------------------|-------------------|
| UE | 0.0001*** (3.78) | -0.002 (0.44) | 0.0002* (1.94) | 0.007** (2.09) | 0.0022* (1.73) |
| MB | -0.017 (1.50) | -0.013 (1.62) | -0.019*** (2.79) | -0.014 (1.63) | -0.003 (0.90) |
| LTA | 0.001 (0.37) | -0.002 (1.36) | 0.002* (1.82) | 0.001 (0.24) | 0.000 (0.03) |
| LEV | -0.018 (1.06) | -0.022* (1.68) | -0.004 (0.38) | -0.013 (0.77) | -0.006 (1.19) |
| ROA | 0.106** (2.57) | 0.012 (0.40) | 0.057** (2.21) | 0.001 (0.02) | 0.000 (0.03) |
| BIG4 | 0.001 (0.12) | 0.000 (0.02) | 0.010 (1.45) | 0.001 (0.19) | 0.001 (0.36) |
| Industry FX | Included | Included | Included | Included | Included |
| Year FX | No | No | No | No | Included |
| N | 337 | 337 | 337 | 337 | 1348 |
| Adj. R ² | 0.17 | 0.28 | 0.18 | 0.29 | 0.11 |

Notes: This table reports the regression results for the investor's perception on IFRS 15 implementation over 2018-2021. The results are reported for each individual year, as well as on aggregate for the whole period under investigation. Several control variables are included to control for differences on ERCs (coefficient on UE) (see e.g., Kormendi and Lipe, 1987; Nichols and Whalen, 2004). Industry fixed effects are included on each year and on aggregate over the whole timeframe, whereas year fixed effects are included on the aggregate level only. The following variables are winsorized at 10%: MB and UE, whereas ROA and LEV are winsorized at 1% and 5% respectively. Statistical significance (two-tailed) is indicated at * $p < 0.1$, ** at $p < 0.05$, and *** at $p < 0.01$. See Appendix B for variable definitions.

V. CONCLUSIONS

Over the last decade, researchers and standard-setters have expressed concerns over three main topics: the eroded value-relevance of financial information, the inconsistencies and weakness found in the application of the prior revenue standards, and consequently the revenue recognition problems being one of the main reasons of recurring accounting scandals. Interestingly, the common denominator for the above topics has recently been the newly issued accounting standard for revenue recognition, IFRS 15. IFRS 15 is the first converged model for revenue recognition proposed by IASB and FASB in an effort to increase the reliability and relevance of accounting information and allow investors to make informative economic decisions. The regulators claim that IFRS 15 has eliminated the weaknesses in prior standards, by establishing a comprehensive five step framework to assist prepares in recognizing and disclosing revenue. Nevertheless, the new standard is costly and its application requires higher professional judgment.

Hence, the purpose of this study is test the efficiency and usefulness of IFRS 15, at least form a practical perspective. The aim of the study is concentrated around two questions: first, whether the application of IFRS 15 has indeed increased the usefulness of accounting information for equity investors, and secondly whether restatement of financial figures due to IFRS 15 adoption, and IFRS 15 adoption in general is perceived as positive in capital markets. The first question linked to the first hypothesis, is tested by comparing the value relevance of firms' financial statements pre and after adoption of IFRS 15 over 2017-2018. FY 2017 is the unique year where financial figures are reported both under IFRS 15 (as

republished figures on FY 2018's annual reports) and prior revenue standards (FY 2017's annual reports). The results of testing the first hypothesis, provide a slight indication but not sufficient evidence that the implementation of IFRS 15 improves the decision-usefulness of financial reporting for both samples and frequency of data (annually and quarterly). Also, the results reveal that earnings under IFRS 15, are more associated to price movements as the coefficient of earnings both on the combined and on the earnings-only model are statistically higher post- IFRS 15. With respect to the second hypothesis, results reveal that the implementation of IFRS 15 is perceived as a positive development from investors, who react positively to the earnings surprises after IFRS15-implementation. The results are similar when testing for investors' perceptions on each individual year over 2018-2021, and on aggregate for the whole period. The results are robust when considering raw returns, a longer event window and binary measures. Especially, when performing the test under the five-day event window to control for delayed market response, the Earnings Response Coefficient is larger and more significant.

From both parts of the analysis it can be concluded that implementation of IFRS 15 has led to a greater reliance on a firm's financial reporting, as investors believe that IFRS 15 brings higher transparency and consistency, by positively reacting on earnings under the new standard. Nonetheless, the findings of this paper should be interpreted carefully due to limited indicative power of Adj. R^2 and other limitations discussed on section 6 below.

This study makes several prominent contributions. It first examines the novelty of IFRS 15 and sheds light on its importance for financial reporting, contributing in this way to the existing literature on value-relevance and literature on economic consequences of IFRS adoption (e.g., Barth et al. 2008; Armstrong et al., 2010). Moreover, it also contributes to the limited literature on the economic consequences of changes on accounting regulations and provides evidence that convergence is important to investors. Subsequently, the findings of this study add insights to the practical debate over the role of financial reporting regulated by standard-setters to calibrate the value relevance of accounting numbers after the proposed amendments. As such, this study should be seen as a general evaluation to inform the standard-setters whether their preliminary beliefs that new amendments introduced in IFRS 15 are indeed fruitful to their deliberations. The implications of this paper are also pertinent for practitioners, auditors and accountants. Lastly, the result of this study provide insights into the importance of stringent revenue recognition methods on financial reporting quality- a subject that has received academic and regulatory attention, but has been not yet examined empirically. The outcomes of the current study can be used as basis to explore a wide range of other potential effects.

VI. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

In this section, certain limitations inherent in this research are acknowledged and other areas for future research are suggested. The first limitation is the sole existence of limited literature available on IFRS 15. The majority of extant research is qualitative and display severe limitations pertaining to the research design, timeframes, sample selection and data used. Therefore, the current study cannot explicitly infer on these investigations. Secondly, this paper relies heavily on the assumption of efficient markets (EMH) of the countries included in the sample selection, which ensures that information related to IFRS 15 adoption will be unbiasedly reflected in security prices. Hence, this permits for a relatively short-window choice of three days: one day before controls for any leak of information, and one day after awaits the late response. Even though the size and liquidity of the European capital market suggest that this is a plausible assumption, there is a possible variation among markets, indicating that a country's equity market might be insufficiently efficient. Thus, in these circumstances, the results of this study might be biased (e.g., Hirshleifer, 2001). Moreover, data used in the first two regressions is manually collected, hence it is prone to human error. Another issue of concern is using stock price performance as proxy for market reaction and as a benchmark to compare the usefulness of earnings and book values (e.g., Ball and Brown, 1968, Dechow, 1994). However, stock price performance would be an inappropriate benchmark, if share prices deviate from fundamentals and do not efficiently reflect the accounting information. Broadly speaking, it is challenging to come up with other proxies for it (Dechow, 1994).

Further limitation is derived from the choice of conducting a value-relevance study. Holthausen & Watts (2001) state that value-relevance research offers modest or no valuable insight for standard-setting simply because the literature uses equity valuation tests and equity investors are not the only intended users of financial statements. Nevertheless, Barth, Beaver and Landsman (2001) findings differ from the afore-mentioned criticism arguing that this type of research is still relevant to the standard-setting and that the other uses of financial statements are by no mean diminishing the importance of value relevance research. Endogeneity concerns are also raised when selecting an appropriate market adjustment for the cumulative abnormal returns. Regardless of the fact that the adjustment can be an EU or non-EU index, it would still not remove the impact of news unrelated to IFRS 15 and specific to Europe. Moreover, this paper regards the changes on the value-relevance of accounting information due to IFRS adoption as a whole, thus it does not control for country-specific characteristics. Therefore, the findings do not generalize that companies in the sample have the same reporting quality. The level of adherence to the new regulation requirements can differ substantially among countries, industries and companies and a change in the Adj. R^2 can be a reflection of these differences, rather a change on the value relevance (Barth et al. 2012). Hence, an interesting area for future research could be an investigation of firms' disclosures to explore the level of compliance with the new requirements of IFRS 15 while controlling for institutional background of the countries under examination. Additionally, since the aim of IFRS 15 is to achieve higher comparability, a study on whether the changes in the value relevance after IFRS 15 adoption is consistent or not across different countries could be an indicator of overall convergence benefits. Also, it would be better to use US-based firms instead of EU firms, since data can be irregular.

Lastly, a replication study based on Dechow, 1994 and Denelson et al., 2011 papers, to revisit their findings, would be an added value to the existing body of the literature on the diminish in the value relevance of earnings. Specifically, given the new institutional background, one can study the components of earnings (accruals and cash flows) on a sample of firms that contract more in terms of earnings (sale), to observe whether now, cash flows are a better contributor to the earnings' ability to measure firm's performance. This could be possible since the problems of timing and matching are supposed to be less severe under the new requirements of IFRS 15. A role for accruals can still be found, if the adoption to IFRS 15 permits less opportunistic manipulation of earnings. Another suggestion, would be research on whether implementation of IFRS 15 results in real effects. Concretely, in line with Imhoff and Thomas (1998) paper, one can investigate whether firms decided to renegotiate the terms of the existing contracts to avoid negative consequences.

APPENDIX A

For completeness and comparison purposes several additional analyses are executed over 2018-2021 only aggregate level for brevity reasons. Table 7, reports the results of the following tests. First, the three-day raw returns for the STOXX600 index regressed on unexpected earnings are tested similar as in Equation 3 (AR1). This analysis serve as a test to evaluate the representativeness of the sample. Furthermore, various confounding factors were included in the regression model (equation 3) to control for differences in ERCs, and to improve the specification of the regression. Nevertheless, issues might arise if the explanatory variables are erroneously measured, and the error is correlated with the unexpected earnings. The latter would indicate that the estimated Earnings Response Coefficient is biased. Hence, to control for possible nonlinearity issues due to inclusion of control variables that are of large measures such as MB (Market-to Book Value) and LTA (log of Total Assets), an additional testing is performed, using binary measures for LTA and MB for the three-day window (CAR2). As a result, LTA and MB have a value of 1, when the measures are higher than the median, and a value of 0 otherwise.

Table 7: Investors's Perceptions over IFRS 15 captured by ERC

| | CAR2 | CAR3 | CAR4 | AR1 | AR2 |
|---------------------|------------------|--------------------|--------------------|------------------|--------------------|
| | Binary | 5-days | Binary | 3-days | 5-days |
| UE | 0.002* (1.72) | 0.006* (2.61) | 0.006*** (2.74) | 0.002* (1.73) | 0.005* (2.60) |
| MB | -0.001 (0.51) | -0.005 (1.03) | -0.003 (1.21) | -0.003 (0.90) | -0.005 (1.02) |
| LTA | 0.001 (0.31) | 0.000 (0.47) | 0.001 (0.29) | 0.002* (0.03) | 0.001 (0.44) |
| LEV | -0.005 (1.05) | -0.008 (1.07) | -0.006 (0.89) | -0.006 (1.20) | -0.008 (1.07) |
| ROA | 0.007 (0.59) | 0.046*** (2.63) | 0.050*** (2.90) | 0.002 (0.03) | 0.043*** (2.63) |
| BIG4 | 0.001 (0.24) | 0.004 (1.17) | 0.004 (1.20) | 0.010 (0.36) | 0.004 (1.17) |
| Industry FX | Included | Included | Included | Included | Included |
| Year FX | Included | Included | Included | Included | Included |
| N | 1348 | 1348 | 1348 | 1348 | 1348 |
| Adj. R ² | 0.13 | 0.19 | 0.11 | 0.13 | 0.19 |

Notes: This table reports the regression results for the investor's perception on IFRS 15 implementation over 2018-2021. The results are reported on aggregate level for the following: (1) when taking raw returns for the three-day event window (AR1); (2) when taking raw returns for the five-day event window (AR2); (3) when including binary measures for MB and LTA for the three-day window (CAR2); (4) when testing stock returns adjusted by market returns for a five-day event window (CAR3); and (5) when including binary measures for MB and LTA for the five-day window (CAR 4). Same control variables are included as in Equation 3. Industry and year fixed effects are included. The following variables are winsorized at 10% :MB and UE, whereas ROA at 1% and LEV at 5%. Statistical significance (two-tailed) is indicated at $p < 0.1^*$, at $** p < 0.05$, and $***$ at $p < 0.01$. See Appendix B for variable definitions.

In addition, to examine whether the short window of three day affects the results and leads to biased implications considering the fact that market reaction might not be complete (i.e., post-earnings announcement drift, when investors do not respond immediately), the same multiple regression as shown on Equation 3, is reperformed using a five-days event window (4):

$$CAR_{ij} = \sum_{tmin}^{tmax} AR_j = \sum_{tmin}^{tmax} (RET_{jt} - DJ_STOXX\ 1800_t) \quad (4)$$

where AR stands for Abnormal Return (Earnings Surprise), RET_{jt} is the daily individual stock return of firm j on day t , $DJ_STOXX\ 1800$ is the market index return on the specific day t over the event window $[-2, +2]$, and CAR_{ij} is the Cumulative Abnormal Return of each firm j on the event date on the first date ($tmin$) and the last date ($tmax$) of the new event window (CAR_3). Similarly, the raw returns for the STOXX600 index regressed on unexpected earnings (CAR_4), and inclusion of the binary measures on the five-day window (CAR_5) are also tested. The results for the raw returns (AR_1), as shown in Table 7, do not differ substantially neither in magnitude or direction from the results of returns adjusted by the market index in both three and five-days event window. Even though the results indicate that the market reaction towards implementation of IFRS 15 is overall positive, this result should be treated with cautiousness and not be claimed as an evidence. It is of high importance that stock returns are adjusted by the market return to control the for the influence of confounding events, and especially for the volatility of the markets during 2020-2021 linked to Corona outbreak. Moreover, the results obtained when including binary measures for LTA and MB on the three-day regression model, are also similar to the results derived before, either when taking normal returns, also when not considering binary measures. The coefficient on earnings surprise is still positive and significant (0.002) at 10%, indicating that the results obtained earlier are robust, and do not suffer from nonlinearity issues. The results pertaining to the five-day event window offer interesting insights. The coefficient of interest (ERC) is higher (0.006 vs 0.0020) and more significant (at 1%) than the coefficient obtained before using the three-day event window. This means that for a 10% increase in unexpected earnings, the cumulative abnormal returns would increase by 6%. The result is of a higher economic significance as well, since the magnitude of change in CAR is bigger. Additionally, the results obtained from raw returns and binary measures in the five-event window, do not indicate high discrepancies, from the results of return adjusted by the market and including non-binary measures.

To conclude, based on the results obtained from additional analyses, the investor's perception on the implementation of IFRS 15 is positive, suggesting that investors believe that the quality of financial reporting improved over years due to IFRS 15 application. This view is more predominant when considering the five-day window, which controls for later response.

APPENDIX B
Summary of Variable Definitions

| Variable | Definition |
|-----------------------------------|---|
| <i>AR</i> | = the abnormal returns calculated as the residual between the daily individual stock return of firm <i>j</i> on day <i>t</i> (<i>RET</i>), and the market return DJ_STOXX 1800 on day <i>t</i> over the [-1, +1] window. |
| <i>DJ_STOXX 1800_t</i> | = the market index return on day <i>t</i> over the [-1, +1] window. |
| <i>BVEQ_{pre-IFRS15}</i> | = the firm's book value of equity per share (divided by the firm's total shares outstanding) before the adoption of IFRS 15. |
| <i>BVEQ_{post-IFRS15}</i> | = the firm's book value of equity per share (divided by the firm's total shares outstanding) after the adoption of IFRS 15. |
| <i>Big4</i> | = a dummy variable which equals 1 if the firm is being audited by one of the BIG4 firms, or it equals 0 if the firm is being audited by a non-Big 4 firm. |
| <i>EARN_{pre-IFRS15}</i> | = the firm's net income before extraordinary items only attributable to shareholders (excluding the non-controlling interest) per share (divided by the firm's total shares outstanding) before the adoption of IFRS 15. |
| <i>EARN_{post-IFRS15}</i> | = the firm's net income before extraordinary items only attributable to shareholders (excluding the non-controlling interest) per share (divided by the firm's total shares outstanding) after the adoption of IFRS 15, which are manually extracted. |
| <i>CAR_{ij}</i> | = the Cumulative Abnormal Return of each firm <i>j</i> on the event date calculated as the sum of all the Abnormal Returns of each firm around the event window (-1, +1) |
| <i>LEV</i> | = The leverage ratio measured as the total liabilities by total assets for each individual firm. |
| <i>LTA</i> | = the natural logarithm of the firm's total assets at the end of the fiscal year. |
| <i>MB</i> | = the ratio of the Market-to-Book value of equity at the beginning of each year for each firm. |
| <i>P_{it}</i> | = the security price of firm <i>i</i> two months after fiscal year end <i>t</i> . |
| <i>ROA</i> | = the return on assets measured as the ratio of the ratio of firm's earnings and total assets. |
| <i>UE_{jt}</i> | = the Unexpected Earnings calculated as residual between the actual reported earnings, and the expected earnings (prior year earnings), scaled by the fiscal-year end stock price. |
| <i>RET_{jt}</i> | = is the daily individual stock return of firm <i>j</i> on day <i>t</i> . |
| <i>Industry</i> | = Industry fixed effects to control differences in operational risk and performance across various type of industry. |
| <i>Year</i> | = Year fixed effects to control for uncommon changes in all countries in year <i>t</i> . |

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