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The Value Relevance of Alternative Performance Measures: Empirical Evidence from the Oslo Stock Exchange

Navn:	Cathrine Olsen Valltoft, Anna Natalia Beckman

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Name: **Anna Natalia Beckman**
Name: **Cathrine Olsen Valltoft**

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Thesis Supervisor:
Tonny Stenheim

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Table of Contents

List of Tables

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Abstract

Companies disclose alternative performance measures, either to provide useful information to the market, or for strategic purposes which can be misleading. Using traditional price regressions, this study examines the value relevance of alternative performance measures and whether alternative performance measures are more value relevant than financial statement measures. The sample consists of the 100 largest companies on the Oslo Stock Exchange with quarterly data from 2012 to 2016. We found alternative performance measures to be value relevant for investors on the Oslo Stock Exchange. Further, we conclude that alternative performance measures are more value relevant than financial statement measures; however, this result should be interpreted with caution due to limited statistically significant results. The findings of this study suggest that companies disclose alternative performance measures to inform rather than mislead the market.

Keywords: Alternative Performance Measures; Non-GAAP Measures; Pro Forma; Value Relevance

1. Introduction

Alternative Performance Measures (APMs) have several names, and are also called “non-GAAP measures”, “pro forma” and “street earnings”, among others. These are adjusted financial measures, not within applicable financial reporting frameworks.

Our experience is that analysts, investors and others frequently use APMs. After reading quarterly reports by companies on the Oslo Stock Exchange (OSE), we found for example: Statoil presents; “adjusted earnings” and “adjusted earnings after tax”, Telenor presents; “adjusted EBITDA”, “adjusted operating profit”, and “adjusted net income”, and Hydro presents; “underlying EBIT” and “underlying EBITDA”. APMs are financial measures adjusted for items, often one-time expenses, that managements claim to express the company’s continuing operations (e.g. Norsk Hydro ASA, 2017; Statoil ASA, 2017; Telenor ASA, 2017). Managements usually disclose APMs in headlines, narratives, or in tables in annual and quarterly reports, and presentations.

The purpose of financial reporting is to provide useful and relevant information, to investors and other stakeholders. The financial reporting should display a company’s financial position and help predict future cash flows. APM disclosures by Norwegian companies can be an indication that the applicable financial reporting frameworks are too focused on reliability and accuracy; hence, the frameworks lack usefulness for predicting future cash flows (Dyrnes & Pettersen, 2012).

There are two reasons for companies to disclose APMs; to reduce information asymmetry and provide useful information to investors, or for strategic purposes which can mislead investors by portraying earnings in a more optimistic manner (Entwistle, Feltham, & Mbagwu, 2010). Since there is flexibility in the calculation and presentation of APMs the assessment of which items to include and exclude is done subjectively by managements. Critics argue that the comparability between different periods and different companies are low, and that APMs are being used to improve the bottom line. Reinforcing this argument is that the adjustment almost always leads to improved earnings numbers (Bradshaw & Sloan, 2002). Managements’ arguments for disclosing APMs are to provide supplemental

information which reflect the company's continuing operations, and are more useful for investors (e.g. Norsk Hydro ASA, 2017; Statoil ASA, 2017; Telenor ASA, 2017). APM is meant to supplement financial statement measures, but Mary Jo White, former Chair of the US Securities and Exchange Commission (SEC), is concerned that APM has become a key message to investors (M. J. White, 2016). M. J. White (2016) also mentioned that: "lack of consistency", "individually tailored" APMs, and "cherry-picking" are problematic. Due to the criticism and discussion, SEC, the European Securities and Markets Authority (ESMA), and the International Accounting Standards Board (IASB) put APM disclosures on the agenda.

In addition to the criticism by standard setters, APMs receive criticism from the financial press. Financial Times Lex (2016, May 2) mentioned that adjusted earnings from the Standard and Poor's (S&P) 500[1] companies exceeded earnings reported in the financial statements by one-third in 2015. The difference between the financial statement measures and APMs had not been greater since the financial crisis in 2008 (Financial Times Lex, 2016, May 2). Another concern discussed in the Financial Times, is companies' use of APMs that bear no relation to financial statement measures, and that APMs are sometimes closer to fantasy (McLennahan, 2017, January 6).

Even though APMs receive much criticism, there are several studies providing evidence that APM is value relevant in the US, as well as significantly more value relevant than financial statement measures (e.g. Bhattacharya, Black, Christensen, & Larson, 2003; Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Entwistle et al., 2010). A financial measure is considered value relevant if it has predicted association with share prices.

In light of the extensive use of management disclosed APMs in Norway; we will investigate whether APM is value relevant for investors on the OSE, motivated by previous studies in the US. The discussion and concern regarding APMs being misleading, or whether APMs are a result of financial statement measures' lacking usefulness, inspire us to investigate the following two research questions:

[1] The S&P's 500 Index, consisting of 500 large-cap companies that are traded on American stock exchanges

Research Question 1: Are alternative performance measures value relevant for investors on the Oslo Stock Exchange?

Research Question 2: Are alternative performance measures more value relevant than financial statement measures?

To the best of our knowledge, there are no previous studies on the value relevance of APM in Norway using company reported quarterly data. We will therefore, in this thesis, contribute with new insight to the value relevance of APM for investors on the OSE.

This thesis proceeds as follows. Section 2 describes the concept of value relevance. Section 3 defines and presents a review of previous literature on APMs. Section 4 describes our methodology, which includes a presentation of our research questions, hypotheses, samples and variables, in addition to how to measure value relevance. Section 5 presents our findings from our estimated regressions. Section 6 discusses our results. Finally, Section 7 concludes this thesis.

2. Value Relevance

Value relevance studies are part of the capital market-based accounting research (CMBAR). CMBAR includes other topics such as; tests of market efficiency, research on earnings response coefficients, and fundamental analysis and valuation research (Kothari, 2001, p. 107). The first evidence of earnings' effect on share returns was found by Ball and Brown (1968) and Beaver (1968) when they investigated the information content of earnings announcements. More recent studies on value relevance focus on the usefulness of financial information by examining the association between financial measures and share prices (Barth, Beaver, & Landsman, 2001; Francis & Schipper, 1999; Holthausen & Watts, 2001).

2.1 Definition of Value Relevance

In value relevance literature, financial information can be defined as value relevant if there is a predicted association with share price (Barth et al., 2001). Francis and Schipper (1999) provided four interpretations of value relevance. The first interpretation can measure value relevance as the profits achieved by using accounting-based trading rules. However, the first interpretation lacks necessary adjustments for shifts in risk over time that are required for the interpretation to hold (Francis & Schipper, 1999). The second interpretation regards financial information as value relevant if the financial information is directly or indirectly used in a valuation model. Using this interpretation, value relevance can be measured by earnings' ability to predict future dividends, future cash flows, future earnings, or future book values (Francis & Schipper, 1999). This interpretation explains why some researchers regard value relevance and fundamental analysis as the same research field, whereas Beaver (2002) regards value relevance as an own area of research. The third interpretation considers the ability of financial information to change the total information in the market. The fourth interpretation measure value relevance as financial reporting's ability to capture, or summarise useful information, that may affect share prices (Francis & Schipper, 1999). Both the third and fourth interpretation measure value relevance as the statistical association between financial information and share prices or returns (Francis & Schipper, 1999). Beaver (2002) had a similar interpretation and

regarded financial information to be value relevant if the financial variables are significantly related to the dependent variable, e.g. share price.

2.2 Value Relevance – Its Usefulness and Contribution

The purpose of financial reporting is to reduce information asymmetry, which may occur in the market. Financial reporting aims to transform internal information to external information accessible to stakeholders and to present a true and clear picture of a company's economic reality (Stenheim & Blakstad, 2007). There are two main developers of financial reporting frameworks; Financial Accounting Standards Board (FASB), and IASB, which develops US GAAP[2] and IFRS[3], respectively. The decision usefulness is the main objective in these two frameworks (FASB, 2010; IASB, 2010). The problem in accounting theory is how to develop accounting standards that are informative for investors and at the same time can evaluate managers' performance (Scott, 2015). Value relevance studies are a popular method to investigate the usefulness of financial information.

Holthausen and Watts (2001) criticise the value relevance literature for only providing evidence of associations between financial information and equity market values, and that they lack descriptive theory to interpret these associations. In contrast, Barth et al. (2001) consider the value relevance literature as insightful, because one role of financial reporting is to facilitate investors' ability to value a company's equity.

2.3 Value Relevance Models

The objective of value relevance studies is to investigate the relationship between market value of equity and accounting numbers, and can be expressed as (Beisland, 2009):

$$MVE = f(AI) \tag{1}$$

[2] Generally Accepted Accounting Principles
[3] International Financial Reporting Standards

The dependent variable is typically the market value of equity (MVE) or share prices, and the independent variables are accounting information (AI) typically earnings measures.

Holthausen and Watts (2001) has classified value relevance studies into three categories: relative association studies, incremental association studies, and marginal information content studies. Relative association studies investigate the statistical associations between share prices or returns, and different accounting measures, typically by measuring the explanatory power (R2) of the estimated model. By examining the difference in the models R2s, using different accounting measures, it can be established which accounting measure is the most value relevant (Holthausen & Watts, 2001). Comparing the explanatory power across samples is criticised because it is difficult to distinguish whether the difference in R2 is a result of changing economic relations or sample characteristics (Gu, 2007). Incremental association studies examine whether an accounting measure is helpful in explaining share prices or returns given other specified variables. If the accounting measure's estimated coefficient is significantly different from zero, the accounting measure is considered value relevant (Holthausen & Watts, 2001). The last group, marginal information content studies, investigate whether the release of new accounting information results in value changes (Holthausen & Watts, 2001).

Holthausen and Watts (2001) found that 94 percent of the reviewed value relevance papers had conducted relative and/or incremental association studies, whereas 11 percent was marginal information content studies.

2.3.1 Price Earnings Regression

The simple price earnings regression derived from the earnings model developed by Miller and Modigliani (1966) is based on perfect and complete markets and use earnings measures as a proxy for permanent earnings. Assuming that constant future earnings equal future cash flows, the model can be expressed by the following simple earnings regression (e.g. Entwistle et al., 2010; Stenheim, 2012):

$$P_{it} = \beta_0 + \beta_1 E_{it} + \varepsilon_{it} \quad (2)$$

The independent variable, share price (P), is expressed as a function of earnings measures (E). The simple regression can be used to find the most value relevant earnings measure (E) by comparing the models explanatory power.

2.3.2 The Ohlson-model and the Price Level Regression

The theoretical framework developed by Ohlson (1995) is one of the most common approaches to study the value relevance of accounting amounts. The dividend and cash flow model can be expressed as a function of accounting measures if the assumption of clean surplus relation holds (Ohlson, 1995). The model can be expressed as follows (e.g. Beisland, 2009, p. 9):

$$MVE_0 = BVE_0 + \sum_{t=1}^{\infty} \frac{E(I_t - r_t * BVE_{t-1})}{(1 + r_t)^t} \quad (3)$$

where

MVE_t = market value of equity at time t

BVE_t = book value of equity at time t

I_t = net income (earnings) at time t

r_t = expected rate of return

Equation (3) expresses the market value of equity (MVE) as a function of the book value of equity and the discounted value of future residual income.

A linear regression equation can be derived from the Ohlson (1995) model. The regression equation is referred to as the price level regression. The price level regression can be used to investigate the association between share price, the book value of equity and the chosen accounting measure. Francis and Schipper (1999) refer to the model as the "balance sheet & earnings relation" as it provides a connection between balance sheet measures and income statement measures. The price level regression can be expressed as follows:

$$P_{it} = \beta_0 + \beta_1 BVE_{it} + \beta_2 E_{it} + \varepsilon_{it} \quad (4)$$

The price level regression expresses the dependent variable, share price (P), as a linear function of the independent variables; book value of equity (BVE) and earnings measures (E). The price level model is used to analyse the linear

regression's explanatory power to explain whether the earnings measure (E) is reflected in share prices.

2.3.3 Return Regression

Price regressions are typically used to determine to which extent accounting measures are reflected in a company's value, whereas return regressions are used to investigate changes in value (Barth et al., 2001; Beaver, 2002). The strength of the return regression is that it is less affected by econometric problems such as scale effects and misspecified models (Kothari & Zimmerman, 1995). The simple return regression can be expressed as:

$$R_{it} = \beta_0 + \beta_1 E_{it} + \varepsilon_{it} \quad (5)$$

Return (R) is expressed as a function of earnings (E). The return model can also be used to investigate abnormal returns, expressed as a function of abnormal earnings. The abnormal return regression can be expressed as:

$$AR_{it} = \beta_0 + \beta_1 AE_{it} + \varepsilon_{it} \quad (6)$$

Abnormal return (AR) is expressed as a function of abnormal earnings (AE). Abnormal earnings (AE) can be calculated as total earnings less expected earnings, where analyst forecasts can be used as a proxy for expected earnings (Beisland, 2009).

The specifications in (5) and (6) are used to look at the earnings response around the publication of new financial information. The β_1 coefficients in the return and abnormal return regressions are often referred to as the earnings response coefficient and is a measure of the magnitude of new information that is captured in (abnormal) returns (Kothari, 2001).

2.3.4 Return Regression – "Earnings Relation"

Another return specification is referred to as the "earnings relation" by Francis and Schipper (1999), because it investigates earnings' ability to explain returns. This return specification can be derived from the Ohlson (1995) model and the price level regression (Easton & Harris, 1991), in specification (2) and (3), respectively. The model can be expressed as:

$$R_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 \Delta E_{it} + \varepsilon_{it} \quad (7)$$

Share return (R) is expressed as a function of earnings (E) and the change in earnings (E_t - E_{t-1}).

2.4 Value Relevance Research and Market Efficiency

Value relevance studies typically employ the assumption of efficient capital markets (Aboody, Hughes, & Liu, 2002; Fung, Su, & Zhu, 2010; Holthausen & Watts, 2001). Fama (1970) divided capital market efficiency into three states: strong, semi-strong and weak. Assuming a strongly efficient market would entail that the market has access to and captures all private and public information in share prices. Consequently, there are no information asymmetry and no need for companies to develop financial statements (Stenheim, 2012). With a weak form of efficiency, it would be difficult to investigate the value relevance since the relationship between share prices, and accounting measures would be random. In a semi-strong efficient market, share prices reflect all publicly available information. Ball and Brown (1968) and Beaver (1968) found the assumption of market efficiency to be reasonable. However, studies have found that capital markets are inefficient regarding accounting issues such as; post-earnings announcements and market-to-book ratios (Beaver, 2002). Despite these findings, it is necessary to have at least some degree of market efficiency when studying value relevance to interpret the results correctly (Barth et al., 2001; Fung et al., 2010; Holthausen & Watts, 2001).

2.5 Econometric Issues in Value Relevance Research

Econometric issues can be a problem in value relevance studies, since misspecified models can lead to incorrect conclusions (Beisland, 2009). An important choice for researchers is which regression model to use. According to Barth et al. (2001), the choice between the price regression or the return regression is dependent on the research question(s). The price regression is most appropriate when investigating what is reflected in company value, and the return regression is most appropriate when examining changes in value (Barth et al., 2001; Beaver, 2002). Kothari and Zimmerman (1995) point out that both

regression models have strengths and weaknesses. Price regressions are more affected by econometric problems such as scale effects, whereas return regressions suffer more from coefficients biased towards zero (Kothari & Zimmerman, 1995). Landsman and Magliolo (1988) suggest that all econometric issues which can cause a violation of the ordinary least square assumptions, should be taken into account in the choice between price and return regressions. Kothari and Zimmerman (1995) suggest using both the price and the return regression to ensure that the study is not sensitive to the choice of regression model.

Another aspect in value relevance studies is the use of (multiple) linear regression models that are based on the assumption of linearity. Violation of linearity can be caused by omitted variables in the model (Stenheim, 2012). Other violations of linearity might be growth opportunities, the ability to liquidate the company, and conservatism (Holthausen & Watts, 2001).

2.6 Value Relevance over Time

Value relevance studies have found that there has been a decrease in the value relevance of earnings measures (e.g. Balachandran & Mohanram, 2011; Collins, Maydew, & Weiss, 1997; Lev & Zarowin, 1999). Collins et al. (1997) used price regressions to investigate the value relevance over time, and compared the relative explanatory power. The incremental value relevance of earnings has decreased in the past 40 years. However, the value relevance of book value of equity has increased in the same period (Collins et al., 1997). Further, Collins et al. (1997) found that the combined value relevance of earnings and book value of equity had increased slightly. Collins et al. (1997) suggest that the shift in value relevance is due to change in company size, and that companies more frequently report negative earnings and non-recurring items. Francis and Schipper (1999) found different evidence to the change in value relevance over time. They conducted a similar test as Collins et al. (1997), and found that the combined value relevance of earnings and book value of equity had not decreased. However, performing another test that controls for scale effects, Francis and Schipper (1999) found indications of decreasing value relevance. Supporting this is a recent study by Barth, Li, and McClure (2017) who also found a decline in earnings' value

relevance in the period 1962-2014. However, Barth et al. (2017) found that the value relevance of the total accounting information does not decrease.

Value relevance studies of earnings measures over time show different results, and Lev and Zarowin (1999) found a decrease in the value relevance of earnings, cash flow and the book value of equity over a 20-year period. Further, Lev and Zarowin (1999) suggest that the decrease in value relevance is due to the great changes in US companies over the 20-year period.

3. Alternative Performance Measures

3.1 Definition of Alternative Performance Measures

Alternative performance measures (APMs) are adjusted financial numbers, other than those defined in applicable financial reporting frameworks (e.g. US GAAP; IFRS). APM is in the academic literature, financial press, and by managers also referred to as: "non-GAAP earnings", "pro forma earnings", "street earnings", and "non-IFRS earnings". ESMA (2016) defines APM as: "a financial measure of historical or future financial performance, financial position, or cash flows, other than a financial measure defined or specified in the applicable financial reporting framework".

It has become common for companies in the US and Europe to disclose APMs as supplemental information in their annual and quarterly reports. APMs often exceed their comparable earnings measures from applicable financial reporting frameworks because managers often exclude certain expenses when deriving APMs (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Isidro & Marques, 2015). Commonly used exclusions when deriving APMs are: restructuring charges, write-downs and impairments, research and development expenditures, merger and acquisitions costs, mandatory stock compensation expenses, amortisation of goodwill, and certain results from subsidiaries (Bradshaw & Sloan, 2002). Further, these exclusions are often considered by the management as "unusual", "non-recurring", "non-cash", or "special items" (Bradshaw & Sloan, 2002).

In addition to the management reported APMs, it is common for analysts to report adjusted earnings information that differs from financial statement measures. Studies on APMs can be divided into two groups. The first group use analyst estimates, often referred to as "street earnings", as a proxy for company disclosed APM (e.g. Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Doyle, Lundholm, & Soliman, 2003). The second group, studies "pro forma" earnings reported by managements (e.g. Bhattacharya et al., 2003; Entwistle et al., 2010; Marques, 2006). APM, or non-GAAP as it is often called in the US, is a general term used for both "street" and "pro forma" in the academic literature and financial press.

APM is a relatively new phenomenon. Bradshaw and Sloan (2002) found that the Institutional Brokers' Estimate System (I/B/E/S) issued earnings estimates excluding some "special" and "non-recurring items" in 1985, but that the use of APMs was uncommon in the US until the early 1990s. In data from analyst tracking services in the period 1986-1997, Bradshaw and Sloan (2002) found an increasing trend to exclude special items and that the degree of exclusions increased over time. The exclusions resulted in a larger gap between APM and financial statement measures, which is consistent with other studies (see Bhattacharya et al., 2003; Isidro & Marques, 2015) that found APMs to exceed financial statement measures.

3.2 Criticism of Alternative Performance Measures

There are two main reasons to report APM according to the APM literature and financial press: to reduce information asymmetry, or for strategic reasons which may be misleading by portraying the company's performance in a more optimistic manner (Entwistle et al., 2010).

Managements argue that APM better express companies' financial reality than financial statement measures (e.g. Norsk Hydro ASA, 2017; Statoil ASA, 2017; Telenor ASA, 2017), thus reduces information asymmetry. This is supported by several studies finding APMs to be more value relevant than financial statement measures (e.g. Bradshaw & Sloan, 2002; Entwistle et al., 2010). Huang and Skantz (2016) provided evidence suggesting that information asymmetry is reduced in quarters with APM disclosures. Further, they found evidence of reductions in information asymmetry when the adjustments in APMs increase. The search for private information increases when investors expect APM disclosures, because APMs reflect the company's true economic reality under the efficient market assumption (Huang & Skantz, 2016). However, Huang and Skantz (2016) mention that if the market is inefficient, APMs can be presumed to be more value relevant even if they are not.

Barth et al. (2017) found that there has been a decrease in the value relevance of earnings from 1962-2014, but that the value relevance of other accounting

amounts increased. An explanation for the decreasing value relevance of earnings can be investors increased focus on APMs instead of financial statement measures (Bradshaw & Sloan, 2002). Investors require value relevant information to make good investments. Managements have incentives to disclose additional information if the quality of financial statement information is low, and as a result of low quality the additional information is beneficial for investors (Gelb & Zarowin, 2002). APM disclosures are additional financial information voluntarily reported by companies and can be an indication of low quality and lacking usefulness in the applicable financial frameworks (Dyrnes & Pettersen, 2012).

Management's focus on APMs in reports and presentations has increased in recent years, while the focus on financial statement measures has been limited. The shift in focus might be a strategic intention to direct the focus to the most favourable earnings measures (Entwistle et al., 2010). A study by Doyle et al. (2003) suggests that managers disclose APM to hide the true economic reality and consequently mislead investors. Reinforcing the argument that managers use APMs with strategic intentions, are the fact that APMs almost always exceed financial statement measures (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Isidro & Marques, 2015). Another concern is that recurring expenses are deemed as "unusual" and are used as adjustments when deriving APMs (Bhattacharya et al., 2003).

Previous literature has found that APM can be used to "meet or beat" earnings benchmarks (Bhattacharya et al., 2003; Black & Christensen, 2009; Doyle, Jennings, & Soliman, 2013; Isidro & Marques, 2015). Bhattacharya et al. (2003) found that 80 percent of APM announcements "meet or beat" analyst forecasts, while only 39 percent of the same companies' financial statement measures "meet or beat" analyst forecasts. Further, Isidro and Marques (2015) claim that APM is more likely to be used to "meet or beat" earnings benchmarks if the country in which the company operates has a strong investor protection, developed financial markets, have efficient law and enforcement, and have sound systems to share information. In countries with no opportunity to manipulate financial statements, and where the pressure to reach earnings benchmarks is high, APMs can be used to portray companies performance in a more optimistic manner (Isidro & Marques, 2015). Isidro and Marques (2015) suggest that when financial earnings

measures do not reach their benchmark, the likelihood for companies to disclose APMs increase.

Black and Christensen's (2009) research suggests that APM does not always reflect recurring income and that APM can be used to signal performance more optimistically. Companies that exclude recurring items such as; research and development costs, depreciation and amortisation, and tax-related expenses, often report APM more aggressively and use APMs to meet strategic targets (Black & Christensen, 2009). On the contrary, excluding non-recurring items, such as restructuring expenses and costs related to new shares, indicate more realistically disclosed APMs (Black & Christensen, 2009). Further, Black and Christensen (2009) suggest that companies disclosing APMs regularly, are less likely to mislead the market than those who disclose APMs sporadically.

Standard setters also criticise APM disclosures, and in May 2002, the International Organization of Securities Commission (IOSCO) was the first organisation to voice concerns about the use of APM in Europe and issued a cautionary advice (IOSCO, 2016). SEC has also been very critical regarding companies use of APMs and voiced concerns that APM could mislead and confuse investors (M. J. White, 2016). Guillamon-Saorin, Isidro, and Marques (2017) suggest that the potential of APM to be misleading is greater in Europe than in the US since there are fewer regulations constraining APM disclosures and because capital markets and institutional mechanisms are less developed. In 2009, the European Financial Reporting Advisory Group (EFRAG), raised concerns, due to the inconsistent and ambiguous use of APMs (EFRAG, 2009). Regulations and auditing of financial statements help to ensure that analysts and investors can make informed decisions, due to higher levels of comparability (Isidro & Marques, 2015). Hence, the flexibility in APM calculations creates opportunities for managements to mislead the capital market. These opportunities are higher if there are few regulations on APM disclosures and if investor protection is low (Guillamon-Saorin et al., 2017). Consistent with the concerns, ESMA (2016) have implemented guidelines in Europe for APMs published after July 3rd, 2016.

Flexibility in earnings announcements creates opportunities for managements to use communication techniques, like impression management, to mislead

investors. In a study of large European companies, Guillamon-Saorin et al. (2017) discovered that recurring items are excluded from APMs and are often combined with high impression management. This study suggests that the market react positively to APMs with low levels of impression management, and punish a high level of impression management. These findings also suggest that the market correctly identifies managements attempt to mislead investors using impression management techniques. In countries with sophisticated investors and a high level of investor protection, companies are punished for using impression management combined with APM disclosures (Guillamon-Saorin et al., 2017).

3.3 Regulation of Alternative Performance Measures

SEC started to regulate APMs in the US by adopting the Sarbanes-Oxley Act in 2002. The first regulations in early 2000 required public companies to present APMs with their most directly comparable financial statement measures and that there is a reconciliation between those two measures (SEC, 2003). SEC (2016) issued new Compliance and Disclosure Interpretations (CDIs) in 2016 regarding APMs. The new CDIs were issued to regulate what SEC thought of as problematic, such as; "lack of consistency", "individually tailored" APMs, and "cherry-picking" (M. J. White, 2016).

Compared to the US, there has been little regulation of APM in Europe until 2016. ESMA (2016) issued mandatory guidelines for APM disclosure in regulated information published in Europe on or after July 3rd, 2016. The ESMA (2016) guidelines apply to APM in the first part (e.g. management review) of quarterly and annual reports. They also apply to other published regulated information, for example, ad-hoc disclosures. The guidelines do not apply to APMs disclosed in the financial statements. One requirement in the guidelines is that companies define APMs in a clear and readable way, with basic calculations (ESMA, 2016). Further, companies should explain the APMs disclosed to ensure reliability. In addition, the calculations and definitions must be consistent over different reporting periods, and if changed, they must be explained (ESMA, 2016). Further requirements are that APM cannot be more prominent than financial statement measures, and that reconciliation between APMs and their most relevant financial statement measures is presented. For example; Statoil presents reconciliation

between adjusted earnings and net operating income, as well as adjusted earnings after tax and net income in their fourth quarter press release in 2016. The ESMA (2016) guidelines also restrict the definitions; "non-recurring", "infrequent" and "unusual".

3.4 Value Relevance of Alternative Performance Measures

Bradshaw and Sloan (2002) studied the relative value relevance of earnings from financial statements and I/B/E/S estimates, using quarterly company observations from 1986-1997. The I/B/E/S estimates are considered good proxies for APMs, and exclude various non-recurring items that are included in financial statement measures. When comparing the earnings coefficients and explanatory power, Bradshaw and Sloan (2002) found evidence of a significant increase in the value relevance of APMs reported by analysts, whereas the value relevance of financial statement measures decreased in the same period. Brown and Sivakumar (2003) drew a similar conclusion in their study, using quarterly data from 1989-1997. By using S&P's measure of ESP and I/B/E/S estimates to study the relative value relevance; Brown and Sivakumar (2003) conclude that APMs reported by managers and analysts are more value relevant than the S&P measure of EPS.

Bhattacharya et al. (2003) investigated APMs disclosed in companies' press releases, operating earnings from financial statements and I/B/E/S estimates for EPS from January 1998 to December 2000. Around earnings announcement dates, they investigated short-window abnormal returns and found evidence suggesting that APMs are significantly more informative to investors than operating earnings reported in financial statements. Bhattacharya et al. (2003) also found evidence consistent with other studies (e.g. Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003); that I/B/E/S estimates are more value relevant than financial statement measures. These evidences suggest that investors perceive APMs reported by managements and analyst estimates to represent "core earnings" better than financial statement measures (Bhattacharya et al., 2003).

Albring, Cabán-García, and Reck (2010) investigated the value relevance of APMs using the S&P's measurement of core earnings which use the same exclusions for all companies in the S&P index. Albring et al. (2010) found APMs

to be significantly associated with share prices and returns; consequently, APMs are value relevant. Further, their findings suggested that APMs are more value relevant than financial statement measures. Albring et al. (2010) mentioned that their result is limited to the investigated S&P measures of core earnings, but suggest that the findings to some extent can be generalised to other definitions of APMs.

In an article by Entwistle et al. (2010), the value relevance of management reported APMs, analyst reported APMs, and earnings from the financial statements in the period 2000-2004 were explored. Further, the article examined which earnings measures were the most value relevant. Entwistle et al. (2010) conducted both price and return regressions, and collected APMs reported in press releases for S&P's 500 companies, I/B/E/S estimates and financial statement measures. All three earnings measures were found to be value relevant. Furthermore, the APMs reported by management were significantly more value relevant than I/B/E/S earnings, and both these earnings measures were more value relevant than financial statement measures (Entwistle et al., 2010). The findings by Entwistle et al. (2010) suggest that managers disclose APMs to inform and not to mislead the market. Further, they suggest that managements have a better understanding of companies continuing operations than analysts, and communicates this through APM disclosures. Brown and Sivakumar (2003) had a similar argument and suggested that managements desire to provide the market with more value relevant information through APM disclosures. Furthermore, Brown and Sivakumar (2003) also suggest that permanent earnings, such as APM reported by managements and analysts are more value relevant than transitory earnings.

4. Methodology

In this section, the methodology is presented. To determine the value relevance of alternative performance measures (APMs), a quantitative study is preformed to examine the association between share prices and earnings measures. The causal relationship between APMs and share prices will not be examined.

4.1 Research Questions and Hypotheses

In this study, two research questions will be investigated. First; are alternative performance measures value relevant for investors on the Oslo Stock Exchange? Second; are alternative performance measures more value relevant than financial statement measures?

APM disclosures receive criticism from the financial press and standard setters, claiming that APM disclosures are done with strategic intentions that can be misleading. Isidro and Marques (2015) found evidence from Europe, that managements use APM disclosures to “meet or beat" strategic benchmarks. Also, researchers have found that APM-earnings almost always exceeds financial statement earnings (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Isidro & Marques, 2015), which supports the criticism that APMs are used with strategic intentions. Another view is that managers disclose APMs to contribute with useful information to the market and reduce information asymmetry. Removing transitory or non-cash items from permanent earnings can improve the value relevance (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Doyle et al., 2003). Further, there are several studies providing evidence that actual management reported APMs are value relevant (e.g. Bhattacharya et al., 2003; Entwistle et al., 2010). Studies also provide evidence that APM is more value relevant than financial statement measures (e.g. Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Entwistle et al., 2010)

In the view of these discussions regarding APM, we find value relevance of APM to be a relevant and interesting topic for research, and we want to contribute with new insight to the value relevance of APM for investors on the OSE. Similar to previous studies in the US, we expect APM to be value relevant for investors on the OSE, as well as more value relevant than financial statement measures. Based

on the previous literature, and the ongoing discussion of APM, our hypotheses are:

Hypothesis 1: Alternative performance measures are value relevant for investors on the Oslo Stock Exchange.

Hypothesis 2: Alternative performance measures are more value relevant than financial statement measures.

4.2 Research Models

There are two main approaches measuring value relevance, namely price regressions and return regressions. The two approaches address similar but not the same research questions. Consequently, it is necessary to have correctly specified regressions, to draw correct conclusions about the statistical associations (Barth et al., 2001; Kothari & Zimmerman, 1995). To establish if APM is value relevant, and if APM is more value relevant than financial statement measures, the price earnings regression and price level regression will be estimated. In addition, the return regression will be estimated to control for possible econometric factors that might influence the price regressions. Due to sample size, pooled regressions will be performed when examining the three APMs and their comparable financial statement measures.

4.2.1 Price Earnings Regression

As a start in the analysis the simple price earnings regression will be estimated, which is derived from the earnings model by Miller and Modigliani (1966). This regression is based on perfect and complete markets, which is an unrealistic assumption in capital markets. However, it is used in the value relevance literature to identify the most value relevant earnings measure (Beisland, 2009; Holthausen & Watts, 2001). To test the hypotheses, the following price earnings model will be estimated:

$$Price_i = \beta_0 + \beta_1 E_i + \varepsilon_i \quad (8)$$

where *Price* is the share price, E is the earnings measure of interest, and ε is the error term.

4.2.2 Price Level Regression

Secondly, the price level regression will be conducted, which is a regression derived from the Ohlson (1995) model. This regression is one of the most common in value relevance studies, since it provides a link between share prices and accounting measures from both the balance sheet and income statement (Stenheim, 2012). The hypotheses will be tested with the following price level model:

$$Price_i = \beta_0 + \beta_1 BVE_i + \beta_2 E_i + \varepsilon_i \quad (9)$$

where *Price* is the share price, *BVE* is the book value of equity, *E* is the earnings measure of interest, and ε is the error term.

4.2.3 Return Regression

The advantage of the return regression is that it is less affected by econometric problems than price regressions (Kothari & Zimmerman, 1995). Accordingly, the return regression will be estimated as a robustness test. However, the return regression might not be best suited when testing the hypotheses, since they are constructed to test whether APMs are reflected in share prices. The return regression is more suitable when studying changes over time (Barth et al., 2001). In return regressions, the earnings measures of interest are typically scaled by the market value of equity at the beginning of the period (Beisland, 2009; Francis & Schipper, 1999). As a control, the following return model will be estimated:

$$Return_i = \beta_0 + \beta_1 E_i + \beta_2 \Delta E_i + \varepsilon_i \quad (10)$$

where *Return* is the share return, *E* is the earnings measure of interest, and ΔE ($E_t - E_{t-1}$) is the change in the earnings measure of interest, and ε is the error term.

4.3 Measure of Value Relevance

The explanatory power (R2) is considered a measure of value relevance (Beisland, 2009; Holthausen & Watts, 2001). R2 is a measure of how much variation in share prices or share returns is explained by the earnings measures of interest and potential control variables. The explanatory power of the different models can be compared to determine the most value relevant earnings measure. Even though the R2 comparison is a popular method in accounting research, it is not considered to be a compatible method across samples and across time (Gu, 2007). The

explanatory power of a model is only related to its specific sample and underlying population, and consequently, not a suitable method across samples (Gu, 2007). To avoid problems with R2 comparisons, data will only be collected where both the APM and its comparable financial earnings measures are available. Consequently, each subsample will consist of the same company-quarter observation for the APM and its comparable financial statement measure. When adding variables to a model, R2 will typically increase; hence, adjusted R2s will be compared since it adjusts for the number of variables included in the model (Stock & Watson, 2012).

In addition to R2, this study will investigate whether the earnings measures are helpful to explain share prices. An earnings measure can be considered value relevant if the earnings coefficient is significantly different from zero (Holthausen & Watts, 2001). We will test if the difference in the earnings coefficients is statistically significant and test the null hypothesis[4]; that there is no difference between the competing models' coefficients.

Vuong (1989) developed a likelihood-ratio test for model selection and non-nested hypotheses that are commonly used in value relevance studies (e.g. Entwistle et al., 2010; Stenheim, 2012). The Vuong (1989) test will be used to test if the difference between two models' explanatory power is statistically significant. The Vuong (1989) test provides a Z-statistic for the two competing models, the first model is preferred if the Z-statistic is significantly positive and the second model is preferred if the Z-statistic is significantly negative.

4.4 Definition of Study Variables

The dependent variable share price (price regressions) has a lag of two months due to delayed publication of quarterly reports. By Norwegian law, quarterly reports must be published within two months after the quarterly period ended (Verdipapirforskriften, 2007, paragraph 5-5)[5].

[4] The hypothesis has been tested using seemingly unrelated estimation (suest) in Stata

[5] Requirement to develop and publish quarterly reports has been annulled as of January 1st, 2017

4.4.1 Variables of Interest

The variables of interest are APMs presented in companies' quarterly reports, and/or quarterly presentations and the comparable reported financial statement measures. Based on availability, the APM and reported variables of interest are: Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA), Earnings Before Interest and Tax (EBIT), Earnings and Earnings per Share (EPS). EBITDA, EBIT and Earnings are divided by the number of common shares outstanding for each company.

To be considered an APM disclosure in this study, the quarterly reports and/or presentations need to disclose the APMs in the headlines, the narratives, or clearly presented in tables. In this study, EBITDA, EBIT or other similar measures are not considered to be APMs, since they are frequently used to derive other income statement numbers. Common terms to describe APMs in quarterly reports are: "underlying", "adjusted", "excluding special items", and "continuing".

4.4.2 Controlling for Company Characteristics

In addition to earnings information and price information, share prices depend on timeliness and the predictability of earnings (Ettredge, Kwon, Smith, & Zarowin, 2005). According to Ettredge et al. (2005), more timely earnings have a stronger relationship with current share prices and a weaker relationship with future share prices. Also, current prices have a closer relationship with future prices if they can be predicted. To avoid unbiased results and ensure that changes in share prices are due to the earnings variables of interest, and not due to omitted correlated variables, control variables will be included in the regressions. The control variables are used to estimate company fixed effects, companies' earnings characteristics and information environment. Value relevance literature has identified several proxies for timeliness and predictability of earnings and some of these will be applied.

In accordance with Entwistle et al. (2010), this study control for the interest in companies and information environment by including the variable; *analyst*[6] as a proxy for analyst followers in the models. This variable is measured as the total number of analyst estimates available in Datastream for each company. The

[6] Thomson Reuters Datastream variable *EPS Total Number of Estimates* (code: EPS1NET)

control variable, *analyst* is included in the regression as the logarithm of the number of analyst followers for the particular company. This variable also serves as a control for company size (Entwistle et al., 2010). When examining different variables, *analyst* has a high correlation with other commonly used control variables for scale, such as market value and total assets (Beisland, 2009; Francis & Schipper, 1999). To avoid multicollinearity problems, *analyst* will be included in the models and the other variables; revenue, total assets, and market value is excluded.

Growth and risk are determinants for price change, and therefore affect the predictability of share prices (Holthausen & Watts, 2001; Kothari, 2001). To control for growth, the commonly used proxy, market-to-book ratio[7] (Ettredge et al., 2005) will be included as the variable *growth* in the regression models.

High risk has a negative effect on share prices, and low risk can give a risk premium (Kothari, 2001). To control for companies' financial risk, the proxy *leverage ratio*[8]*,* which is total debt in percent of total capital, will be included in the regressions. A company with a relatively high leverage ratio will typically have more risk due to a higher level of debt financing.

When determining control variables, previous literature on value relevance (e.g. Holthausen & Watts, 2001; Kothari, 2001), as well as APM studies (e.g. Entwistle et al., 2010), were consulted. Data was collected from Datastream, but some control variables were unavailable for the Norwegian market, or on a quarterly basis, and therefore not used in this study. The number of analyst followers for each company was not available in Datastream for many companies listed on the OSE, and analyst estimates (*analyst*) in Datastream were the best available substitute. There were also some problems finding variables to use as proxies for risk available on a quarterly basis. The variable *leverage ratio* was chosen because it explains a lot of company risk, but also due to availability.

[7] Thomson Reuters Datastream variable *price to book value* (code: PTBV)
[8] Thomson Reuters Datastream variable *total debt % total capital* (code: WC08221)

4.5 Data and Sample

In this study, the hypotheses will be tested using data from the 100 largest companies on the OSE measured in market value per May 15th, 2017 (Appendix 1). The APMs and their most comparable financial statement measures are handpicked from companies' quarterly reports and/or presentations in the period 2012 to 2016. The actual sample size was 760 company quarterly observations. For comparability, data was collected exclusively where APM and its comparable and relevant financial statement measure are disclosed and vice versa. Banks and insurance companies were excluded from the samples since they use deviating accounting principles. Also, companies without fiscal year-end at 31st of December were excluded. These exclusions are a commonly to avoid biased estimations (Beisland, 2009; Kothari & Zimmerman, 1995). There were 820 quarterly reports where APMs of interest were not disclosed.

Table 4.1 – Data Sample

	Quarterly Observations
Total observations	2000
Bank and Insurance companies	-380
Company observations not reporting APM of interest	-820
Observations with deviating fiscal year end	-20
Missing company observations	-20
Total sample size	**760**

Subsample:	**EBITDA-APM & EBITDA**	**EBIT-APM & EBIT**	**EPS-APM & EPS**
Total sample size	760	760	760
Observations, not containing variable of interest	-543	-467	-504
Missing data for price variable	-3	-2	-2
Missing data for control variables	-6	-5	-4
Outliers	-6	0	0
Subsample total	**202**	**286**	**250**

Our observations are divided into three subsamples, with 202 EBITDA-APM and EBITDA observations, 286 EBIT-APM and EBIT observations, and 250 EPS-APM and EPS observations. There were six outliers excluded from the EBITDA-APM/EBITDA subsample.

When sampling book value of equity, shares outstanding, and control variables, the Thomson Reuters Datastream database is used. Some observations were excluded from the sample because of missing control variables. Because the

companies included in this study were reporting in different currencies, the Oanda currency converter was used to convert all measures to Norwegian kroner.

The sample size should ideally be larger for each subsample to investigate the hypotheses because a larger sample is more likely to give statistically significant results. Due to time restraints, the study has been restricted to the 100 largest companies on the OSE where data is collected from 2012-2016. The largest companies were chosen since the pilot study showed that smaller companies are less likely to report APM. We are confident that that this study contributes with insight to value relevance of APM in Norway, despite the relatively small sample size.

4.5.1 Pilot Study

To determine if the companies of interest disclosed APM, and of what nature, a pilot study was performed. Companies of various sizes and from different industries were selected until we had a sample of 10 companies disclosing APMs. To determine whether a company disclosed APMs, the quarterly reports and presentation were read thoroughly. The pilot study helped to get familiarised with the OSE listed companies' use of APMs to determine which measures to include in this study.

5. Empirical Analyses

This section presents the estimated regressions and main findings. Section 5.1 contains summary statistics and correlations matrices for the three subsamples. Section 5.2 and 5.3 contain the estimated regressions and findings related to Hypothesis 1 and Hypothesis 2, respectively. Finally, Section 5.4 presents the control and robustness tests.

5.1 Descriptive Statistics

5.1.1 Summary Statistics

Table 5.1 shows the summary statistics for the variables of interest along with control variables for each subsample.

Table 5.1 – Summary Statistics

Panel A: EBITDA-APM and EBITDA

	Observations	Mean	Median	Standard Deviation	Min	Max
Price	202	102.61	61.13	101.68	0.80	422.00
EBITDA-APM	202	4.33	2.22	5.10	-4.99	24.15
EBITDA	202	4.29	1.95	5.81	-7.45	37.02
BVE	202	54.76	33.96	64.43	1.05	274.22
growth	202	2.08	1.49	1.54	0.20	7.42
leverage ratio	202	33.79	28.46	22.79	0.00	96.54
analyst	202	2.46	2.56	0.91	0.00	3.58

Panel B: EBIT-APM and EBIT

	Observations	Mean	Median	Standard Deviation	Min	Max
Price	286	72.64	49.86	62.36	0.80	359.00
EBIT-APM	286	2.24	1.28	2.88	-1.74	18.62
EBIT	286	2.33	1.23	3.45	-8.04	19.50
BVE	286	36.93	34.26	25.60	1.82	120.29
growth	286	1.93	1.61	1.16	0.23	7.42
leverage ratio	286	30.82	33.57	13.85	0.00	55.57
analyst	286	2.43	2.40	0.75	0.00	3.66

Panel C: EPS-APM and EPS

	Observations	Mean	Median	Standard Deviation	Min	Max
Price	250	91.10	60.38	88.65	0.80	422.00
EPS-APM	250	1.18	0.68	3.12	-16.50	13.10
EPS	250	0.63	0.37	4.83	-36.83	14.56
BVE	250	61.33	36.54	68.99	-20.90	352.04
growth	250	1.68	1.33	1.69	-10.48	7.39
leverage ratio	250	31.75	29.75	21.88	0.00	109.22
analyst	250	2.61	2.64	0.71	0.00	3.66

As expected, the EBITDA-APM mean of 4.33 is higher than the EBITDA mean of 4.29, and the EPS-APM mean of 1.19 is higher than the EPS mean of 0.63. However, the EBIT-APM mean is lower than the EBIT mean of 2.25 and 2.36, respectively. This is surprising, considering the criticisms implying that APM is used for strategic reasons and tend to exceed financial statement measures (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Isidro & Marques, 2015).

5.1.2 Correlation Matrices

Table 5.2 contains the correlation matrices for the earnings measures and control variables. The correlation matrix with EBITDA-APM, EBIT-APM, EPS-APM, and their comparable financial statement measures are presented in Panel A, Panel B and Panel C, respectively.

Table 5.2 – Correlation Matrices

Panel A: EBITDA-APM and EBITDA

	Price	EBITDA-APM	EBITDA	BVE	growth	leverage ratio	analyst
Price	1.0000						
EBITDA-APM	0.7681*	1.0000					
EBITDA	0.7380*	0.9024*	1.0000				
BVE	0.7638*	0.7702*	0.7251*	1.0000			
growth	0.4430*	0.1404*	0.1242*	-0.0918	1.0000		
leverage ratio	0.0133	0.1667*	0.1741*	-0.1017	0.0604	1.0000	
analyst	0.3703*	0.4082*	0.3694*	0.4157*	-0.0961	-0.0512	1.0000

Panel B: EBIT-APM and EBIT

	Price	EBIT-APM	EBIT	BVE	growth	leverage ratio	analyst
Price	1.0000						
EBIT-APM	0.6950*	1.0000					
EBIT	0.6206*	0.8067*	1.0000				
BVE	0.6948*	0.8049*	0.5984*	1.0000			
growth	0.4973*	0.1577*	0.2039*	-0.0232	1.0000		
leverage ratio	-0.0689	0.0176	-0.0163	0.0582	-0.3170*	1.0000	
analyst	0.1512*	0.2899*	0.1563*	0.4565*	-0.2376*	0.2101*	1.0000

Panel C: EPS-APM and EPS

	Price	EPS-APM	EPS	BVE	growth	leverage ratio	analyst
Price	1.0000						
EPS-APM	0.5576*	1.0000					
EPS	0.4285*	0.5707*	1.0000				
BVE	0.6758*	0.4667*	0.2654*	1.0000			
growth	0.3200*	0.1453*	0.1380*	-0.0766	1.0000		
leverage ratio	-0.1342*	-0.3479*	-0.2672*	-0.0692	-0.3220*	1.0000	
analyst	0.4285*	0.3554*	0.1092*	0.3596*	-0.0209	-0.0994	1.0000

* Significant at 10 percent level

As expected, there are significant positive correlations between the dependent variable *Price* and the earnings variables of interest. The APMs and their comparable financial statement measures are also positively and significantly correlated with one another. In addition, the matrices show some correlation between the independent variables; therefore, a test to check for possible issues with multicollinearity in the estimated regressions will be conducted.

5.2 Value Relevance of Alternative Performance Measures

Based on the hypotheses and sample size, pooled regressions have been conducted to test Hypothesis 1. The price earnings regression and price level regression (Ohlson, 1995) have been estimated for each APM, with and without control variables. All regressions in section 5.2 have been estimated with Huber-White-sandwich robust standard errors (Huber, 1967; H. White, 1980) because this method can correct for minor problems with; heteroscedasticity, normality, and large residuals.

5.2.1 Price Earnings Regressions

Table 5.3 presents the estimated simple earnings regressions. The coefficients are all strongly positive, and statistically significant at 1 percent level. To determine the value relevance of the earnings measures, the explanatory power for each model was examined. The results show a relatively high explanatory power for each model at 58.80 percent for the EBITDA-APM model, 48.12 percent for the EBIT-APM model, and 30.81 percent for the EPS-APM model. The explanatory power in the price earnings regressions can be unusually high due to econometric problems such as scale effects (Barth & Clinch, 2009; Gu, 2007).

Since all three models have adjusted R2s significantly different from zero, the findings suggest that APM is value relevant for investors on the OSE. These findings are consistent with Hypothesis 1.

Table 5.3 – Price Earnings Regressions: APM

Model spesicifation:

(1) Price = β_0 + β_1 EBITDA-APM + ε

(2) Price = β_0 + β_1 EBIT-APM + ε

(3) Price = β_0 + β_1 EPS-APM + ε

	(1) Price		(2) Price		(3) Price	
Intercept	36.331	***	38.875	***	72.347	***
	(6.83)		(3.53)		(5.82)	
EBITDA-APM	15.323	***				
	(1.20)					
EBIT-APM			15.041	***		
			(2.07)			
EPS-APM					15.832	***
					(2.75)	
Adjusted R-squared	0.5880		0.4812		0.3081	
F-test	161.92	***	52.69	***	33.16	***
Observations	202		286		250	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EPS-APM	Earnings and Earnings per share disclosed as an APM

5.2.2 Price Earnings Regressions Controlling for Company Characteristics

Table 5.4 presents the estimated price earnings regression with control variables that are known to affect the price earnings model. The APM-coefficients are all positive, and statistically significant at 1 percent level. The coefficient on EBITDA-APM, EBIT-APM and EPS-APM are 13.73, 13.12 and 13.22, respectively. The coefficients are slightly lower, but still strongly positive, compared to the simple model in section 5.2.1.

The adjusted R2 is 72.71 percent, 63.84 percent and 45.07 percent for EBITDA-APM, EBIT-APM and EPS-APM, respectively when controlling for company characteristics. The adjusted R2 suggests that the price earnings regressions are improved after including control variables. The adjusted R2s are significantly different from zero, and therefore support Hypothesis 1, but the explanatory power might be unusually high due to scale effects (Barth & Clinch, 2009; Gu,

2007). A variance inflation factor (VIF) test has been conducted for the three models and no severe problems with multicollinearity were found (Appendix 3).

Table 5.4 – Price Earnings Regressions Controlling for Company Characteristics: APM

Model spesicifation:

(1) $Price = \beta_0 + \beta_1$ EBITDA-APM $+ \beta_2$ growth $+ \beta_3$ leverage ratio $+ \beta_4$ analyst $+ \varepsilon$

(2) $Price = \beta_0 + \beta_1$ EBIT-APM $+ \beta_2$ growth $+ \beta_3$ leverage ratio $+ \beta_4$ analyst $+ \varepsilon$

(3) $Price = \beta_0 + \beta_1$ EPS-APM $+ \beta_2$ growth $+ \beta_3$ leverage ratio $+ \beta_4$ analyst $+ \varepsilon$

	(1) Price	(2) Price	(3) Price
Intercept	-21.853	-21.203 ***	-64.860 ***
	(16.18)	(7.90)	(23.27)
EBITDA-APM	13.727 ***		
	(1.53)		
EBIT-APM		13.119 ***	
		(1.72)	
EPS-APM			13.220 ***
			(2.80)
growth	24.085 ***	23.128 ***	16.204 ***
	(3.08)	(3.03)	(5.44)
leverage ratio	-0.524 **	0.193	0.630 ***
	(0.26)	(0.16)	(0.16)
analyst	13.269 ***	5.728 **	35.742 ***
	(5.00)	(2.58)	(7.03)
Adjusted R-squared	0.7271	0.6384	0.4507
F-test	104.07 ***	64.86 ***	13.11 ***
Observations	202	286	250

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EPS-APM	Earnings and Earnings per share disclosed as an APM
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

5.2.3 Price Level Regression

Table 5.5 presents the estimated price level regressions, which are commonly used in value relevance research (Barth et al., 2001; Holthausen & Watts, 2001; Kothari, 2001). The APM-coefficients and the BVE-coefficients are all

statistically significant at 1 percent level. The estimated coefficients on EBITDA-APM, EBIT-APM and EPS-APM are 8.82, 8.35 and 8.79, respectively. For the price level regressions, the earnings coefficients are lower, because share prices are also explained by the book value of equity.

Table 5.5 – Price Level Regressions: APM

Model spesicifation:

(1) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBIT\text{-}APM + \varepsilon$

(3) $Price = \beta_0 + \beta_1 BVE + \beta_2 EPS\text{-}APM + \varepsilon$

	(1) Price	(2) Price	(3) Price
Intercept	27.881 ***	19.334 ***	38.824 ***
	(5.28)	(4.04)	(5.07)
BVE	0.668 ***	0.936 ***	0.683 ***
	(0.12)	(0.20)	(0.08)
EBITDA-APM	8.821 ***		
	(1.75)		
EBIT-APM		8.346 ***	
		(2.49)	
EPS-APM			8.792 ***
			(1.76)
Adjusted R-squared	0.6595	0.5318	0.5279
F-test	315.04 ***	56.73 ***	74.28 ***
Observations	202	286	250

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EPS-APM	Earnings and Earnings per share disclosed as an APM

The adjusted R2s are 65.95 percent, 53.18 percent and 52.79 percent for the regressions with EBITDA-APM, EBIT-APM and EPS-APM, respectively. The adjusted R2s are all significantly different from zero, and therefore, confirm the findings in the price earnings regressions; that APM is value relevant for investors on the OSE.

5.2.4 Price Level Regression Controlling for Company Characteristics

The estimated price level regressions including control variables are presented in Table 5.6.

Table 5.6 – Price Level Regressions Controlling for Company Characteristics: APM

Model spesicifation:

(1) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \beta_3 growth + \beta_4 leverage\ ratio + \beta_5 analyst + \varepsilon$

(2) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBIT\text{-}APM + \beta_3 growth + \beta_4 leverage\ ratio + \beta_5 analyst + \varepsilon$

(3) $Price = \beta_0 + \beta_1 BVE + \beta_2 EPS\text{-}APM + \beta_3 growth + \beta_4 leverage\ ratio + \beta_5 analyst + \varepsilon$

	(1) Price		(2) Price		(3) Price	
Intercept	-61.736	***	-36.241	***	-63.330	***
	(12.04)		(7.07)		(14.61)	
BVE	1.040	***	1.539	***	0.698	***
	(0.12)		(0.18)		(0.07)	
EBITDA-APM	3.061	*				
	(1.78)					
EBIT-APM			2.758	*		
			(1.47)			
EPS-APM					6.573	***
					(1.55)	
growth	32.218	***	26.548	***	19.456	***
	(3.10)		(2.72)		(6.32)	
leverage ratio	0.132		0.288	**	0.487	***
	(0.19)		(0.12)		(0.17)	
analyst	9.184	***	-5.805	**	21.402	***
	(3.17)		(2.77)		(5.31)	
Adjusted R-squared	0.8650		0.7548		0.6648	
F-test	249.60	***	77.55	***	51.08	***
Observations	202		286		250	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EPS-APM	Earnings and Earnings per share disclosed as an APM
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

The earnings coefficients are lower after controlling for company characteristics, but still positive. The coefficient on EBITDA-APM, EBIT-APM and EPS-APM is 3.06, 2.76 and 6.57, respectively. The coefficient on EBITDA-APM and EBIT-APM are both statistically significant at 10 percent level, and the EPS-APM coefficient is statistically significant at 1 percent level.

The explanatory power is 86.50 percent, 75.48 percent and 66.48 percent for the regression with EBITDA-APM, EBIT-APM and EPS-APM, respectively. These adjusted R2s are very high, which can be due to econometric problems, such as scale effects (Barth & Clinch, 2009; Gu, 2007). The VIF test showed no indication of problems with multicollinearity in the three models (see Appendix 3). The adjusted R2s and APM-coefficients support Hypothesis 1; APM is value relevant for investors on the OSE.

5.3 Value Relevance of Alternative Performance Measures and Financial Statement Measures

To test Hypothesis 2, pooled regressions have been conducted with the APMs of interest and their comparable financial statement measures. To determine if APMs are more value relevant than financial statement measures, the relative explanatory power and the estimated coefficients have been examined. All regressions in section 5.3 are estimated with Huber-White-sandwich robust standard errors (Huber, 1967; H. White, 1980), to control for minor problems with; heteroscedasticity, normality and large residuals.

5.3.1 Price Earnings Regressions – EBITDA-APM & EBITDA

Table 5.7 presents the estimated price earnings regressions, including EBITDA-APM and EBITDA, with and without control variables. The coefficients in model (1) and (2), without control variables are positive and statistically significant at 1 percent level. The results show that EBITDA-APM has the highest coefficient on 15.32, compared to the EBITDA coefficient on 12.91 for model (1) and (2), respectively. This can be interpreted as one unit increase in EBITDA-APM increases the share price with 15.32 NOK, and one unit increase in EBITDA increases share price with 12.91 NOK. Kothari and Zimmerman (1995) called this the basic price-earnings ratio. The difference between the EBITDA-APM

coefficient and the EBITDA coefficient, is statistically significant at 5 percent level (Appendix 2), supporting hypothesis 2.

Table 5.7 – Price Earnings Regressions: EBITDA

Model spesicifation:

(1) $Price = \beta_0 + \beta_1\ EBITDA\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1\ EBITDA + \varepsilon$

(3) $Price = \beta_0 + \beta_1\ EBITDA\text{-}APM + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1\ EBITDA + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	36.331 ***	47.175 ***	-21.853	-26.132
	(6.83)	(7.46)	(16.18)	(16.45)
EBITDA-APM	15.323 ***		13.727 ***	
	(1.20)		(1.53)	
EBITDA		12.911 ***		11.385 ***
		(1.42)		(1.60)
growth			24.085 ***	25.385 ***
			(3.08)	(3.04)
leverage ratio			-0.524 **	-0.513 *
			(0.26)	(0.26)
analyst			13.269 ***	18.029 ***
			(5.00)	(5.34)
Adjusted R-squared	0.5880	0.5423	0.7271	0.7027
F-test	161.92 ***	83.03 ***	104.07 ***	82.31 ***
Observations	202	202	202	202
Vuong Z-statistic	0.6753		0.4278	
p-value	0.4995		0.6688	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Considering the relative value relevance, the estimated price earnings regressions indicate that EBITDA-APM is the most value-relevant. The adjusted R2s for model (1) and (2) are 58.80 percent and 54.23 percent, respectively. The Vuong (1989) Z-statistic of 0.68 suggests that model (1) with EBITDA-APM is better than model (2) with EBITDA; however, the Z-statistic is not statistically significant.

When controlling for company characteristics, the earnings coefficients are still positive and statistically significant at 1 percent level in model (3) and (4), with EBITDA-APM and EBITDA, respectively. The APM-coefficient is the highest at

13.73 compared to the EBITDA coefficient at 11.39. The difference between the two earnings coefficients is slightly insignificant at 10 percent level (Appendix 2). The adjusted R2s for model (3) and (4) are 72.71 percent and 70.27 percent, respectively. The Z-statistic of 0.43, when testing the two price earnings models including control variables, is positive towards EBITDA-APM, but not statistically significant.

5.3.2 Price Level Regressions – EBITDA-APM & EBITDA

The estimated price level regressions with EBITDA-APM and EBITDA are presented in Table 5.8.

Table 5.8 – Price Level Regressions: EBITDA

Model spesicifation:

(1) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA + \varepsilon$

(3) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \beta_3 growth + \beta_4 leverage\ ratio + \beta_5 analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA + \beta_3 growth + \beta_4 leverage\ ratio + \beta_5 analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	27.881 ***	31.766 ***	-61.736 ***	-61.016 ***
	(5.28)	(5.26)	(12.04)	(11.69)
BVE	0.668 ***	0.761 ***	1.040 ***	1.035 ***
	(0.12)	(0.11)	(0.12)	(0.10)
EBITDA-APM	8.821 ***		3.061 *	
	(1.75)		(1.78)	
EBITDA		6.795 ***		2.902 **
		(1.44)		(1.31)
growth			32.218 ***	32.290 ***
			(3.10)	(2.98)
leverage ratio			0.132	0.116
			(0.19)	(0.18)
analyst			9.184 ***	9.489 ***
			(3.17)	(3.13)
Adjusted R-squared	0.6595	0.6514	0.8650	0.8685
F-test	315.04 ***	277.08 ***	249.60 ***	261.57 ***
Observations	202	202	202	202
Vuong Z-statistic	0.2606		-0.4729	
p-value	0.7944		0.6363	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

All coefficients are positive, and statistically significant at 1 percent level in model (1) and (2). The coefficient for EBITDA-APM is higher than EBITDA at 8.21 and 6.80, respectively. The adjusted R2s at 65.95 percent and 65.14 percent for model (1) and (2), respectively, suggesting very little difference in value relevance. This is supported by the highly insignificant Vuong (1989) Z-statistic of 0.26. The earnings coefficients suggest that EBITDA is the most value relevant earnings measure. However, the difference between the two earnings coefficients is not statistically significant (Appendix 2).

The earnings coefficients in model (3) and (4), when controlling for company characteristics, are positive and statistically significant at 10 percent and 5 percent level, respectively. The coefficients are 3.06 and 2.90 for EBITDA-APM and EBITDA, respectively. The adjusted R2s are almost equal when comparing model (3) and model (4), at 86.50 percent and 86.85 percent, respectively. The Vuong (1989) test has a slightly negative and not statistically significant Z-statistic of -0.47. When considering the coefficients, EBITDA-APM is the most value relevant, but the difference is insignificant.

5.3.3 Price Earnings Regressions – EBIT-APM & EBIT

Table 5.9 presents the estimated simple earnings regressions with EBIT-APM and EBIT, with and without control variables. In model (1) and (2), all coefficients are positive and statistically significant at 1 percent level. EBIT-APM has the highest coefficient 15.04 compared to the EBIT coefficient 11.23. When considering model (3) and (4), including control variables, the EBIT-APM coefficient 13.12 and the EBIT coefficient 9.11, are both statistically significant at 1 percent level. In the models with and without control variables, the difference between the EBIT-APM and EBIT coefficients is statistically significant at 1 percent level (Appendix 2).

The estimated coefficients suggest that EBIT-APM is more value relevant than EBIT, supported by the relative adjusted R2s in the estimated price earnings regressions. The explanatory power of model (1) and (2) are 48.12 percent and 38.30 percent for EBIT-APM and EBIT, respectively. The Vuong (1989) test favours model (1) with Z-statistic 1.59, however slightly insignificant at 10 percent level. The explanatory power of model (3) and (4) are 63.84 percent and

55.20 percent for EBIT-APM and EBIT, respectively. The Vuong (1989) test comparing model (3) and (4) favours EBIT-APM with the Z-statistic of 2.05. The Z-statistic is statistically significant at 5 percent level. These findings are relatively strong considering the sample size, and support Hypothesis 2; APM is more value relevant than financial statement measures.

Table 5.9 – Price Earnings Regressions: EBIT

Model spesicifation:

(1) $Price = \beta_0 + \beta_1\ EBIT\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1\ EBIT + \varepsilon$

(3) $Price = \beta_0 + \beta_1\ EBIT\text{-}APM + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1\ EBIT + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	38.875 ***	46.411 ***	-21.203 ***	-35.684 ***
	(3.53)	(3.64)	(7.90)	(10.48)
EBIT-APM	15.041 ***		13.119 ***	
	(2.07)		(1.72)	
EBIT		11.231 ***		9.105 ***
		(1.57)		(1.36)
growth			23.128 ***	24.093 ***
			(3.03)	(3.17)
leverage ratio			0.193	0.208
			(0.16)	(0.18)
analyst			5.728 **	14.088 ***
			(2.58)	(3.38)
Adjusted R-squared	0.4812	0.3830	0.6384	0.5520
F-test	52.69 ***	51.23 ***	64.86 ***	59.28 ***
Observations	286	286	286	286
Vuong Z-statistic	1.5854		2.0490	
p-value	0.1129		0.0405	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT	Earnings Before Interest and Tax per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

5.3.4 Price Level Regressions – EBIT-APM & EBIT

Table 5.10 presents the estimated price level regressions with EBIT-APM and EBIT. In model (1) and (2), the estimated coefficients are positive and significant at 1 percent level. The coefficients are 8.35 and 5.78 on EBIT-APM and EBIT, respectively. The coefficients suggest that EBIT-APM is more value relevant than EBIT, but the difference between the two coefficients is not statistically

significant (Appendix 2). The adjusted R2s are 53.18 percent for model (1), and at 54.49 percent for model (2). Considering the relative value relevance, this suggests a very small difference in favour of EBIT. The Vuong (1989) test comparing model (1) and (2) is not statistically significant.

Table 5.10 – Price Level Regressions: EBIT

Model spesicifation:

(1) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EBIT\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EBIT + \varepsilon$

(3) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EBIT\text{-}APM + \beta_3\ growth + \beta_4\ leverage\ ratio + \beta_5\ analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EBIT + \beta_3\ growth + \beta_4\ leverage\ ratio + \beta_5\ analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	19.334 ***	13.837 ***	-36.241 ***	-37.846 ***
	(4.04)	(3.88)	(7.07)	(6.69)
BVE	0.936 ***	1.227 ***	1.539 ***	1.566 ***
	(0.20)	(0.13)	(0.18)	(0.12)
EBIT-APM	8.346 ***		2.758 *	
	(2.49)		(1.47)	
EBIT		5.775 ***		2.667 ***
		(1.44)		(0.91)
growth			26.548 ***	26.117 ***
			(2.72)	(2.59)
leverage ratio			0.288 **	0.288 **
			(0.12)	(0.12)
analyst			-5.805 **	-5.226 **
			(2.77)	(2.65)
Adjusted R-squared	0.5318	0.5449	0.7548	0.7625
F-test	56.73 ***	65.71 ***	77.55 ***	84.48 ***
Observations	286	286	286	286
Vuong Z-statistic	-0.5437		-1.1487	
p-value	0.5866		0.2507	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT	Earnings Before Interest and Tax per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Model (3) and (4) are controlling for company characteristics with EBIT-APM and EBIT, respectively. The estimated EBIT-APM coefficient is 2.76, which is statistically significant at 10 percent level and the EBIT-coefficient is 2.67, which is significant at 1 percent level. The adjusted R2s are 75.48 percent for model (3) and 76.25 percent for model (4), which suggests that EBIT is slightly more value

relevant; hence, not supporting Hypothesis 2. The Vuong (1989) test is not statistically significant.

5.3.5 Price Earnings Regressions – EPS-APM & EPS

Table 5.11 presents the estimated price earnings regressions with EPS-APM and EPS.

Table 5.11 – Price Earnings Regressions: EPS

Model spesicifation:

(1) $Price = \beta_0 + \beta_1\ EPS\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1\ EPS + \varepsilon$

(3) $Price = \beta_0 + \beta_1\ EPS\text{-}APM + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1\ EPS + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	72.347 ***	86.166 ***	-64.860 ***	-86.520 ***
	(5.82)	(5.32)	(23.27)	(21.09)
EPS-APM	15.832 ***		13.220 ***	
	(2.75)		(2.80)	
EPS		7.858 ***		6.774 ***
		(2.14)		(1.84)
growth			16.204 ***	16.361 ***
			(5.44)	(4.34)
leverage ratio			0.630 ***	0.426 **
			(0.16)	(0.18)
analyst			35.742 ***	50.816 ***
			(7.03)	(7.95)
Adjusted R-squared	0.3081	0.1803	0.4507	0.4079
F-test	33.16 ***	13.52 ***	13.11 ***	23.29 ***
Observations	250	250	250	250
Vuong Z-statistic	1.9866		0.7285	
p-value	0.0470		0.4663	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EPS-APM	Earnings Per Share disclosed as an APM
EPS-APM	Earnings Per Share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Model (1) and (2) are estimated regressions on EPS-APM and EPS, respectively, without control variables. The earnings coefficients 15.83 and 7.86 on EPS-APM and EPS, respectively, are statistically significant at 1 percent level. The APM coefficient is the highest, and the difference between the two earnings coefficients is statistically significant at 1 percent level (Appendix 2).

After including control variables, the earnings coefficients are still positive and statistically significant at 1 percent level in model (3) and (4). The EPS-APM coefficient in model (3) is the highest at 13.22 compared to the EPS coefficient at 6.77. The difference between the two earnings coefficients is statistically significant at 5 percent level (Appendix 2).

Considering the relative value relevance, the price earnings regressions indicate that EPS-APM is more value relevant than EPS. The adjusted R2 for model (1) is at 30.81 percent compared to 18.03 percent for model (2). The Vuong (1989) test supports that EPS-APM is more value relevant with the positive Z-statistic 1.99, statistically significant at 5 percent level. The adjusted R2 when including control variables is at 45.07 percent for model (3) compared to 40.79 percent for model (4). The Vuong (1989) test has a positive Z-statistic which favours the APM-model, but this test-result is not statistically significant. The estimated earnings coefficients in model (1) to (4), and the explanatory power of model (1) and (2) support Hypothesis 2.

5.3.6 Price Level Regressions – EPS-APM & EPS

The estimated price level regressions for EPS-APM and EPS, with and without control variables, are presented in Table 5.12. The models have positive and statistically significant earnings coefficients at 1 percent level. In the basic model (1) and (2), the coefficients are 8.79 and 4.92 on EPS-APM and EPS, respectively. The size of the coefficients suggests that EPS-APM is more value relevant, and the difference between the earnings coefficients is statistically significant at 1 percent level (Appendix 2). The explanatory power of model (1) with EPS-APM is at 52.79 percent, and 51.96 percent in model (2) with EPS. The Vuong (1989) test comparing model (1) and (2) has a Z-statistic of 0.22, which is highly insignificant.

When controlling for company characteristics, the estimated EPS-APM-coefficient is 6.57 in model (3), which is higher than the estimated EPS-coefficient 4.23 in model (4). The higher EPS-APM coefficient suggests that EPS-APM is more value relevant than EPS, but the difference between the two earnings coefficients is slightly insignificant (Appendix 2). The adjusted R2 at 66.48 percent for model (3) and the adjusted R2 at 67.63 percent for model (4),

suggest that model (4) has slightly more explanatory power. The Vuong (1989) Z-statistic is -0.53 in favour of model (4), but not statistically significant. The earnings coefficients in model (1) to (4), suggest that EPS-APM is more value relevant than EPS; however, this is not supported by the relative adjusted R2s.

Table 5.12 – Price Level Regressions: EPS

Model spesicifation:

(1) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EPS\text{-}APM + \varepsilon$

(2) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EPS + \varepsilon$

(3) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EPS\text{-}APM + \beta_3\ growth + \beta_4\ leverage\ ratio + \beta_5\ analyst + \varepsilon$

(4) $Price = \beta_0 + \beta_1\ BVE + \beta_2\ EPS + \beta_3\ growth + \beta_4\ leverage\ ratio + \beta_5\ analyst + \varepsilon$

	(1) Price	(2) Price	(3) Price	(4) Price
Intercept	38.824 ***	40.371 ***	-63.330 ***	-73.886 ***
	(5.07)	(5.83)	(14.61)	(15.86)
BVE	0.683 ***	0.777 ***	0.698 ***	0.736 ***
	(0.08)	(0.10)	(0.07)	(0.10)
EPS-APM	8.792 ***		6.573 ***	
	(1.76)		(1.55)	
EPS		4.915 ***		4.227 ***
		(1.09)		(1.01)
growth			19.456 ***	19.520 ***
			(6.32)	(5.84)
leverage ratio			0.487 ***	0.438 **
			(0.17)	(0.17)
analyst			21.402 ***	27.070 ***
			(5.31)	(6.42)
Adjusted R-squared	0.5279	0.5196	0.6648	0.6763
F-test	74.28 ***	60.95 ***	51.08 ***	59.38 ***
Observations	250	250	250	250
Vuong Z-statistic	0.2171		-0.5310	
p-value	0.8281		0.5955	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EPS-APM	Earnings Per Share disclosed as an APM
EPS	Earnings Per Share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

5.4 Robustness Tests

This section present findings from three robustness tests. The first robustness test is to run a return regression instead of a price regression. Further, this study has included a control for the implementation of ESMA guidelines. Finally, the main findings in section 5.2 and 5.3 are controlled for by using a three-month lag in share prices.

5.4.1 Return Regression

The estimated return regressions are performed as a robustness test, because this model is known to be less affected by econometric problems than the price regressions (Kothari & Zimmerman, 1995). Table 5.13 presents the estimated return regressions.

Table 5.13 – Return Regressions

Model spesicifation:

(1) $Return = \beta_0 + \beta_1 EBITDA\text{-}APM + \beta_2 \Delta EBITDA\text{-}APM + \varepsilon$
(2) $Return = \beta_0 + \beta_1 EBITDA + \beta_2 \Delta EBITDA + \varepsilon$
(3) $Return = \beta_0 + \beta_1 EBIT\text{-}APM + \beta_2 \Delta EBIT\text{-}APM + \varepsilon$
(4) $Return = \beta_0 + \beta_1 EBIT + \beta_2 \Delta EBIT + \varepsilon$
(5) $Return = \beta_0 + \beta_1 EPS\text{-}APM + \beta_2 \Delta EPS\text{-}APM + \varepsilon$
(6) $Return = \beta_0 + \beta_1 EPS + \beta_2 \Delta EPS + \varepsilon$

	(1) Return	(2) Return	(3) Return	(4) Return	(5) Return	(6) Return
Intercept	0.084 ***	0.061 ***	0.084 ***	0.085 ***	0.074 ***	0.076 ***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
EBITDA-APM	-0.537 ***					
	(0.15)					
ΔEBITDA-APM	0.680 *					
	(0.36)					
EBITDA		-0.002				
		(0.00)				
ΔEBITDA		0.157				
		(0.21)				
EBIT-APM			0.244			
			(0.37)			
ΔEBIT-APM			-0.730			
			(0.49)			
EBIT				0.002		
				(0.00)		
ΔEBIT				-0.048		
				(0.09)		
EPS-APM					0.115	
					(0.09)	
ΔEPS-APM					-0.144 **	
					(0.07)	
EPS						0.110 **
						(0.05)
ΔEPS						-0.047 **
						(0.02)
R-squared	0.0703	0.0065	0.0083	0.0015	0.0328	0.0401
Adjusted R-squared	0.0600	-0.0044	0.0012	-0.0056	0.0239	0.0312
F-test	6.88 ***	0.60	1.17	0.22	3.68 **	4.53 **
Observations	185	185	282	282	220	220

Standard errors in parentheses
Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables

Return	Share return, scaled by share price
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation disclosed as an APM, scaled by share price$_{t-1}$
ΔEBITDA-APM	Change in EBITDA-APM (EBITDA-APM$_t$ – EBITDA-APM$_{t-1}$), scaled by share price$_{t-1}$
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation, scaled by share price$_{t-1}$
ΔEBITDA	Change in EBITDA (EBITDA$_t$ – EBITDA$_{t-1}$), scaled by share price$_{t-1}$
EBIT-APM	Earnings Before Interest and Tax disclosed as an APM, scaled by share price$_{t-1}$
ΔEBIT-APM	Change in EBIT-APM (EBIT-APM$_t$ – EBIT-APM$_{t-1}$), scaled by share price$_{t-1}$
EBIT	Earnings Before Interest and Tax, scaled by share price$_{t-1}$
ΔEBIT	Change in EBIT (EBIT$_t$ – EBIT$_{t-1}$), scaled by share price$_{t-1}$
EPS-APM	Earnings Per Share disclosed as an APM, scaled by share price$_{t-1}$
ΔEPS-APM	Change in EPS-APM (EPS-APM$_t$ – EPS-APM$_{t-1}$), scaled by share price$_{t-1}$
EPS	Earnings Per Share, scaled by share price$_{t-1}$
ΔEPS	Change in EPS (EPS$_t$ – EPS$_{t-1}$), scaled by share price$_{t-1}$

The results from the estimated return regressions are weak, with coefficients and adjusted R2s barely significantly different from zero. The three subsamples consist of fewer observations than the price regressions, due to calculations of change in earnings measures, which is an effect from companies' inconsistent reporting of APMs. The smaller subsamples may contribute to the weak findings. The estimated model (1) with EBITDA-APM has the highest adjusted R2 at 6.00 percent. The adjusted R2 for model (2) and (4) are negative, indicating very poor model fit. As a consequence, the return regression is inconclusive for this study.

5.4.2 Controlling for the Implementation of ESMA Guidelines

To control for the effect ESMA (2016) guidelines might have on the value relevance of APMs, the price earnings regression (Appendix 4) and the price level regression have been estimated by including an ESMA dummy variable. The dummy variable; *ESMA* takes the value 1 for the observations after the implementation of guidelines (2nd quarter, 2016), and 0 otherwise. The results from the estimated price level regressions are provided in Table 5.14.

The interaction term between EBITDA-APM and ESMA in model (1) and (2) are -1.74 and -1.57, respectively. The interaction-term coefficients are not statistically significant, which indicates that ESMA guidelines do not influence EBITDA-APMs ability to explain share prices. The same result is found for EPS-APM, where the interaction term with ESMA is -3.66 and -1.98 in model (5) and (6), respectively. The interaction term between EPS-APM and ESMA is not statistically significant. The interaction-term coefficients are 19.68 in model (3) and 12.74 in model (4), on EBIT-APM, and both coefficients are statistically significant at 1 percent level. This result suggests that the relationship between EBIT-APM and share prices are higher after the guidelines were implemented; hence more value relevant.

The results indicate that ESMA guidelines have little impact on the value relevance of EBITDA-APM and EPS-APM. However, ESMA guidelines seem to have a positive influence on the value relevance of EBIT-APM. This result is somewhat supported by Marques (2006), who found a positive market reaction to adjusted earnings in the third regime of SEC-regulations.

Table 5.14 – Controlling for the Implementation of ESMA Guidelines

Model spesicifation:

(1) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \beta_3 EBITDA\text{-}APM*ESMA + \beta_4 ESMA + \varepsilon$

(2) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBITDA\text{-}APM + \beta_3 EBITDA\text{-}APM*ESMA + \beta_4 ESMA + \beta_5 growth + \beta_6 leverage\ ratio + \beta_7 analyst + \varepsilon$

(3) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBIT\text{-}APM + \beta_3\ EBIT\text{-}APM*ESMA + \beta_4\ ESMA + \varepsilon$

(4) $Price = \beta_0 + \beta_1 BVE + \beta_2 EBIT\text{-}APM + \beta_3 EBIT\text{-}APM*ESMA + \beta_4 ESMA + \beta_5 growth + \beta_6 leverage\ ratio + \beta_7 analyst + \varepsilon$

(5) $Price = \beta_0 + \beta_1 BVE + \beta_2 EPS\text{-}APM + \beta_3 EPS\text{-}APM*ESMA + \beta_4 ESMA + \varepsilon$

(6) $Price = \beta_0 + \beta_1 BVE + \beta_2 EPS\text{-}APM + \beta_3 EPS\text{-}APM*ESMA + \beta_4 ESMA + \beta_5 growth + \beta_6 leverage\ ratio + \beta_7 analyst + \varepsilon$

	(1) Price		(2) Price		(3) Price		(4) Price		(5) Price		(6) Price	
Intercept	23.584	***	-65.457	***	20.260	***	-34.319	***	37.808	***	-62.074	***
	(5.97)		(12.49)		(3.40)		(7.08)		(5.56)		(15.06)	
BVE	0.659	***	1.029	***	0.891	***	1.405	***	0.681	***	0.698	***
	(0.12)		(0.11)		(0.16)		(0.16)		(0.07)		(0.07)	
EBITDA-APM	9.323	***	3.452	**								
	(1.66)		(1.73)									
EBITDA-APM * ESMA	-1.741		-1.565									
	(2.18)		(1.88)									
EBIT-APM					6.547	***	2.323	*				
					(1.98)		(1.26)					
EBIT-APM * ESMA					19.681	***	12.739	***				
					(2.86)		(2.72)					
EPS-APM									9.411	***	6.879	***
									(1.90)		(1.71)	
EPS-APM * ESMA									-3.664		-1.984	
									(3.58)		(3.45)	
ESMA	16.451		9.739		-18.563	***	-14.584	***	5.329		-0.310	
	(14.33)		(8.86)		(5.20)		(4.95)		(9.88)		(7.61)	
growth			32.108	***			23.653	***			19.452	***
			(3.09)				(2.54)				(6.35)	
leverage ratio			0.130				0.306	**			0.476	***
			(0.18)				(0.12)				(0.18)	
analyst			9.929	***			-3.159				21.083	***
			(3.33)				(2.50)				(5.63)	
Adjusted R-squared	0.6591		0.8649		0.6352		0.7907		0.5264		0.6628	
F-test	169.05	***	194.81	***	74.15	***	82.21	***	37.39	***	39.53	***
Observations	202		202		286		286		250		250	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

BVE	Book Value of Equity per share
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA-APM * ESMA	Interaction term between EBITDA-APM and ESMA
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT-APM * ESMA	Interaction term between EBIT-APM and ESMA
EPS-APM	Earnings per share disclosed as an APM
EPS-APM * ESMA	Interaction term between EPS-APM and ESMA
ESMA	Dummy variable equal 1 in quarters after ESMA guidelines were implemented, zero otherwise
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

5.4.3 Robustness Test using Share Price with Three-Month Lag

To control whether two months lag in share prices are enough time for the market to react to quarterly reported earnings-information, the robustness test using share prices with a three-month lag (*Price 3*) was conducted. The findings (Appendix 5-Appendix 10) in this section are similar to the main findings in section 5.2 and 5.3, with two months lag in share prices.

The estimated regression coefficients for EBITDA-APM is higher than the EBITDA coefficients, and confirm the main findings. For example; the coefficients in the price level regressions are 8.35 compared to 5.91, and 2.59 compared to 1.89 for EBITDA-APM and EBITDA, respectively (Appendix 8). Considering the relative value relevance, the adjusted R2s indicate that EBITDA-APM is more value relevant than EBITDA. In the price level regressions, the adjusted R2s are 65.19 percent compared to 63.43 percent, and 85.95 percent compared to 85.88 percent, for EBITDA-APM and EBITDA, respectively (Appendix 8). The Vuong (1989) test shows that the difference in explanatory power is highly insignificant.

The estimated regression coefficients for EBIT-APM are higher than the EBIT coefficients, confirming the main findings. For example; the coefficients in the price level regressions are 8.35 compared to 5.41, and 2.83 compared to 2.30, for EBIT-APM and EBIT, respectively (Appendix 9). In the price level regressions, the adjusted R2s are 52.98 percent compared to 53.46 percent, and 74.54 percent compared to 74.94 percent, for EBIT-APM and EBIT, respectively (Appendix 9). Considering the relative value relevance, the adjusted R2s indicate that EBIT is slightly more value relevant than EBIT-APM; however, the Vuong (1989) test shows that the difference in explanatory power is insignificant.

The EPS-APM and EPS coefficients also confirm the main findings that the EPS-APM coefficients are relatively higher. The price level regression coefficients are 8.77 compared to 4.86, and 6.55 compared to 4.16 for EPS-APM and EPS, respectively (Appendix 10). In the price level regressions, the adjusted R2s are 52.79 percent compared to 51.83 percent, and 66.82 percent compared to 67.86 percent, for EPS-APM and EPS, respectively (Appendix 10). The Vuong (1989) test shows that the difference in explanatory power is highly insignificant.

6. Discussion

There are several value relevance studies on alternative performance measures (APMs), especially in the US. We were inspired to study the value relevance of APMs in Norway after reading previous studies, comparing the value relevance of APM with financial statement measures in the US (e.g. Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Entwistle et al., 2010). As concluded in these previous studies, we expect APM to be value relevant, as well as more value relevant than financial statement measures. To the best of our knowledge, we are the first to study the value relevance of actual reported APM in the form of EBITDA, EBIT and EPS in Norway on a quarterly basis.

The expectations were met when testing Hypothesis 1, and we consider our findings to be relatively strong. The explanatory power, which is considered to be a measure of value relevance (Barth et al., 2001; Entwistle et al., 2010; Francis & Schipper, 1999; Holthausen & Watts, 2001), is significantly different from zero; hence, APM is value relevant. However, the explanatory power in the estimated price regressions can be unusually high, due to econometric problems such as scale effects (see e.g. Barth & Clinch, 2009; Gu, 2007). The APM coefficients strengthen the evidence that APM is value relevant, since they are significantly different from zero, in accordance with incremental-association studies (Holthausen & Watts, 2001).

When investigating which earnings measure that is the most value relevant in Hypothesis 2, there were some problems with weak statistical significance. This was not entirely unexpected, considering the small sample size. The most interesting findings, supporting Hypothesis 2, were the price earnings regressions where the relative explanatory power in favour of EBIT-APM was statistically significant. The price earnings regressions' relative explanatory power was also statistically significant in favour of EPS-APS. However, the price level regressions (Ohlson, 1995) showed no significant difference in the relative value relevance of APMs and financial statement measures. Therefore, the difference between the estimated coefficients was tested to strengthen the analysis, since the APM coefficients are larger than the financial statement measure coefficients in all estimated models. The difference between the APM coefficients and the financial statement measure coefficients is statistically significant in favour of

APM, in all except for one price earnings model. For the price level regressions, the difference is statistically significant in only one case. Our findings are supportive of Hypothesis 2, but weak when considering the statistically insignificant results in the price level models.

The results suggest that the market react positively to APM disclosures, which indicates that APM reporting is a good supplement to financial statement measures and is informing rather than misleading investors. This is supported by Entwistle et al. (2010), who found evidence that APMs are more value relevant than both financial statement measures and analyst estimates.

The price models used in this study are based on the assumption of linearity. This assumption can be violated if there are omitted variables correlated with share prices, and consequently result in biased coefficients and R2 estimates (Stock & Watson, 2012). Barth and Clinch (2009) identifies possible scale effects in capital market-based accounting research where a company's size can affect other aspects such as the restructuring of equity, the persistence of economic returns, and how likely they are to survive negative earnings. Trying to avoid these effects, the price models were estimated with variables divided by the number of shares, which according to Barth and Clinch (2009) is an effective proxy for scale effects, resulting in less biased estimates. Proxies for growth, financial risk, size and information environment were included, to avoid unbiased results due to possible omitted correlated variables. Further, the regressions were estimated with robust standard errors to control for some of the scale effects arising from heteroscedasticity (Huber, 1967; H. White, 1980). However, the adjusted R2s might still be somewhat inflated due to econometric problems.

The estimated return regressions have been conducted as a robustness test, because return regressions, according to Kothari and Zimmerman (1995) are less subject to severe econometric problems than the price regressions. The estimated return regression provided very weak results. Return regressions are most appropriate when considering new accounting information that is presented to the market within the return interval. However, price regressions are better suited to test the hypotheses in this study, since book value and earnings measures are summarised information relevant when forecasting a company's future

performance (Barth & Clinch, 2009). The second robustness test which involve testing three months lag in share prices, ensure that the market have sufficient time to react to the earnings announcements in the main models with two months lag in share prices. When considering the earnings coefficients and explanatory power of the estimated regressions, the robustness test provides similar results as the regression using a two-month lag in share prices. This confirms that a two-month lag is a sufficient time for the market to respond to earnings announcements.

Marques (2006) provided evidence that the market reacted positively to some SEC-regulations on APM disclosures in the US; therefore, a test to control for the impact ESMA guidelines might have on the value relevance of APMs in Norway was conducted. The ESMA guidelines seem to have a positive influence on the value relevance of EBIT-APM, but not the other two APMs. We think that this is an interesting finding, and it might be relevant for future studies when the implemented guidelines are more mature.

This study has limitations, where the sample size is the most profound. The OSE is a small equity market with approximately 200 listed companies, and because of time constraints, we were only able to collect data from the 100 largest companies. A larger sample would presumably result in more statistically significant findings. Further, only OSE-listed companies were examined; therefore, this study also has limitations regarding generalisability. A suggestion for future research is to enhance the sample size by including more companies from OSE. Another suggestion is to include companies from other stock exchanges to enhance generalisability.

7. Conclusion

This study has examined whether alternative performance measures (APMs) are value relevant and whether APM is more value relevant than financial statement measures. Pooled regressions have been estimated with quarterly data from the 100 largest companies on the Oslo Stock Exchange (OSE), from 2012 to 2016. The variables of interest were the APMs for EBITDA, EBIT, EPS and their comparable financial statement measures.

We found APM to be value relevant for investors on the OSE. However, when considering whether APM is more value relevant than financial statement measures, we found various results. Two regression models were used in this study, where the price earnings model supports our expectation that APM is more value relevant than financial statement measures for EBIT and EPS. In the price level model, the relative value relevance is not statistically significant in favour of either APMs or financial statement measures. Our expectation that APMs are more value relevant than financial statement measures was supported by the two price regressions' estimated coefficients for EBIT and EPS. However, both models gave inconclusive results for EBITDA. With caution, we conclude that APMs are more value relevant than financial statement measures for investors on the OSE. However, note that the conclusion is based on limited statistically significant findings.

Critics of APM claim that APM's are used for strategic reasons, and can be misleading for investors. Another view is that APM reporting can be an indication of lacking usefulness in financial statement measures. Our findings support the second view and suggest that companies disclose APM's to inform, and not mislead the market.

The study has limitations, where the sample size is the most profound which may have contributed to weak statistically significant results. This study examined only Norwegian listed companies, and therefore, the study also has limitations regarding generalisability. Because of the limitations, the results should be interpreted with caution.

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Appendices

Appendix 1: The 100 Largest Companies on the Oslo Stock Exchange per May 15th, 2017

Number	Company	Company Ticker	Market Value (MNOK)	APM	Number	Company	Company Ticker	Market Value (MNOK)	APM
1	**Statoil**	**STL**	**485 684,6**	**APM**	**51**	SpareBank 1 Nord-Norge	NONG	5 998,8	N/A
2	DNB	DNB	231 941,0	N/A	**52**	Nordic Semiconductor	NOD	5 759,9	N/A
3	**Telenor**	**TEL**	**206 300,3**	**APM**	**53**	Norwegian Property	NPRO	5 757,1	N/A
4	**Norsk Hydro**	**NHY**	**94 874,0**	**APM**	**54**	**Opera Software**	**OPERA**	**5 592,1**	**APM**
5	**Yara International**	**YAR**	**88 085,4**	**APM**	**55**	B2Holding	B2H	5 463,0	N/A
6	**Orkla**	**ORK**	**80 644,8**	**APM**	**56**	**BW LPG**	**BWLPG**	**5 157,0**	**APM**
7	Gjensidige Forsikring	GJF	68 846,2	N/A	**57**	SAS AB	SAS NOK	4 885,2	N/A
8	**Marine Harvest**	**MHG**	**67 935,5**	**APM**	**58**	IDEX	IDEX	4 467,8	N/A
9	Aker BP	AKERBP	48 566,6	N/A	**59**	Hexagon Composites	HEX	4 401,3	N/A
10	**Subsea 7**	**SUBC**	**45 172,3**	**APM**	**60**	Nordic Nanovector	NANO	4 351,5	N/A
11	Lerøy Seafood Group	LSG	26 808,3	N/A	**61**	Scatec Solar	SSO	4 107,2	N/A
12	Storebrand	STB	26 000,2	N/A	**62**	Gaming Innovation Group	GIG	4 037,2	N/A
13	**SalMar**	**SALM**	**24 595,2**	**APM**	**63**	**Ekornes**	**EKO**	**3 976,9**	**APM**
14	Aker	AKER	23 918,8	N/A	**64**	BW Offshore Limited	BWO	3 809,1	N/A
15	**Schibsted ser. A**	**SCHA**	**23 691,0**	**APM**	**65**	Treasure	TRE	3 454,0	N/A
16*	**Schibsted ser. B**	**SCHB**	**23 512,7**	**APM**	**66**	Songa Offshore	SONG	3 433,2	N/A
17	Wallenius Wilhelmsen Logistics	WWL	18 701,2	N/A	**67**	Odfjell Drilling	ODL	3 378,5	N/A
18	TGS-NOPEC Geophysical Company	TGS	18 631,2	N/A	**68**	**Akastor**	**AKA**	**3 322,5**	**APM**
19	Entra	ENTRA	18 362,3	N/A	**69**	**Selvaag Bolig**	**SBO**	**3 274,8**	**APM**
20	Olav Thon Eiendomsselskap	OLT	18 078,7	N/A	**70**	**Arcus**	**ARCUS**	**3 217,5**	**APM**
21	SpareBank 1 SR-Bank	SRBANK	17 767,1	N/A	**71**	**Bonheur**	**BON**	**3 115,5**	**APM**
22	Kongsberg Gruppen	KOG	15 896,6	N/A	**72**	Sparebanken Vest	SVEG	3 095,2	N/A
23	Veidekke	VEI	15 442,9	N/A	**73**	Thin Film Electronics	THIN	3 038,7	N/A
24	AF Gruppen	AFG	15 354,0	N/A	**74**	**Axactor**	**AXA**	**2 980,4**	**APM**
25	**Bakkafrost**	**BAKKA**	**15 292,7**	**APM**	**75**	**Kværner**	**KVAER**	**2 943,8**	**APM**
26	**Tomra Systems**	**TOM**	**14 904,0**	**APM**	**76**	Wilh. Wilhelmsen Holding ser. B	WWIB	2 812,4	N/A
27	**Austevoll Seafood**	**AUSS**	**14 329,5**	**APM**	**77**	**REC Silicon**	**REC**	**2 785,5**	**APM**
28	XXL	XXL	13 024,8	N/A	**78**	**Seadrill**	**SDRL**	**2 727,8**	**APM**
29	**Aker Solutions**	**AKSO**	**12 859,8**	**APM**	**79**	SpareBank 1 Ringerike Hadeland	RING	2 608,0	N/A
30	Norwegian Finans Holding	NOFI	12 410,1	N/A	**80**	**Kongsberg Automotive**	**KOA**	**2 591,4**	**APM**
31	**Atea**	**ATEA**	**11 127,9**	**APM**	**81**	ABG Sundal Collier Holding	ASC	2 433,0	N/A
32	Hafslund ser. A	HNA	11 081,1	N/A	**82**	**Multiconsult**	**MULTI**	**2 427,2**	**APM**
33	Borregaard	BRG	9 603,3	N/A	**83**	Prosafe	PRS	2 420,7	N/A
34	**Ocean Yield**	**OCY**	**9 565,9**	**APM**	**84**	Sparebanken Møre	MORG	2 385,3	N/A
35	**Frontline**	**FRO**	**9 424,4**	**APM**	**85**	**NRC Group**	**NRC**	**2 263,3**	**APM**
36	SpareBank 1 SMN	MING	9 250,7	N/A	**86**	Asetek	ASETEK	2 112,8	N/A
37	**Norwegian Air Shuttle**	**NAS**	**8 518,0**	**APM**	**87**	Team Tankers International	TEAM	2 048,9	N/A
38	Skandiabanken	SKBN	8 496,1	N/A	**88**	Pareto Bank	PARB	2 045,5	N/A
39	Wilh. Wilhelmsen Holding ser. A	WWI	8 427,1	N/A	**89**	Spectrum	SPU	1 987,4	N/A
40	DNO	DNO	8 230,9	N/A	**90**	SpareBank 1 Østfold Akershus	SOAG	1 951,6	N/A
41	**Grieg Seafood**	**GSF**	**8 038,0**	**APM**	**91**	Odfjell ser. A	ODF	1 931,5	N/A
42	Hafslund ser. B	HNB	7 631,5	N/A	**92**	**Archer**	**ARCHER**	**1 870,4**	**APM**
43	Stolt-Nielsen	SNI	7 197,8	N/A	**93****	**The Scottish Salmon Company**	**SSC**	**1 865,2**	**APM**
44	**Norway Royal Salmon**	**NRS**	**6 975,3**	**APM**	**94**	Norwegian Energy Company	NOR	1 816,3	N/A
45	Golden Ocean Group	GOGL	6 854,2	N/A	**95**	**Link Mobility Group**	**LINK**	**1 776,5**	**APM**
46	**Europris**	**EPR**	**6 662,1**	**APM**	**96**	Helgeland Sparebank	HELG	1 757,2	N/A
47	Arendals Fossekompani	AFK	6 625,8	N/A	**97**	AKVA Group	AKVA	1 748,4	N/A
48	Höegh LNG Holdings	HLNG	6 538,1	N/A	**98**	Siem Offshore	SIOFF	1 734,6	N/A
49	**Petroleum Geo-Services**	**PGS**	**6 487,5**	**APM**	**99**	SpareBank 1 BV	SBVG	1 729,2	N/A
50	Protector Forsikring	PROTCT	6 374,7	N/A	**100**	NEL	NEL	1 647,1	N/A

39 out of 100 companies report one or several of the alternative performance measures of interest

* Company number 16 is excluded from the dataset since there is two share classes for the company
** Company number 93 is excluded from the sample due to missing control variables

Appendix 2: Testing the Difference in Earnings Coefficients

Panel A: H_0 : β(EBITDA-APM) - β(EBITDA) = 0

	Price Earnings Regression		Price Level Regression	
	Model (1) & (2)	Model (3) & (4)	Model (1) & (2)	Model (3) & (4)
chi2(1)	3.97	2.46	1.15	0.01
Prob > chi2	0.0463	0.1170	0.2844	0.9172

Panel B: H_0 : β(EBIT-APM) - β(EBIT) = 0

	Price Earnings Regression		Price Level Regression	
	Model (1) & (2)	Model (3) & (4)	Model (1) & (2)	Model (3) & (4)
chi2(1)	6.85	9.41	1.76	0.01
Prob > chi2	0.0089	0.0022	0.1850	0.9414

Panel C: H_0 : β(EPS-APM) - β(EPS) = 0

	Price Earnings Regression		Price Level Regression	
	Model (1) & (2)	Model (3) & (4)	Model (1) & (2)	Model (3) & (4)
chi2(1)	8.67	5.30	6.73	2.36
Prob > chi2	0.0032	0.0213	0.0095	0.1244

Appendix 3: Variance Inflation Factor (VIF)

Panel A:EBITDA-APM & EBITDA

Price Earnings Regression with control variables

	Variable	VIF	1/VIF
EBITDA-APM	EBITDA_APM	1.30	0.769127
	Analyst	1.26	0.796126
	Growth	1.05	0.951833
	Leverage	1.05	0.954897
	Mean VIF	1.16	

	Variable	VIF	1/VIF
EBITDA	EBITDA	1.24	0.803696
	Analyst	1.20	0.830551
	Leverage	1.05	0.953840
	Growth	1.04	0.960818
	Mean VIF	1.13	

Price Level Regression with control variables

	Variable	VIF	1/VIF
EBITDA-APM	EBITDA_APM	3.40	0.293761
	BVE	3.20	0.312595
	Analyst	1.27	0.789970
	Leverage	1.21	0.829204
	Growth	1.16	0.860343
	Mean VIF	2.05	

	Variable	VIF	1/VIF
EBITDA	EBITDA	2.69	0.372309
	BVE	2.64	0.379139
	Analyst	1.24	0.806675
	Leverage	1.17	0.854659
	Growth	1.11	0.902618
	Mean VIF	1.77	

Panel B:EBIT-APM & EBIT

Price Earnings Regression with control variables

	Variable	VIF	1/VIF
EBIT-APM	Growth	1.22	0.818627
	Analyst	1.22	0.819594
	EBIT_APM	1.16	0.861052
	Leverage	1.14	0.879770
	Mean VIF	1.18	

	Variable	VIF	1/VIF
EBIT	Growth	1.23	0.815852
	Leverage	1.14	0.879875
	Analyst	1.13	0.882551
	EBIT	1.09	0.913592
	Mean VIF	1.15	

Price Level Regression with control variables

	Variable	VIF	1/VIF
EBIT-APM	BVE	3.46	0.289400
	EBIT_APM	3.15	0.317953
	Analyst	1.39	0.720956
	Growth	1.26	0.795657
	Leverage	1.14	0.876800
	Mean VIF	2.08	

	Variable	VIF	1/VIF
EBIT	BVE	1.98	0.503998
	EBIT	1.70	0.587512
	Analyst	1.39	0.717989
	Growth	1.23	0.811316
	Leverage	1.14	0.878720
	Mean VIF	1.49	

Panel C:EPS-APM & EPS

Price Earnings Regression with control variables

	Variable	VIF	1/VIF
EPS-APM	EPS_APM	1.29	0.772213
	Leverage	1.24	0.803668
	Analyst	1.15	0.868325
	Growth	1.12	0.890175
	Mean VIF	1.20	

	Variable	VIF	1/VIF
EPS	Leverage	1.19	0.839086
	Growth	1.12	0.890014
	EPS	1.09	0.918133
	Analyst	1.02	0.979051
	Mean VIF	1.11	

Price Level Regression with control variables

	Variable	VIF	1/VIF
EPS-APM	EPS_APM	1.55	0.643731
	BVE	1.39	0.718894
	Leverage	1.25	0.799893
	Analyst	1.21	0.824208
	Growth	1.14	0.876087
	Mean VIF	1.31	

	Variable	VIF	1/VIF
EPS	BVE	1.24	0.808437
	Leverage	1.19	0.839060
	EPS	1.16	0.860705
	Analyst	1.16	0.864725
	Growth	1.14	0.879361
	Mean VIF	1.18	

Appendix 4: Price Earnings Regression, Controlling for ESMA Guidelines

Model spesicifation:

(1) $Price = \beta_0 + \beta_1 EBITDA\text{-}APM + \beta_2 EBITDA\text{-}APM * ESMA + \beta_3 ESMA + \varepsilon$

(2) $Price = \beta_0 + \beta_1 EBITDA\text{-}APM + \beta_2 EBITDA\text{-}APM * ESMA + \beta_3 ESMA + \beta_4 growth + \beta_5 leverage\ ratio + \beta_6 analyst + \varepsilon$

(3) $Price = \beta_0 + \beta_1 EBIT\text{-}APM + \beta_2 EBIT\text{-}APM * ESMA + \beta_3 ESMA + e$

(4) $Price = \beta_0 + \beta_1 EBIT\text{-}APM + \beta_2 EBIT\text{-}APM * ESMA + \beta_3 ESMA + \beta_4 growth + \beta_5 leverage\ ratio + \beta_6 analyst + \varepsilon$

(5) $Price = \beta_0 + \beta_1 EPS\text{-}APM + \beta_2 EPS\text{-}APM * ESMA + \beta_3 ESMA + \varepsilon$

(6) $Price = \beta_0 + \beta_1 EPS\text{-}APM + \beta_2 EPS\text{-}APM * ESMA + \beta_3 ESMA + \beta_4 growth + \beta_5 leverage\ ratio + \beta_6 analyst + \varepsilon$

	(1) Price		(2) Price		(3) Price		(4) Price		(5) Price		(6) Price	
Intercept	30.724	***	-31.708		38.787	***	-21.540	***	70.945	***	-63.806	***
	(6.95)		(19.19)		(3.11)		(8.00)		(6.89)		(23.26)	
EBITDA-APM	16.002	***	14.333	***								
	(1.21)		(1.38)									
EBITDA-APM * ESMA	-3.214		-3.497									
	(3.52)		(3.50)									
EBIT-APM					12.876	***	11.502	***				
					(1.71)		(1.50)					
EBIT-APM * ESMA					20.068	***	15.358	***				
					(3.37)		(3.39)					
EPS-APM									16.598	***	13.532	***
									(3.24)		(3.27)	
EPS-APM * ESMA									-4.696		-1.980	
									(5.57)		(5.25)	
ESMA	21.456		22.884		-18.598	***	-14.444	**	6.711		0.790	
	(17.78)		(16.19)		(6.56)		(6.46)		(12.92)		(10.92)	
growth			24.032	***			19.881	***			16.183	***
			(3.07)				(2.68)				(5.47)	
leverage ratio			-0.511	*			0.232				0.619	***
			(0.26)				(0.15)				(0.16)	
analyst			14.947	***			7.892	***			35.429	***
			(5.38)				(2.39)				(6.88)	
Adjusted R-squared	0.5895		0.7307		0.5889		0.6957		0.3063		0.4469	
F-test	63.28	***	73.16	***	62.60	***	67.01	***	11.17	***	11.97	***
Observations	202		202		286		286		250		250	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA-APM * ESMA	Interaction term between EBITDA-APM and ESMA
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT-APM * ESMA	Interaction term between EBIT-APM and ESMA
EPS-APM	Earnings per share disclosed as an APM
EPS-APM * ESMA	Interaction term between EPS-APM and ESMA
ESMA	Dummy variable equal 1 in quarters after ESMA guidelines were implemented, 0 otherwise
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 5: Price Earnings Regression using Price 3, EBITDA-APM & EBITDA

Model spesicifation:

(1) $Price\ 3 = \beta_0 + \beta_1\ EBITDA\text{-}APM + \varepsilon$

(2) $Price\ 3 = \beta_0 + \beta_1\ EBITDA + \varepsilon$

(3) $Price\ 3 = \beta_0 + \beta_1\ EBITDA\text{-}APM + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

(4) $Price\ 3 = \beta_0 + \beta_1\ EBITDA + \beta_2\ growth + \beta_3\ leverage\ ratio + \beta_4\ analyst + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	37.853 ***	49.569 ***	-19.194	-24.863
	(6.67)	(7.57)	(16.32)	(17.54)
EBITDA-APM	15.009 ***		13.446 ***	
	(1.22)		(1.52)	
EBITDA		12.392 ***		10.837 ***
		(1.44)		(1.62)
growth			23.794 ***	25.247 ***
			(3.00)	(3.03)
leverage ratio			-0.522 **	-0.496 *
			(0.26)	(0.27)
analyst			12.968 **	18.425 ***
			(5.13)	(5.66)
Adjusted R-squared	0.5753	0.5093	0.7136	0.6708
F-test	150.30 ***	74.43 ***	98.59 ***	78.33 ***
Observations	202	202	202	202
Vuong Z-statistic	1.0388		0.8140	
p-value	0.2989		0.4157	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 6: Price Earnings Regression using Price 3, EBIT-APM & EBIT

Model spesicifation:

(1) $\text{Price 3} = \beta_0 + \beta_1\ \text{EBIT-APM} + \varepsilon$

(2) $\text{Price 3} = \beta_0 + \beta_1\ \text{EBIT} + \varepsilon$

(3) $\text{Price 3} = \beta_0 + \beta_1\ \text{EBIT-APM} + \beta_2\ \text{growth} + \beta_3\ \text{leverage ratio} + \beta_4\ \text{analyst} + \varepsilon$

(4) $\text{Price 3} = \beta_0 + \beta_1\ \text{EBIT} + \beta_2\ \text{growth} + \beta_3\ \text{leverage ratio} + \beta_4\ \text{analyst} + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	39.942 ***	48.047 ***	-18.084 **	-33.098 ***
	(3.53)	(3.57)	(8.19)	(10.70)
EBIT-APM	15.055 ***		13.198 ***	
	(2.06)		(1.72)	
EBIT		11.001 ***		8.898 ***
		(1.50)		(1.30)
growth			22.654 ***	23.827 ***
			(3.01)	(3.23)
leverage ratio			0.186	0.203
			(0.16)	(0.18)
analyst			5.285 **	13.952 ***
			(2.64)	(3.38)
Adjusted R-squared	0.4794	0.3652	0.6296	0.5294
F-test	53.37 ***	53.47 ***	62.95 ***	56.66 ***
Observations	286	286	286	286
Vuong Z-statistic	1.9842		2.5501	
p-value	0.0472		0.0108	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT	Earnings Before Interest and Tax per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 7: Price Earnings Regression using Price 3, EPS-APM & EPS

Model spesicifation:

(1) $\text{Price 3} = \beta_0 + \beta_1\ \text{EPS-APM} + \varepsilon$

(2) $\text{Price 3} = \beta_0 + \beta_1\ \text{EPS} + \varepsilon$

(3) $\text{Price 3} = \beta_0 + \beta_1\ \text{EPS-APM} + \beta_2\ \text{growth} + \beta_3\ \text{leverage ratio} + \beta_4\ \text{analyst} + \varepsilon$

(4) $\text{Price 3} = \beta_0 + \beta_1\ \text{EPS} + \beta_2\ \text{growth} + \beta_3\ \text{leverage ratio} + \beta_4\ \text{analyst} + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	73.113 ***	86.891 ***	-63.924 ***	-85.464 ***
	(5.78)	(5.26)	(22.94)	(20.87)
EPS-APM	15.758 ***		13.159 ***	
	(2.71)		(2.77)	
EPS		7.785 ***		6.698 ***
		(2.03)		(1.73)
growth			16.383 ***	16.548 ***
			(5.20)	(4.14)
leverage ratio			0.633 ***	0.428 **
			(0.16)	(0.18)
analyst			35.513 ***	50.543 ***
			(6.99)	(7.91)
Adjusted R-squared	0.3089	0.1791	0.4543	0.4096
F-test	33.82 ***	14.77 ***	13.51 ***	24.55 ***
Observations	250	250	250	250
Vuong Z-statistic	2.0946		0.7718	
p-value	0.0362		0.4402	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
EPS-APM	Earnings Per Share disclosed as an APM
EPS-APM	Earnings Per Share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 8: Price Level Regression using Price 3, EBITDA-APM & EBITDA

Model spesicifation:

(1) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBITDA-APM} + \varepsilon$

(2) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBITDA} + \varepsilon$

(3) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBITDA-APM} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

(4) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBITDA} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	29.197 ***	33.243 ***	-59.792 ***	-61.647 ***
	(5.26)	(5.38)	(11.89)	(12.48)
BVE	0.684 ***	0.806 ***	1.059 ***	1.091 ***
	(0.12)	(0.12)	(0.11)	(0.11)
EBITDA-APM	8.349 ***		2.589 *	
	(1.64)		(1.57)	
EBITDA		5.912 ***		1.891
		(1.43)		(1.34)
growth			32.072 ***	32.528 ***
			(2.96)	(2.94)
leverage ratio			0.145	0.167
			(0.18)	(0.19)
analyst			8.810 ***	9.420 ***
			(3.38)	(3.38)
Adjusted R-squared	0.6519	0.6343	0.8595	0.8588
F-test	245.94 ***	203.54 ***	193.83 ***	192.72 ***
Observations	202	202	202	202
Vuong Z-statistic	0.6540		0.1324	
p-value	0.5131		0.8947	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
BVE	Book Value of Equity per share
EBITDA-APM	Earnings Before Interest, Tax, Depreciation and Amortisation per share disclosed as an APM
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 9: Price Level Regression using Price 3, EBIT-APM & EBIT

Model spesicifation:

(1) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBIT-APM} + \varepsilon$

(2) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBIT} + \varepsilon$

(3) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBIT-APM} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

(4) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EBIT} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	20.370 ***	14.632 ***	-33.134 ***	-35.316 ***
	(4.07)	(3.89)	(7.28)	(6.94)
BVE	0.938 ***	1.259 ***	1.540 ***	1.606 ***
	(0.20)	(0.13)	(0.18)	(0.13)
EBIT-APM	8.350 ***		2.828 *	
	(2.50)		(1.49)	
EBIT		5.405 ***		2.296 ***
		(1.33)		(0.84)
growth			26.077 ***	25.903 ***
			(2.70)	(2.63)
leverage ratio			0.281 **	0.284 **
			(0.13)	(0.12)
analyst			-6.257 **	-5.856 **
			(2.78)	(2.70)
Adjusted R-squared	0.5298	0.5346	0.7454	0.7494
F-test	57.12 ***	66.16 ***	76.65 ***	80.17 ***
Observations	286	286	286	286
Vuong Z-statistic	-0.2234		-0.7193	
p-value	0.8232		0.4720	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
BVE	Book Value of Equity per share
EBIT-APM	Earnings Before Interest and Tax per share disclosed as an APM
EBIT	Earnings Before Interest and Tax per share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size

Appendix 10: Price Level Regression using Price 3, EPS-APM & EPS

Model spesicifation:

(1) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EPS-APM} + \varepsilon$

(2) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EPS} + \varepsilon$

(3) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EPS-APM} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

(4) $\text{Price 3} = \beta_0 + \beta_1\ \text{BVE} + \beta_2\ \text{EPS} + \beta_3\ \text{growth} + \beta_4\ \text{leverage ratio} + \beta_5\ \text{analyst} + \varepsilon$

	(1) Price 3	(2) Price 3	(3) Price 3	(4) Price 3
Intercept	39.853 ***	41.373 ***	-62.404 ***	-72.892 ***
	(5.00)	(5.79)	(14.25)	(15.59)
BVE	0.677 ***	0.772 ***	0.693 ***	0.733 ***
	(0.08)	(0.10)	(0.07)	(0.10)
EPS-APM	8.773 ***		6.554 ***	
	(1.73)		(1.54)	
EPS		4.859 ***		4.164 ***
		(1.04)		(0.97)
growth			19.615 ***	19.691 ***
			(6.09)	(5.62)
leverage ratio			0.491 ***	0.440 ***
			(0.17)	(0.17)
analyst			21.265 ***	26.914 ***
			(5.19)	(6.37)
Adjusted R-squared	0.5279	0.5183	0.6682	0.6786
F-test	74.29 ***	61.36 ***	50.28 ***	59.31 ***
Observations	250	250	250	250
Vuong Z-statistic	0.2478		-0.4630	
p-value	0.8043		0.6434	

Standard errors in parentheses

Significance levels: * p<0.10, ** p<0.05, *** p<0.01

Definition of Variables:

Price 3	Share price with three-month lag after quarter end
BVE	Book Value of Equity per share
EPS-APM	Earnings Per Share disclosed as an APM
EPS	Earnings Per Share as disclosed in financial statements
growth	Price to Book as proxy variable for growth
leverage ratio	Total debt in percent of total capital as a proxy for financial risk
analyst	Logarithm of number of EPS analyst estimates provided in the Datastream database as a proxy for information environment and size