



Have IFRS Contributed to an Increased Value-Relevance?

THE SCANDINAVIAN EVIDENCE

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ABSTRACT

This paper examines the value-relevance of Scandinavian earnings information and book values over the past decade in order to shed some light on whether the extensive global adoption of IFRS/IAS has contributed to an increased accounting quality in terms of economic decision-usefulness to equity investors. We address this research question using a sample of 4.310 firm-year observations for 431 exchange-listed companies at NASDAQ OMX Nordic and Oslo Stock Exchange between 2001 and 2010. The degree of value-relevance in our firm-sample is operationalized through two price regressions and one return regression and empirically tested via the statistical association between capitalized values of equity or annual changes in capitalized values of equity and the study's three explanatory accounting variables: (i) book values, (ii) accrual-based earnings and (iii) cash-flow-based earnings. Taken as a whole, our results show significant empirical signs of an increased value-relevance in both Scandinavian earnings information and book values, allowing us to draw significant as well as contributing conclusions on the information content of financial statement information disclosed in the Scandinavian region. We believe our study adds empirical substance to practical debates over the function of financial reporting as well as resourceful material to both Scandinavian investors and to the ongoing international discussion on the harmonization of financial reporting standards.

Keywords · *Accruals, Book Values, Cash Flows, Earnings, FASB, IASB, IFRS, Value-Relevance*

I. INTRODUCTION

THE OBJECTIVE OF THIS STUDY is to examine the value-relevance of earnings information and book values over the past decade in order to shed some light on whether the extensive global adoption of International Financial Reporting Standards and its predecessor set of standards, International Accounting Standards, henceforth IFRS¹ and IAS² respectively, has contributed to an increased accounting quality in terms of economic decision-usefulness to equity investors. Our inquiry is motivated by the recent practical concern of an eroded economic relevance of publicly reported accounting information. Particular concern among practitioners such as corporate accountants, auditors and financial analysts (e.g., Jenkins, 1994 and Elliott, 1995) and academics (e.g., Francis and

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1 The European parliament and the council of the European Union made it via regulation number 1606/2002 mandatory for all publicly traded companies within the European Union and the European Economic Area to prepare their consolidated financial statements in accordance with International Financial Reporting Standards no later than 1 January 2005.

2 The main difference between IAS's and IFRS's is that the former were issued by the International Accounting Standards Committee, IASC, between 1973 and 2001, while the latter were issued by the International Accounting Standards Board, IASB, from 2001 and onwards. Both types are included in the regulatory accounting framework that surrounds IFRS-reporting.

Schipper, 1999 and Lev and Zarowin, 1999) has been directed towards the declined decision-usefulness of earnings information, especially towards bottom line amounts based on accruals and cash flows.³

We address this research question on the basis of Scandinavian data using a sample of 4,310 firm-year observations for 431 exchange-listed companies at NASDAQ OMX Nordic⁴ and Oslo Stock Exchange between 2001 and 2010. The choice of the Scandinavian region, where we, in addition to the three genuine Scandinavian countries – Denmark, Norway and Sweden – also include Finland, is motivated for several reasons. The main rationale stems from the fact that the Scandinavian region, due to its investor-oriented accounting philosophy, strong legal enforcement and relatively stable external surroundings, today and in turbulent times such as these, represents an established and secure and thus attractive investment environment appealing to investors from all over the globe.⁵

The attraction of the Scandinavian market is particularly evident when looking at the increasing rate of publicly listed companies owned by foreign investors. Denmark, Finland, Norway and Sweden have all seen the proportion of foreign non-Scandinavian ownership increase from a level of around 1.00-5.00 percent to a level of around 20.00-40.00 percent since the early 1990s (Statistics Denmark, 2012; Statistics Finland, 2012; Statistics Norway, 2012 and Statistics Sweden, 2012). Sweden, as an example, saw the proportion of non-Scandinavian ownership increase from a level of 1.70 percent⁶ to a level of 23.10 percent⁷ between 1990 and 2010. This number corresponds to an average yearly increase in non-Scandinavian ownership of about 13.90 percent⁸ over the past two decades. Similar increases have occurred also in Denmark, Finland and Norway, leading to an increased need among investors also outside the Scandinavian region to obtain knowledge about the informational content in Scandinavian earnings information and book values.

The degree of value-relevance in our firm sample is operationalized through two price regressions and one return regression and empirically tested via the statistical association between capitalized values of equity or annual changes in capitalized values of equity⁹ and the study's three independent explanatory accounting variables: (i) book values, (ii) an accrual component of earnings, and (iii) a cash-flow component of earnings. To maintain comparability across tables and graphs and thus the possibility to triangulate our results, all tests are based on the same broad set of exchange-listed firms. And, in order to mitigate the possibility of incorrect inferences associated with scale-related effects such as size differences across firms and extreme values in the firm sample, panel data regressions are conducted in all the three regression models.

The results from our empirical tests show that both Scandinavian earnings information, accrual-based as well as cash-flow-based, and book values are positively associated, albeit, to varying degrees, with capitalized equity values as well as with annual changes in capitalized equity values.

3 Section II and Section III discusses the concern and its implications in greater detail.

4 Firm-year observations for exchange-listed companies at NASDAQ OMX Nordic include observations from companies listed on NASDAQ OMX Copenhagen, NASDAQ OMX Helsinki and NASDAQ OMX Stockholm.

5 An investor-oriented accounting philosophy combined with a strong legal enforcement and relatively stable external surroundings is in itself no guarantee for a good investment, but are often cited as important characteristics for an attractive investment environment; see, e.g., La Porta, Lopez-de-Silanes, Schleifer and Vishny (2002), La Porta, Lopez-de-Silanes and Schleifer (2006) and Holthausen (2009).

6 The proportion of non-Scandinavian ownership of publicly listed companies in Sweden in 1990 is calculated by subtracting the proportion of Scandinavian ownership (Denmark, Finland and Norway) from the total proportion of foreign ownership: Year 1990 = 7.70 – (1.90 + 2.60 + 1.50) = 1.70 percent. Statistics Sweden, 2012.

7 The proportion of non-Scandinavian ownership of publicly listed companies in Sweden in 2010 is calculated by subtracting the proportion of Scandinavian ownership (Denmark, Finland and Norway) from the total proportion of foreign ownership: Year 2010 = 37.80 – (2.80 + 9.50 + 2.40) = 23.10 percent. Statistics Sweden, 2012.

8 The average yearly increase in foreign non-Scandinavian ownership of publicly listed companies in Sweden between 1990 and 2010 is calculated by dividing the proportion of non-Scandinavian ownership for year 2010 with the proportion for year 1990. Thereafter, the result is unsquared and divided by the number of years: $[(23.10/1.70) = 13.58823529 \wedge (1/20)] = 1.139352614 - 1 = 0.139352614 \times 100 = 13.9352614 \approx 13.90$ percent.

9 Throughout the paper we use capitalized values of equity, market values of equity and capitalized equity value interchangeably.

These results are broadly consistent with previous value-relevance related research, originating from the seminal discoveries of Ball and Brown (1968) and Beaver (1968). The results are also, at least to some extent, in line with our predictions of the modern utilitarian role of publicly reported accounting information in the Scandinavian region. However, unlike previous value-relevance related research, particularly empirical research carried out on accounting data between the early 1990s and the beginning of the twenty first century, our results show a relatively strong explanatory power, regardless of the regression used. These results in combination with the statistical strength allow us to draw both significant and contributing conclusions with regards to publicly reported accounting information, disclosed in Scandinavian financial statements.

We believe that the results in this study are particularly pertinent to accounting standard-setting bodies such as the International Accounting Standards Board and the Financial Accounting Standards Board, henceforth IASB and FASB respectively, since it, to some extent, penetrates the relatively unresolved question of whether or not the current IFRS-based regulatory framework has been fruitful in terms of an increased economic decision-usefulness of Scandinavian financial statement information. Our conclusions also provide equity investors with both resourceful material and valuable insights on the relevance and the reliability of Scandinavian accounting numbers. We also believe that our study might be useful in regions other than the Scandinavian, especially in countries where directives from the European Union are compulsory to follow and where the accounting philosophy is the same. The study might also be of value to regions outside the European Union with an investment environment similar to the Scandinavian and where IFRS-reporting recently have been or will be adopted.

Outline

The remainder of the paper is organized as follows. Section II presents the background of the study where we highlight the primary objective of general purpose financial reporting and discuss its utilitarian role in capital markets. In Section III we review and discuss previous research, which, in turn, constitutes the underpinning theoretical ground for our empirical study. First, we present different types of value-relevance related studies, which, in particular, include various ways to operationalize and interpret value-relevance. Thereafter, we draw attention to the most significant empirical findings since the seminal discoveries of Ball and Brown (1968) and Beaver (1968). Ultimately, we sum up by formalizing our predictions for this study. In Section IV we present our methodological approach. Section V presents data and descriptive statistics and in Section VI we interpret, discuss and analyze our empirical results. Section VII finally summarizes the study and we reveal our conclusions and provide some suggestions for further research.

II. BACKGROUND

Economic decision-usefulness is typically viewed as one of the most important attributes of publicly reported accounting information, particularly among users such as equity investors, lenders and other capital providers (Francis, LaFond, Olsson and Schipper, 2004). The attribute of economic decision-usefulness is therefore – by accounting standard-setting organizations such as the IASB and the FASB – also recognized as a fundamentally significant qualitative characteristic in the pursuit of high accounting quality¹⁰ in corporate reports and financial statements. The importance of economic

¹⁰ Neither the IASB nor the FASB specify the term accounting quality. Instead, they enumerate properties such as relevance, faithful representation, comparability, verifiability, timeliness and completeness that will lead to a high accounting quality among publicly reported accounting information. In this paper, we defined accounting quality in terms of economic decision-usefulness, which we, in turn, test via the statistical association between capitalized equity values or annual changes in capitalized equity values and (i) book value, (ii) accrual-based earnings, and (iii) cash-flow-based earnings.

decision-usefulness is especially evident when looking at the primary objective of general purpose financial reporting as stated in the conceptual framework:¹¹

The objective of general purpose financial reporting is to provide financial information about the reporting entity that is *useful* to existing and potential investors, lenders and other creditors in making *decisions* about providing resources to the entity. Those decisions involve buying, selling or holding equity and debt instruments, and providing or settling loans and other forms of credit. IASB, 2010 and FASB, 2010.

If publicly reported accounting information is to be considered as useful for economic-decision making, it must be both relevant and faithfully represent what it purports to represent in the financial reports (IASB, 2010 and FASB, 2010). The conceptual framework for financial reporting define *relevant* accounting information as information capable of making a difference in the decisions made by users¹² and *faithful* accounting information as information that is *complete, neutral and free from error*, typically referred to as *reliable* accounting information in value-relevance related research; see, e.g., Barth, Beaver and Landsman (2001) and Holthausen and Watts (2001).

This means, in a more general sense, that publicly reported accounting information, disclosed in annual as well as in quarterly corporate reports and financial statements, is set out to serve the public interest by functioning as a corporate blueprint of the financial health so that its users can assess aspects associated with corporate growth, profitability and risk¹³ in order to make smart and informative economic decisions. Accordingly, financial reporting does not only constitute an important source of information when assessing the performance of firms, but also a valuable and critical cornerstone set out the meet the society's need for an effective as well as an efficient capital resource allocation. In the following subsection, we therefore reflect upon the critical role of financial reporting in capital markets.

The Role of Financial Reporting in Capital Markets

A critical challenge for any economy is to assign available financial resources in an economically efficient manner (Healy and Palepu, 2001). Much of this challenge stems from difficulties in overcoming the problem with the information asymmetry that exist between companies and potential capital investors and with the incentive issue that arise between the producer of accounting information and the user of accounting information once an investment has been placed; see, Akerlof (1970) and Jensen and Meckling (1976). Frequently discussed along these two dilemmas is the lemon problem, which, potentially, can break down the very functioning of the capital market. It works like this:

Consider a situation where half the business ideas are "good" business ideas and where the other half of the business ideas is "bad" business ideas. If investors cannot distinguish between the two types of business ideas, entrepreneurs with "bad" ideas will try to claim that their ideas are as valuable as the "good" ideas. Realizing this possibility, investors value both good and bad ideas at an average level. Unfortunately, this penalizes good ideas, and entrepreneurs with good ideas find the terms on which they can get financing to be unattractive. As these entrepreneurs leave the capital market, the proportion of bad ideas in the market increases. Over time, bad ideas "crowd out" good ideas, and investors lose confidence in this market. Palepu, Healy and Peek, 2010.

Economies that overcome these problems well can exploit new business ideas to spur innovation

11 The conceptual framework for financial reporting is a joint project undertaken by the IASB and the FASB set out to assist the development of future International Financial Reporting Standards and to promote the harmonization of regulations, accounting standards and procedures relating to the presentation of financial statements.

12 Worth noting is that information might be capable of making a difference in a decision even if some users choose not to take advantage of it or are already aware of it from other sources of information; see, e.g., IASB (2010) and FASB (2010).

13 Corporate growth, profitability and risk are typically the three main areas when assessing the performance of firms; see, e.g., Koller, Goedhart and Wessels (2010) and Palepu, Healy and Peek (2010).

and create jobs and wealth at a rapid pace; meanwhile, economies that manage this process poorly dissipate their wealth and fail to support business opportunities (Healy and Palepu, 2001). In overcoming the lemon dilemma and prevent such a capital market breakdown, intermediaries, financial¹⁴ intermediaries as well as information¹⁵ intermediaries, are of great value to capital markets since they help investors and other stakeholders to distinguish between good and bad investment opportunities (Palepu, Healy and Peek, 2010).

Accordingly, financial reporting and other corporate disclosures clearly have high importance for the functioning of capital markets since it to a great extent is the information that investors and other stakeholders adopt and concurrently react upon, and therefore also an important source of information to scrutinize and conduct empirical research on. In the following section, we therefore present the primary purpose of value-relevance related research along some of the most seminal empirical findings related to the objective of this study.

III. PREVIOUS RESEARCH

The primary purpose with empirical tests of value-relevance is to examine whether publicly reported accounting information, disclosed in annual as well as in quarterly corporate reports and financial statements, fulfill its utilitarian role of being useful for economic decision-making (Barth *et al.*, 2001 and Holthausen and Watts, 2001). That is, to investigate whether users such as equity investors, lenders and other capital providers appreciate the information and perceive it as relevant once it has been publicly available in the marketplace.

A significant portion of the value-relevance related research is therefore, either explicitly or implicitly, motivated from an accounting standard-setting point of view, especially vis-à-vis the accounting criteria of *relevance* and *reliability* as specified in the conceptual framework for financial reporting (Holthausen and Watts, 2001; Kothari, 2001 and Francis *et al.*, 2004).

Important to note is that there is no such thing as a standardized one-way-solution on how to assess how well a particular accounting amount reflects information used by investors. However, in general, it is measured as the ability of earnings information and book values to explain market values of equity and/or changes in market values of equity (Barth *et al.*, 2001; Holthausen and Watts, 2001 and Beaver, 2002). A typical value-relevance study therefore examines the relationship between an equity-dependent variable such as security prices and/or security returns¹⁶ with a set of explanatory accounting variables, typically book values in combination with at least one bottom line amount of earnings information based on either accruals or cash flows or both.

In the extant accounting literature, an accounting amount is defined as value-relevant, i.e., able to change investors' assessment of the probability distribution of an entity's future earnings capacity, if it has a *significant* predicted association with an equity-dependent variable such as share prices and/or security returns. Barth *et al.* (2001).

Accordingly, publicly reported accounting information can be viewed as value-relevant if it reflect a *significant* portion of the capitalized equity value or if the information is *significantly* associated

14 Financial intermediaries include institutions and organizations such as venture capital firms, banks, collective investment funds, pension funds and insurance companies.

15 Information intermediaries include institutions and organizations such as auditors, financial analysts, credit rating agencies and the financial press.

16 The key distinction between value-relevance related studies examining price levels, typically referred to as price-level studies, and those examining price changes, typically known as return studies, is that the former are interested in determining what is reflected in the capitalized equity value, whilst the latter are interested in determining what is reflected in changes in the capitalized equity value over a specific period of time (Barth *et al.*, 2001).

with changes in the capitalized equity value.¹⁷ However, significant results of value-relevance, i.e., data indicating that an accounting amount is *relevant* and *reliable*, at least to some degree, are difficult to assign to one or the other attribute (Barth *et al.*, 2001). This, since neither *relevance* nor *reliability* is of dichotomous nature nor does the conceptual framework specify the extent to which *relevance* or *reliability* is sufficient enough to meet IASB's and FASB's criteria of decision-useful information; see, e.g., IASB (2010) and FASB (2010). As a result, regardless of the empirical test used, value-relevance related research is carried out as joint tests of *relevance* and *reliability* and therefore, by researchers, typically seen as a direct operationalization of the decision-usefulness objective as specified in the conceptual framework.

Worth emphasizing is that value-relevance related research to a great extent is premised on the notion of some sort of capital market equilibrium since it assume that a substantial degree of the information content in earnings information and book values is strongly reflected in equity-dependent variables such as security prices, stock returns and/or trading volumes (Barth *et al.*, 2001; Holthausen and Watts, 2001 and Kothari, 2001). Much of the value-relevance related research is therefore based on the underlying assumption of the existence of efficient capital markets¹⁸ and/or on the descriptive validity of an equilibrium model such as the capital asset pricing model, hereafter CAPM¹⁹ for convenience, or any extension of the model (Lev and Ohlson, 1982; Kothari and Zimmerman, 1995; Barth *et al.*, 2001; Holthausen and Watts, 2001 and Kothari, 2001). In the following subsections, we will present some of the most seminal and important empirical findings that relates to the objective of this paper.

*Early Empirical Findings based on Association Studies*²⁰

Ball and Brown's pioneering study from 1968 was the first paper to formalize the positive relationship between security returns and earnings information. That is, they established the fact that movements in common stock *partly* can be explained by the information content in earnings numbers such as by accrual-based net income and cash-flows, as approximated by operating income. The

17 Another approach to operationalize value-relevance is to examine whether there is any abnormal security price volatility and/or abnormal trading volume around the announcement period. This approach originates from Beaver (1968) and Fama, Fischer, Jensen and Roll (1969).

18 The theory of *efficient capital markets* is concerned with whether security prices at any point in time fully reflect all available information and reaches market equilibrium. The assumption of some sort of market equilibrium is, in turn, typically referred to as the efficient market hypothesis, henceforth EMH, which, originally, was developed by Fama in 1965. It is common to distinguish among three versions of the EMH, *viz.*, the weak form, the semi-strong form and the strong form. These versions differ by their notions of what is meant by the term all available information. Specifically, the *weak* form asserts that security prices reflect all information that can be derived by examining market-trading data such as the history of past prices, trading volume and/or short interest, while the *semi-strong* form asserts that stock prices reflect all publicly available information regarding the prospects of an entity, which, in addition to past prices and other technical figures, includes fundamental information such as an entity's product line, quality of management, earnings forecasts and balance sheet composition. The *strong* and final form of the EMH asserts that stock prices reflect all information that is relevant to the firm, including monopolistic information available only to company insiders. These three versions are discussed in great detail in Fama's seminal paper from 1970.

19 The capital asset pricing model, CAPM, or any extension of the model, e.g., the zero-beta model, is a set of predictions with regards to equilibrium expected returns on risky assets, which, to a great extent, rests on the foundation of Harry Markowitz's (1952) modern portfolio theory. The model itself was independently developed by Sharpe (1964), Lintner (1965) and Mossin (1966) and can in general terms be described as a simplified version of investors and their behavior in the marketplace. Specifically, the model assumes that all investors are price-takers, in that they act as though security prices are unaffected by their own trades, and that they are rational and risk-averse and aim to maximize economic utilities. The model also assumes that all investors can lend and borrow unlimited amounts under the risk-free rate of interest, and that they analyze securities in the same way and that all investors share the same economic view the world. Obviously, the model ignore many real world complexities and is therefore constantly subject to criticism; see, e.g., Grossman and Stiglitz (1980), Kandel and Stambaugh (1995), Fama and French (1992), Roll (1977) and Roll and Ross (1994).

20 An association study conducts empirical tests on the relationship between publicly reported accounting information, typically earnings information and/or book values, and security prices and/or returns over relatively long observation windows such as one or several years (Kothari, 2001).

positive relationship between security returns and earnings information has also been confirmed in a number of other different economic settings (see, e.g., Beaver and Dukes, 1972; Beaver, Lambert and Morse, 1980; Lipe, 1986; Rayburn, 1986; Bowen, Burgstahler and Daley, 1987; Collins and Kothari, 1989; Livnat and Zarowin, 1990; Dechow, 1994; Ali and Pope, 1995 and Basu, 1997).

Ball and Brown (1968) also highlight the fact that more prompt media like interim reports and quarterly earnings tend to supersede the information in annual reports and that most of the information contained in annual earnings and book values therefore is anticipated by the market before it is released. In other words, when annual earnings information and balance sheet information is announced the information might already be obsolete. Kothari (2001) share the same view as Ball and Brown (1968) and argues that investors and stakeholders in today's capital markets are utilizing quarterly reports and other more timely information, leading to a scenario where annual reports as a consequence are rendered less useful.

*Early Empirical Findings based on Event Studies*²¹

Ball and Brown (1968) and Beaver (1968) both provide compelling evidence indicating that earnings announcements seem to capture the performance of firms. The key argument in the two pioneering event studies is that there is a substantial empirical association between earnings announcements and security prices. Ball and Brown (1968) find that the market positively (negatively) adopts information with regards to unexpected increased (decreased) earnings, which, leads to an increase (decrease) in security prices. Beaver (1968) examines movements of security prices and trading volume at the time of the earnings announcements. First, and foremost, his argument is that company information is more available, scrutinized and adopted surrounding earnings announcements vis-à-vis periods with no earnings announcements. The findings in Beaver's (1968) study are bracketing the findings in Ball and Brown's (1968) study, forwarding the fact that earnings information positively adheres to the market price of securities. Specifically, in periods where earnings announcements are made, the flow of information increases, and the stock prices are to a great extent reflecting the content and quality of this information.

Accordingly, early event studies find that the flow of information is higher in periods with earnings announcement in contrast to periods with no earnings announcements and that information released by publicly listed companies significantly affects security prices. More recent event studies support the seminal finding of a significant association between earnings announcements and security prices; see, e.g., Landsman and Maydew (2002) and Landsman, Maydew and Thornock (2012).

Decline in Value-Relevance of Publicly Reported Accounting Information

It is apparent from early value-relevance related findings that earnings information as well as book values are positively associated with contemporaneous security returns and reflected in capitalized equity values over time. However, since the early 1990s, concerns have been expressed by academics (e.g., Francis and Schipper, 1999 and Lev and Zarowin, 1999) as well as by accounting practitioners in the financial press (e.g., Rimerman, 1990; Sever and Boisclair, 1990; Elliot, 1994a; Elliot, 1994b, Jenkins, 1994 and Elliott, 1995) that publicly reported accounting information, disclosed in corporate reports and financial statements, has lost a significant portion of its relative economic decision-usefulness to other sources of information available in the market place. In particular, it is claimed that publicly reported accounting information, particularly book values and earnings information

²¹ In an event study, one infers whether an event such as an earnings announcement, CEO resignations and/or profit warnings conveys new and relevant information to market participants such as equity investors as reflected in changes in the level or variability of security prices or trading volume over relatively short observation windows such as a few days or a couple of weeks (Kothari, 2001).

based on accruals and cash-flows, today is less relevant in assessing the fundamental value of high-technology, service-oriented firms, which, by nature are knowledge-intensive:

Early in the century, financial statements represented a large part of the information available to an enterprise's debt and equity investors. As accounting principles improved, the value of financial statements also improved. But, facilitated by information technology, other sources of relevant information are increasingly available; for example, investors can get up-to-the-minute data about companies through public and proprietary databases without waiting for quarterly or annual reports. Moreover, information technology has created new ways for businesses to become more competitive; for example, continuous quality improvement, cycle-time reduction and enhanced vendor and customer relations – effects of which are not reflected in financial statements. Thus, financial statements describe modern companies less well than they described industrial-era companies. Elliott, 1994b.

Hence, the traditional association between publicly reported accounting information and capitalized values of equity have been called into question. Consistent with these claims Brown, Lo and Lys (1999 and 2002), Francis and Schipper (1999), Lev and Zarowin (1999) and Core, Guay and Van Buskirk (2003) find evidence for a decline in the value-relevance of both earnings information and book values. Value-relevance is in these studies mainly tested for through price-level/return regressions, where the adjusted explanatory power of the coefficient of determination (R^2) typically is used as the yardstick of value-relevance. A higher adjusted R^2 is generally taken as evidence of higher value-relevance, which, under normal circumstances, means that the accounting amount with the highest adjusted R^2 is interpreted as most *relevant* and *reliable* to its users. Worth emphasizing is that there also are findings with somewhat contrary indications. For example, Collins, Maydew and Weiss (1997) find no evidence of a decline in the value-relevance of earnings information and book values. In fact, they find evidence for a slight increase in value-relevance, particularly among book values and other balance sheet information.

IFRS Adoption

A growing body of the most recent value-relevance related research examines the implications of the increasingly widespread adoption of IFRS-reporting among stock exchanges and accounting standard-setting bodies all over the globe. Heretofore, the research provides somewhat mixed empirical signals on whether financial statements prepared in accordance with IFRS/IAS exhibit higher accounting quality than financial statements prepared in accordance with other sets of generally accepted accounting principles (Ball, 2006 and Leuz and Wysocki, 2008). Worth repeating is that the European Union did not mandate the use of IFRS-reporting for publicly listed companies until January 2005. As a result, much of the overall impact of IFRS-reporting is therefore yet still to be determined.

Mixed Evidence on Voluntary IFRS Adoption

Barth, Landsman and Lang (2008) analyze changes in the properties of reported earnings around voluntary adoption of IFRS-reporting and find empirical evidence that publicly reported accounting information prepared in accordance with IFRS/IAS generally exhibit less earnings management, more timely loss recognition and higher value-relevance than publicly reported accounting information prepared in accordance with other generally accepted accounting principles. This allows them to conclude that financial statements prepared in accordance with IFRS/IAS generally are associated with higher accounting quality compared to financial statements prepared in accordance with other domestic accounting standards. This conclusion is supported by empirical evidence from a cross-sample comparison between German-based, US-based and IFRS-based generally accepted accounting principles in a study carried out by Bartov, Goldberg and Kim (2005). The view of higher accounting quality in conjunction with voluntary adoption of IFRS-reporting is also the general opinion of

Soderstrom and Sun (2007) and Leuz and Wysocki (2008) in their reviews of empirical studies examining the implications of voluntary IFRS adoption. However, contrary to this view, Hung and Subramanyam (2007) find no evidence for a higher value-relevance associated with voluntary IFRS-reporting and thereby no evidence for a higher accounting quality among financial statements prepared in accordance with IFRS/IAS. Eccer and Healy (2003) find similar results in their cross-sample comparison between accounting amounts based on IFRS/IAS standards and accounting amounts based on Chinese standards.

Overall, the empirical evidence on voluntary IFRS disclosure is somewhat mixed. Possible explanations for this diversity might be due to sample selection biases and/or methodological issues such as omitted variables, lack of robustness and/or problems with deflation among the firm sample; see, e.g., Brown *et al.* (1999 and 2002) and Barth and Clinch (2009). Another possible explanation for the mixed results stem from the many institutional factors that surround each and every industry, country and region. In the following subsection, we therefore discuss some empirical evidence upon the importance of institutional factors.

The Importance of Institutional Factors

Looking at previous research with regards to the IFRS debate, there are, as mentioned above, somewhat mixed empirical evidence, particularly with respect to voluntary IFRS-reporting. This is, as noted above, assumingly, associated with either econometrical issues or with the quality of the legal environment and institutional factors that surrounds each and every industry, country and region. Specifically, institutional factors such as regulatory accounting frameworks and investor protection are immensely important factors for how companies and investors act with regards to financial reporting (Soderstrom and Sun, 2007 and Leuz and Wysocki, 2008). The strength of domestic regulatory bodies is closely connected to the interplay between companies and investors, and will, concurrently, affects what kind of information, and in what way, companies display (in) their financial reports (Ball, Kothari and Robin, 2000 and Leuz, Nanda and Wysocki, 2003). The key argument is that it might be common in some industries, countries, and/or regions to mislead investors and other stakeholders by acting on personal incentives rather than adhering to regulations, which, thus, reduce the overall accounting quality by ignoring the relevance and the reliability of the financial reports.

The issues mentioned in the above are part of what the IASB and the FASB constantly are trying to improve upon. Institutional factors that are of particular concern in previous research and associated with stronger (weaker) reporting quality and thus stronger (weaker) accounting quality are strong (weak) investor protection (see, e.g., La Porta *et al.*, 2002); strong (weak) legal enforcement (see, e.g., Leuz and Wysocki, 2008) and a strong (weak) tax enforcement system (see, e.g., Guenther and Young, 2000 and Haw, Hu, Hwang and Wu, 2004). The content of previous research, with regards to institutional factors, is that a poor institutional quality will excavate the effectiveness of accounting standards, which, as noted above, potentially might disassemble the main objective of accounting standards and thus lead to a decreased accounting quality among financial reports. Accordingly, it is of vital importance to be aware of the external surroundings when conducting value-relevance related research.

Lack of Evidence on Mandatory IFRS Adoption

The European Union mandated, as mentioned in the introduction, the adoption and implementation of IFRS/IAS in January 2005. Much of the overall impact with respect to the mandatory adoption of IFRS-reporting is therefore yet still to be determined, particularly pertaining the accounting quality in terms of economic decision-usefulness among equity investors. However, recently, Landsman, Maydew and Thornock (2012) found that, in countries with mandatory IFRS-

MATRIX I

Value-Relevance Related Studies Examining Earnings Information and Book Values of Equity

AUTHORS AND YEAR	TYPE OF STUDY	DATA	METHODOLOGY	FINDINGS AND CONTRIBUTION
Ball and Brown, 1968	BB conduct a combined association and event study that examines the relative as well as the incremental informational content of earnings information.	The final firm sample includes 261 publicly listed companies. The data is obtained from Compustat, CRSP and The Wall Street Journal between 1957 and 1965.	The degree of information content is operationalized via a return regression that regresses change in firm-specific earnings with change in market-specific earnings. A simple time-series model, building on the somewhat naïve assumption of a random walk, is used as a check of the statistical efficiency of the first model.	The first paper to formalize the relationship between security returns and earnings information. The paper also highlights evidence for the post-earnings-announcement drift, the relative importance of earnings information and on the incremental value of different earnings information.
Beaver, 1968	B conducts an event study that examines the information content of annual earnings announcements.	The final firm sample includes 143 NYSE listed companies. The data is obtained from Compustat and The Wall Street Journal between 1961 and 1965.	The degree of information content in annual earnings announcements is operationalized via both abnormal trading volume and abnormal security price volatility.	The first paper to find significantly strong empirical evidence for value-relevance in earnings information in the week of the announcement.
Collins, Maydew and Weiss, 1997	CMW conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time.	The final firm sample includes 115,154 firm-year observations for NYSE, AMEX and NASDAQ listed companies. The data is obtained from Compustat and CRSP between 1953 and 1993.	The degree of value-relevance in earnings information and book values is operationalized via the valuation framework provided by Ohlson (1995), which expresses price as a linear function of earnings information and book values.	CMW find no empirical evidence for a decline in the value-relevance of earnings information and books values. Contrary, they find evidence for a slight increase in the value-relevance of earnings information and book values – over the sample period: 1953-1993.
Brown, Lo and Lys, 1999	BLL conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time.	The final firm sample includes 112,134 firm-year observations for publicly listed companies. The data is obtained from Compustat and CRSP between 1958 and 1996.	The degree of value-relevance in earnings information and book values is operationalized via both price regressions and return regressions.	BLL find significant empirical evidence for a decline in the value-relevance of both earnings information and book values – over the sample period: 1958-1996.
Francis and Shipper, 1999	FS conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time.	The final firm sample includes between 393 and 1,419 firms per year for NYSE listed companies and between 1,124 and 2,866 firms per year for NASDAQ listed companies. The data is obtained from Compustat and CRSP between 1952 and 1994 for NYSE listed companies and between 1974 and 1994 for NASDAQ listed companies.	The degree of value-relevance in earnings information and book values is operationalized via (i) price regressions and return regressions, and (ii) the total return that could be earned from foreknowledge of publicly reported accounting information.	FS find significant empirical evidence for a decline in the value-relevance of earnings information, and an increase in the value-relevance of balance sheet and book value information over the sample period, i.e., between 1952 and 1994.

MATRIX I (CONTINUED)

Value-Relevance Related Studies Examining Earnings Information and Book Values of Equity

AUTHORS AND YEAR	TYPE OF STUDY	DATA	METHODOLOGY	FINDINGS AND CONTRIBUTION
Lev and Zarowin, 1999	LZ conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time.	The final firm sample includes between 3,700 and 6,800 firms per year for publicly listed companies. The data is obtained from Compustat between 1977 and 1996 and from CRSP between 1963 and 1995.	The degree of value-relevance in earnings information and book values is operationalized via both price regressions and return regressions.	LZ find significant empirical evidence of a decline in the value-relevance of both earnings information and book values – over the sample period: 1963-1996.
Landsman and Maydew, 2002	LM conduct an inter-temporal event study that examines systematic changes in the information content of quarterly earnings announcements.	The final firm sample includes 92,613 firm-quarter observations for publicly listed companies. The data is obtained from Compustat between 1972 and 1998.	The degree of information content in quarterly earnings announcements is operationalized via both abnormal trading volume and abnormal security price volatility.	LM find no empirical evidence of a decline in the information content of quarterly earnings announcements – over the sample period: 1972-1998.
Core, Guay and Van Buskirk, 2003	CGB conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time.	The final firm sample includes 109,559 firm-year observations for NASDAQ listed companies. The data is obtained from Compustat and CRSP between 1975 and 1999.	The degree of value-relevance in earnings information and book values is operationalized via price regressions.	CGB find empirical evidence of a slight decrease in the value-relevance of earnings information and book values – over the sample period: 1975-1999.
Bartov, Goldberg and Kim, 2005	BGK conduct a combined inter-temporal and cross-sectional association study that examines systematic changes in the value-relevance of earnings information and book values over time and between three different sets of generally accepted accounting principles.	The final firm sample includes 915 firm-year observations for Frankfurt, NYSE, AMEX, NASDAQ and LSE listed companies. The data is obtained from The Global Vantage Database between 1998 and 2000.	The degree of value-relevance in earnings information and book values is operationalized via a time-series return regression and between three sets of generally accepted accounting principles using a cross-sectional return regression.	BGK find significant empirical evidence for a higher degree of value-relevance among accounting amounts prepared in accordance with IFRS reporting than accounting amounts prepared in accordance with other accounting standards – over the sample period: 1998-2000.
Barth, Landsman and Lang, 2008	BLL conduct an inter-temporal association study that examines systematic changes in the value-relevance of earnings information and book values over time, particular focus revolves around accounting amounts prepared in accordance with IFRS reporting.	The final firm sample includes 1,896 firm-year observations for publicly listed companies from 21 different countries. The data is obtained from DataStream and WorldScope between 1990 and 2003.	The degree of value-relevance in earnings information and book values is operationalized via both price regressions and return regressions.	BLL find significant empirical evidence for a higher degree of value-relevance among accounting amounts prepared in accordance with IFRS reporting than accounting amounts prepared in accordance with other accounting standards – over the sample period: 1990-2003.
Landsman, Maydew and Thornock, 2012	LMT conduct a combined inter-temporal and cross-sectional event study that examines systematic changes in the information content of earnings announcements, particular focus revolves around accounting amounts prepared in accordance with IFRS reporting.	The final firm sample includes 20,517 earnings announcements from 16 countries that mandated adoption of IFRS/IAS and 11 countries that retained domestic accounting standards. The data is obtained from I/B/E/S, DataStream and WorldScope between 2002 and 2007.	The degree of information content in annual earnings announcements is operationalized via both abnormal trading volume and abnormal security price volatility.	LMT find significant empirical evidence for a greater increase in both abnormal trading volume and abnormal security price volatility in firms that prepare their financial statements in accordance with IFRS reporting than in firms that follow other accounting standards – over the sample period: 2002-2007.

reporting the usefulness and utilization of information surrounding earnings announcements is greater than in countries that have retained domestic accounting standards.

These findings, thus, indicate that IFRS-reporting positively affects the value-relevance of accounting information, but the area is still an unexplored territory, especially with regards to value-relevance and the effects of IFRS-reporting. The majority of previous research on mandatory IFRS-reporting cogitates how IFRS/IAS has affected companies' cost of capital as well as the market liquidity of its securities (see, e.g., Daske, Hail, Leuz and Verdi, 2008). The quality of accounting measures and amounts is still somewhat imprecise, which connects to the fact that data regarding pre- and post-IFRS adoption to a great extent still is unavailable. The main rationale for the lack of evidence on mandatory IFRS-reporting is therefore, that there, until recently, has been non-existent analyzable data.

Empirical Summary and Predictions

Both earnings information and book values are, as appears from the preceding subsections and Matrix 1 above, positively associated with contemporaneous security returns and reflected in capitalized equity values over time. This is evident in both event- and association studies and applies regardless of the specific parameters used. That is, irrespective of which expectation model, earnings definition, return and price specification, statistical model and set of generally accepted accounting principles the study is conducted on. It is also apparent that the relationship during the beginning of the early 1990s until the beginning of the twenty first century has become weaker, which, in turn, indicates that publicly reported accounting information, disclosed in financial statements, has lost a significant portion of its relevance to equity investors. This could, in a worst-case scenario, lead to a so-called lemon market, see, e.g., Akerlof, 1970, that potentially might frustrate the function and thus the very objective of capital markets; see also, e.g., Jensen and Meckling (1976) and Healy and Palepu (2001). Against the background of the mixed empirical evidence vis-à-vis voluntary IFRS adoption and the lack of evidence vis-à-vis mandatory IFRS adoption, it is also clear that much of the implications of IFRS-reporting are still yet to be determined, particularly with respect to the overall reporting quality and whether or not the principle-based regulatory framework of accounting standards has been fruitful in terms of an increased economic decision-usefulness to its users.

From the preceding subsections, Matrix I, and the above empirical summary, it is feasible to depict some predictions with regards to this study. First of all, we believe that the Scandinavian region, in which we include Denmark, Finland, Norway and Sweden, due to its investor oriented accounting philosophy, strong legal enforcement and relatively stable external surroundings – institutional factors of importance when implementing regulatory frameworks – has experienced an increase in the value-relevance over the past decade. Worth to emphasize is that the relatively short time period equity investors and financial intermediaries have had to adjust to the new set of accounting standards might have led to a slight decrease in the post-adoption period. Our notion is that this will be revealed in an increase in the explanatory power (adjusted R^2) over the full sample period between 2001 and 2010 and in a slight decrease in adjusted R^2 between the pre-IFRS period and the post-IFRS period.

IV. METHODOLOGY

In previous research, several models are being utilized to provide empirical results on the value-relevance of accounting measures (see, e.g., Dechow, 1994; Kothari and Zimmerman, 1995 and Barth, Beaver, Hand and Landsman, 2005). There are, as mentioned in the preceding section, two approaches that elevate with regards to the value-relevance discussion. The two approaches are referred to as

price-level regressions²² and return regressions, and yield different answers to the same inquiry; namely, the value-relevance of accounting amounts. This study is constructed upon similar models and sample variables initiated in previous studies, and will, concurrently, adopt the methods utilized in previous research. Thus, the methodology applied in this study, is also advocated in a great amount of previous research (e.g., Kothari and Zimmerman, 1995; Barth *et al.*, 2005 and Hellström, 2006).

As previously described, the intention of this study is to assess how and to what extent book values and earnings, divided into accruals and cash-flows, henceforth BV, ACC and CF, are connected to the year-end market capitalization as well as the change in year-to-year market capitalizations, hereafter MC, for the sample period 2001-2010 and the two sub-periods, i.e., the period before, 2001-2004, and after, 2005-2010, the mandatory introduction of IFRS-reporting. To obtain this information, the study performs several regressions, specifically a price regression, a lagged price regression and a return regression (see, e.g., Kothari and Zimmerman, 1995 or Hellström, 2006). The above-mentioned regression models are widely used to assess value-relevance, but they differ, as hinted in the preceding paragraph, distinctively in what they actually answer (Barth *et al.*, 2001). Barth *et al.* (2001) state that level regressions examine if accounting measures are reflected in price levels, whilst return regressions examine if accounting measures are reflected in the change in price levels over a specific period of time; see also, footnote 14.

This study, following the arguments from previous research, defines the different year-end accounting variables as the level variables, and the year-to-year change in the different accounting variables as the return variables. Following the considerations of Barth *et al.* (2001) it is clear that two level regressions and one return regression will produce suitable results that relates to the objective of this study. In the following subsections, the regression models adopted in this study as well as particular issues connected to this area are described and discussed. Following the regression models, we dive into the different alternatives available when performing panel data analysis and we further develop the environment attached to the regression models. Hereunder, we also describe the tests and the necessary econometric adjustments connected to the tests.

Cross-Sectional Time-Series Analysis

Price regressions and return regressions in their simplest forms are some of the most adopted and established models in value-relevance related research (see, e.g., Kothari and Zimmerman, 1995 or Barth *et al.*, 2005). The Ohlson-framework (1995) or any extension of the framework is a well-known example of a valuation model that commonly is connected to value-relevance regression models. The Ohlson-model is based upon the dividend discount model and is defined as:

$$P_t = \sum_{\tau=1}^{\infty} R^{-\tau} E_t(d_{t+\tau}) \quad (\text{Ohlson-Model})$$

The price and return regressions that we have used in this paper can be traced back to several articles in previous research. To establish the regression models in this study, equivalent methodologies as e.g., Collins *et al.* (1997), Burgstahler and Dichev (1997) and Hellström (2006) is operationalized. The price and lagged price regression determines how much of the MC-variable that is explained by respectively BV and earnings, divided into CF and ACC, and the return regression determines the relationship between the change in MC and the change in BV, ACC and CF. Effectively, we are using a panel regression to express the relationship between the dependent variable, MC, and the independent variables, BV and earnings, defined as ACC and CF.

Panel regressions are equivalent to cross-sectional time-series analysis, which are regressions that adjust for company and time specific errors (Gujarati, 2004). In order to streamline the lagged price

²² Level regressions and price regressions are the same. Both names are interchangeably used in this paper.

and return regressions we have operated with a one-year lag and return window, i.e., from fiscal year to fiscal year. This means that the relationship between the dependent variables and the explanatory variables in the lagged price and return regression is affected by every announcement the company makes throughout a full year respectively.

In panel data there are essentially two main alternatives related to how the regression is carried out, either fixed effects or random effects (Gujarati, 2004). The fixed effect model assumes, in short, that the variables are correlated and applies corrections to the regression accordingly. Moreover, the fixed effect panel regression takes into account the individuality of the sample variables similar to introducing dummy variables to the regression. The equation for a cross-sectional time-series regression with fixed effects can be expressed in the following way:

$$Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \varepsilon_{it} \quad (\text{Fixed Effects})$$

The random effect regression is theoretically the opposite of the fixed effect regression; in terms of it assuming that the variables are uncorrelated and appropriately can apply random effects when performing the regression. Moreover, the random effect regression disregards the need for generating dummy variables and instead uses a disturbance term (u) in correspondence with the error term. The equation for a cross-sectional time-series regression with random effects can be expressed in the following way:

$$Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \varepsilon_{it} + u_i \quad (\text{Random Effects})$$

The following four subsections will, in detail, explain the price regression, the lagged price regression and the return regression. Alongside, we also present adjustments that enable more statistically accurate results. Please note that we, to some extent, simplify the illustration of both the price regression and the return regression in the equations below, but the underlying equation utilized by the statistical software, STATA, is the comprehensive regressions for both random effects and fixed effects.

Price Regression : Model 1

The price regression utilized in this paper is based on what is proposed by Burgstahler and Dichev (1997) and Hellström (2006). Several other researchers have utilized similar regressions; see, e.g., Collins *et al.* (1997), Francis and Schipper (1999) and Lev and Zarowin (1999). The basic regression is concurrently a function of MC as the dependent variable and BV, ACC and CF as the three independent variables. One issue, proposed by certain researchers, is to express the regression without scaling the numbers; see, e.g., Easton and Sommers (2003) and Barth and Clinch (2009). Scaling, or deflating, means that you divide the variables by a common denominator in order to increase comparability and remove company specific issues. We have, however, decided not to scale, or deflate, our variables but instead recognize the arguments of Gujarati (2004), i.e., that panel data takes into consideration the individual panels, i.e., firm and year specification. Therefore, we argue, that by running panel data regressions, the issues with scale effects will not be that significant. Or, phrased differently, by deflating the accounting numbers the transformation might bias the results rather than improve them. To some extent, we have already explained the different variables that we have chosen to investigate in this paper. However, in order to further clarify, the different variables in the two price regressions are listed below:

$$\begin{aligned} MC_{it} &= \text{Market Capitalization of Firm } i \text{ in Fiscal Year } t && (\text{MC}) \\ BV_{it} &= \text{Total Shareholder Equity of Firm } i \text{ in Fiscal Year } t && (\text{BV}) \\ ACC_{it} &= \text{Earnings}_{it} - CF_{it} \text{ of Firm } i \text{ in Fiscal Year } t && (\text{ACC}) \\ CF_{it} &= \text{Cash-Flow from Operations of Firm } i \text{ in Fiscal Year } t && (\text{CF}) \end{aligned}$$

The sample consists of data between 2001 and 2010, which will be analyzed for the full time period, as well as for the pre- and post-IFRS periods. The different equations that are implemented in Model 1 and the unlagged price regressions are:

$$MC_{it} = \beta_0 + \beta_1 BV_{it} + \beta_2 ACC_{it} + \beta_3 CF_{it} + \varepsilon_{it} \quad (1A)$$

$$MC_{it} = \beta_0 + \beta_1 BV_{it} + \varepsilon_{it} \quad (1B)$$

$$MC_{it} = \beta_0 + \beta_1 ACC_{it} + \varepsilon_{it} \quad (1C)$$

$$MC_{it} = \beta_0 + \beta_1 CF_{it} + \varepsilon_{it} \quad (1D)$$

Lagged Price Regression : Model 2

Following the price regression we also introduce a lagged price regression model. The reason behind this is that we also want to test a one-year lag effect on the variables. More precisely, we lag the independent variables, BV, ACC and CF, on the opening dependent variable, MC.²³ This will result in a more accurate perspective of the relationship between MC and BV, ACC and CF because the market has received a full year to react, and adopt to the dependent variable, the information content of the independent variables. Accordingly, the different regressions that are implemented in Model 2 and the lagged price regressions are:

$$MC_{it} = \beta_0 + \beta_1 BV_{it-1} + \beta_2 ACC_{it-1} + \beta_3 CF_{it-1} + \varepsilon_{it} \quad (2A)$$

$$MC_{it} = \beta_0 + \beta_1 BV_{it-1} + \varepsilon_{it} \quad (2B)$$

$$MC_{it} = \beta_0 + \beta_1 ACC_{it-1} + \varepsilon_{it} \quad (2C)$$

$$MC_{it} = \beta_0 + \beta_1 CF_{it-1} + \varepsilon_{it} \quad (2D)$$

Return Regression : Model 3

Similar to the above-mentioned regressions the return regression is based on MC, BV, ACC and CF. We anchor our return regression in several prior researchers' methodology; see, e.g., Easton and Harris (1991), Kothari and Zimmerman (1995) and Hellström (2006). Hellström's (2006) methodology originates from Easton and Harris' model that regresses the return variable against both price level and price change. Our model is solely considering the return variable and change in BV, ACC and CF. One reason for this is that we already have performed level models in the price regression and the lagged price regression, and therefore want to execute a clean return regression to facilitate comparison between diverse models. According to e.g., Brown, Lo and Lys (1999) and Hellström (2006) a return regression is preferably deflated by price at the beginning of the year. Thus, our return regression model is deflated by the opening price at period t . Before we move on, we believe it is imperative to define all the distinctive variables that will be employed in the return regression constituting Model 3:

$$MC_R = (MC_{it} - MC_{it-1}) / MC_{it-1} \quad (MC_R)$$

$$BV_R = (BV_{it} - BV_{it-1}) / MC_{it-1} \quad (BV_R)$$

$$ACC_R = (ACC_{it} - ACC_{it-1}) / MC_{it-1} \quad (ACC_R)$$

$$CF_R = (CF_{it} - CF_{it-1}) / MC_{it-1} \quad (CF_R)$$

Following the same thoughts as presented above we adopt return equations comparable to previous research (see, e.g., Kothari and Zimmerman (1995) or Hellström (2006)). The assumption in this study is that the return variables are as normally distributed as possible and therefore will yield unbiased

²³ To clarify, with MC_{it} for 2002 the regression is run with explanatory variables for 2001 etc.

statistical results. Listed below are the equations implemented in Model 3 and the return regression approach:

$$MC_{R_{it}} = \beta_0 + \beta_1 BV_{R_{it}} + \beta_2 ACC_{R_{it}} + \beta_3 CF_{R_{it}} + \varepsilon_{it} + u_i \quad (3A)$$

$$MC_{R_{it}} = \beta_0 + \beta_1 BV_{R_{it}} + \varepsilon_{it} + u_i \quad (3B)$$

$$MC_{R_{it}} = \beta_0 + \beta_1 ACC_{R_{it}} + \varepsilon_{it} + u_i \quad (3C)$$

$$MC_{R_{it}} = \beta_0 + \beta_1 CF_{R_{it}} + \varepsilon_{it} + u_i \quad (3D)$$

Tests and Final Econometric Adjustments

Preliminary testing consists of determining whether to use a fixed effect or a random effect regression model. Which model to utilize is established by running both regressions, saving their estimates, and subsequently run a Hausman test; see, StataCorp (2011). The Hausman test assumes the null hypothesis that you can use the random effect regression model. To interpret the Hausman test, in short, you reject the hypothesis to use the random effect model if the probability of the test is lower than five percent. Therefore, if the probability of the test is higher than five percent, you can use random effects and if it is lower than five percent you should use fixed effects. Regarding our price and lagged price data the probability of the Hausman test is 0.26 percent or lower and we will accordingly use the panel data fixed effect model. For the return regression model we accept the Hausman-test with 11.87 percent and will therefore use the panel data random effect model.

After determining that the fixed effect model is preferred in the price and lagged price regressions, it is also necessary to control for heteroskedasticity and auto/serial-correlation. In STATA this is accomplished by running a Wald-test, testing for groupwise heteroskedasticity, and a Wooldridge-test, testing for autocorrelation; see, StataCorp (2011). The Wald-test assumes the null-hypothesis that there are no groupwise heteroskedasticity, however, in our case we reject this hypothesis and accept that there is heteroskedasticity present in our data. The Wooldridge-test assumes that there are no autocorrelation in the data, however, also apparent after testing is that our data contain autocorrelation. Considering the random effects approach in the return regression, the assumption is that there are no, or low, heteroskedasticity and autocorrelation. This is, first and foremost, because the very basis of the random effects regression assumes that the error term of the coefficients are random rather than fixed (Gujarati, 2004).

Autocorrelation means that the error terms in the model are correlated, which is especially common in regression analysis containing dummy variables, which, in turn, is similar to a fixed effect model; see, e.g., Gujarati (2004). In panel data it is also very common to be affected by heteroskedasticity and therefore we are not surprised that the general response, from testing, is that both autocorrelation and heteroskedasticity is present in our study.

The first step to deal with autocorrelation and heteroskedasticity is to introduce robust standard errors to the fixed effect regression model. This means that the regression models will be less sensitive to outliers and therefore might deliver an improved statistical result. The second step to deal with both autocorrelation and heteroskedasticity is to cluster the panel variable, i.e., the firm variable, which also will help deliver stronger econometrical results. The following section will elaborate on the data and descriptive statistics of this paper, followed by the empirical results and our analyzes vis-à-vis the objective of this paper.

V. DATA AND DESCRIPTIVE STATISTICS

Prominent approaches with regards to value-relevance research and the components of earnings are based on reported accounting numbers from the financial statements; see, e.g., Healy (1985) and Dechow, Sloan and Sweeney (1995). The foundation of the components in our regression models is

based on financial data derived from each respective company. There are several different approaches in previous research that all disassembles and define earnings into an accrual component and a cash flow component. The most eligible methods, with respect to this study, are perhaps Sloan (1996) and Barth *et al.* (2005). Sloan (1996) defines accruals by combining a subset of accounting measures and then subtracts this component from earnings in order to receive a cash flow component. By restructuring the definition of accruals, this study determines accruals as net income before extraordinary items subtracted by cash flow from operations. A similar approach is used and recommended by Barth *et al.* (2005).

The accounting and firm specific measures collected in this study are net income before extraordinary items, cash flow from operations, market capitalization, and the total value of shareholders' equity. Additional clarifications involving how the accounting measures will be implemented and/or adjusted is further explained for each regression model as described in the methodological part in Section IV. However, to eliminate any misinterpretations the accounting measures in this paper are the following:

Market Capitalization	(MC)
The Total Value of Shareholders' Equity	(BV)
Net Income Before Extraordinary Items	(EARN)
Cash Flow from Operations	(CF)
An Accrual Component (EARN – CF)	(ACC)

Sample Selection and Choice Criteria

In order to enable the supplement of the continuous growing research concerning the value-relevance of accruals and cash flows, we intend to perform this study on the Scandinavian region, in which we include Denmark, Finland, Norway and Sweden; see, Table 1. Simply determining which areas and exchanges to study is, nevertheless, insufficient since all the securities listed on the exchanges may not meet the criteria required to conduct the methodology presented in this paper. It is important to make sure that every firm included in the sample satisfies the demands necessitated by the regression models. Albeit, there are several reasons for why this study decided to enhance the empirical evidence surrounding the Scandinavian stock exchanges. Firstly, all the four countries are closely connected both from an economic as well as a geographical perspective. Secondly, similarities are also evident when scrutinizing the listed securities from an industry specific perspective, i.e., the Scandinavian countries are also comparable when looking at the variety of businesses apparent on the stock exchanges. Thirdly, as in detail described in the introduction, the foreign non-Scandinavian ownership, and thus interests, in the Scandinavian stock exchanges is noticeably high. This means that the comparability and importance of the countries in the sample are high, and concurrently also interesting to study.

The criteria in this study are conservative, and consist of two stages. First, the study necessitates data for a considerable time period, and the selected sample has been set to ten years. This yields ten years of data, which is sufficient in order to complete both the two price regressions and the return regression. In other words, any company that does not have data for at least ten years will be excluded from the sample. Second, to perform the methodology presented in this paper, all the accounting measures as defined above are required to be available for each company. Accordingly, if either MC, BV, EARN, or CF is unavailable, the company will be excluded from the sample. The outcome of these criteria is that we have an available sample of 4.310 firm-year observations, consisting of 431 exchange-listed firms with ten years of data spanning between 2001 and 2010, which, depending on the model specifications, will deliver nine or ten years of analyzable regression variables.

To collect comparable data in this study we have used DataStream, Worldscope, henceforth DS. This choice affects the study both positively and negatively. The positive effect of using DS, as the only source of data, is that the entire sample is available in one database. Furthermore, if some parts of the data have been altered, all the measures are assumingly changed in the same manner. For example, EARN may not equal what is found in the financial reports of the companies, but all the EARN found in DS are assumed to be comparable. The negative aspect of only using this database is that the sample size might be limited due to DS license agreements. However, since the positive aspects unquestionably outweigh the negative aspects, we have chosen to utilize DS Worldscope as the exclusive source of data.

The data collection process has resulted in the collection of accounting measures for ten consecutive years for 431 Scandinavian publicly listed companies. Originally, the sample was intended to consist of all companies on each respective stock exchange. However, after running the sample through the above-mentioned criteria, the final sample consists of 85 firms listed on NASDAQ OMX Copenhagen, 96 firms listed on NASDAQ OMX Helsinki, 75 firms listed on Oslo Stock Exchange and 175 firms listed on NASDAQ OMX Stockholm. In total, we are, as mentioned above, consequently carrying out our research on a sample of 431 Scandinavian exchange-listed firms; see also, Table 1 and Table 2.

Table 2 presents the descriptive statistics for the full sample and the different regressions that have been performed in this study. As is portrayed in Table 2 the availability of descriptive statistics for a panel data sample is limited. Nevertheless, Table 2 also highlights the fact that all of the regressions are significantly dispersed and that there are no explanatory variables that have distinctive outliers compared to each other. To further clarify, the descriptive statistics in Table 2 are expressed with within-values²⁴ for each panel, which is why we also recognize the descriptive statistics for each stock exchange in Table 1 via Panel A, B and C.

Table 1, Panel A concerns the price regression and consecutively encloses the variables utilized by the price regression. Although the variables in the three regressions all are based on the same accounting measures, they are implemented differently in each regression respectively. By further examining Panel A below, it is evident that the range of values is significant. Table 1, Panel B concerns the lagged price regression, and successively presents the variables adopted in the lagged price regression model. Accordingly, it is evident that the sample in the lagged price regression is somewhat smaller. However, the reason behind the smaller sample is that the independent variables, BV, ACC and CF, are lagged with one year. This is apparent when comparing N/n in Panel A, B and C. Furthermore, also for the lagged price regression the dispersion of variable values is significant, meaning that the values are spread out and thus not grouped in clusters close to each other.

Table 1, Panel C apprehends the return regression in this study, and displays the variables relevant for the return regression model. Similar to the lagged price data, the sample size is also for the return regression smaller than the price regression data. This is because the return variable is calculated by dividing by opening market price and the model therefore has to be shortened with one year. However, the sample used to obtain the return values is still the full ten-year period between 2001 and 2010. By looking at the *min* and *max* values in Panel C, which probably best explain the distribution of the variables, it is acknowledged that the variables are significantly dispersed. However, they are more closely structured than in Panel A and B.

²⁴ Within-values refer to descriptive statistics for the full sample, which is impossible to portray in the more extensive way as Table 2.

TABLE 1
Descriptive Statistics per Stock Exchange

1, 2	COPENHAGEN				HELSINKI				OSLO				STOCKHOLM			
	MC	BV	ACC	CF	MC	BV	ACC	CF	MC	BV	ACC	CF	MC	BV	ACC	CF
PANEL A																
N / N	850/85	850/85	850/85	850/85	960/96	960/96	960/96	960/96	750/75	750/75	750/75	750/75	1750/175	1750/175	1750/175	1750/175
Q1	176.1	147.1	-169.9	7.9	37.3	23.8	-36.8	2.4	407.3	242.2	-288.2	15.5	210.4	103.5	-132.3	-1.3
MEAN	6223.4	2253.0	-330.8	623.6	1498.1	665.3	-66.1	148.1	10743.6	5721.3	-990.9	1781.1	11738.9	5550.1	-396.6	1034.0
Q3	3056.4	1911.0	-8.1	350.2	578.4	348.6	-1.4	72.1	4506.4	2470.1	-7.7	594.8	4014.9	1681.1	-3.8	308.5
STD. DEV.	21182.2	5898.1	1137.2	1926.4	7634.4	1930.7	248.7	567.8	44022.9	20037.8	5079.7	8556.7	38828.8	17602.5	2979.6	3694.4
MIN	1.0	-96.4	-12604.0	-514.3	1.4	-15.0	-3396.0	-1289.0	5.8	-859.1	-63073.0	-4395.7	3.4	-484.0	-40322.0	-34677.0
MEDIAN	706.9	482.7	-46.5	70.0	130.8	62.8	-6.5	13.3	1216.1	767.1	-69.5	130.3	735.7	407.4	-23.6	51.8
MAX	359657.9	64248.0	3938.0	21346.0	137163.3	15148.0	2003.0	7289.0	538510.4	219542.0	12237.0	106338.0	450795.9	169947.0	43190.0	32496.0
PANEL B																
N / N	765/85	765/85	765/85	765/85	864/96	864/96	864/96	864/96	675/75	675/75	675/75	675/75	1575/175	1575/175	1575/175	1575/175
Q1	176.1	148.1	-165.0	8.0	37.8	23.7	-36.8	2.5	416.9	230.4	-270.3	15.5	216.8	100.9	-130.9	-1.6
MEAN	6398.7	2139.8	-327.7	604.5	1440.1	656.6	-69.9	152.0	11248.0	5476.0	-941.3	1720.1	11949.7	5348.9	-406.7	982.6
Q3	3192.0	1844.5	-8.1	-350.2	606.8	344.2	-1.4	71.7	4850.5	2346.0	-6.3	550.1	4320.3	1616.8	-3.8	295.1
STD. DEV.	21708.2	2139.8	-327.7	604.5	6558.0	1915.5	257.6	588.5	45879.4	18967.0	4814.2	8152.8	38692.7	17042.6	2956.8	3604.6
MIN	1.0	-96.4	-12604.0	-514.3	1.4	-13.9	-3396.0	-1289.0	5.8	-859.1	-63073.0	-4395.7	3.4	-108.6	-40322.0	-34677.0
MEDIAN	750.4	469.0	-46.0	70.4	137.9	61.5	-6.5	13.3	1285.8	738.9	-65.2	127.2	749.5	393.0	-23.2	46.6
MAX	359657.9	55521.0	3938.0	21346.0	101994.6	15148.0	2003.0	7289.0	538510.4	214079.0	12237.0	106338.0	439116.4	159167.0	43190.0	32496.0
PANEL C																
N / N	765/85	765/85	765/85	765/85	864/96	864/96	864/96	864/96	675/75	675/75	675/75	675/75	1575/175	1575/175	1575/175	1575/175
Q1	-0.18	-0.04	-0.05	-0.03	-0.23	-0.06	-0.04	-0.03	-0.20	-0.02	-0.03	-0.02	-0.20	-0.04	-0.04	-0.03
MEAN	0.34	0.13	0.01	0.03	0.35	0.10	0.05	0.05	0.31	0.06	0.01	0.03	0.33	0.05	0.02	0.02
Q3	0.46	0.09	0.04	0.06	0.46	0.10	0.04	0.06	0.48	0.10	0.02	0.05	0.51	0.10	0.03	0.06
STD. DEV.	2.91	2.66	0.26	0.28	1.44	0.83	0.83	0.43	1.19	0.47	0.32	0.22	1.67	0.38	0.52	0.51
MIN	-0.85	-6.86	-2.85	-1.44	-0.96	-2.66	-6.22	-4.24	-0.93	-2.54	-2.23	-1.14	-0.97	-3.88	-7.06	-11.74
MEDIAN	0.11	0.02	0.00	0.01	0.11	0.03	0.00	0.01	0.13	0.03	0.00	0.01	0.13	0.03	0.00	0.01
MAX	77.86	72.48	1.67	4.38	18.58	13.27	19.63	6.05	18.98	6.21	3.74	2.45	50.55	4.07	11.23	7.19

1 Panel definitions of Table 1: Panel A = Unlagged price regression; Panel B = Lagged price regression; and, Panel C = Return regression.

2 Variable definitions of Table 1: MC = Market capitalization sorted by stock exchange; BV = Book value sorted by stock exchange; ACC = Accruals sorted by stock exchange; and, CF = Cash flows sorted by stock exchange.

TABLE 2
Descriptive Statistics for the Firm Sample

1.2	VARIABLES			
	N/N	STD. DEV.	MIN	MAX
Panel A				
MC _{it}	4310/431	12778.7	-180159.4	234640.6
BV _{it}	4310/431	5037.1	-79619.1	93733.9
ACC _{it}	4310/431	1930.5	-50602.0	32910.0
CF _{it}	4310/431	2054.7	-46186.5	44765.2
Panel B				
MC _{it}	3879/431	12452.2	-196838.6	214953.0
BV _{it}	3879/431	4760.6	-69779.7	98110.3
ACC _{it}	3879/431	1928.4	-48627.6	34884.4
CF _{it}	3879/431	2023.4	-44961.9	48730.0
Panel C				
MC _{it}	3879/431	1.8	-9.0	69.4
BV _{it}	3879/431	1.2	-8.6	64.7
ACC _{it}	3879/431	0.5	-7.9	17.5
CF _{it}	3879/431	0.4	-10.8	8.1

1 Panel definitions for Table 2: Panel A = Price regression; Panel B = Lagged price regression; and, Panel C = Return regression.

2 Variable definitions for Table 2: MC_{it} = Market capitalization of firm *i* in fiscal year *t*. BV_{it} = Book value of equity of firm *i* in fiscal year *t*. ACC_{it} = Accruals of firm *i* in fiscal year *t*. CF_{it} = Cash flows of firm *i* in fiscal year *t*.

VI. EMPIRICAL RESULTS

This section will present the results from the three regression models that this study has implemented and conducted on Scandinavian data. Important to remember is that this study identifies earnings as one accrual component and one cash flow component. To reduce the possibility of confusion, the tables enclosed below will only include information that is considered relevant in terms of the analysis of the objective of this study. The adjusted explanatory power of the different regression models is defined by R^2 in each respective model. Table 3, 4 and 5 also include the coefficients (β) for each explanatory variable. It is particularly important to keep in mind that for the two level regressions the coefficients can be arbitrary due to scale-related effects²⁵, while, for the return regression, which deflates the variables with the opening market capitalization, awareness regarding the explanatory variable coefficients can be beneficial to recognize. Nevertheless, the pivotal subject in this study is value-relevance and therefore the explanatory power (R^2) of each respective regression model is of focal interest. Also, worth noting is that all the R^2 values are significant at a 1 percent level. The T-value is also deliberately excluded from the tables since it is significantly high for all the regression models.

Similar to e.g., Kothari and Zimmerman (1995) this study also found that the return regression was less affected by heteroskedasticity and autocorrelation than the two level regressions, i.e., the price regression and the lagged price regressions. Therefore, as previously mentioned, the price and lagged price results found in Table 3 and Table 4 are predicted by using a fixed effect panel data regression, while the return regression results found in Table 5 is predicted using a random effect panel data regression. The following section will analyze the results within each regression model for the full

²⁵ Scale-effects refers to issues that can bias the analysis if the data differs from another due to e.g. firm size. Scaling the data means dividing by a common variable to increase comparability.

sample period, as well as the pre- and post-IFRS sub-periods. Conclusively, a discussion connecting the research question to the results from each regression model is presented.

TABLE 3
Price Regression : Model 1

PRICE ¹	1A: BV _{it} + ACC _{it} + CF _{it}				1B: BV _{it}		1C: ACC _{it}		1D: CF _{it}	
	β ₁	β ₂	β ₃	R ²	β ₁	R ²	β ₁	R ²	β ₁	R ²
2001-2010	0.460 ***	0.911 ***	3.144 ***	34.98%	1.246 ***	24.14%	-1.063 ***	2.58%	3.478 ***	31.27%
PRE-IFRS	0.625 ***	3.048 ***	1.321 ***	11.38%	0.844 ***	3.32%	1.748 ***	4.15%	0.380 **	0.48%
POST-IFRS	-0.463 ***	1.023 ***	4.430 ***	23.32%	0.679 ***	4.64%	-0.501 ***	0.13%	3.162 ***	18.70%

*** Significant at 1 percent level ** Significant at 5 percent level * Significant at 10 percent level

1 Price Regression: $MC_{it} = \beta_0 + \beta_1 BV_{it} + \beta_2 ACC_{it} + \beta_3 CF_{it} + \epsilon_{it}$

Variable definitions for Table 3: MC_{it} = Market capitalization of firm i in fiscal year t . BV_{it} = Book value of equity of firm i in fiscal year t . ACC_{it} = Accruals of firm i in fiscal year t . CF_{it} = Cash flows of firm i in fiscal year t . β = Coefficient of the explanatory variables. R^2 = Adjusted R^2 within the panel regression.

Price Regression : Model 1

The price regression considers the relationship between the company specific year-end market capitalization, book value of equity and the study's two earnings measures using a fixed effect panel data regression. Table 3 presents the results after running regression 1A, 1B, 1C, and 1D, as described in the methodological part in Section IV. When examining the price regression results, it is apparent that the explanatory power of the four price regressions has very high significance for all the time periods. Below we discuss the results, and reflect upon substantial issues, pertaining to the price regression models.

For the full sample period Model 1 indicate that the combined explanatory variables, 1A, explain 34.98 percent of the variance in the market capitalization. Apparent from regression 1B and 1D is that both book values and cash flows have much higher explanatory power than accruals. Since both book values and cash flows have high-adjusted R^2 values (24.14 percent and 31.27 percent) it is presumable that they contain overlapping incremental information with regards to the combined explanatory power. A possible explanation for these values could be the fact that one of the main valuation models utilized by investors today is the discounted cash flow model, henceforth DCF-model. A high application of DCF-models could also help explaining the low explanatory power of the accrual component (2.58 percent) highlighted under regression 1C.

The pre-IFRS period compared to the post-IFRS period indicates lower value-relevance, i.e., lower explanatory power, for the explanatory variables in regression 1A (respectively 11.38 percent and 23.32 percent). Another interesting finding in Model 1 concerns the pre- and post-IFRS results and the fact that in the pre-IFRS period regression 1C shows stronger explanatory power of accruals (4.15 percent) than cash flows in regression 1D (0.48 percent). This means that for the pre-IFRS period accruals have more value-relevance than cash flows. Thus, accruals, for the pre-IFRS period, are the most important explanatory variable²⁶. The post-IFRS period indicates that book values have slightly increased in terms of value-relevance. More interesting, though, is the difference that is apparent

26 Note that regression 1B show that also book values are lower than accruals with 3.32 percent for the pre-IFRS period.

when looking at the explanatory power of regression 1C and 1D (0.13 percent and 18.70 percent respectively). This means that for the post-IFRS period cash flows have ascended with almost 97.5 percent and accruals have descended with almost 97 percent in the post-IFRS period compared to the pre-IFRS period.

Albeit, since Model 1 employs the year-end market capitalization it is understandable that the accruals measure has lower explanatory power than book values and cash flows. One issue that is apparent when considering Model 1 is, in fact, that it looks at the relationship between the market capitalization at the end of period t and the book value and earnings at the end of period t . The model is, nevertheless, interesting, in terms of explanatory power of recent book value and earnings measures concerning the market capitalization at the same date, since a number of valuation models consists of predicting future equity and cash flows based on the present value today. Hence, the increased use of cash flow as a predictor in equity investments can probably be one reason for the sudden change of value-relevance from the pre-IFRS period to the post-IFRS period. Nevertheless, logical assumptions would suggest that the explanatory variables should be better reflected in the market capitalization for the lagged price regression than in the price regression.

TABLE 4
Lagged Price Regression : Model 2

LAGGED PRICE ¹	2A: BV _{it-1} + ACC _{it-1} + CF _{it-1}				2B: BV _{it-1}		2C: ACC _{it-1}		2D: CF _{it-1}	
	β_1	β_2	β_3	R ²	β_1	R ²	β_1	R ²	β_1	R ²
2001-2010	0.225 ***	0.387 ***	3.100 ***	29.05%	1.062 ***	16.48%	-1.316 ***	4.15%	3.273 ***	28.28%
PRE-IFRS	-0.120 ***	-1.349 ***	4.040 ***	68.80%	0.209 *	0.29%	-4.663 ***	47.83%	4.896 ***	66.80%
POST-IFRS	0.765 ***	0.591 ***	3.467 ***	2.08%	1.114 ***	0.40%	-0.582 ***	0.02%	3.831 ***	2.70%

*** Significant at 1 percent level ** Significant at 5 percent level * Significant at 10 percent level

¹ Lagged Price Regression: $MC_{it} = \beta_0 + \beta_1 BV_{it-1} + \beta_2 ACC_{it-1} + \beta_3 CF_{it-1} + \epsilon_{it}$

Variable definitions for Table 4: MC_{it} = Market capitalization of firm i in fiscal year t . BV_{it-1} = Book value of equity of firm i in fiscal year $t-1$. ACC_{it-1} = Accruals of firm i in fiscal year $t-1$. CF_{it-1} = Cash flows of firm i in fiscal year $t-1$. β = Coefficient of the explanatory variables. R² = Adjusted R² within the panel regression.

Lagged Price Regression : Model 2

The lagged price regression considers the relationship between the market capitalization at year t and the one-year lagged book value of equity and the study's two earnings measures using a fixed effect panel data regression. This means that book values, accruals and cash flows are measured against the market capitalization for the subsequent year. This study assumes that this should remedy any issues that might be present in the price regression with regards to the explanatory variables not yet being mirrored in the market capitalization. Table 4 presents the results after running regression 2A, 2B, 2C and 2D as presented in the methodological part in Section IV. Moreover, each regression is performed for the entire sample period, for the pre-IFRS period and for the post-IFRS period. In Model 2 all the regression models are significant at a 1 percent level, which means that we have strong statistical evidence for the displayed adjusted R² values as well as the model's coefficients.

For the full sample period Model 2 indicate that the combined explanatory variables, displayed in 2A, explains 29.05 percent of the variance in the market capitalization. Furthermore, regressions 2B, 2C and 2D reveal that, similar to Model 1, cash flows have the strongest explanatory power for the

full sample period with 28.28 percent. Book values are also important in Model 2 with an adjusted R^2 value of 16.48 percent, while accruals have the lowest explanatory power for the full sample period with 4.15 percent. Nevertheless, accruals have more explanatory power in Model 2 than in Model 1, an increase of 1.57 percent, which means that in Model 2, for the full sample period, a higher amount of the accrual-based information has been adopted in the market capitalization.

Looking at the pre-IFRS period in Model 2, the results are astoundingly distinctive in comparison to Model 1. The combined explanation power of the independent variables, 2A, for the pre-IFRS period is 68.80 percent. Moreover, book values, 2B, have lost almost all their importance with regards to value-relevance, only 0.29 percent, and the highest explanatory power, in the pre-IFRS period, lies within accruals and cash flows with 47.83 percent and 66.80 percent respectively. This means, however, that both regression 2C and 2D contain information that incrementally overlaps, i.e., accruals and cash flows contain similar information for the pre-IFRS period since they both have explanatory power close to the combined explanatory power found in regression 2A. The clear indication of Model 2 is that, for the pre-IFRS period, both accruals and cash flows have high value-relevance and are better predictors of the market capitalization than the book value found in regression 2B. One explanation for the strong results is that the economy in the Scandinavian countries was growing and expanding rapidly, especially within the technology sector, in the years representing the pre-IFRS period. This is especially evident in the aftermath of the Dot-Com bubble in 2000/2001, as all the markets show signs of optimism and increased growth between 2001/2002 and 2007/2008²⁷. Thus, the positive upturn in the market is highly dependent on the economic growth in companies on the market.

The post-IFRS period displays a different result than the pre-IFRS period, with a combined explanatory power of 2.08 percent, 2A. The difference between the pre-IFRS period and the post-IFRS period is remarkable with a drop in explanatory power of 66.72 percent, and there has to be several underlying reasons for the sudden decrease. Model 2B, 2C and 2D explain 0.4 percent, 0.02 percent and 2.70 percent of the variance in the market capitalization respectively. Although these results are weak, it is evident that cash flows have the strongest explanatory power by far. It is difficult to explain the reasons behind the sudden decrease in value-relevance; however, one reason can definitely be the financial turmoil that emerged between 2007 and 2008. Moreover, the results of the post-IFRS period could be highly affected by the destructive effects of the financial crisis. This could also help acknowledge the assumption that Model 2 is a better predictor of value-relevance than Model 1, i.e., during the financial crisis it is likely that the market utilized other factors than book values, accruals and cash flows since they did not rely on financial information in the same manner as they did before the financial crisis.

The issue with this explanation is that it is unsupportive of the results in Model 1. However, it could also be argued that Model 1 looks at the relationship between market capitalization and book values, accruals and cash flows at the same point in time, while Model 2 looks at how the information in year 1 is reflected in the price of year 2. More precisely, the argument is that Model 1 displays how much the explanatory variables actually explain at the same point in time, while Model 2 displays how much the explanatory variables explain after the market has adopted the information in the market capitalization. Accepting this argumentation, it is evident that during the post-IFRS period in Model 2, perhaps due to the financial crisis, the market did not choose to rely on the information in neither book values, accruals nor cash flows, although, the explanation power of the explanatory variables actually increased from the pre-IFRS period to the post-IFRS period in Model 1.

²⁷ The Scandinavian stock exchanges in this study also experienced positive growth in the period 2001 to 2005 (defined as the pre-IFRS period in this study) with respectively 53, 30, 98.5 and 123 percent growth on NASDAQ OMX Copenhagen, NASDAQ OMX Helsinki, Oslo Stock Exchange and NASDAQ OMX Stockholm; see, MarketWatch, Inc. (2012).

TABLE 5
Return Regression : Model 3

RETURN ¹	3A: BV_R _{it} + ACC_R _{it} + CF_R _{it}				3B: BV_R _{it}		3C: ACC_R _{it}		3D: CF_R _{it}	
	β ₁	β ₂	β ₃	R ²	β ₁	R ²	β ₁	R ²	β ₁	R ²
2001-2010	1.094 ***	0.226 ***	0.248 ***	58.73%	1.117 ***	58.46%	0.482 ***	1.92%	0.553 ***	1.29%
PRE-IFRS	1.077 ***	0.347 ***	0.346 ***	84.51%	1.106 ***	84.04%	0.750 ***	3.90%	0.978 ***	2.33%
POST-IFRS	0.976 ***	0.093 *	0.077 *	19.96%	0.996 ***	19.97%	0.171 **	0.79%	0.171 **	0.35%

*** Significant at 1 percent level ** Significant at 5 percent level * Significant at 10 percent level

1 Return Regression: $MC_R_{it} = \beta_0 + \beta_1 BV_R_{it} + \beta_2 ACC_R_{it} + \beta_3 CF_R_{it} + \varepsilon_{it}$

Variable definitions for Table 5: MC_R_{it} = Change in market capitalization of firm i in fiscal year t divided by MC_{t-1} . BV_R_{it} = Change in book value of equity of firm i in fiscal year t divided by MC_{t-1} . ACC_R_{it} = Change in accruals of firm i in fiscal year t divided by MC_{t-1} . CF_R_{it} = Change in cash flows of firm i in fiscal year t divided by MC_{t-1} . β = Coefficient of the explanatory variables. R^2 = Adjusted R^2 within the panel regression.

Return Regression : Model 3

The return regression reflects the relationship between the change, or return, in market capitalization and the change in book value of equity and the change in earnings measures, defined as accruals and cash flows. Table 5 displays the results after running regression 3A, 3B, 3C and 3D as presented in the methodological part in Section IV. Similar to Model 1 and Model 2, each regression is run for the full sample period, for the pre-IFRS period and for the post-IFRS period. Worth specifying is that all the regressions in Model 3 are significant at a 1 percent level and that some of the coefficients have weaker significance than in Model 1 and Model 2. This can also be verified by looking at Table 5 and the strong results of book values, 3A and 3B, compared to accruals and cash flows, 3A, 3C and 3D.

Issues with heteroskedasticity and autocorrelation, which are present in the level regressions, are not common in return regression models. This is also the case for our return regression model. However, Francis and Schipper (1999) point out that return regression models might be less suited for economically unstable periods. Therefore, to build on the previous arguments regarding both the upturn during the pre-IFRS period and the recession in the post-IFRS period, the sample period in this study can be defined as economically unstable. Nevertheless, the intention of this study is not to study the effects of financially upturns and downturns, but the value-relevance of the above-mentioned explanatory variables. It is, in any way, important to comment on what, at least in certain ways, that can affect the results of the different regression models.

For Model 3, the full sample period results found in regression 3A indicate that, combined, the explanatory variables explain 58.73 percent of the variance in the market capitalization returns. It is evident, though, that book value returns, 3B, have the outright strongest explanatory power of the three explanatory variables. According to regression 3B book value returns explain 58.46 percent while accrual returns and cash flow returns, 3C and 3D, for the full sample period explain 1.92 percent and 1.29 percent of the variance in market capitalization returns. That the results for regressions 3C and 3D are quite low is not necessarily negative. It means, however, that for this return model and the full sample period, book value returns have considerably stronger explanatory power than accrual returns and cash flow returns.

The pre-IFRS period indicates a stronger explanatory power than for the full sample period when looking at regression 3A, 84.51 percent. Similar to the full sample period, the book value return found

in regression 3B is the strongest explanatory variable with 84.04 percent for the pre-IFRS period as well. Compared to Model 1 and Model 2, the distribution of explanatory power between book value returns, accrual returns and cash flow returns is fairly constant for all the periods. In the pre-IFRS period accrual returns, 3C, and cash flow returns, 3D, indicate explanatory power of 3.90 percent and 2.33 percent respectively. Thus, in the pre-IFRS period accrual returns explain, out of the two earnings components, more of the variance in market capitalization returns than cash flow returns.

In the post-IFRS period, there are indications in all the regressions, 3A, 3B, 3C and 3D, that the value-relevance, i.e., that the explanatory power, has plummeted. For the combined regression model, 3A, this study finds that the explanatory power is 19.96 percent – a significant decline compared to the pre-IFRS period. The relationship between the models is, however, the same as in the two previous periods. Book value returns, 3B, explain more than the combined model, 3A, with an explanatory power of 19.97 percent. Accrual returns, 3C, and cash flow returns, 3D, explains 0.79 percent and 0.35 percent of the variance in the market capitalization returns. The weak results of accrual returns and cash flow returns, in the post-IFRS period, could definitely be connected to the financial turmoil that erupted between 2007 and 2008. Also important, is the suggestion that return models, by some extent, are considered to be unsuitable for unstable financial times; see, Francis and Schipper (1999).

This study finds that all the regression models are coinciding on the fact that the financial crisis and the arduous economic situation on the market have affected the outcome of the regression analysis. Since Model 3 measures the return, and not the level, it is more comparable to Model 2 than Model 1. Therefore, the same argumentation is compatible, and valid, for Model 3 as it was for the lagged price regression in Model 2. Moreover, the return model looks at the change in each variable with a return window of one year, and thus how the information has been transformed over the course of the return window. The argument, and possible explanation, is accordingly, even though we find an increase in value-relevance in Model 1, this increase has not been recognized by the market and implemented in the market capitalization in Model 3.

Value-Relevance and Proximate Implications

Based on the above results there are, first of all, strong indications that there is a positive association between market capitalization and book values, accruals and cash flows for the given sample period between 2001 and 2010. This means that the current accounting standards are producing accounting numbers that can be utilized to predict and explain the variance in market capitalization, which, thus, are important regarding the value-relevance discussion. There are, nevertheless, also several other areas that are important in relation to value-relevance and accounting information. In the following paragraphs, we will further discuss the above results in connection with other ramifications existent in the area of financial reporting.

One element that is highly important is, as mentioned above, the quantity of key accounting items that are utilized by investors, which to a great extent affects the value-relevance of reported accounting information. The argumentation behind this statement is founded in the efficient market hypothesis, elevating that all accounting information should be adopted and reflected in the capitalized market value of equity; see, e.g., Fama (1965 and 1970). Furthermore, if investors, due to for example economic turbulence, decide to form their investment approaches on other information than what is enclosed in financial reports, the market capitalization will not likely comprehend the same degree of accounting information. Therefore, in situations where investors feel that there is information, other than what is disclosed in the financial reports, that are more beneficial in terms of investment opportunities, the value-relevance will most likely decline. This can perhaps be what is reflected in Model 2 and Model 3, compared to Model 1.

If it is the general consent on the market that publicly available accounting information is too uncertain with regards to the financial situation on the market, the investment community might consider knowledge, other than financial, when anticipating investment prospects. For example, organic growth companies, i.e., companies that grow without acquisitions, are good investment opportunities because they are a safer option, in terms of risk, especially in turbulent times. Another area that is highly important, and should receive further attention, is the very substance of the income statement, the cash flow statement and the balance sheet within each company. Thus, if investors believe new accounting information to be unjustifiable, they might consider investing in companies that over time have proven that they have a strong economy and the financial ability to overcome obstacles.

The economical strength of each company should definitely be taken into consideration when discussing the value-relevance of their financial information, and on that note, e.g., the balance sheet information can have very high impact on each respective company's market capitalization. In other words, if a company has an exceptionally strong (weak) financial leverage in the balance sheet, it most likely will affect the market capitalization positively (negatively). Therefore, it is also important to keep in mind that some companies might have implicating effects in relation to this study, e.g., due their strong (weak) balance sheet information and how this affects the market.

During the whole sample period, 2001-2010, information technology has been growing and evolving, leading to a significant increase in the amount of information available to investors and other stakeholders, as well as an increase in the time it takes for information to become obsolete. In other words, the developments within information technology can also be argued as an important contributor when it comes to the value-relevance discussion. Connecting this argument to the findings in this study, the lower value-relevance found in Model 2 and Model 3 for the post-IFRS period can also be explained by the evolvement in information technology and the adjacent increased informational flow. This can even be linked to the previous arguments regarding investors utilizing other information, i.e., investors that are faced with an expanded area of information and thus either find it difficult to apprehend the financial information, react to other information available or even combine financial information with other information available. This can lead to decreased value-relevance of specific accounting components since market capitalization also contain a wide range of different information.

Another implication, yet to be mentioned, is that the data for the pre-IFRS period cover fewer years than the data for the post-IFRS period. The analysis might suffer from biased results due to this, since, having fewer analyzable years in the pre-IFRS period than the post-IFRS period can affect the regression results. When analyzing data with fewer observations it is more likely to be more sensitive to extreme values and thus yield significantly stronger, or weaker, results. Likewise, the data for the post-IFRS period contain more observations than the pre-IFRS period and it can be assumed that accounting variables stabilize over time, the post-IFRS results might therefore be lower than the pre-IFRS results. Nevertheless, both the pre-IFRS period and the post-IFRS period have sufficient observations to be analyzed, and therefore it is important to also keep in mind that there might be other reasons, such as those mentioned above, causing the incline in value-relevance from the pre-IFRS period to the post-IFRS period.

In total, there is significant empirical evidence that book values, accruals and cash flows all have value-relevance. Book values are in most of the regression models very important when trying to explain the variation in market capitalization. In Model 2 and Model 3 the results indicate that the value-relevance of book values, accruals and cash flows have decreased after the implementation of IFRS, while the results in Model 1 indicate that the value-relevance have increased. This can, however, as discussed in detail above, have several explanations. Conclusively, it is imperative to keep in mind that the results of this analysis are valid only for the exact years, sample and

methodology as presented earlier in the paper. In the following and final section, we will summarize and draw our conclusions regarding the findings presented above. We will also provide some suggestions for further research.

VII. SUMMARY AND CONCLUSIONS

This paper examines the value-relevance of Scandinavian earnings information and book values over the past decade in order to shed some light on whether the extensive global adoption of IFRS-reporting has contributed to an increased accounting quality in terms of economic decision-usefulness to equity investors. Our inquiry is motivated by the recent practical and empirically validated concern of an eroded economic decision-functionality of publicly reported accounting information. Particular concern among practitioners such as corporate accountants, auditors and financial analysts has been directed towards the declined decision-usefulness of bottom line amounts based on accruals and cash flows.

We address this research question using a sample of 4.310 firm-year observations for 431 exchange-listed companies at NASDAQ OMX Nordic and Oslo Stock Exchange between 2001 and 2010. The degree of value-relevance in our firm sample is operationalized through two price regressions and one return regression and empirically tested via the statistical association between capitalized values of equity or annual changes in capitalized values of equity and the study's three independent explanatory accounting variables: (i) book values, (ii) accrual-based earnings and (iii) cash-flow-based earnings. To maintain comparability across tables and graphs and thus the possibility to triangulate our results, all tests are based on the same broad set of exchange-listed firms. And in order to mitigate the possibility of incorrect inferences associated with scale-related effects such as size differences across firms and extreme values in the firm sample, panel data regressions are conducted in all the three regression models.

The results from our empirical tests show that both Scandinavian earnings information, accrual-based as well as cash-flow-based, and book values are positively associated, albeit, to varying degrees, with capitalized market values of equity as well as with annual changes in capitalized market values of equity. These results are broadly consistent with previous value-relevance related research, originating from the seminal discoveries of Ball and Brown (1968) and Beaver (1968). The results are also, at least to some extent, in line with our theoretical predictions of the modern utilitarian role of publicly reported accounting information. However, unlike previous value-relevance related research, particularly empirical research carried out on accounting data between the early 1990s and the beginning of the twenty first century, our results show a relatively strong explanatory power, regardless of the regression used. This indicates, in comparison to previous periods, that there has been an increased value-relevance among bottom line amounts based on both accruals and cash flows over the full sample period. Similar reasoning applies also to Scandinavian book values, albeit, not in the same extent.

Worth emphasizing is that our tests within the sample period – pre- and post the mandatory adoption of IFRS-reporting in January 2005 – demonstrate somewhat mixed empirical signals on whether the explanatory variables adopted in the study exhibit higher or lower value-relevance after the shift from voluntary to mandatory IFRS disclosure. Findings from the lagged price regression as well as the return regression show significant signs of a decline in value-relevance subsequent to the mandatory adoption of IFRS, while the reverse reasoning applies for the results from the unlagged price regression. Namely that, book values, accrual-based earnings and cash-flow-based earnings, in connection with the shift from voluntary to mandatory IFRS disclosure, exhibit an increase in value-relevance. A possible explanation for this discrepancy might, as discussed in Section V, stem from the fact that the pre-IFRS period is characterized by a strong economic upturn, particularly in the

technology-sector, while the post-IFRS period to a great extent is reflected by a number of destructive effects caused by the financial turmoil that emerged between 2007 and 2008. Part of the explanation can of course also be attributed to the fact that the unlagged price regression mirrors the information at the time of the announcement, while the lagged price regression looks at how the information is reflected in the subsequent year's price and the return regression as reflected in annual changes between capitalized market values of equity and the study's three explanatory variables.

Taken as a whole, our results show significant empirical evidence of an increased value-relevance in Scandinavian earnings information as well as in Scandinavian book values compared to earlier periods as presented in previous research, and thereby also as evidence of an increased accounting quality in terms of economic decision-usefulness to equity investors over the past decade. However, we are, at the same time, due to our mixed empirical findings within the full sample period, unable to conclude whether or not this increased value-relevance is related to the adoption and implementation of IFRS-reporting, and therefore also unable to conclude whether or not the harmonized regulatory framework of accounting standards surrounding the current IFRS-based reporting model is moving corporate disclosure regulation in a satisfying direction. Nevertheless, as hinted above, we are able to conclude that publicly reported accounting information, disclosed in the income statement, the cash flow statement and the balance sheet, not have continued to lose its relevance. On the contrary, it has regained much of the decision-usefulness that has been lost in the past. However, to fully understand whether or not this can be related to the adoption and implementation of IFRS-reporting, further research, which in depth considers the concerns within the full sample period, is necessary to undertake.

Contribution

We believe that the results in this study are pertinent to both Scandinavian investors and to accounting standard-setting bodies such as the IASB and the FASB since it – to some extent – penetrates the relatively unresolved question of whether or not the current IFRS-based regulatory framework has been fruitful in terms of an increased economic decision-usefulness among financial statement information, which provide equity investors with resourceful material as well as with valuable insights on the relevance and reliability of Scandinavian accounting numbers.

We also believe that our study might be useful in regions other than the Scandinavian, particularly in countries where directives from the European Union are compulsory to follow and where the accounting philosophy is the same. The study might also be of value to regions outside the European Union with an investment environment similar to the Scandinavian and where IFRS-reporting recently have been or will be adopted.

The analyses in this paper also raise a number of other interesting questions and unresolved issues related to financial reporting and the current IFRS-based regulatory framework. In the following and final subsection, we therefore list some of the more interesting areas where value-relevance research might be fruitful or where value-relevance research could be improved.

Suggestions for Further Research

Our first research suggestion is detailed studies of the specifics in the regulatory framework of accounting standards that surround the current IFRS-based financial reporting model. Increased insights and understanding of how these accounting standards are perceived, interpreted and utilized by users such as corporate accountants, auditors and financial analysts would certainly contribute to the overall international debate on harmonized accounting standards and to the issue of whether or not we should have a global framework for financial reporting. By studying the specifics, we would also be able to approach an answer of the underlying *raison d'être* for the increased value-relevance in the

Scandinavian region. Given the recent global changes from a traditional capital-intensive economy into a high-tech and service oriented economy with knowledge-intensive companies, we suggest that particular research interest is directed towards intangible assets and the, since long, controversial subject of goodwill – typically referred to as the black sheep of the balance sheet. Accounting standards of particular research interest should therefore include IAS 38, which deals with both intangible assets and internally generate goodwill. Particular research interest should also include IFRS 3 where business combinations and thus externally generated goodwill are treated. IAS 36 should also obtain some research interest since it deals with impairments of both intangible assets and goodwill, internally as well as externally generated.

A second suggestion for further research is to test and compare the value-relevance of annual and quarterly earnings in order to shed some light on whether the market adopts and reacts to audited- and non-audited financial information differently. Relative value-relevance comparisons of annual and quarterly accounting data will to a great extent also reflect and address questions associated with the modern role of the auditor.

A third research suggestion is to address and discuss the implications of the many underlying assumptions and econometrical issues that surround value-relevance related research. Tests of market efficiency could bring us closer to an answer of how rapidly equity investors react upon announcements of publicly reported accounting information and improvements of equilibrium models can help us broaden the scope of value-relevance research by eliminating some of the limitations that is related to the simplifying assumptions of rational market behavior among investors.

A fourth and closely related issue to investigate is how we methodologically can address the fact that financial information might be relevant – in that it is capable of making a difference in a decision as issued in the conceptual framework for financial reporting – even though some user choose not to take advantage of it or are already aware of it from other sources of information.

As a fifth and final recommendation for further research, we suggest studies that advance the current knowledge on how we could simplify financial reports and statements into a language that is understandable to even untrained accounting individuals. Research attention should primarily be directed towards the problem of so-called black-box accounting where complex principle-based accounting standards enable companies to hide unfavorable information by restating facts and include unnecessary technical information, which easily can confuse untrained investors and force them into wrong economic decisions. Contributions in this research area would benefit the society on a both personal investor level and on a broader macro-economic level since it would increase the possibility for investors, untrained as well as trained, to avoid investing in unprofitable companies, which, in the long run, would benefit the society by mitigating the possibility for so-called lemons to exist.

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