Aalto University
School of Business

What Drives Earnings Acceleration and Does it Convey Valuable Information?

Finance

Master's thesis

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Abstract of master's thesis

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PURPOSE OF THE STUDY:

Existing literature of valuation theories and financial statement analyses suggests that the change in earnings growth (earnings acceleration) conveys valuable information to investors. In my research, I study with a large sample of European middle and large market capitalization firms, whether earnings acceleration is useful in predicting stock returns, future earnings, and whether financial analysts appear to use this information in revising their forecasts. Besides extending geographically the study of Cao et al. (2011), I also contribute to the literature by studying whether the earnings acceleration information value derives from the operating cash flow or accruals component of earnings, whether the information value differs between the middle and large cap companies, and whether the results hold for both annual and quarterly earnings announcement data.

METHODOLOGY AND DATA:

My sample includes 387 large cap, and 1055 middle cap European developed country stocks from the years 1995-2012. The total sample size is 19 051 observations for the annual, and 23 596 observations for the quarterly tests. My methodology is based on a large number of multivariate regression equations, and the results are robust for various adjustments in the regression settings.

MAIN FINDINGS:

I find highly significant results supporting that the European stock earnings acceleration conveys valuable information similarly to that of prior U.S. literature. Hence, the earnings acceleration explains long-window stock returns, future earnings, analyst forecast revisions, and contributes incremental information to the analyst long-term forecasts. Another significant finding is that the absolute majority of the earnings acceleration information value derives from the operating cash flow component of earnings, indicating that the market can differentiate between the real earnings increase and the increase of discretional accounting items. The information value does not appear to depend on the company size, and the quarterly earnings acceleration conveys similarly valuable and partially complementary information to the annual information. Overall, my study provides strong support for the use of horizontal financial statement analysis in assessing stock returns.

Keywords earnings acceleration, earnings growth, horizontal financial statement analysis

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TUTKIMUKSEN TARKOITUS:

Nykyinen tutkimus tilinpäätösanalyyseista ja valuaatioteorioista esittää tuloksen kasvun muutoksella (tuloksen kiihtyvyys) olevan infomaatioarvoa sijoittajille. Oma tutkielmani selvittää, voiko tuloksen kasvun muutoksella ennustaa osakkeiden tuottoja, tulevaa tulosta tai huomioivatko analyytikot tuloksen kiihtyvyyden omien tulosennusteidensa muutoksissa. Tutkielmani paitsi laajentaa maantieteellisesti eurooppalaistella datalla Cao (2011) tuloksia, myös kasvattaa tutkimuskirjallisuutta selvittämällä, onko tuloksen kiihtyvyyden informaatioarvo peräisin liiketoiminnan kassavirrasta vai suoriteperusteisista kirjanpidollisista eristä, vaikuttaako yrityksen markkina-arvon suuruus tuloksen kiihtyvyyden informaatioarvoon, onko tämä informaatio muuttunut vuosien kuluessa, ja onko infomaatio samanlaista riippumatta siitä, mitataanko tuloksen kiihtyvyyttä kvartaali- vai vuositasolla.

DATA JA MENETELMÄT

Tutkielmani otos muodostuu markkina-arvolla mitattuna 387 suuresta ja 1 055 keskisuuresta eurooppalaisesta pörssilistatusta yhtiöstä vuosilta 1995-2012. Koko otokseni koostuu 19 051 vuosittaisesta- ja 23 596 kvartaalittaisesta havainnosta. Menetelmänä käytän useita erilaisia monimuuttujaregressioyhtälöitä, joiden tuloksia on testattu useilla erilaisilla muutoksilla alkuperäisissä regressio-oletuksissa.

TULOKSET:

Tutkimustulokseni osoittavat vahvasti, että eurooppalaisten pörssiyhtiöiden tuloksen kiihtyvyys välittää arvokasta tietoa sijoittajille. Tuloksen kiihtyvyys selittää osakkeiden tuottoja, tulevaa tulosta sekä analyytikoiden tarkennuksia tulosennusteisiin. Toinen merkittävä löytö on, että suurin osa havaitusta informaatioarvosta on peräisin liiketoiminnan kassavirrasta, mikä tukee oletusta, että markkinat kykenevät erottamaan toisistaan kassavirtaan perustuvan- ja suoriteperuteisiin kirjanpidollisiin eriin perustuvan tuloksen kasvun. Informaatioarvo ei myöskään riipu yrityksen koosta, eikä vaikuta muuttuneen viimeisten vuosien aikana. Lisäksi kvartaaleittain ja vuositasolla mitattu tuloksen kiihtyvyys sisältää samanlaista ja osittain jopa komplementaarista arvokasta tietoa. Kaiken kaikkiaan tulokseni tukevat horisontaalisen tilinpäätösanalyysin käyttöä osakkeiden tuottojen arvioinnissa.

Avainsanat tuloksen kasvun muutos, tuloksen kasvu, earnings acceleration

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1. Introduction

1.1 Academic and practical motivation

The goal of my study is to determine whether the earnings acceleration (EA hereafter), defined as the change in earnings growth, conveys value relevant information to the pricing of stocks. Secondly, I also attempt to determine what drives this EA information value. Overall, EA is stated as a fundamental element in the traditional earnings-based equity valuation models (for example, Gordon 1959; Malkiel and Cragg 1970; Ohlson and Juettner-Nauroth 2005), but has so far received only limited academic attention, thus leaving the empirical evidence scarce. However, the valuation theory, investment managers[1], financial analysts[2], and textbooks covering horizontal financial statement analysis[3] suggest that the EA information is valuable in the pricing of equities. Cao et al. (2011) is one of the few papers that study EA systematically, and my thesis contributes to this U.S research with European data.

My research starts by studying, whether the EA information is valuable in predicting contemporaneous long-term and short-term stock returns, whether the EA information explains future earnings, and whether the analysts appear to use the EA information while revising their earnings forecasts. After studying whether the EA conveys valuable information, I study whether this information value derives from the cash flow or accruals components of earnings, whether the EA information value depends on the firm size, whether it changes over time, and finally, whether both the annual and quarterly earnings reports convey similar information.

The prior literature of the valuation of earnings growth serves as the fundamental cornerstone of my study. I begin with the earnings-based equity pricing model of Ohlson and Juettner-

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[1] See for example The Paradox of Growth Investing, by AllianceBernstein Investments, and the Bernstein Quantitative Handbook

[2] E.g. Ford Equity Research uses an earnings trend analysis, which measures the acceleration or deceleration of the growth of firms' quarterly operating earnings per share after adjusting for earnings volatility, in evaluating stocks.

[3] William O'Neil, IBD (Investor Business Daily)'s founder, explains the importance of earnings acceleration in several books including ''24 Essential Lessons for Investment Success: Learn the Most Important Investment Techniques from the Founder of Investor's Business Daily'' (1999), ''How to Make Money in Stocks—A Winning System in Good Times or Bad'' (2002), and ''The Successful Investor: What 80 Million People Need to Know to Invest Profitably and Avoid Big Losses'' (2003). Finally, books that discuss earnings acceleration include Vega (1994), Sethna (1997), Fabozzi (1998), and Mintz et al. (1999), among others.

Nauroth (2005), which Chen and Zhang (2007) develop further. My approach differs from the existing theory by focusing on the realized, instead of expected, earnings acceleration in order to explain current stock returns. Thus, I examine, whether the investors are able to extract information from the current change in earnings growth variable (EA) beyond that revealed by the current earnings or the current earnings growth. Also, Cao et al. (2011) use this exploratory approach of current change in their study. Another unique feature in my approach is the inclusion of the EA as an explanatory variable in the Easton and Harris' (1991) contemporaneous empirical model, while the prior studies of Aboody et al. (2004), Copeland et al. (2004), and Chen and Zhang (2007) use it only as a control variable. Thirdly, my EA research is also in accordance with the principles of the common-sized horizontal financial statement analysis, which is based on the comparison of growth rates in individual line items over time (e.g. Lundholm and Sloan 2006; Stickney et al. 2007; Penman 2010; Cao et al. 2011). The final extension of my study is the approach of not only detecting, but also explaining which factors drive the EA information value by studying separately the operating cash flow and the accruals components of earnings.

My overall findings support the view that the reported EA numbers reveal incremental and valuable pricing information. As a conclusion of the academic and practical motivation, EA is a widely used concept in many investment strategies and the expected EA is also theoretically defined as a fundamental element in several traditional earnings-based equity valuation models. I extend the study of Cao et al. (2011) to the European setting and find significant results supporting that EA conveys valuable information with both annual and quarterly data.

1.2 Contribution to the literature

Since the academic field of the EA research is relatively unexploited, I contribute to the literature in several ways. Firstly, I geographically extend the U.S. research by providing evidence that the EA phenomenon also applies to the European markets. Secondly, after showing that the EA does convey information, I extend the literature by assessing this information value from the perspective of both annual and quarterly earnings growth. To my knowledge, this kind of approach has not yet been tested. The final unique extension of my study is to observe what affects the EA information value. To do this, I study whether the information in EA derives from cash, accruals, or both components of earnings, whether it depends on the firm size, and whether the information value changes over time. Overall, my study further deepens the knowledge of the explanatory power of EA in determining the stock prices.

1.3 Research questions and hypotheses

Cao et al. (2011) find significant evidence with the U.S data that the EA conveys valuable information about stock returns, future earnings, and analyst forecast revisions. My research question is twofold, and divides further into several hypotheses. Firstly, I study whether the EA information is valuable with the European data, and secondly I study where this value derives from. Below, I describe the two research questions and the underlying hypotheses. In my thesis I define the long-window as the annual period from 9 months before to 3 months after the annual/quarterly earnings fiscal-period end, and the short-window as the three days around the annual/quarterly earnings report date from 1 day before to 1 day after.

Table 1: First research question hypotheses; does EA convey valuable information

Table 1 presents the first research question; does EA convey valuable information and the underlying hypotheses

	Hypothesis:	**Description**
H1	EA is a significant explanatory factor for the contemporaneous returns in short/long-window measured with annual/quarterly data	The association between contemporaneous stock returns and EA
H2	EA is a significant explanatory factor for the next period reported earnings measured with annual/quarterly data	Whether the EA is informative in predicting future earnings
H3	EA is a significant explanatory factor for analyst 1- year earnings per share (EPS) forecast revisions around earnings report dates measured with annual/quarterly data	Whether the financial analysts use the EA information in revising their earnings forecasts
H4	Both EA and analyst long-term EPS growth revision variables are significant explanatory factors for the contemporaneous returns in short/long-window measured with annual/quarterly data.	Whether the EA conveys incremental information to that provided by changes in analysts' forecasts of long-term growth

Table 2: Second research question hypotheses; what drives EA information value

Table 2 presents the second research question; what drives EA information value, and the underlying hypotheses

	Hypothesis:	Description
H5	EA from the cash flow component of earnings is more significant explanatory factor for the contemporaneous returns in short/long-window than EA from the accruals component of earnings, measured with annual/quarterly data	Whether the EA information derives from cash rather than from accruals or both components of earnings
H6a	EA is a similarly significant explanatory factor for the contemporaneous returns in short/long-window for both large and middle cap companies measured with annual/quarterly data	Whether the EA information value depends on the firm size – for explaining stock returns
H6b	EA is a similarly significant explanatory factor for explaining next period reported earnings for both large and middle cap companies measured with annual/quarterly data	Whether the EA information value depends on the firm size – for explaining future earnings
H6c	EA is a similarly significant explanatory factor for explaining analyst 5-year earnings per share (EPS) growth rate forecast revisions for both large and middle cap companies measured with annual/quarterly data	Whether the EA information value depends on the firm size – for explaining analyst forecast revisions
H7	EA is a similarly significant explanatory factor for the contemporaneous returns in short/long-window before and after the year 2008 (financial crisis and the EU-implementation of the IFRS rules) measured with annual/quarterly data	Whether the EA information value changes over time
H8	EA is a similarly significant explanatory factor for the quarterly and annual data analyses	Whether the annual and quarterly EA convey similarly valuable information

1.4 Main findings

The overall findings of my study suggest that the EA conveys valuable information to the European investors, measured with both annual and quarterly earnings data. Moreover, my results are fairly similar to those of the U.S. study of Cao et al (2011). In more detail, I detect a strong positive connection between the annual returns and positive EA. A similar EA association also exists with future earnings and analyst forecast revisions, indicating that the EA information is useful to and used by analysts. More specifically, the analysts seem to value mostly the information in the earnings growth reversals. However, the analyst forecast revisions do not consume all the EA information, which can be seen from the fact that even when including the forecast revision variable in the regression equation, there still exist some incremental information in the EA variables. Despite the highly significant results from the annual returns, the short-window returns do not provide useful information due the data availability issues in the earnings report dates.

My findings not only confirm that the EA information is valuable, but also show that the value derives from the operating cash flows and not from the earnings accruals. The overall results of the EA information also hold regardless of the company size, and seem to be rather constant over time. The quarterly and annual results are highly similar, with the main differences being mostly in the emphasis between different EA patterns. At some points, the quarterly and annual information seems to be complementary, judged by the fact that for example, the long-term forecast revisions with the annual earnings data show more extreme forecast adjustments, while the revisions based on the quarterly earnings data are generally smaller.

1.5 **Limitations of the study**

My study contributes to the EA literature, which is so far not very exhaustive. Hence, the approach is more exploratory than firmly based on theoretical frameworks, and due to the scarcity of the prior literature the scope of my study is somewhat descriptive and only in the second research question unravels the more fundamental core issues of where the information value derives from. The more practical limitations of the study associate strongly with the data availability issues for the reported quarterly data. With a large number of robustness checks I try to overcome some of the negative implications of the imperfect data sets, but naturally the scalability of the inferences suffers from the fact that the databases and reporting standards differ between the countries.

1.6 Structure of the study

In the introduction (Chapter 1) I present the academic and practical motivations for my study and the contribution to the literature. I also state my research questions and hypotheses and explain briefly my main findings and limitations to the study. In Chapter 2, I provide an insight into the theoretical background of EA. In Chapter 3, I present the data; in Chapter 4, I explain the methodology, and in Chapter 5, I present the annual and quarterly results. Chapter 6 presents how I control for the robustness of the results, and finally the Chapter 7 concludes the whole study.

2. Theoretical background

There is a fundamental difference in the stock price determination between the finance and accounting literature. While the accounting literature studies whether the accounting earnings process captures the factors that affect the security prices in the efficient market (Ball and Brown, 1968; Easton et al, 1992), the finance literature tries to explain the stock prices with economic fundamentals (Fama, 1990) and views the stock returns rational. The theoretical background for the EA literature builds on the traditional earnings-based equity valuation models of Gordon (1959) and Malkiel and Gragg (1970). These traditional models identify the change in earnings growth (EA), the change in the rate of returns, and the change in earnings as the three fundamental variables explaining the stock price changes. A large body of accounting literature is written considering the change in expected earnings (see Kothari 2001), and the same applies for the financial literature concerning the change in expected returns (see Vuolteenaho 2002). However, the academic literature on the change in earnings growth (EA) is still relatively scarce with Cao et al. (2011) being one of the most important developers of this field of study. In the following sections, I briefly go through all these three variables explaining stock prices, and then focus more closely on the EA literature.

2.1 Earnings change literature

The earnings change literature builds on the dividend discounting model of Williams (1938), which defines the share price as the present value of the expected future dividends discounted at their risk-adjusted expected rate of return. Gordon (1959) makes some simplified assumptions to the dividend process and the discount rate making him the first to present an elementary theory of the stock price variation explained by dividends and earnings. His work consolidates the literature of various cross-section studies attempting to detect attractive investment opportunities and to arrive at buy and sell recommendations. Gordon studies the three possible hypotheses of whether the investor is actually buying the dividends, the earnings, or both components, when acquiring a company stock. The performance of the model in explaining the price variation is far superior to the simple empirical approach, but has still considerably room for improvements. On the other hand, Malkiel and Cragg (1970) show in their study of year-end common stock prices from 1961 through 1965 that the ratios of market prices to earnings are related to such factors as earnings growth, dividend payout, and various proxy variables designed to measure the risk or the quality of the returns stream.

The earnings capitalization model of Fama and Miller (1972) extends the Gordon growth model by writing future dividends as forecasted earnings and forecasted investments. Two main contributions of Fama and Miller are that the dividends are interesting as signals of future investments, and that the growth depends not only on investments, but also on investments with a return that is higher than the return determined by the CAPM model.

A second branch of the change in earnings literature builds on the earnings response coefficient research, which links earnings and security returns literatures by measuring the extent of security's abnormal market return in response to the unexpected component of reported earnings (Collins and Kothari, 1989). This research is contingent on the market efficiency, and has also received a fair amount of criticism in different papers (see for example Ahmed, 1994; Anthony and Ramesh, 1992; Ohlson, 1995; Watts, 1992; and Kormendi and Lipe, 1987). One important developer of the earnings change, as a determinant of the stock prices, literature is the returns-earnings model of Easton and Harris (1991), which focuses on the current earnings change, and has strongly affected the methodological fundamentals of my thesis. The main findings of Easton and Harris (1991) are threefold. Firstly, the financial analysts use financial statement information in generating and revising their earnings forecasts. Secondly, the change in reported accounting earnings is a proxy for the change in expected earnings. Finally, their empirical evidence indicates that the earnings changes are positively associated with returns. As a summary, Easton and Harris show the connection between accounting earnings and security returns.

However, there are two features of the returns-earnings model that need further discussing. Firstly, Beaver et al (1980) have documented the prices lead earnings –phenomenon, which means that the accounting earnings appear in the stock prices with a lag that depends on the accounting standards. Secondly, the transitory earnings, or, the one-time gains or losses are reported more quickly for the bad news than for the good news due to the information asymmetry costs and the litigation threat, leading to the fact that the negative news are priced on a more timely basis than the positive news (Ball et al, 2000). The use of transitory earnings also enables the managerial earnings management in the form of choosing for example whether to take a big bath, and whether to keep high accruals (Healy, 1985). To sum up the earnings change literature, the core idea is that the stock prices can be explained by the changes in current earnings. The two branches of this body of literature suggest on one hand that the stock price is the present value of the future dividend stream deriving from the future earnings, and on the other hand, the returns response coefficient research explains the stock price changes with the unexpected earnings information component. Generally these two approaches look at the same question from two different angles.

2.2 Rate of return literature

A notable recent study explaining stock returns with the changes in discount rate comes from Vuolteenaho (2002). He uses the vector autoregressive model (VAR)[4] to decompose an individual firm's stock returns into components of changes in cash-flow expectations and changes

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[4] Vector autoregression (VAR) is a statistical model that can be used to capture linear interdependencies among multiple time series. The model allows for more than one evolving variable, which are all treated symmetrically in a structural sense. Each variable has an equation explaining its evolution based on its own lags and the lags of the other model variables. The popularity of the model is partly explained by the fact that VAR modeling does not require as much knowledge about the forces influencing the variable; only a list of variables which can be hypothesized to affect each other intertemporally.

in discount rates. As shown by Campbell and Shiller (1988a), the stock return volatility must originate from volatile cash-flow and/or expected-return news. Vuolteenaho's three main findings are that the stock-returns are mainly driven by the cash-flow news, and that for a typical stock, the variance of cash-flow news is more than twice that of the expected-return news. Secondly, the shocks affecting the expected returns and the cash flows are positively correlated for a typical small stock. Thirdly, the cash-flow news is more easily diversified away in a portfolio than the expected-return news. This finding suggests that the cash-flow information is largely firm specific and that the expected-return information is predominantly driven by the systematic, market wide components. Thus, the information about the future cash flows is a more dominant factor driving firm-level stock returns than the information about the discount rate that describes the firm's riskiness.

Supporting Vuolteenaho's findings that the variance decomposition differs by firm size, there is a lot of evidence of different firm-specific factors affecting the return-predictability patterns. For example, Banz (1981) discovers the "size effect" according to which small firms earn higher average stock returns than large firms. DeBondt and Thaler (1985) detect the "long-term reversal" effect, where the past long-term losers outperform the past long-term winners. Contrarily to this "long-term reversal", Jegadeesh and Titman (1993) present the "momentum" phenomenon, where the past short-term winners outperform the past short-term losers. Rosenberg, Reid and Lanstein (1985) discuss the "book-to-market" anomaly, where the high book-to-market firms earn higher average stock returns than the low book-to-market firms. Finally, the higher profitability firms earn higher returns than the lower-profitability firms based on Haugen and Baker (1996), and based on the "leverage effect" the high-leverage firms have historically outperformed the low-leverage firms (Bhandari's, 1988). Summarizing the above, several authors document different kinds of returns-anomalies, but their existence depends on different research settings, and therefore they cannot be formally approved. Most of these anomalies also challenge the efficient market hypothesis.

Other research relating the rate of return to stock prices includes among others Campbell et al (2010), which states that the systematic risk of stocks with similar accounting characteristics is primarily driven by the systematic risk in their fundamentals. More specifically, the growth stocks are particularly sensitive to temporary movements in the equity risk premium, while the value stocks are particularly sensitive to the permanent movements in market-wide shocks. Thus, the growth stocks are not merely glamour stocks whose systematic risk is purely driven by investor sentiment. Also, Chen and Zhao (2009) emphasize the understanding of the relative importance of discount rate news and cash flow news driving the stock return variation. Chen and Zhao argue against the commonly used method of estimating the discount rate news directly, and having the cash flow news as a residual, which might possibly lead to large misspecification errors.

Campbell and Ammer (1993) research the movements in stock and bond returns by studying the underlying variables of short-term real interest rates, expected changes in dividends, inflation and excess returns on stocks and bonds. They discover that the real interest rate changes have little impact on the stock and 10-year bond returns, although the real interest rates do affect the short-term nominal interest rates and the slopes of the bond term structure. To sum up, these findings are not in contradiction with the rate of return change literature, because the real rates determine at best the risk-free discount rate, on top of which the risk premiums are then added. Also, somewhat contradicting results are presented by Campbell and Shiller (1988) who fail to find any support for the various measures of short-term discount rates explaining the stock prices.

A totally new approach for this body of literature is presented by Shiller (2003) who questions the ability of efficient market theory to predict stock prices, and turns to the behavioral finance for new answers. Behavioral finance has a broader social science perspective by including psychology and sociology aspects to the traditional finance theory. The revolution of rational expectations reached its height of dominance around 1970s, and believed that the speculative asset prices always incorporate the best information about fundamental values and that the prices only change because of good sensible information. However, the rational expectations models could not explain among other things the pricing anomalies, which lead to the behavioral finance assumptions that the market participants or the individual investors do not always act rationally. Hence, the behavioral finance assumptions undermine the traditional models ability to predict stock prices by adding an additional “human judgment” variable into consideration. While the theoretical models of efficient markets illustrate and characterize the ideal world, they do not describe the actual markets in their pure form.

2.3 **Earnings acceleration literature**

EA literature is still rather uncovered topic in the academia. The two major lines of study focus on either the expected EA, or on the stock-price reactions to earnings strings-analyses. Moreover, there are only a few studies that include the EA variable in a returns model. In this section I will briefly cover these topics starting from the expected change literature.

Ohlson and Juettner-Nauroth (2005) present an earnings-based price model that is the first to distinguish between the short-term and the long-term growth. The short-term earnings growth rate enters linearly into the price equation, while the long-term earnings growth enters non-linearly through the valuation parameters. The price model explains stock returns as a linear function of the change in the expected short-term earnings growth rate. The model distinguishes itself from the standard (Gordon/Williams) text-book approaches, which fix the growth rate and the payout rate, by resting on more general principles such as dividend policy irrelevancy. A second key difference in the Ohlson and Juettner-Nauroth (2005) model is that it inverts the valuation formula by showing how one expresses the cost-of-capital as a function of the forward-EPS to price ratio and the short-term and long-term measures of growth in the expected EPS. A central principle in this equity valuation focuses on firms’ near term expected EPS and its subsequent growth. Hence, making money in the stock market is reduced to the idea of buying future earnings as cheaply as possible for a given level of risk. As an equilibrium consequence, firms with large price to future-EPS ratio should have large growth in expected EPS. The Ohlson and Juettner-Nauroth (2005) approach can be useful in the research that focuses on individual firms’ expected returns and risks. Penman (2005) also compares the two models with a utilitarian conclusion that the choice between the competing models ultimately comes down to the fact of how useful they are for the practical task of evaluating investments. He also points out the need to track the book values, because besides adjusting the leverage, some earnings growth measures increase by reducing the book values. Correspondingly, Feltham and Ohlson (1995) and Zhang (2000) anticipate that the conservative accounting of book values anticipates earnings growth.

Chen and Zhang (2007) is one of the few papers that present in their returns model the significance of expected change in growth opportunities, as one of the accounting variables explaining cross-sectional stock returns. Compared to the finance literature models that are based on common risk factors, this accounting-based model holds greater promise in explaining cross-sectional price movements. The results suggest that it may be more fruitful for investors to search for information on the fundamental characteristics of firms' operations than to exploit the common-factor-based anomalies. In the model of Chen and Zhang (2007), the earnings variable valuations are conditional on the level of profitability. Moreover, the future EA is proxied by the change in analysts' consensus forecast of the firms' long-term earnings growth rate.

Next, I briefly introduce the two other studies that include EA in their returns models. Firstly, Aboody et al. (2004) investigate the relation between the share price and the stock-based compensation expenses that are disclosed, but not recognized, in the net income. They use an instrumental variables approach that includes the forecasted EA as a control variable. Secondly, Copeland et al (2004) find that the shareholder returns in current year are primarily related to the expectations about the long-term performance, which are measured with expected earnings growth, and the EA as a control variable. Overall, there are not many studies that measure EA, and the few examples that exist have EA only as a control variable and as a proxy for expected, and not current, EA.

The only study that utilizes historical accounting numbers in the valuation is the one of Cao et al (2011), whose methods I largely extend in my own study. Cao et al. study whether the current EA measures convey value to stock returns and future earnings, and whether the analysts use the EA information in revising their earnings forecasts. Cao et al find very strong evidence for the EA information value. However, this study settles with concluding that the EA conveys valuable information in the U.S. without trying to explain what affects this information. My own study extends this field by showing that the information is similarly valuable in Europe and that the value derives from the cash flows and not from the earnings accruals.

To conclude, the academic literature on EA is relatively scarce, given that the EA is one of the three fundamental elements of the traditional earnings-based equity valuation models of Gordon (1959), and Malkiel and Gragg (1970). The concept of EA is, however, widely recognized in the non-academic literature, and is discussed in several investment research publications. There is also a large body of literature concerning the earnings growth and expected earnings growth, which is, however, out the scope of my study (see for example Fama and French, 1995, 2000; DeAngelo and Skinner, 1996; Burgstahler et al., 1997 and many more). Finally, the most relevant recent EA study is written by Cao et al. (2011), to which I contribute in my own study.

3. Data

3.1 Sample building

The sample selection starts with the Thomson ONE tool for geographic company screening. My selection criteria includes all the large and middle cap stocks from the 16 European developed countries, which are Austria (AUT), Belgium (BEL), Switzerland (CHE), Germany (DEU), Denmark (DNK), Spain (ESP), Finland (FIN), France (FRA), United Kingdom (GBR), Greece (GRC), Ireland (IRL), Italy (ITA), Netherlands (NLD), Norway (NOR), Portugal (PRT), and Sweden (SWE). The original sample size contains 387 large cap stocks with current market cap greater or equal to USD 5 000 Mil and 1055 middle cap stocks. My sample period runs from the beginning of 1995 to the fiscal year-end 2012. The data availability especially in the early years of my sample is partially very scarce, especially for the middle cap companies, and for the variables such as analyst forecasts and earnings report dates. Also, the 2012 earnings are not yet reported for all of the companies during my data gathering period. Another issue is the dearth of quarterly data in the databases. I perform cross-checks between the Thomson and Worldscope data sources, but either the reporting requirements in different European countries differ, or the databases are otherwise imperfect, since the total annual sample is 19 051 and the quarterly sample only 23 596 observations for the same time period. The financial statement data comes from Worldscope and Reuters, which are operated through Thomson One, the pricing data comes from Datastream, and the analyst forecast data comes from I/B/E/S through Thomson One. A full list of the data items, their sources, and their existence is tabulated in the Appendix Table 18. A natural starting period for the empirical research is 1995, where theoretically more than half of the data points exist based on the Appendix Table 18. Naturally, the final sample is smaller since the observations of the different variables need to be matched by company and by observation period. The building of the annual and quarterly samples requires combining information from several databases with the company fiscal-period-end date as the common ticker.

I eliminate from my sample the firms with negative book value of equity and the observations without data available for total assets. The data availability varies highly between different variables as can be seen from the Table 3 below.

Table 3: Percentage and number of observations for different variables

This table shows the variables and their number of observations for both annual and quarterly samples. The percentage of total –column shows the number of observations of a variable benchmarked to the total sample size.

Variable	**Annual data**		**Quarterly data**	
	Obs.	% of total	Obs.	% of total
Total assets	19 051	100%	23 596	100%
EBIT	18 977	99%	22 003	93%
Number of shares outstanding	18 344	96%	20 853	88%
ROA	17 288	91%	20 769	88%
Market value	17 090	90%	20 035	85%
Operating cash flow	16 942	89%	19 432	82%
Book-to-market	16 351	86%	19 653	83%
Future earnings	16 044	84%	20 230	86%
Change in earnings	15 371	81%	17 191	73%
Change in lagged equity book value	15 085	79%	18 881	80%
Earnings acceleration	15 035	79%	16 109	68%
Long-window returns	14 636	77%	22 068	94%
Change in dividends	12 331	65%	6 272	27%
Short-window returns	4 060	21%	13 120	56%
5Y EPS growth forecast revision	2 064	11%	7 141	30%
1Y EPS forecast revision	1 246	7%	3 979	17%
Total sample size	19 051	100%	23 596	100%

For example, the financial statement information is relatively complete, but the reporting dates and the analyst forecasts are more deficient. For some of the analyses I also lose 1-year observations from the sample period beginning and from the end, due to the earnings prediction test requirement for one-year-ahead data, and the lagged variable requirement for one-year-before data. The observations with the stock price less than USD 2 are dropped.[5] Moreover, my data is winsorized at the top and the bottom 0,5% to control for data outliers.[6] After the data cleaning, my sample size is 19 051 observations for the annual, and 23 596 for the quarterly data, which I report in USD.

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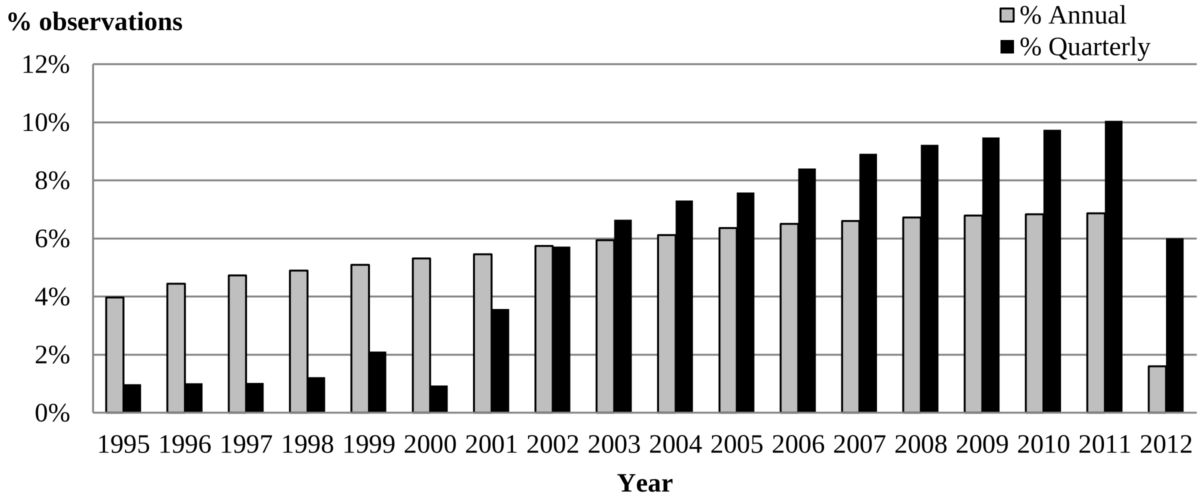
[5] My results are robust to alternative share price cut-off points such as USD 1, or 3.

[6] Winsor takes the non-missing values of a variable *x* and generates a new variable *y* identical to *x* except that the *x* highest and *x* lowest values are replaced by the next value counting inwards from the extremes. This transformation is named after the biostatistician Charles P. Winsor (1895-1951). For more discussion and references, see Barnett and Lewis (1994). My results are robust for alternative levels of winsor e.g. 1%, or 5%.In the Stata, the winsor command is written by Nicholas J. Cox, Durham University, U.K., n.j.cox@durham.ac.uk

3.2 Data limitations

One limitation in evaluating the data robustness is choosing between the alternative sources of earnings report dates. For example, the data for EPS announcement dates is partially different from the data for EBIT reporting dates, cross-checked with the companies' actual report dates found on their websites. Luckily, the data is mostly comparable, and I also perform the tests with alternative report dates with no major differences in the results. A greater problem with the report dates is the low total amount of data and the fact that some databases consider the period end date as the report date if the actual report date is missing. More specifically, these report date issues add noise to the forecast revision analyses, since the matching of the forecast revisions data with the data for the earnings report dates further decreases the number of observations. These are the major explanations why the results for the short-window analyses are extremely vague. However, in the long horizon the minor differences between the exact dates are not an issue, and the results are checked for robustness with different sources for report dates and forecast revisions. Figure 1illustrates how the shortage of the early report dates makes the overall periodic observation distribution skewed for the quarterly data.

Figure 1: Illustration of annual distribution of quarterly and annual data



Another limitation in the comparability of the quarterly data analyses is caused by the control variable, change in dividends. Normally, dividends are paid once a year, and therefore the databases usually report the dividends for only one of the four quarterly observations, reducing my sample size remarkably. I attempt to overcome this issue with different adjustments, but there are significant downsides in each of the alternatives. Firstly, I consider using the same annual dividend for each of the four quarters, but this would cause the change in dividends to be zero for three out of the four quarterly observations of the year. Secondly, I consider distributing the dividends incrementally between the four quarters, but based on the dividend behavior literature of Miller and Modigliani (1961), and Jagannathan and Weisbach (2000), I conclude that the dividends do not correlate credibly with any given metrics, making any discretional assessments very dubious. This is why I decide to continue with the original quarterly sample and to accept a lower number of quarterly observations (6 272).

3.3 Variable definitions

The definition of the EA variable is based on the arguments of Chan et al. (2003, 2004), and Daniel and Titman (2006), who argue that calculating earnings growth on a per share basis accounts better for merger and acquisition effects. Moreover, Chan et al. (2003, 2004) deflate the change in earnings per share by total assets per share rather than by earnings per share at the beginning of the period in order to avoid possible negative denominators from negative earnings. The prior literature considers various alternative earnings measures, but based on my robustness checks and the results of Cao et al. (2011), the change in earning measure does not affect the main results. Hence, I follow the methods of Cao et al. (2011) and Sloan (1996) in defining the EA as the change in operating income before extraordinary items per share from t-1 to t, divided by total assets per share at t-1. As a formula, the earnings growth rate at t is calculated as:

$$\mathrm{EG(OCF)}_t = [(\frac{\mathrm{OI}_t}{\mathrm{Shares}_t}) - (\frac{\mathrm{OI}_{t-1}}{\mathrm{Shares}_{t-1}})] \;/\; [\frac{\mathrm{Total\ Assets}_{t-1}}{\mathrm{Shares}_{t-1}}] \tag{1}$$

Where, OI is operating income, and shares are adjusted for stock splits and stock dividends. Consequently, the EA is defined as the per share change in earnings growth, $EG_t – EG_{t-1.}$ In the next table, I present the definitions for other key variables of my study.

Table 4: Key variables and their definitions

Symbol	**Name**	**Definition**
EA	Earnings acceleration	$EG_t – EG_{t-1}$ Change in earnings growth from t to t-1
OI	Operating income	Income before extraordinary items
R_{ST}	Short-term return	3-day buy-and-hold returns measured [-1;1] days around earnings report date
R_{LT}	Long-term return	Annual buy-and-hold returns measured from [-9;3] months around fiscal year-end
MV	Market value	Number of common $shares_t$ * Stock closing price at fiscal $year\text{-}end_t$
E	Earnings	OI_t / MV_{t-1} Income divided by the market value at the beginning of the year
ΔE	Change in earnings	(OI_t - OI_{t-1})/ MV_{t-1} Change in income divided by the market value at the beginning of the year
EG	Earnings growth	EG_t = [OI_t/$Shares_t$ - OI_{t-1}/$Shares_{t-1}$] / [Total $Assets_{t-1}$/$Shares_{t-1}$)]; adjusted for stock splits and stock dividends
BM	Book-to-market	Equity book $value_t$ / Market value of equity at fiscal $year\text{-}end_t$
ROA	Return on assets	OI_t / Total $Assets_{t-1}$ Operating income divided by the assets at the beginning of the year
ΔD	Change in dividends	Δ$Dividends_t$ / MV_{t-1} Change in dividends divided by the market value of equity at the beginning of the year
FRY	Analyst forecast revision	Percentage 1-year EPS consensus forecast revision after the earnings announcement
ΔLTG	Change in long-term growth forecast	Revision to the consensus 5-year EPS growth rate forecast after the earnings announcement

4. Description of the methodology

4.1 Theoretical background for the returns model

My returns model is based on the equity valuation model of Ohlson and Juettner-Nauroth (2005), which is the first to distinguish between short-term and long-term future earnings growth. This model assumes the current firm value as the sum of the capitalized one-period-ahead earnings and the capitalized future abnormal change in earnings, which is assumed to grow at the constant rate, μ-1:[7]

Equation 2: Ohlson and Juettner-Nauroth model (2005)

$$p_t = E_{t+1}/\mathrm{r} + \ [(E_{t+2} - \ E_{t+1}) - \ \mathrm{r}(E_{t+1} - d_{t+1})]/\mathrm{r}(\mathrm{R} - \mathrm{\mu})$$

where, p_t is the current stock price, E_{t+1} is one-period ahead earnings, E_{t+2} is two-period-ahead earnings, r is the cost of equity capital (constant), R is defined as 1+r, d_{t+1} is one-period-ahead dividends, and μ = 1 + long-term perpetual earnings growth rate (also constant). Short-term future earnings-growth is reflected in (E_{t+2} - E_{t+1}), while the long-term future earnings growth is reflected in μ. The original Ohlson and Juettner-Nauroth model is then developed further by Ozair (2004) and Ohlson and Gao (2006), who add the assumption of clean surplus accounting, the presence of "other information", and the linear information dynamics, resulting in the following model:

$$p_t = \mathrm{b_t} + \ \beta_1 E_t^a + \ \mathrm{r} + \beta_2 v_{1t} + \ \beta_3 v_{2t} \tag{3}$$

where b_t is the current book value of equity, stock price (E_t^a) is the current abnormal earnings, v_{1t} captures the change in future expected abnormal earnings, v_{2t} is the "other information"

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[7] The Ohlson and Juettner-Nauroth model in (1) becomes equivalent to the Gordon growth model when d_{t+1} = E_{t+1} (i.e., when the dividend payout is 100%). Thus, the Ohlson and Juettner-Nauroth model is less restrictive than the Gordon growth model. In addition, it satisfies the Modigliani-Miller dividend irrelevance property

beyond the basic accounting data, and β_1, β_2, and β_3 are valuation parameters. Cao et al. (2011) develop the model further by taking the historical change from t-1 to t and applying the clean surplus relation of the change in equity book value, equaling the earnings deducted by dividends[8] ($b_t - b_{t-1} = E_t - d_t$), which yields to the following price change model:

Equation 4: Developed Ohlson and Juettner-Nauroth model (2005)

$$p_t - p_{t-1} + d_t = E_t + \beta_1 \Delta E_t + \frac{1}{\gamma}\beta_2(\Delta E_{t+2} - \Delta E_{t+1}) - \frac{1}{\gamma}\beta_2 r \Delta E_{t+1} - \beta_1 r \Delta b_{t-1} + \frac{1}{\gamma}\beta_2 r \Delta d_{t+1} + \beta(v_{2t} - v_{2t-1})$$

where the returns model is linear in the level of current earnings (E_t), current earnings growth (ΔE_t), the change in future (t+2) earnings growth ($\Delta E_{t+2} - \Delta E_{t+1}$), the change in future earnings (ΔE_{t+1}), the lagged change in book value of equity (Δb_{t-1}), the change in future dividends (Δd_{t+1}), and the change in current other information ($v_{2t} - v_{2t-1}$). Theory predicts positive coefficients on E_t, ΔE_t, ($\Delta E_{t+2} - \Delta E_{t+1}$), and Δd_{t+1}, and negative coefficients on ΔE_{t+1} and Δb_{t-1} since they reflect the residual income components.[9]

I follow the approach of Cao et al. (2011), which replaces the expected EA, ($\Delta E_{t+2} - \Delta E_{t+1}$) with current EA, ($\Delta E_t - \Delta E_{t-1}$), and the future change in dividends, (Δd_{t+1}) with the current change in dividends, Δd_t. Furthermore, Cao et al. (2011) replace the change in future earnings, ΔE_{t+1} with the current book-to-market ratio BM_t because the latter is a forward-looking variable, which should help reducing any coefficient biases from not including ΔE_{t+1}. Finally, the effects of any omitted variables should be reflected in the regression intercept and error terms. Overall, this study is more exploratory than a set of formal hypotheses deriving from theory.

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[8] The clean surplus relation assumes the change in book value of equity to equal the amount of retained earnings

[9] Note that the coefficient $1/\mu*\beta_2$ on ($\Delta E_{t+2} - \Delta E_{t+1}$), is an increasing function of μ. This makes economic sense because it indicates that the higher the rate of growth, the more highly valued is EA ($\Delta E_{t+2} - \Delta E_{t+1}$).

4.2 Empirical methodology for the research questions

My empirical analyses employ a large sample of large and middle cap firm observations, for which I calculate the EA in USD, and report the results on a per share basis. The robustness checks confirm that my main results hold also for alternative earnings measures. The research questions are approached with seven different regression types, which are then further divided into two sub-regressions to survey the same setting with different time windows. These two time horizons are the three-day short-window, with the cumulative raw returns centered on the earnings announcement date, and the annual long-window starting from 9 months before to 3 months after the fiscal-period end date. As a research method, I use the two-tailed OLS regression with Newey-West standard errors for coefficients. The error structure is assumed to be heteroskedastic and autocorrelated up to some lag.

4.2.1 Newey-West standard errors for OLS coefficients

A Newey-West estimator is used in statistics and econometrics to provide an estimate of the covariance matrix in situations where the standard assumptions of regression analysis do not apply. The original authors are Whitney K. Newey and Kenneth D. West in 1987[10], although other versions of the model have been developed thereafter. Newey-West estimator can be used to improve the OLS regression by correcting autocorrelation, which is the over-time decreasing error term correlation in the time series regression.

Stata has a user-written command, newey2[11], which is an extension of Stata's official Newey-West estimator, which accepts panel, as well as time series data sets[12]. Due to the limitations in the data availability, I am effectively dealing with an unbalanced panel data, which is the

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[10] See Whitney K. Newey and Kenneth D. West (1987). A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix. Econometrica Vol.55, No.3 (May, 1987), pp. 703-708

[11] The author of newey2 command for Stata: David Roodman, Center for Global Development, USA, droodman@cgdev.org

[12] Description of newey2 features: http://ideas.repec.org/c/boc/bocode/s428901.html, or by typing the command “help newey2” to Stata after installing the package

reason for using the newey2. If the lag is specified to zero, the variance estimates produced by newey2 equal the Huber-White robust variance estimates, which are also known as the "heteroskedasticity consistent standard error" estimates. My chosen regression method is the Newey-West estimator with the lag of 1, due to the literature evidence of earnings items' persistency over subsequent periods. For example, Richardson and Sloan find that the earnings persistence is correlated with the reliability of accruals, and Hanlon (2005) detects negative association between the earnings persistence and the difference between the book income and taxable income. The evidence from earnings persistence suggests that the lag term should not be ignored.

To check the overall robustness of my regression method, I test the results with different regression models, including the Newey-West estimator with lags from 0 to 5. Moreover, the reported results with Newey-West zero lag and OLS regression with Huber-White standard errors[13] are indeed exactly the same. Finally, the increase in the Newey-West lag-term has only minor effects in the regression t- and p-values, thus, not enough to affect the overall significance of the results. Cao et al (2011) use the two-step Fama Macbeth (1973) procedure[14] in studying the information content of EA. In the first step, Fama Macbeth (1973) method performs cross-sectional regressions for each time period, and in the second step the final coefficient estimate is obtained as the average of the first step coefficient estimates. I also perform the Fama Macbeth (1973) regressions, but due to my survey period of 16 years being much shorter (1995-2012) than Cao's U.S data (1966-2008) the standard errors are high and the t-values very low, as expected. Hence, with my sample, the Newey-West estimator yields significantly more accurate results than the Fama Macbeth (1973) model.

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[13] Huber-White standard errors can be achieved with vce(robust) command in Stata and the Fama Macbeth (1973) estimators with xtfmb command

[14] Description of Fama MacBeth (1973) features in Stata: http://ideas.repec.org/c/boc/bocode/s456786.html

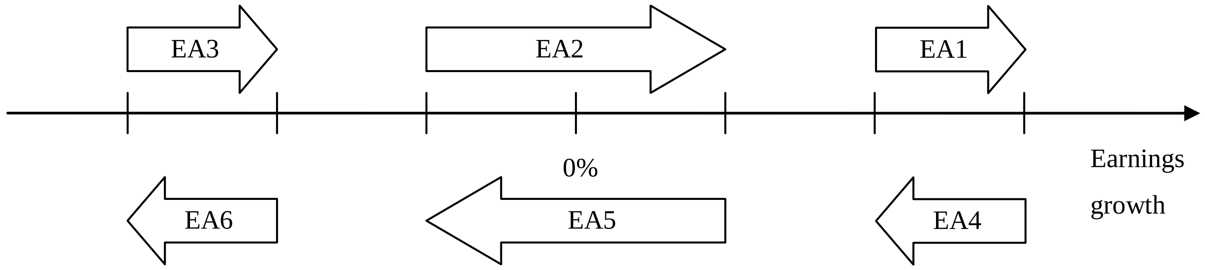
4.2.2 Specific patterns of earnings growth

The regression equations are divided into two sub-regressions, (a) and (b), to account for the specific patterns of earnings growth, instead of only differentiating between positive and negative EA. In the base case scenario (a), the EA variable is considered either positive (PEA) or negative (NEA). The modified regression type (b) differentiates between the six specific patterns of earnings growth (EG), and hence leads into the following six different EA variables:

Figure 2: Specific patterns of EA

Partition	Formula	Description
EA1	$EG_t > EG_{t-1} > 0$	EG is more positive in t than in (t-1)
EA2	$EG_t > 0 > EG_{t-1}$	EG reverts from negative in (t-1) to positive in t
EA3	$0 > EG_t > EG_{t-1}$	EG is less negative in t than in (t-1)
EA4	$0 < EG_t < EG_{t-1}$	EG is less positive in t than in (t-1)
EA5	$EG_t < 0 < EG_{t-1}$	EG reverts from positive in (t-1) to negative in t
EA6	$EG_t < EG_{t-1} < 0$	EG is more negative in t than in (t-1)

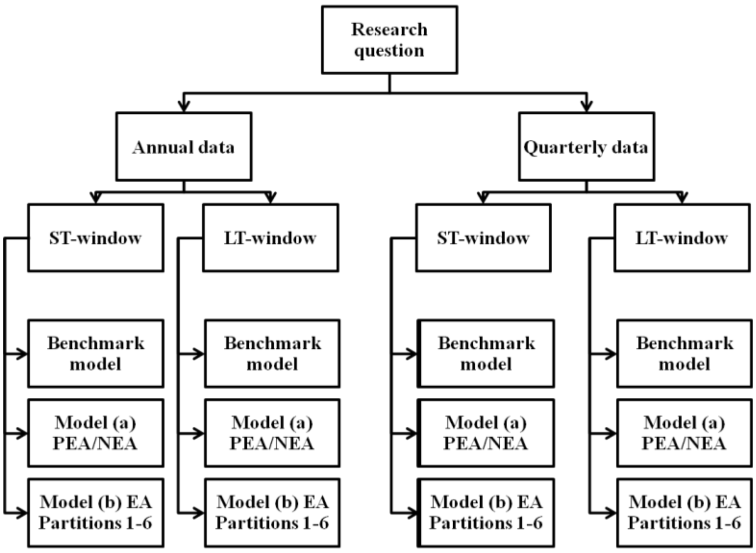
Figure 3: Illustration of the six EA patterns



The first three EA partitions capture the increases, and the last three partitions capture the decreases in earnings growth rates. The partitions therefore differ in terms of both signs and relative magnitudes of earnings growth in t and t-1. Conclusively, in order to answer the two research questions I have seven different regression equations, which are then analyzed in two different time windows, whenever the dependent variable is contemporaneous returns. Additionally, the equations are also divided into two sub-equations (a) and (b), to account for the different patterns of EA. As a comparison, I also have a benchmark model for the regression equations which does not include EA variables.

Figure 4: Illustration how the research questions are divided into multiple regressions

This figure shows for the two research questions how all hypotheses are analyzed with both quarterly and annual data, and in short-term and long-term window, whenever the dependent variable is the contemporaneous returns.



4.3 Regression equations for the research questions

When testing the hypotheses, the regression equations are estimated as the empirical analogs of the Equation 4: The developed Ohlson and Juettner-Nauroth model. All my research questions are answered with different adjustments to this same base-regression model as illustrated in Table 5: The summary of regression equations. The table lists all the regression equations for different hypotheses and identifies the variables that are common to all of the equations, and the variables that are specific for different hypotheses.

In the first column, I list all the seven regression equations and for each hypothesis I show the benchmark model (BM), the model (1a) that identifies the positive and negative EA, and the model (1b) that differentiates the six different EA partitions. In the second column, I show the dependent variable for each of the equations, and in the next five columns, I show the common control variables for each of the equations (a_0-a_4). In the EA variables –column, I show which EA variable I use in each of the regressions (a_5-a_6), and in the following four columns I show the remaining common control variables (a_7-a_{10}). The final two columns show the equation specific variables (a_{10}), and the error term. The equation specific items are marked with grey color in Table 5. In the following section I describe all the equations in more detail.

Table 5: Summary of all regression equations

▨ Equation specific variables
☐ Common equation variables

Equation	Dependent variable	Common control variables					EA variables		Common control variables				Specific variables	Error
BM = Benchmark model	R = returns $E_{(t+1)}$ = future earnings FRY = analyst forecast revision	Intercept	Earnings (a_1)	Negative Earnings (a_2)	Δ in earnings (a_3)	Negative Δ in earnings (a_4)	a) Positive and negative EA (a_5) b) 6 EA partitions (a_6)		Δ in lagged equity book value (a_7)	Negative Δ in lagged equity book value (a_8)	Δ in dividends (a_9)	Book-to-market (a_{10})	Δ in analyst long-term EPS forecast (a_{11})	
BM1	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$			ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
1a	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	PEA_t	NEA_t	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
1b	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_t]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
BM2	$E_{(t+1)}$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$			ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
2a	$E_{(t+1)}$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	PEA_t	NEA_t	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
2b	$E_{(t+1)}$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_t]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
BM3	FRY_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$			ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
3a	FRY_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	PEA_t	NEA_t	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
3b	FRY_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_t]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
BM4	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$			ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t	ΔLTG_t	u_t
4a	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	PEA_t	NEA_t	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t	ΔLTG_t	u_t
4b	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_t]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t	ΔLTG_t	u_t
BM5	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$EA_{OCF/ACCRUALS,t}$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
5a	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$PEA_{OCF/ACCRUALS,t}$	$NEA_{OCF/ACCRUALS,t}$	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
5b	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_{OCF/ACCRUALSt}]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
BM6	$R_t / E_{(t+1)} / \Delta LTG_t$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$EA_{LARGE/MIDDLE,t}$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
$6a_{1/2/3}$	$R_t / E_{(t+1)} / \Delta LTG_t$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$PEA_{LARGE/MIDDLE,t}$	$NEA_{LARGE/MIDDLE,t}$	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
$6b_{1/2/3}$	$R_t / E_{(t+1)} / \Delta LTG_t$	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_{LARGE/MIDDLE,t}]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
BM7	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$EA_{BEOFRE/AFTER,t}$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
$7a_1$	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$PEA_{BEFORE/AFTER,t}$	$NEA_{BEFORE/AFTER,t}$	ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t
$7b_1$	R_t	a_0	E_t	$(D1*E_t)$	ΔE_t	$(D1*\Delta E_t)$	$[EA(k)_{BEFORE/AFTER,t}]$		ΔB_{t-1}	$(D3*\Delta B_{t-1})$	ΔD_t	BM_t		u_t

For each firm, i:

R_t = stock return in period t

E_t = earnings in period t

ΔE_t = change in earnings from t-1 to t

PEA_t = set to EA_t, when EA_t is positive and 0 otherwise

NEA_t = set to EA_t, when EA_t is negative and 0 otherwise

ΔB_{t-1} = change in book value of equity from t-2 to t-1

ΔD_t = change in dividends from t-1 to t

BM_t = book-to-market ratio at t

D1 = indicator 1, if earnings (E_t) is negative, and 0 otherwise

D2 = indicator 1, if change in earnings (ΔE_t) is negative, and 0 otherwise

D3 = indicator 1, if negative lagged equity book value ($\Delta B_{i,t-1}$), 0 otherwise

EA(k) = k runs from 1 through 6, and identifies the EA partition. Each EA(k) takes the value of [EG_t – EG_{t-1}] for firms that belong to partition k, and 0 otherwise

E_{t+1} = earnings in t+1, i.e. future earnings

$FRY_{i,t}$ = forecast revision variable, which is determined as the mean (consensus) analysts' earnings forecast revision for a given firm for the year t+1, following the announcement of year t earnings

ΔLTGt = change in the forecast of long-term (5y) EPS growth rate for year t+1 before and after the earnings announcement dates for year t

PEA/NEA_{OCF} = positive/negative earnings acceleration from operating cash flow

$PEA/NEA_{ACCRUALS}$ = positive/negative earnings acceleration from accruals

4.3.1 **H1: What is the association between stock returns and EA?**

Models (1a) and (1b) extend the Easton and Harris's (1991) contemporaneous returns-earnings model by adding earnings acceleration (EA), change in book value of equity, ΔB_{t-1}, and book-to-market, BM_t, variables into the equation. The models (1a) and (1b) differ only in the EA term; (1a) splits the EA term into positive and negative EA (PEA_t and NEA_t), and the (1b) splits the EA into six different partitions specified in Figure 2. Both returns models are estimated in the short- and long-window with both annual and quarterly data. The regression equation is described in Table 5: Summary of all regression equations.

The indicator variables control for negative changes in the book value of equity, and for negative earnings levels and changes (Hayn, 1995). Based on prior literature, the theory indicates that the stock returns correlation, and thus the coefficient signs, should be positive for a_1 (earnings) and a_3 (earnings change), and negative for a_2 (negative earnings) and a_4 (negative earnings change). The sign for positive EA should be positive (a_5), and negative for negative EA (a_6), and the lagged book value of equity, (a_7) is expected to have a negative sign. Finally, the theory does not predict the signs for the negative change in lagged book value (a_8), for the current change in dividends (a_9), or for the book-to-market ratio (a_{10}).

The specific patterns of earnings growth can be differentially informative. The EA variable categorization into six partitions is done by comparing the earnings growth, EG, at year t to the earnings growth in the prior year (t-1) in the model (1b). The term EA(k) identifies the EA partition. Each EA(k) takes the value of $[EG_t – EG_{t-1}]$ for firms that belong to the given partition k, and 0 otherwise. Hence, the sum of the six EA partitions equals the EA. The signs for the EA partition coefficients are expected to be positive for the positive EA partitions and negative for the negative partitions.

4.3.2 **H2: Is EA informative in predicting future earnings?**

Theoretically and intuitively, if the EA and its partitions are priced by investors, suggested by significant positive results from (1a) and (1b); they should also be relevant in predicting future earnings. Prior literature of Fama and French (2000), and Sloan (1996) documents strong associations between future earnings and current earnings levels and changes. Cao et al.

(2011) also documents with U.S. data that the EA associates strongly with future earnings. I test the EA hypothesis with European data in two different time horizons with the models (2a) and (2b) described in Table 5: Summary of all regression equations. The dependent variable is the future earnings in t+1, (E_{t+1}), and all the other variables are defined as in (1a) and (1b).

Fama and French (2000) document different earnings reversals, when the earnings levels and changes are negative, which I control in my models (2a) and (2b). The inclusion of book-to-market (BM_t) variable is also consistent with Fama and French (2000), who find that this variable correlates with future profitability. Considering the expected coefficient signs, I expect the earnings persistence coefficient (a_1) to be positive but less than 1.0 (Sloan, 1996). The earnings change coefficient (a_3) indicates the speed of earnings mean reversion as in Fama and French (2000), and I expect it to be negative and greater than -1.0. The theory does not predict signs for the change in lagged book value of equity (ΔB_{t-1}) (a_7), or for its negative dummy (a_8). Nissim and Ziv (2001) document that dividend changes convey information about future earnings, which is why the predicted sign for (a_9) is positive. Finally, Fama and French (2000) report a connection between future profitability and positive market-to-book ratio, indicating that the coefficient for the inverse book-to-market variable (BM_t) should be negative (a_{10}). The EA coefficients (a_5) and (a_6) are expected to be positive and expected to indicate the direction of the earnings growth.

In general, the EA coefficients capture the effect of reinforcement or attenuation of the mean reversion in earnings, depending on the EA growth pattern. For example, if the change in earnings in two subsequent years is positive, and the change in earnings is higher in the latter period, this leads to positive EA term (PEA), signaling that the earnings reversion to mean is slower. Consequently, if the change in earnings in two subsequent periods is still positive, but if the earnings growth in the latter period is slower, leading to negative EA (NEA), it can be interpreted as the accelerated mean reversion of earnings, since the NEA indicates negative change in earnings growth. In brief, the mean reversion feature of EA can be summarized as follows; while the change in earnings, ΔE_t, indicates the one-period firm performance, the change in earnings growth (EA) indicates the underlying growth pattern, which either reinforces or attenuates the given change in earnings.

4.3.3 H3: Do financial analysts use EA information to revise their forecasts?

In the third regression type, I study the association between analysts' earnings forecast revisions and the EA in order to determine whether the EA is useful to, or used by, analysts in predicting future earnings. Intuitively, if the EA is priced (1a) and (1b), and it predicts future earnings (2a) and (2b), it would be natural that the analysts would include this information into their earnings forecast revisions. A large body of literature suggests that the financial analysts use financial statement information in generating and adjusting their earnings forecasts (Bradshaw et al. 2001; Kothari 2001). I follow the approach of Cao et al. (2011) in determining whether the EA is used in the forecast revisions. The models (3a) and (3b) are described in Table 5: Summary of all regression equations, where $FRY_{i,t}$ is the forecast revision variable, which is determined as the mean (consensus) analysts' earnings forecast revision for a given firm for the year t+1, following the year t earnings announcement[15]. All the other variables are defined as in (1a) and (1b). It is unclear, how the analysts simultaneously use the earnings information, which is why I follow Cao et al. (2011) and not predict the signs for the coefficients. The model (3b) takes into account the different earnings growth patterns as in (1a) and (1b).

4.3.4 H4: Does EA convey incremental information to the changes in analysts' long-term earnings growth forecasts?

In the fourth regression type I examine whether current EA is informative in the presence of forward-looking information. I follow the method of Chen and Zhang (2007), and Cao et al. (2011) and add the change in consensus analysts' forecast of the firm's long-term earnings growth rate, ΔLTG, to the regression equation (1a) and (1b). Since the variable ΔLTG indicates the future expected earnings growth, and the EA measures the current change in earnings growth, the variable ΔLTG can be used as a proxy of future EA, and to examine, whether

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[15] The FRY variable is defined as the percentage revision of the mean earnings per share (EPS) consensus forecast around the earnings announcement date. The data comes from I/B/E/S. Cao et al. (2011) define the FRY as the forecast revision scaled by the absolute value of the latter forecast. Since the FRY is considered a percentage revision, I use the natural logarithm ln(FRY) in the regression equation and take into consideration the logarithmic interpretation of the regression coefficients

the current EA coefficients are incrementally significant in explaining the future earnings growth. The ΔLTG[16] is defined as the change in the consensus analysts' forecast of the firm's long-term earnings growth rate before and after the earnings announcement. Based on Chen and Zhang (2007), I expect the coefficient on ΔLTG (a_{11}) to be positive.

4.3.5 H5: Does EA information derive from cash or accruals or both components of earnings?

The EA variable builds on the operating income, which is constructed of two different earnings components. These components are operating cash flow and accruals, and the accruals[17] consist mostly of inventories, accounts receivable, and accounts payable. The distribution between cash and accruals has a strong explanatory power on earnings quality. For example, Sloan (1996) shows that the accruals component of earnings is less persistent than the cash flow component and attributes the difference to the greater subjectivity of accruals. Moreover, Xie (2001) shows that earnings' persistence differs between discretionary and non-discretionary accruals, and therefore finds evidence for the earnings subjectivity. However, slightly contradicting, Dechow (1994), and Dechow et al. (1998) report that the earnings accruals are more relevant in reflecting the firm performance than the cash flows. Hence, irrespective of the different suggested outcomes, the literature provides evidence that the division between cash and accruals can provide meaningful results. The cash versus accruals question also provides insights into the company cash cycle (see for example Dechow et al. 1995), and even into the earnings management (see for example Healy and Wahlen, 1999). Overall, a large body of literature discusses the earnings relation between accruals and cash flow. For example, Healy (1985) defines discretionary accruals as adjustments to the cash flows selected by managers in order to affect reported net income. In the studies of Healy (1985), Dechow (1994), and Sloan (1996), the accounting accruals are generally described as the product of accounting entries and management estimations that have no cash flow effects. Their basic

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[16] The ΔLTG variable is defined as the change in the consensus forecast of long-term (5y) EPS growth rate before and after the earnings announcement dates

[17] Accruals refer to accounts on a balance sheet that represent liabilities and non-cash-based assets used in accrual-based accounting. These types of accounts include, among others, accounts payable, accounts receivable, inventories, goodwill, deferred tax liability and future interest expenses

characteristic is that they sum to zero over time and are therefore both more predictable and less persistent than the cash flow components of earnings. To my knowledge, besides my study, there is no relevant prior research of cash flows and accruals explaining the EA information. I start by defining these two earnings components.[18]

(5)

Operating cash flow (OCF) = EBIT – Change in inventory + Change in deferred revenues + Non-Cash Items

(6)

Net operating accruals (NOA) = EBIT – Operating cash flow (OCF)

There are some arguments why operating cash flow is a better measure of firm revenue than operating income. Cash flow is harder to manipulate under GAAP (Generally Accepted Accounting Principles), and the cash flow captures the changes in working capital. Operating cash flow shows how the cash is generated during the period, and it shows the translation process from accrual accounting to cash accounting. The key differences between the accrual and cash accounting are demonstrated in the cash cycle concept, which is the process of converting sales into cash flows via inventories and accounts receivables. There are many ways that cash can get trapped on the balance sheet and many opportunities for managerial discretion. The two most common ways for how the cash can be cumulating on the balance sheet are customers delaying payments (build up of receivables), and rising inventory levels. The comparison between operating cash flow and net income reveals the problems in the cash cycle (Jones, 1991; Dechow et al. 1995), making the operating cash flow a more reliable source of the real income effects. There are also ways for companies to temporarily boost their cash flows for example by delaying payments to suppliers (extending payables), selling securities, and reversing charges made in prior quarters. Whether these kinds of decisions reflect discretional management of cash figures or are simply parts of the company financing strategy, de-

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[18] This division of earnings components builds on accruals definitions by Healy (1985), Sloan (1996) and the FASB definition of Financial Accounting Standards Number 95 “Statement of Cash Flows”

pend on the managerial motives. In my approach, I study how these two components explain EA by dividing the variable into EA from operating cash flow (OCF) and EA from accruals.

$$\mathrm{EG(OCF)_t} = [(\frac{\mathrm{OCF_t}}{\mathrm{Shares_t}}) - (\frac{\mathrm{OCF_{t-1}}}{\mathrm{Shares_{t-1}}})] \;/\; [\frac{\mathrm{Total\ Assets_{t-1}}}{\mathrm{Shares_{t-1}}}] \tag{7}$$

$$\mathrm{EG(ACCRUALS)_t} = [(\frac{\mathrm{Accruals_t}}{\mathrm{Shares_t}}) - (\frac{\mathrm{Accruals_{t-1}}}{\mathrm{Shares_{t-1}}})] \;/\; [\frac{\mathrm{Total\ Assets_{t-1}}}{\mathrm{Shares_{t-1}}}] \tag{8}$$

This decomposition of earnings growth leads to two corresponding EA variables:

$$\mathrm{EA_{OCF}} = \mathrm{EG(OCF)_t} - \mathrm{EG(OCF)_{t-1}} \tag{9}$$

$$\mathrm{EA_{ACCRUALS}} = \mathrm{EG(ACCRUALS)_t} - \mathrm{EG(ACCRUALS)_{t-1}} \tag{10}$$

Hence, I adjust the regression type (1a) and (1b), and create three equations for both $\mathrm{EA_{OCF}}$ and $\mathrm{EA_{ACCRUALS}}$ to study their information effects. To the benchmark model (BM5) I add the $\mathrm{EA_{OCF}}$ or $\mathrm{EA_{ACCRUALS}}$ variables, and all the regressions are analyzed in both short- and long-windows when applicable. Originally, I considered regressing the $\mathrm{EA_{OCF}}$ and $\mathrm{EA_{ACCRUALS}}$ in the same regression equation, but since the variables are highly correlated, the results suffer from extreme levels of multicollinearity[19], which is why I must regress $\mathrm{EA_{OCF}}$ and $\mathrm{EA_{ACCRUALS}}$ separately. The regression equation (5a) differentiates between the positive and negative EA of the cash flow and accruals components similarly than in regression (1a), where, $\mathrm{PEA_{OCF/ACCRUALS}}$ corresponds to the PEA, and the $\mathrm{NEA_{OCF/ACCRUALS}}$ corresponds to the NEA. The third regression equation (5b) differentiates between the six different EA partitions for the cash flow and accruals components.

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[19] The Pearson correlation coefficient between $\mathrm{EA_{OCF}}$ and $\mathrm{EA_{ACCRUALS}}$ is -0.7484, which is why I regress the variables separately. There exists a trade-off between the costs omitting the other explanatory variable and the cost of increased multicollinearity.

Considering the earnings quality, higher significances for the EA_{OCF} coefficients would be more desirable than for the $EA_{ACCRUALS}$ coefficients. This would indicate that the market can distinguish the EA that derives from the real operations and is not fooled by the changes in the discretional accrual elements. My results contribute to the wide literature of accruals anomaly from the EA perspective. Sloan (1996) is the first to document that the stocks of companies with low accruals outperform the companies with high accruals, if the stocks are held for a one year period. This happens because the accruals are less persistent and lead to negative future abnormal stock returns. Sloan also concludes that the investors do not fully comprehend the greater subjectivity involved in the estimation of accruals. Hence, by showing that the EA information derives from the cash element and not from the accruals, I show that the accruals anomaly does not apply to the EA information value. Overall, the question of earnings management is widely documented in the literature. Examples of the studies considering the earnings management include for example Jones (1991), De Fond and Park (1997), Healy and Wahlen (1999), Cohen et al. (2007), Zhang (2005), and Jiambalvo (1996). However, after the Sarbanes-Oxley Act (2002), the trend has been increasingly shifting from earnings management to expectations management (Graham, Harvey, and Rajgopal, 2005).

4.3.6 **H6: Does EA information differ between the large and middle cap firms?**

My data set comprises of the European developed countries' large and middle cap firms. The general intuition suggests that the large companies have higher analyst following, more media attention, and larger investor bases than the smaller companies. The literature starts by stating that ceteris paribus, stocks with lower analyst coverage should be the ones with slower movement of firm-specific information across the investment public (Hong et al. 2000). The caveat is that the analyst coverage is very strongly correlated with the firm size (Bhushan, 1989), and the lower analyst coverage has been used as an explanation for the inverse relation between the information content and the firm size (Atiase, 1985; Freeman, 1987; and Bhushan, 1989). Following this logic, the literature argues that larger firms are followed by more analysts, which results in more private information available, which in turn leads to superior forecasting accuracy over time and the earnings announcements for these firms being less informative, due to smaller surprise elements. Hence, I study the effect of the company size on the EA information value. The initial assumption is that since the large cap firms are more thoroughly followed and analyzed than the middle cap firms, the EA coefficients should also be more significant for them. The empirical methodology is exactly the same as in H5, with the exception that the EA_{OCF} is replaced with EA_{MIDDLE} and the $EA_{ACCRUALS}$ is replaced with EA_{LARGE}. The sample is divided into large and middle cap firms based on the Thomson One Banker's categorization, with the category cut-off point being USD 5 000 Million.

4.3.7 H7: Does EA information differ over time?

To better understand what determines the EA information value, it can be lucrative to study whether this information changes over time. Possible determinants that may cause changes during my sample period are major regulatory changes (European IFRS implementation in 2008[20]), or macroeconomic effects (2008 financial crisis). Hence, I divide my sample into pre- and post-2008 to study the possible changes in the EA information. Again, my approach is exactly the same as in H5, and I compare the subsamples of pre- and post-2008.

Possible differences between the two samples would indicate that the earnings reporting is changing either towards positive or normative direction. The normative accounting of early capital markets research (e.g. Hendriksen, 1965) was the leading theory until mid-1960s, doubting the usefulness of the historical cost accounting in assessing the firm's financial health. The reasoning behind is that the normative accounting practices are designed to serve the assumed set of accounting objectives, instead of explaining stock price reactions. A more recent critique for the usefulness of the earnings information is presented by Lev (1989), who explains the weak returns-earnings correlation with reported earnings' low quality, caused by biases in accounting measurement, valuation principles, and managerial data manipulation. The change into positive accounting research (Ball and Brown, 1968) is boosted in the 1960s by the development of the Keynesian positive economic theory, the efficient market hypothe-

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[20] For example Daske (2006) states that the benefit of IFRS adoption to some jurisdictions is that financial reporting becomes more transparent, with additional disclosure requirements and rules that impact the quality of accounting numbers. Moreover, Barth, Landsman, and Lang 2008 find that firms adopting IFRS engage in less earnings management and exhibit more timely loss recognition, which the authors interprets as evidence of higher financial reporting quality. However, Brown (2011) shows that IFRS adoption European effects are far from uniform, and finally Ahmed et al. (2012) finds that IFRS is not associated with discretionary accruals, which is a construct for earnings management

sis, the capital asset pricing models (Fama, 1965; Sharpe, 1964, and Lintner, 1965), and the event study of Fama et al. (1969). The pioneers of this new positive accounting research of "explain and predict" are Ball and Brown (1968), Beaver (1968), and Watts and Zimmerman (1986), who believe the investors may find valuable pricing information in the accounting figures. Also, Cao et al. (2011) report a strong correlation between the EA and stock returns, which is why I hypothesize that if there is a change in the EA information, it should be towards the positive accounting theory.

4.4 Empirical methodology to study quarterly EA

In the variables section, I define the EA as the change in earnings growth per share, $\mathrm{EG_t - EG_{t-1}}$, and the earnings growth as $\mathrm{EG_t = [(OI_t/Shares_t)\ -\ (\ OI_{t-1}/Shares_{t-1})]\ /\ [Total\ Assets_{t-1}/Shares_{t-1}]}$, where OI is operating income after depreciation and the shares are adjusted for stock splits and stock dividends. When addressing the two research questions, the focus is on the annual EA and on the annual figures. I extend the literature by examining whether the results are affected when the EA is calculated as a change in quarterly earnings growth. $\mathrm{EG_{FQ} - EG_{FQ-1}}$. I also consider all the other variables on a quarterly basis to maintain the comparability of the results. As a summary, I perform all the regressions with both annual and quarterly data samples.

4.5 Univariate analyses

4.5.1 Univariate analyses for annual data

In Table 6, I present the descriptive statistics for the annual sample and for the six EA partitions. I report the averages of the yearly values from 1995 to 2012, with all the statistics based on non-zero EAs in each EA partition. Panel A reports distributional statistics for the EA and its six partitions EA1-EA6. The distribution is overall rather symmetric, but there are on average three times as many observations in the two reverting EA partitions; EA2 (revert to positive) and EA5 (revert to negative). Altogether these two partitions cover 66% of the total number of annual 15 035 EA observations, and Cao et al. (2011) report a similar high concentration of reverting earnings. The financial crisis of 2008 may be one explanatory factor, why the smallest number of observations is in partition EA1 (more positive). The partitions EA3 (less negative) and EA6 (more negative) contain each less than 10% of the observations. In total, roughly half of the observations experience negative EA.

Panel B presents the means, medians, and the standard deviations of firm characteristics for the full sample and for the six EA partitions. There are large standard deviations indicating substantial variability around the mean of each firm characteristic. The standard deviations between different earnings partitions remain relatively constant with the exception of EA1 (more positive) having higher standard deviations for the earnings related variables. The means remain relatively constant, except for the opposite extremes of EA1 (more positive) and EA6 (more negative). Logically, also the book-to-market ratio is greater than 1 for the negative EA partitions and below 1 for the positive EA partitions. Except for the change in dividends, all the variables are highly and positively skewed. This can be interpreted from the fact that the means are almost twice the amount of medians for most of the variables. The mean (17.9%) and the median (11.5%) contemporaneous annual long-term returns (LT-RETURN) measured from 9 months before to 3 months after fiscal year-end for the full EA sample are significantly positive. Evidently, there is a positive association between EA and current long-term returns. The partitions with positive EA and positive earnings growth, EA1 (more positive) and EA2 (revert to positive) show high and positive mean returns, (35.5% and 25.9%), while the partitions with negative EA and negative earnings growth, EA5 (revert to negative) and EA6 (more negative) show lower than average and even negative mean returns (10.9% and -3.0%). The partitions EA3 (less negative) and EA4 (less positive) are the most difficult to interpret. For the long-term returns, the initial benchmark still affects strongly, making the EA3 (less negative) have low returns (9.5%), and the EA4 (less positive) have high returns (27.2%). The general interpretation based on the high amount (66%) of reverting EA observations is that one-period change in earnings growth, EA3 (less negative) and EA4 (less positive) does not affect the long-term returns significantly, but if the pattern continues, EA1 (more positive) and EA6 (more negative), the effects on long-term returns are higher. However, for the short-term returns, the average return is practically 0%, and there are no real deviations between the partitions. The lack of short-window returns can be mostly explained by the lacking reporting dates in my sample.

Cao et al. (2011) detect clustering in the company market values between the partitions. The largest firms belong to the EA1 (more positive) and the smallest firms to the EA6 (more negative) suggesting that the large firms would create larger long-term returns. However, my data does not show any significant differences between the company sizes in different partitions. All in all, the healthiest companies can be found in the EA1 (more positive), with higher earnings growth (7.1%), higher future profitability, ROA_{T+1}, (9.7%) and lower book-to-market ratio (0.70) than in the other partitions.

Panel C reports Pearson correlations between key variables and EA partitions. Most of the correlations are significant and suggest that overall the EA may be informative. EA correlates strongly with most of the long-term returns partitions, suggesting that the EA conveys information to investors. Moreover, the correlation is significant and positive for the positive partitions EA1 (more positive), and EA2 (revert to positive). The partitions EA3 (less negative) and EA5 (revert to negative) coefficients do not differ significantly from 0, and the negative partitions EA4 (less positive) and EA6 (more negative) have also significant positive correlations. The positive correlations between EA partitions and earnings and change in earnings are highly expected, since all these variables derive from earnings. The strong correlations between ROA_{1+T} and EA indicate that the EA may predict future earnings, which in turn may explain the correlation between EA and the long-term returns. Overall the results are very similar to those of Cao et al. (2011), and the correlations predict that EA may be informative. Next, I present a similar univariate analysis for the quarterly data.

Table 6: Descriptive statistics and correlations for annual data

This table presents the descriptive statistics and Pearson correlation coefficients for the annual data sample. The sample consists of 19 051 firm-year observations from 1995 to 2012. The variables are defined in the Table 4 and the EA partitions in the Figure 3. The EA partition statistics reported in Panels A-C are based on non-zero EAs in each partition. For example the mean of EA2 is based on 4 522 observations. All variables are winsorized at the top and the bottom 0.5% to control for outliers. ***, **, and * indicate significances at 1, 5, and 10% levels based on two-tailed t-tests. The *t* statistics are based on the means and standard errors of the yearly values as in Newey-West (1987), and they are adjusted for serial correlation.

	EA	EA1	EA2	EA3	EA4	EA5	EA6
Panel A: Distribution of earnings acceleration							
N	15 035	1 007	4 522	1 176	1 678	5 360	1 292
N%	100%	7%	30%	8%	11%	36%	9%
Mean	(0.002)	0.071	0.080	(0.026)	0.034	(0.077)	(0.057)
Standard deviation	0.132	0.130	0.151	0.049	0.066	0.144	0.080
Minimum	(0.691)	0.000	0.000	(0.360)	0.000	(1.098)	(0.586)
Q1	(0.027)	0.010	0.010	(0.025)	0.003	(0.076)	(0.068)
Median	(0.001)	0.028	0.029	(0.009)	0.010	(0.028)	(0.033)
Q3	0.022	0.068	0.083	(0.003)	0.033	(0.009)	(0.013)
Max	0.750	0.896	1.191	(0.000)	0.499	(0.000)	(0.001)

Panel B Variable distribution	EA	EA1	EA2	EA3	EA4	EA5	EA6
ST-RETURN,	4 060	250	1 180	351	309	1 341	382
Mean	0.002	0.010	0.003	0.001	0.004	0.001	0.001
Median	0.002	0.008	0.002	0.002	0.004	0.002	0.000
Std	0.060	0.056	0.056	0.062	0.061	0.061	0.067
LT-RETURN							
N	14 636	850	3 787	995	1 334	4 414	1 074
Mean	0.179	0.355	0.259	0.095	0.272	0.109	(0.030)
Median	0.115	0.262	0.176	0.026	0.178	0.057	(0.082)
Std	0.523	0.554	0.548	0.552	0.521	0.483	0.505
MARKET VALUE. (M$)							
N	14 583	985	4 427	1 156	1 572	5 177	1 266
Mean	7040	7700	7130	7500	6540	6920	6980
Median	1570	1730	1600	1550	1370	1580	1580
Std	16700	17900	16800	17500	16700	16300	16100
EARNINGS							
N	14 386	979	4 381	1 147	1 533	5 092	1 254
Mean	0.091	0.150	0.106	0.052	0.119	0.083	0.027
Median	0.072	0.098	0.079	0.060	0.087	0.069	0.047
Std	0.173	0.226	0.195	0.171	0.154	0.151	0.160
CHANGE IN EARNINGS							
N	14 386	979	4 381	1 147	1 533	5 092	1 254
Mean	0.019	0.133	0.090	(0.055)	0.061	(0.029)	(0.078)
Median	0.009	0.043	0.025	(0.009)	0.029	(0.002)	(0.027)
Std	0.171	0.287	0.289	0.147	0.107	0.127	0.158
EARNINGS GROWTH							
N	15 035	1 007	4 522	1 176	1 678	5 360	1 292
Mean	0.011	0.071	0.042	(0.026)	0.038	(0.015)	(0.039)
Median	0.004	0.030	0.015	(0.006)	0.020	(0.001)	(0.018)
Std	0.080	0.124	0.098	0.063	0.059	0.063	0.070
BOOK-TO-MARKET							
N	14 583	985	4 427	1 156	1 572	5 177	1 266
Mean	0.790	0.702	0.774	0.848	0.753	0.796	0.882
Median	0.561	0.538	0.561	0.586	0.546	0.561	0.589
Std	1.015	0.785	0.959	1.258	0.926	1.046	1.172
ROA (T+1)							
N	16 374	952	4 232	1 014	1 587	4 838	1 160
Mean	0.071	0.097	0.074	0.063	0.084	0.067	0.059
Median	0.049	0.062	0.054	0.046	0.057	0.048	0.040
Std	0.120	0.132	0.112	0.106	0.119	0.113	0.108
CHANGE IN DIVIDENDS							
N	12 331	789	3 596	962	1 191	4 091	1 072
Mean	(0.002)	(0.004)	0.004	0.003	(0.005)	(0.006)	(0.001)
Median	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Std	0.030	0.029	0.034	0.034	0.022	0.026	0.030

Panel C: Pearson correlations

	EA	EA1	EA2	EA3	EA4	EA5	EA6
ST-RETURN	0.012	(0.115)*	(0.026)	0.032	0.056	0.011	0.080
LT-RETURN	0.145***	0.126***	0.124***	0.046	0.080***	(0.010)	0.087***
MARKET VALUE. (M$)	0.004	(0.088)***	(0.070)***	0.101***	(0.054)**	0.069***	0.098***
EARNINGS	0.178***	0.327***	0.205***	0.237***	0.058**	0.053***	0.287***
CHANGE IN EARNINGS	0.569***	0.664***	0.606***	0.491***	0.481***	0.378***	0.433***
EARNINGS GROWTH	0.760***	0.937***	0.853***	0.795***	0.737***	0.539***	0.766***
BOOK-TO-MARKET	(0.012)	0.005	(0.003)	(0.065)**	(0.040)	0.002	0.041
ROA (T+1)	0.070***	0.171***	0.164***	0.087***	0.193***	(0.074)***	(0.133)***
CHG IN DIVIDENDS	0.079***	(0.009)	0.085***	(0.040)	(0.012)	0.003	0.024

4.5.2 **Univariate analyses for quarterly data**

In the Appendix Table 21,Table 6: Descriptive statistics and correlations for annual data I present the descriptive statistics for the quarterly sample and for the six EA partitions similarly to the annual sample in Table 6. Panel A reports distributional statistics for the EA and its six partitions. The distribution is again very symmetric with the same clustering of observations in the two reverting EA partitions, EA2 (revert to positive) with 34% of observations, and EA5 (revert to negative) with 37% of observations. The slightly increased percentages in these two partitions can be explained by the quarterly data being highly skewed to the right (see Figure 1) and not representing the sample period with equal weights than the annual data. The total number of quarterly EA observations is 23 596, compared to the annual number of 19 051. Overall, the quarterly EA distribution is fairly similar to the annual distribution.

Panel B presents the means, medians, and the standard deviations of the firm characteristics to the quarterly data. The quarterly standard errors are similarly skewed as in the annual data, but the differences between the means across the partitions are slightly smaller. It is noteworthy that the long-term mean returns and standard deviations are roughly similar for all the partitions suggesting that the connection between the EA and the stock returns is not especially strong in the quarterly window. This interpretation is also supported by the non-significant Pearson correlation coefficients in Panel C for the long-term and short-term stock returns. To conclude, the results of the quarterly descriptive analysis are in line with those of the annual with the exception that there is no significant correlation between the long-term returns and the EA in the quarterly data. Otherwise, the results are in general comparable and support the hypothesis that the EA may convey valuable information to investors. In the next section, I continue with the results for the multiple regression analyses.

5. Analysis and results

After describing the sample characteristics, I present the results for my multiple regression analyses. I start with the first research question and show that the EA conveys valuable information to the investors in the European markets, and then continue to the second research question and explain what drives this information. I perform all my tests with both annual and quarterly data.

5.1 Empirical results of EA conveying valuable information with European data

5.1.1 Association between contemporaneous stock returns and EA (H1)

Table 7 reports the results for the long-window contemporaneous returns model (1a) and (1b) using the annual buy and hold returns accumulated from 9 months before to 3 months after the firm's fiscal year-end. Overall, my results are mostly in line with the prior literature of Cao et al. (2011). Column 1 presents the results for the benchmark model that does not include EA variables. More specifically, the earnings coefficient is positive and highly significant in 1% level, and the incremental coefficient for negative earnings is negative and highly significant. However, unlike Cao et al. (2011), I do not find significant results for the earnings change, or for the negative earnings change. Column 2 reports results for model (1a). I find highly significant negative coefficient for the negative earnings change, and the coefficients for earnings and negative earnings are significant. Furthermore, the coefficient on positive EA (PEA) is negative (-0.344) and significant in 5% level, and the negative EA (NEA) coefficient is positive (0.861) and highly significant in 1% level. However, the negative coefficient for the positive EA is somewhat counter-intuitive. Column 3 reports the results for estimating model (1b). The coefficients for earnings, negative earnings, and negative earnings change are highly significant, and their signs are as predicted. Most of the EA partitions are also positive and highly significant. Specifically, the partitions EA3 (less negative), EA5, (revert to negative), and EA6 (more negative) have highly significant (1% level) positive coefficients. The coefficient for EA1 (more positive) is positive and significant in 10% level, and the coefficient for EA2 (revert to positive) has a slightly negative coefficient (-0.258) in the 10% level. The insignificance of EA4 can result from the noise in the annual data, but also from the nature of the information conveyed by EA4 (less positive). The information may be transitory and fully valued already in the short-window, having no longer information value in the long-window. Another unexplored possibility is that the stocks might be mispriced, but this question is beyond the scope of my study.[21] All the four control variables (change in lagged equity book value, change in dividends, negative change in lagged equity book value, and book-to-market) are highly significant with the two latter having negative coefficients. Finally, the

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[21] See for example Vermaelen (1981), Ikenberry and Vermaelen (1996), Lakonishok, Shleifer, and Vishny (1994), and La Porta, Lakonishok, Shleifer, and Vishny (1997) for more discussion on the stock mispricing

adjusted R^2 in model (1b) increases to 17.0% from the 15.5% in the benchmark model with the number of observations in models (1a) and (1b) being 9 943.

Panel B supplements the Panel A statistical significances with the economic significances. The association between the change in annual returns and the change in EA is calculated by multiplying the EA coefficients with the standard deviations of the earnings variables. Column 3 indicates that one standard deviation change in EA1 through EA6 relates to the changes in respective returns of 13.0; -3.9; 11.7; 3.4; 11.5; and 21.1%. For a comparison, one standard deviation change in earnings level is associated with a change in returns of 20.3%, suggesting that the economic impact of EA is comparable to the impact of changes in earnings levels.

Panel C tests, whether the different EA partitions are significantly different from each other, by pair wise comparing their annual returns regression (1b) coefficients with the bootstrapping method[22]. This comparison adds value, because the existing EA theory suggests only one positive valuation coefficient for EA (e.g. Chen and Zhang, 2007; and Easton and Harris, 1991), but following the method of Cao et al. (2011), I have six different coefficients. The results from Panel C show that the different EA partition coefficients are significantly different from each other in 11 pairs out of 15, supporting the view that the market views and prices the various EA patterns differently. The largest coefficients are for EA3 (revert to positive) and for EA6 (more negative), indicating that the investors view the pattern EA3 (less negative) as the most favorable and the EA6 (more negative) as the least favorable. Cao et al. (2011) find similar results with the highest coefficients in partitions EA1 and EA6. Conclusively, I consider the long-window results in Table 7 as strong evidence that current EA conveys value relevant information to investors with a significant economic impact, and which is incremental to that of earnings levels and changes. The results are in line with the findings of Cao et al. (2011) supporting strongly the hypothesis H1 stating that with annual long-window data the EA is a significant explanatory factor for the contemporaneous returns. Next, I briefly analyze the results of the same regressions with the short-window, and with the quarterly data.

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[22] See Mooney, C. Z., and R. D. Duval. 1993. Bootstrapping: A Nonparametric Approach to Statistical Inference. Newbury Park, CA: Sage.

Table 7: Regressions of contemporaneous annual raw returns on EA

This table presents the regression results of annual buy-and-hold returns for firm i over the period 9 months before to 3 months after the firm's t fiscal year end. The results are obtained from 19 051 firm-year observations. $R_{i.t}$ = annual buy-and-hold return for firm i over the period 9 months before to 3 months after the firm's t fiscal year end. $PEA_{i.t}$ is set to $EA_{i.t}$ when $EA_{i.t}$ is greater than (or equal to) 0, and 0 otherwise; $NEA_{i.t}$ is set to $EA_{i.t}$ when $EA_{i.t}$ is less than 0, and 0 otherwise; $\Delta B_{i.t-1}$ is the change in book value of equity for firm i from year t-2 to year t-1, divided by the market value of equity at the end of year t-1; EA(k) identifies the EA partition, k = 1 to 6. Other variables are defined in the Table 4 and the EA partitions in the Figure 2. I run regressions for unbalanced panel sample over the period 1995 through 2012. The t statistics are based on the means and standard errors of the yearly coefficients as in Newey-West (1987), and they are adjusted for serial correlation in the yearly values. The p values are based on two-tailed t tests. All independent variables are winsorized at the top and the bottom 0.5% to control for outliers. ***, **, and * indicate significance at 1, 5, and 10%, respectively. Panel B reports the change in annual stock returns for one-standard deviation change in the level of earnings, change in earnings, or EA, calculated as the product of the average annually estimated coefficient and the average annual standard deviation of the corresponding earnings variable. Panel C reports the coefficient differences of each pair of EA partitions and the significances of the differences based on the bootstrapping method of Mooney and Duval (1993). In each cell, the figure equals the coefficient on EA(i) minus the coefficient on EA(i+1), where i = 1, 2, 3, 4, or 5.

Independent variable	Pred-Sign	Benchmark model		Model (1a)		Model (1b)	
		Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.144	15.22***	0.176	17.90***	0.178	17.62***
Earnings	+	1.186	9.23***	1.173	8.61***	1.155	8.52***
Neg. Earnings	-	(1.344)	(5.07)***	(1.091)	(4.12)***	(1.063)	(4.03)***
ΔEarnings	+	0.043	0.34	0.175	1.06	0.044	0.27
Neg. ΔEarnings	-	(0.141)	(0.70)	(0.764)	(3.18)***	(0.726)	(3.01)***
PEA - Positive EA	+			(0.344)	(2.25)**		
NEA - Negative EA	+			0.861	10.11***		
EA1 - More positive	+					0.997	1.73*
EA2 - Revert to positive	+					(0.258)	(1.81)*
EA3 - Less negative	+					2.389	3.21***
EA4 - Less positive	+					0.519	0.81
EA5 - Revert to negative	+					0.795	9.48
EA6 - More negative	+					2.629	9.73
ΔLagged equity BV	-	0.410	6.93	0.509	8.64	0.512	8.70
Neg. ΔLagged equity BV	?	(0.990)	(7.67)	(1.126)	(8.58)	(1.123)	(8.46)
ΔDividends	?	1.774	5.54	1.733	5.36	1.784	5.50
Book-to-market	?	(0.211)	(15.23)	(0.237)	(16.45)	(0.234)	(16.46)
Adjusted R^2		15.5%		17.0%		17.5%	
Number of observations		10 148		9 943		9 943	

	Column 1 (%)	Column 2 (%)	Column 3 (%)
Panel B: Economic significance (stock returns change for a one-standard-deviation change in earnings)			
Earnings	20.6	20.3	20.0
ΔEarnings	0.7	3.0	0.7
PEA - Positive EA		(4.6)	
NEA - Negative EA		10.6	
EA1 - More positive			13.0
EA2 - Revert to positive			(3.9)
EA3 - Less negative			11.7
EA4 - Less positive			3.4
EA5 - Revert to negative			11.5
EA6 - More negative			21.1

	EA1	EA2	EA3	EA4	EA5	EA6
Panel C :Coefficient comparison (bootstrapping)						
EA1		1.278**	(1.637)**	0.124	0.270	(1.528)**
EA2			(2.915)***	(1.153)**	(1.007)***	(2.805)***
EA3				1.762**	1.908***	0.110
EA4					0.146	(1.652)**
EA5						(1.798)***

(1a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

(1b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

5.1.1.1 Contemporaneous returns with short-window stock returns

The Appendix Table 22 reports the short-window results using three-day cumulative raw returns centered on the annual earnings announcement date. The analysis setting is exactly the same as in the long-window model in Table 7, but practically none of the long-window results apply to the short-window, and my results are in total contradiction with those of Cao et al. (2011). The most plausible explanation, why I have mainly insignificant results between the short-window returns and EA variables is the low quality of the report dates data. Based on prior literature, I would have expected to see highly significant results. However, I must reject my hypothesis H1 considering the EA explaining short-window returns. Next, I report the quarterly results for H1.

5.1.1.2 Contemporaneous returns with quarterly data

In the Appendix Table 23, I present the quarterly results for the long-window returns. Compared to the annual data the results are very similar. Throughout the three regression models (benchmark, 1a, and 1b) the control variables are equally significant between the annual and quarterly data except for the negative change in earnings and the negative change in lagged equity book value. The significances of the EA variables may differ slightly from the annual data results, but the only truly different interpretation considers the partition EA3 (less negative). For the annual data the coefficient is positive (2.389) and highly significant, while for the quarterly data the coefficient is insignificant. The quarterly short-window returns suffer from similar data availability issues than the annual data and do not give meaningful results. However, the overall evidence suggests that the EA explains long-window returns also with the quarterly data, supporting H1.

5.1.2 **EA informativeness in predicting future earnings (H2)**

Table 8 presents the results for models (2a) and (2b); whether the EA is informative in predicting future earnings. My results are highly significant and in line with the prior literature of Cao et al. (2011). Column 1 presents the benchmark model results, which are mainly highly significant except for the earnings change, negative earnings change, and the negative change in lagged equity book value. Similarly to the benchmark model, all the control variables in (2a) and (2b) are significant or highly significant, except for the negative change in lagged equity book value. More specifically, the change in dividends has a negative coefficient in all of the three models in 10% confidence level supporting the dividend signaling theory on future earnings (Miller and Modigliani, 1961; and Jagannathan and Weisbach, 2000). To continue, the book-to-market coefficients are highly significant and negative for all of the three models, supporting the theory that the growth firms yield higher earnings, but are more highly priced in the market than the value firms. Lakonishok et al. (1994) and Haugen (1995) argue that the value premium in average returns arises because the market undervalues distressed stocks and overvalues growth stocks. The core idea in “growth investing” is to focus on stocks that are growing with potential for continued growth, while “value investing” seeks stocks that the market has underpriced, which have the potential for an increase when the market corrects the price. The highly significant coefficients on earnings in the benchmark model (0.211), and in the models (2a) (0.217) and (2b) (0.215) indicate that roughly 20% of the current earnings persist in the next period. Cao et al. (2011) show 80% earnings persistence levels with the U.S. data from 1966-2007.

The incremental coefficient for negative earnings in the benchmark model, and in the models (2a) and (2b), is negative and highly significant, suggesting that the negative earnings are more persistent than the positive earnings. In the models (2a) and (2b), both the change and the negative change in earnings are highly significant. The earnings change indicates earnings mean reversion rate (-16.9% and -18.9%), which is of similar magnitude in my study than in the prior literature. Moreover, the incremental coefficients for the negative change in earnings are positive for the models (2a) and (2b), (24.7% and 26.2%), indicating that the negative earnings changes are more persistent.[23]

The Column 2 results for (2a) present that the positive EA coefficient (PEA) is positive (0.158) and highly significant, and the negative EA coefficient (NEA) is negative (-0.225) and significant in 10% level. The results for (2b) in Column 3 confirm that the different EA partitions explain future earnings. The signs are consistently negative for the coefficients of negative earnings growth, and positive for the coefficients of positive earnings growth with the absolute sizes being largest for the partitions EA1 (more positive; 0.604), EA3 (less negative; -0.572), and EA4 (less positive; 0.684). The results are highly significant for the partitions EA1 through EA4, and almost significant in 10% level for EA5 and EA6 (10.1%. and 11.0%).

Overall, the earnings prediction results reveal that the EA is important in predicting future earnings, strongly supporting the H2, and that the negative EA patterns predict lower future earnings than the positive patterns, indicating that there may be some momentum evidence in the earnings persistence. The literature recognizes two related widely known investment strategies. The first is the contrarian strategy studied by DeBondt and Thaler (1985, 1987) suggesting that stock prices overreact to information, which makes contrarian strategies (buying

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[23] Note that the opposite signs on the ΔEt coefficients in the contemporaneous returns and earnings prediction models do not imply an inconsistency. The negative coefficient on ΔEt in the earnings prediction model captures the mean reversion of earnings (Fama and French, 2000), while the positive coefficient on ΔEt in the contemporaneous returns model is consistent with valuation theory (Ohlson, 1995) and with empirical evidence indicating that earnings changes are positively associated with returns (Kothari, 2001).

past losers and selling past winners) achieve abnormal returns. Although contrarian strategies have received a lot of academic attention, there is also a widely researched opposite strategy called the momentum, which buys past winners and sells past losers. Lev (1967), and Jegadeesh and Titman (1993, 1999) find significant evidence for this market anomaly assuming that stocks with strong past performance continue to outperform stocks with poor past performance in the next period.

Table 8: Regressions of future earnings on EA

This table presents the regression results of 1-year ahead future earnings on EA. The dependent variable, $E_{i.t+1}$ is $ROA_{i.t+1}$, or operating income after depreciation for firm i in t + 1 scaled by total assets at the end of year t; D1 is an indicator set to 1 if $ROA_{i.t}$ is negative. 0 otherwise; D2 is an indicator set to 1 if $\Delta ROA_{i.t}$ is negative, 0 otherwise, and all the other variables and regression characteristics in (2a) and (2b) are as defined in Table 7.

Independent variable	Pred.	Benchmark model		Model (2a)		Model (2b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.070	22.06***	0.061	11.09***	0.058	12.45***
Earnings	+	0.211	4.18***	0.217	4.41***	0.215	4.67***
Neg. Earnings	-	(0.459)	(2.09)**	(0.539)	(2.08)**	(0.532)	(2.09)**
ΔEarnings	-	(0.102)	(1.50)	(0.169)	(2.63)***	(0.189)	(2.92)***
Neg. ΔEarnings	+	0.048	1.25	0.247	3.73***	0.262	5.02***
PEA - Positive EA	+			0.158	5.51***		
NEA - Negative EA	?			(0.225)	(1.68)*		
EA1 - More positive	+					0.604	7.12***
EA2 - Revert to positive	+					0.159	5.20***
EA3 - Less negative	+					(0.572)	(2.72)***
EA4 - Less positive	+					0.684	6.38***
EA5 - Revert to negative	+					(0.237)	(1.64)
EA6 - More negative	+					(0.198)	(1.60)
ΔLagged equity BV	?	(0.042)	(3.92)***	(0.060)	(3.24)***	(0.056)	(2.97)***
Neg. ΔLagged equity BV	?	(0.033)	(0.48)	(0.007)	(0.11)	(0.018)	(0.31)
ΔDividends	+	(0.270)	(1.73)*	(0.257)	(1.78)*	(0.255)	(1.78)*
Book-to-market	-	(0.035)	(4.70)***	(0.030)	(5.46)***	(0.029)	(5.32)***
Adjusted R^2		2.9%		3.8%		4.1%	
Number of observations		10 879		10 664		10 664	

(2a) : $E_{i.t+1} = b_0 + b_1E_{i.t} + b_2(D1 * E_{i.t}) + b_3\Delta E_{i.t} + b_4(D2 * \Delta E_{i.t}) + b_5PEA_{i.t} + b_6NEA_{i.t} + b_7\Delta B_{i.t-1} + b_8(D3 * \Delta B_{i.t-1}) + b_9\Delta D_{i.t} + b_{10}BM_{i.t} + e_{i.t}$

(2b) : $E_{i.t+1} = b_0 + b_1E_{i.t} + b_2(D1 * E_{i.t}) + b_3\Delta E_{i.t} + b_4(D2 * \Delta E_{i.t}) + b_{5.k}[EA(k)_{i.t}] + b_7\Delta B_{i.t-1} + b_8(D3 * \Delta B_{i.t-1}) + b_9\Delta D_{i.t} + b_{10}BM_{i.t} + e_{i.t}$

5.1.2.1 Future earnings with quarterly data

The Appendix Table 24 presents the quarterly results for (2a) and (2b), which are mainly highly significant and very much in line with the annual results in Table 8. The main difference in the control variables is that unlike for the annual data, the negative earnings are generally non-significant in explaining the next quarter earnings. The most plausible explanation for this is the cyclicality in the company's profit formation, and that the quarterly unaudited accounting items do not fully predict the future earnings. Also, having the annually paid dividend variable in the quarterly analysis creates some additional noise, which I discuss more thoroughly in the data section. The EA coefficients are, however, significant and very similar to the annual results with the overall interpretation that the quarterly data seems to be far more sensitive to the negative EA information, which can be seen for example in the EA5 (revert to negative), which has become highly significant in the quarterly data compared to being non-significant in the annual data. Overall, I find strong support for the H2 both with annual and quarterly data.

5.1.3 **Financial analysts using EA information to revise their forecasts (H3)**

Table 9 reports the results for the models (3a) and (3b), whether the financial analysts appear to use the EA information in their forecast revisions. The results from the benchmark model indicate that the analysts do revise their one-year earnings (EPS) forecasts based on the most recently announced earnings reports, which is in line with the prior literature. Moreover, all the benchmark regression variables are significant at either 5% or 1% confidence levels, except for the change in dividends variable. Compared to the two previous regression models (1a) and (2a), the sample size in (3a) and (3b) is somewhat smaller due to the low availability of I/B/E/S forecast data. I try to overcome the problem by searching for alternative earnings forecast measures e.g. forecasts for shorter or longer EPS periods, forecasts on EBIT instead of EPS, and forecasts on earnings long-term growth rate, but the one-year-ahead EPS provides the highest number of usable observations with the least amount of noise. The second challenge is to combine the earnings forecast revisions with the imperfect data for earnings report dates, which is the most plausible reason that my results concerning the connection between EA and the forecast revisions do not show as significant results as Cao et al. (2011)

find with the U.S. data. The final methodological notion before analyzing the results is that my dependent variable (forecast revision) is logarithmic, because I consider the forecast revision as a percentage change.

Column 2 reveals that the coefficient for positive EA (PEA) is positive, and the coefficient for negative EA (NEA) is negative. NEA is significant in the 5% level, but PEA is significant only in the 15% level. However, taken the caveats of the data availability into account, I believe this is a strong positive sign that EA is informative in the analyst forecast revisions. The results from model (3b) partially support the view of EA usefulness to the analysts by showing that not only the traditional earnings figures are important determinants of forecast revisions, but there is also evidence that the analysts look at the reversions in EA while adjusting their forecasts. EA5 (revert to negative) coefficient is negative and significant in 5% level, and the EA2 (revert to positive) is positive with a significance level of 14.8%. Hence, the overall results from Table 9 moderate support for annual H3, suggesting that the analysts consider EA in their forecast revisions, and focus especially on EA reversals. The prior literature of Cao et al. (2011) show evidence that all the EA partitions except for EA4 (less positive) convey information to the forecast revisions, but there may be geographical and cultural factors explaining this difference in the results. Next, I present the quarterly results for H3.

Table 9: Regressions of analyst earnings forecast revision on EA

This table presents the regression results of analysts' one-year-ahead earnings forecast revisions on EA. The dependent variable, analyst 1-year-ahead earnings forecast revision (FRY1) is defined as the natural logarithm of the percentage mean (consensus) analysts' earnings forecast (EPS) revision of firm i for year t + 1 that becomes available to the market as soon as the annual earnings of year t are announced. All other variables and regression characteristics in (3a) and (3b) are as defined in Table 7.

Independent variable	Pred.	Benchmark model		Model (3a)		Model (3b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	(1.791)	(13.42)***	(1.920)	(13.60)***	(1.893)	(13.21)***
Earnings	?	(2.041)	(2.24)**	(1.839)	(2.03)**	(1.869)	(2.05)**
Neg. Earnings	?	3.675	1.96**	2.459	1.25	3.024	1.60
ΔEarnings	?	2.553	3.18***	2.250	2.70***	2.396	2.84***
Neg. ΔEarnings	?	(6.270)	(3.89)***	(4.558)	(2.57)***	(5.592)	(2.97)***
PEA - Positive EA	?			1.372	1.43		
NEA - Negative EA	?			(3.507)	(2.00)**		
EA1 - More positive	?					0.529	0.21
EA2 - Revert to positive	?					1.417	1.45
EA3 - Less negative	?					(6.509)	(0.83)
EA4 - Less positive	?					(4.035)	(0.62)
EA5 - Revert to negative	?					(4.173)	(2.27)**
EA6 - More negative	?					3.534	0.98
ΔLagged equity BV	?	(1.580)	(2.56)**	(1.951)	(3.10)***	(1.928)	(3.05)***
Neg. ΔLagged equity BV	?	1.864	2.22**	2.389	2.77***	2.353	2.73***
ΔDividends	?	0.284	0.15	0.818	0.42	0.680	0.35
Book-to-market	?	0.579	3.99***	0.659	4.41***	0.624	4.13***
Adjusted R^2		6.1%		7.0%		7.8%	
Number of observations		930		922		922	

(3a) : $FRY_{i.t} = c_0 + c_1E_{i.t} + c_2(D1 * E_{i.t}) + c_3\Delta E_{i.t} + c_4(D2 * \Delta E_{i.t}) + c_5PEA_{i.t} + c_6NEA_{i.t} + c_7\Delta B_{i.t-1} + c_8(D3 * \Delta B_{i.t-1}) + c_9\Delta D_{i.t} + c_{10}BM_{i.t} + \varsigma_{i.t}$

(3b) : $FRY_{i.t} = c_0 + c_1E_{i.t} + c_2(D1 * E_{i.t}) + c_3\Delta E_{i.t} + c_4(D2 * \Delta E_{i.t}) + c_{5.k}[EA(k)_{i.t}] + c_7\Delta B_{i.t-1} + c_8(D3 * \Delta B_{i.t-1}) + c_9\Delta D_{i.t} + c_{10}BM_{i.t} + \varsigma_{i.t}$

5.1.3.1 Earnings forecast revisions with quarterly data

The Appendix Table 24 presents how the EA information explains the analyst forecast revisions around the quarterly reporting dates. The quarterly results are somewhat different from the annual results with the control variables being overall non-significant in explaining the earnings forecast revisions. The quarterly results for model (3a) show significant positive coefficient for PEA (positive EA), and in (3b) there is a modest positive association with EA2 (revert to positive) in 10% level, and a negative coefficient for the EA3 (less positive) in 5% level. The interpretation of these results suggests that the annual data explains better the forecast revisions with the focus in negative EA patterns, while for the quarterly data the results are less clear with the focus on the positive EA patterns. Overall, the explanatory power for both quarterly and annual models of (3a) and (3b) is not especially high, seen from the low adjusted R^2 figures, and from the low number of observations (922 and 634). Hence, based on the lack of observations and the results, there is only weak evidence to support the quarterly H3.

5.1.4 **EA conveying incremental information to forecast changes (H4)**

Table 10 reports the long-window results for estimating models (4a) and (4b), which are effectively the models (1a) and (1b) with an additional independent variable of change in analysts' five-year EPS growth forecast. The overall results are comparable to those of models (1a) and (1b) in Table 7 with only minor changes in the significance levels of the EA variables. The most notable differences are in the partitions EA2 (revert to positive) and EA3 (less negative), which are no longer statistically significant in the model (4b). More importantly, the key value in the models (4a) and (4b) is to notice that the coefficient for the change in long-term earnings growth rate is significant and positive in all of the three regression models, with the EA coefficients being simultaneously significant. More specifically, the coefficient for the benchmark model is 0.258 in 10% level, the coefficient for (4a) is 0.286 in 5% level, and the coefficient for (4b) is 0.345 in 5% level. The joint interpretation is that EA conveys incremental information to the forward-looking analysts' earnings growth forecasts. Therefore the subsequent assumption is that the analysts do not include all the pricing-related EA information in their forecasts, leading to strong support for the annual H4 hypothesis.

Table 10: Regressions of annual returns on EA and the change in long-term forecasts

This table presents the regression results of annual stock returns on EA and the change in analysts' long-term-growth forecasts. The dependent variable, $R_{i.t}$ is annual buy-and-hold return for firm i over the period 9 months before to 3 months after the firm's t fiscal year end and the ΔLTG is the mean (consensus) analysts' forecast of long-term growth in earnings (5y EPS growth rate) immediately after earnings announcement minus the last available forecast immediately before the announcement. All other variables and regression characteristics in (4a) and (4b) are as defined in Table 7.

Independent variable	Pred.	Benchmark model		Model (4a)		Model (4b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.063	1.82*	0.122	3.22***	0.121	3.28***
Earnings	+	2.923	6.70***	2.797	6.49***	2.846	6.68***
Neg. Earnings	-	(3.056)	(3.55)***	(2.236)	(2.64)***	(2.346)	(2.81)***
ΔEarnings	+	0.317	0.59	0.473	0.78	0.244	0.39
Neg. ΔEarnings	-	(1.369)	(1.82)*	(2.368)	(2.90)***	(2.192)	(2.67)***
PEA - Positive EA	+			(0.409)	(0.99)		
NEA - Negative EA	+			1.528	5.88***		
EA1 - More positive	+					2.757	1.78*
EA2 - Revert to positive	+					(0.482)	(1.16)
EA3 - Less negative	+					3.122	1.50
EA4 - Less positive	+					(0.707)	(0.46)
EA5 - Revert to negative	+					1.369	5.50***
EA6 - More negative	+					3.132	4.86***
ΔLagged equity BV	-	0.294	1.73*	0.379	2.31**	0.330	2.02**
Neg. ΔLagged equity BV	?	(1.959)	(4.32)***	(2.064)	(4.78)***	(1.975)	(4.66)***
ΔDividends	?	4.199	4.82***	3.736	4.31***	3.869	4.46***
Book-to-market	?	(0.374)	(11.08)***	(0.406)	(11.33)***	(0.398)	(11.16)***
ΔLT-forecast growth	+	0.258	1.77*	0.286	1.97**	0.345	2.44**
Adjusted R^2		38.1%		39.5%		40.3%	
Number of observations		1 680		1 663		1 663	

(4a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

(4b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

5.1.4.1 EA and changes in long-term growth forecasts explaining short-window returns

The Appendix Table 26 presents the short-window results for estimating models (4a) and (4b). Again, the short-window results are mainly highly insignificant like in the Appendix Table 22 for the results for (1a) and (1b). However, one curious remark from the results is that despite all the other variables being insignificant, the coefficients for the changes in long-term earnings growth forecasts are positive and significant in 5% level. This may be evidence from the fact that there is not much earnings surprise on average, and that the EA information is already priced before the actual earnings announcement (see e.g. Matsumoto, 2002 for earnings surprise effects). Based on these results, the market seems to find value-adding information from the earnings announcements to adjust their views of the future long-term earnings growth, which affects the stock prices in the short-term window. Post-earnings announcement drift could also provide another explanation stating that the three-day returns window is simply too short for the market to account for the new information (Bernard and Thomas 1989, 1990). However, based on very weak data evidence, I do not find support for the short-window H4 hypothesis. Next, I continue to the quarterly models of (4a) and (4b).

5.1.4.2 EA and changes in long-term growth forecasts with quarterly data

The Appendix Table 27 presents the quarterly results for the models (4a) and (4b), which are very similar to those of annual data. The change in analyst forecast coefficients are even more significant in the quarterly models (1% level) than in the annual models. As stated in the Table 10, the annual data long-term returns associate highly with the negative EA patterns, while the quarterly results report strong returns associations with the positive EA variables; PEA (positive EA), EA1 (more positive), and EA2 (revert to positive). The number of observations is roughly two times as high for the quarterly sample (2 462 compared to 1 663), but the adjusted R^2 reduces from the annual 39.5% to the quarterly 14.3% in model (4b). The short-window results are rather uninformative also for the quarterly sample due to the aforementioned data issues. The joint interpretation of the differences between the incremental EA information with the quarterly and annual data, is that the quarterly data conveys incremental information from the positive variables, and the annual data conveys incremental information from the negative variables. The quick conclusion would be that the analysts overestimate the forecast revisions after the annual earnings announcements, and underestimate the forecast revisions after the quarterly earnings announcements. Overall, the results are in line with the prior studies of e.g. Cao et al. (2011), and I find strong support for the hypothesis H4 for both the annual and quarterly long-window data, but no support for the short-window results.

5.2 Empirical results of what drives EA

After discovering in the first research question that the EA conveys valuable information to the investors, in the second research question I study, what drives this EA information by analyzing whether the EA information derives from the cash flow or from the accruals component of earnings (H5), whether the EA information differs between middle and large cap stocks (H6), and finally, whether the EA information value changes over time (H7).

5.2.1 EA information deriving from cash or accruals (H5)

Table 11 reports the differences in information between the EA caused by the operating cash flows and the earnings accruals. The regression equations are exactly the same as in (1a) and (1b) with the long-term returns as the dependent variable. The two earnings components are regressed in separate equations due to their high multicollinearity, and the results are presented side by side in Table 11. The benchmark model in the first column is adjusted by adding the EA from accruals or EA from cash variable to the equation. The second column presents the model (5a), which divides the EA into positive and negative components, and the third column shows the results for (5b), which divides the EA into six different partitions. The adjusted R^2 is roughly 16% throughout all the six regressions. The results show highly significant coefficients (1% level) for all of the control variables, except for the change in earnings and the negative change in earnings variables. The benchmark model shows that the coefficient for the total EA from the cash flow is positive (0.268) and highly significant, and the total EA from accruals is close to zero (0.032) and non-significant. The results indicate that the EA information is derived from the operational cash flows and not from the accruals, which could mean that the markets can detect and value only the EA that derives from the increased cash flows and not from the discretional accruals that can be subject to earnings management. The results support the view that the earnings management would not affect the long-term returns. The results from the model (5a) in the second column support the benchmark model evidence by showing more specifically that the EA value comes from the cash flow component of positive EA (PEA), which has a highly significant coefficient of 0.511. The reported result for negative EA (NEA) from cash flows is insignificant (0.032), and both the PEA (positive EA) and the NEA (negative EA) from the accruals EA are non-significant.

Finally, the model (5b) sheds even more light on the phenomenon by showing positive and highly significant coefficients for the cash flow EA1 (more positive), EA2 (revert to positive), EA4 (less positive), and EA6 (more negative), while the coefficients for EA3 (less negative) and EA5 (revert to negative) are insignificant. The model (5b) for the accruals EA shows significant negative coefficient only for the variable EA6 (more negative) in 5% confidence level. This could mean that the cash flow EA is the major determinant of the EA information value, and the accruals are only important to the shareholders when the EA pattern is very alarming, for example when the earnings growth is consequently declining (EA6). However, the literature offers some explanations, why the accruals-based EA6 (more negative) could be statistically significant. Firstly, for example Sloan (1996) discusses the accruals anomaly, where the investors cannot differentiate the earnings caused by accruals and the earnings caused by cash flows. Secondly, Shleifer (2000) finds evidence that the individuals extrapolate past trends from short histories too far into the future, indicating that the accruals EA6 (more negative) would be over-interpreted as a negative sign for the future earnings. Thirdly, Dechow (2006) argues that the negative accruals indicate that the firms can be reducing their assets and downsizing their balance sheets to reflect the fair values. This argument is closely related to the increased bankruptcy risk presented by Hayn (1995), who suggests that the balance sheet downsizing is an indication of the firm exercising an abandonment option, which may finally lead to the firm exiting the business.

I also perform similar cash flow versus accruals EA analysis for the short-window returns, for the future earnings (2a and 2b), and for the forecast revisions (3a and 3b). The results are not reported in this paper, because for the short-window of (5a and 5b) none of the explanatory variables are significant due to the bad quality data for the report dates. For the future earnings models (2a) and (2b), the results are by definition significant for both cash flow and accruals, because the dependent variable includes both the elements of cash and accruals. For the earnings forecast revision models (3a) and (3b), the comparison is equally non-meaningful.

Table 11: Regressions of annual returns on EA components of cash flow and accruals

This table presents the regression results for the EA that derives from either cash flow or accruals component of earnings. The dependent variable $R_{i,t}$ is the annual buy-and-hold return for firm i, EA_{OCF} is the cash flow component, and $EA_{ACCRUALS}$ is the accruals component. All the other variables are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model				Model (5a)				Model (5b)			
		CASH		ACCRUALS		CASH		ACCRUALS		CASH		ACCRUALS	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.146	14.93***	0.145	14.76***	0.128	11.75***	0.138	13.31***	0.130	11.79***	0.134	12.97***
Earnings	?	1.206	8.98***	1.214	8.91***	1.195	8.95***	1.210	8.90***	1.192	8.93***	1.207	8.89***
Neg. Earnings	?	(1.413)	(5.23)***	(1.432)	(5.23)***	(1.415)	(5.24)***	(1.439)	(5.25)***	(1.399)	(5.18)***	(1.436)	(5.25)***
ΔEarnings	?	0.052	0.38	0.061	0.45	0.053	0.40	0.055	0.40	0.058	0.43	0.054	0.39
Neg. ΔEarnings	?	(0.124)	(0.61)	(0.131)	(0.64)	(0.111)	(0.55)	(0.109)	(0.53)	(0.132)	(0.65)	(0.101)	(0.49)
EA	?	0.268	4.36***	0.032	0.60								
PEA - Positive EA	?					0.511	5.02***	0.123	1.43				
NEA - Negative EA	?					0.032	0.35	(0.060)	(0.73)				
EA1 - More positive	?									0.947	3.05***	0.372	1.31
EA2 - Revert to positive	?									0.448	3.96***	0.133	1.43
EA3 - Less negative	?									0.522	0.78	0.441	0.73
EA4 - Less positive	?									0.965	2.37	0.350	1.15
EA5 - Revert to negative	?									(0.015)	(0.15)	(0.025)	(0.30)
EA6 - More negative	?									0.732	2.84***	(0.794)	(2.39)**
ΔLagged equity BV	?	0.462	7.79***	0.464	7.79***	0.458	7.77***	0.461	7.72***	0.460	7.82***	0.463	7.81***
Neg. ΔLagged equity BV	?	(1.035)	(7.91)***	(1.038)	(7.69)***	(1.027)	(7.86)***	(1.030)	(7.59)***	(1.029)	(7.89)***	(1.032)	(7.62)***
ΔDividends	?	1.818	5.52***	1.817	5.49***	1.819	5.53***	1.817	5.49***	1.825	5.56***	1.812	5.48***
Book-to-market	?	(0.221)	(16.02)***	(0.222)	(15.93)***	(0.218)	(15.97)***	(0.220)	(15.69)***	(0.218)	(16.02)***	(0.220)	(15.65)***
Adjusted R^2		16.3%		16.1%		16.5%		16.1%		16.6%		16.2%	
Number of observations		9 736		9 695		9 736		9 695		9 736		9 695	

(5a): $R_{i,t} = a_0 + a_1E_{i,t} + a_2(D1 * E_{i,t}) + a_3\Delta E_{i,t} + a_4(D2 * \Delta E_{i,t}) + a_5PEA_{OCF/ACCRUALS} + a_6NEA_{OCF/ACCRUALS} + a_7\Delta B_{i,t-1} + a_8(D3 * \Delta B_{i,t-1}) + a_9\Delta D_{i,t} + a_{10}BM_{i,t} + \varepsilon_{i,t}$

(5b): $R_{i,t} = a_0 + a_1E_{i,t} + a_2(D1 * E_{i,t}) + a_3\Delta E_{i,t} + a_4(D2 * \Delta E_{i,t}) + a_{5,k}[EA_{OCF/ACCRUALS}(k)_{i,t}] + a_7\Delta B_{i,t-1} + a_8(D3 * \Delta B_{i,t-1}) + a_9\Delta D_{i,t} + a_{10}BM_{i,t} + \varepsilon_{i,t}$

5.2.1.1 EA information deriving from cash or accruals with quarterly data

The Appendix Table 28 presents the quarterly results for whether the EA information value derives from the cash or from the accruals. On a high level, the annual and quarterly results show similarly significant coefficients for the cash flow variables and similarly non-significant results for the accruals variables. On a more detailed level, there are slight differences in the annual and quarterly EA patterns explaining the long-window returns, with the quarterly results being slightly weaker. Contrary to the annual results, the quarterly benchmark model EA variable is not significant, and while the annual model (5a) has significant coefficient for the positive EA, the quarterly model shows the same with the negative EA.

The model (5b) shows the differences in the annual and quarterly EA patterns. In the annual data the partitions EA1 (more positive), EA2 (revert to positive), and EA6 (more negative) are highly significant, suggesting that the patterns with either continuing positive or negative earnings growth convey valuable information. For the quarterly data, only the patterns EA2 (revert to positive), EA3 (less positive), and EA4 (less negative) are highly significant, suggesting that the fundamental difference between the annual and quarterly data is that the annual data values the extreme EA patterns, and the quarterly data values the mean reverting EA patterns. The interpretation would be that the market pays more attention to, and draws stronger inferences from the annual reports and then only adjusts their views based on the quarterly reports. Kothari (2001) summarizes some pros and cons of using quarterly data in the studies by stating that the quarterly data is more seasonal and timelier. Salamon and Stober (1994) specify that the errors in the expense estimates occurring during the first three quarters will be reversed in the last quarter, and Hopwood et al (1982) argue that there are theoretically four times as many quarterly than annual observations, leading to larger samples and reduced survivorship bias. For the possible downsides, Kothari (2001) lists the increased incidence of transitory items, and the fact that the quarterly reports are not audited. Although, most of the earnings management research is based on annual data, there is a growing body of evidence suggesting that the quarterly data is more prone to include managerial discretion due to its unaudited nature (Shivakumar, 1997; and Rangan, 1998). Jeter and Shivakumar (1999) also detect slightly lower R^2-values for the quarterly, than for the annual regressions. Overall, both annual and quarterly long-window results show strong support for the H5 that the EA information value derives from the operational cash flows and not from the earnings accruals. Next, I continue to the EA information between the large and middle cap firms.

5.2.2 **EA information differing between the large and middle cap firms (H6)**

After discovering that the EA information value derives from the operating cash flows component of earnings, I divide my sample into the middle and large cap stocks based on Thomson One categorization. In the following sections, I show the EA association with the annual long-window returns (models 6a1 and 6b1), future earnings (models 6a2 and 6b2), and revisions in the earnings growth forecasts (models 6a3 and 6b3).

5.2.2.1 Large and middle cap firm EA explaining stock returns

Table 12 illustrates the association between the EA and the annual long-window returns for the large and middle cap firms. The middle cap sample size (7 649) is over three times the size for the large cap (2 294), but the overall sample size is still large enough to draw inferences based on the results. The control variables are mainly highly significant for all of the models with the exception that the variable for negative earnings is only significant for the middle cap stocks and the change in earnings variable is not significant for neither of the samples. The EA coefficients are highly significant for both the middle and large cap samples in all of the three models. In the model (6a1) in Table 12 the only difference between the two samples is that the PEA (positive EA) is not significant for the large cap sample. In the model (6b1) the coefficients are highly significant for the partitions EA3 (less negative), EA5 (revert to negative) and EA6 (more negative) for both large and middle cap firms, and additionally, the EA2 (revert to positive) is significant in 10% level for the middle cap sample. As a conclusion, the long-window returns for the large cap firms seem to be affected only by the negative EA and the negative earnings variables in general, while the middle cap firms are otherwise similar, but there is some evidence that also the positive EA information has some effect on the long-window returns. Some possible explanations for why only the negative EA information is valuable for the large cap firms and not for the middle cap firms can derive from the generally higher institutional ownership of large cap stocks, with specific trading rules, or from the generally higher analyst following and the better quality of financial statement analysis as discussed in the section 4.3.6.

Table 12: Regressions of annual raw returns on large and middle cap EA

This table presents the regression results for the long-window stock returns explaining the EA that derives from either middle or large cap firms. The dependent variable $R_{i.t}$ is the annual buy-and-hold return for firm i. EA_{LARGE} is the EA for the large cap subsample and EA_{MIDDLE} is the EA for the middle cap subsample. All the other variables are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model				Model (6a1)				Model (6b1)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.159	6.39***	0.150	14.40***	0.178	6.63***	0.178	16.67***	0.180	6.75***	0.180	16.26***
Earnings	?	1.027	3.88***	1.226	8.11***	1.018	3.89***	1.189	7.75***	0.963	3.62***	1.176	7.65***
Neg. Earnings	?	(0.888)	(1.75)*	(1.344)	(4.40)***	(0.747)	(1.42)	(1.127)	(3.72)***	(0.641)	(1.20)	(1.104)	(3.64)***
ΔEarnings	?	0.097	0.40	(0.157)	(0.91)	0.225	0.81	0.150	0.81	0.166	0.65	0.009	0.05
Neg. ΔEarnings	?	(0.613)	(1.71)*	(0.071)	(0.31)	(0.943)	(2.06)**	(0.720)	(2.66)***	(0.886)	(2.02)**	(0.685)	(2.47)**
EA	?	0.632	2.53**	0.282	3.65***								
PEA - Positive EA	?					0.033	0.07	(0.336)	(2.40)**				
NEA - Negative EA	?					1.150	4.58***	0.792	8.70***				
EA1 - More positive	?									1.499	1.15	0.907	1.44
EA2 - Revert to positive	?									(0.165)	(0.36)	(0.227)	(1.72)*
EA3 - Less negative	?									5.147	2.75***	1.787	2.28**
EA4 - Less positive	?									2.404	0.96	0.161	0.30
EA5 - Revert to negative	?									1.082	4.23***	0.725	8.25***
EA6 - More negative	?									1.510	2.10**	2.654	9.15***
ΔLagged equity BV	?	0.626	4.73***	0.448	6.84***	0.659	4.84***	0.481	7.31***	0.661	4.78***	0.483	7.40***
Neg. ΔLagged equity BV	?	(1.616)	(3.87)***	(0.972)	(7.35)***	(1.664)	(3.95)***	(1.043)	(7.85)***	(1.698)	(3.98)***	(1.032)	(7.70)***
ΔDividends	?	2.681	3.09***	1.537	4.53***	2.658	3.11***	1.537	4.58***	2.697	3.18***	1.587	4.73***
Book-to-market	?	(0.269)	(7.02)***	(0.215)	(14.63)***	(0.279)	(6.85)***	(0.231)	(14.97)***	(0.275)	(6.91)***	(0.229)	(14.98)***
Adjusted R^2		20.6%		15.4%		21.0%		16.4%		21.4%		17.0%	
Number of observations		2 294		7 649		2 294		7 649		2 294		7 649	

(6a1) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{LARGE/MIDDLE} + a_6NEA_{LARGE/MIDDLE} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(6b1) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.}$

5.2.2.1.1 Large and middle cap firm EA explaining stock returns with quarterly data

The Appendix Table 29 shows the quarterly results for the large and middle cap firm EA association with the long-window contemporaneous stock returns. Quite surprisingly, there seems to be rather large differences between the quarterly and annual results suggesting that the quarterly EA is non-significant in explaining the large cap stocks long-window returns. The difference is rather large compared to the annual large cap results showing support for the negative EA conveying valuable returns information. For the middle cap stocks the results are generally similar with annual and quarterly data, with the difference that while the annual data results are more affected by the negative EA information, the quarterly data does not differentiate between the negative or positive EA, but is mostly concerned with the EA reversals in both directions; EA2 (revert to positive) and EA5 (revert to negative), and with the continued patterns of either increasing or decreasing earnings growth; EA1 (more positive) and EA6 (more negative).

Before drawing any conclusions, it should be noted that the annual sample size is 2 294 large cap and 7 649 middle cap observations, and the quarterly sample size is 2 355 large cap and 3 392 middle cap observations. It is important to notice that the corresponding annual and quarterly observations are not necessarily from the same time periods due to the more limited quarterly data availability. The result is that the annual observations represent generally better the whole sample period, whereas the quarterly observations are more concentrated around the more recent years. Therefore, there can also be other explanatory factors besides the company size that affect the results. Secondly, the overall explanatory power of the model is weaker for the quarterly data, and the annual data has higher adjusted R^2 for the large cap stocks while the quarterly data has higher R^2 for the middle cap stocks. Conclusively, the annual data sees value in the negative EA information for both the large and middle cap firms, while the quarterly EA does not explain the large cap long-window returns, and values highly the middle cap firms' EA reversals. Hence, I find only weak support that the large and middle cap firms convey similar information to support H6a.

5.2.2.2 Large and middle cap firm EA explaining future earnings

Table 13 shows the association between the large and middle cap firm EA and future earnings. Again, the middle cap sample size (6 986) is twice the size of the annual sample (3 678). The control variables are mainly highly significant for both large and middle cap companies with the only exception being the change in dividends, which is significant for neither, and the negative change in lagged book value, which is only moderately significant for the large cap companies. The EA coefficients are slightly different for the large and middle cap stocks; in the benchmark model the EA coefficient is positive and highly significant for the large cap companies, but negative and non-significant for the middle cap firms. The model (6a2) in the second column confirms that the association between EA and future earnings is indeed stronger for the large cap companies, with both the PEA (positive EA) and the NEA (negative EA) being significant, and for the middle cap companies only the PEA (positive EA) being highly significant.

Finally, the model (6b2) in the third column shows that the results between the large and middle cap stocks are fairly similar and highly significant for the partitions EA1-EA4, which represent either positive change in earnings or positive EA. However, for the partitions EA5 (revert to negative) and EA6 (more negative), the coefficients are significant only for the large cap sample. Overall, the results suggest that the EA explains future earnings for both large and middle cap companies, but that the correlations are generally stronger for the large cap stocks. Fama and French (1995) show that the firm size is related to profitability, which can also be seen from my sample that the large cap firms have higher EA coefficients than the middle cap firms. Furthermore, Kothari (1987) shows evidence that the firm size and the earnings persistence are positively correlated, which supports my findings of larger coefficients and higher significances for the large cap future earnings. Kothari also argues that given the amount and timeliness of the information processed by market participants, the price changes and the earnings information should signal future earnings changes earlier for the large than for the small firms. The results are also in line with the casual observation that there are greater numbers of traders and professional analysts expending resources on information activities with respect to large versus small firms. Hence, I find only moderate support for H6b that the middle and large cap firms convey similar information on future earnings.

Table 13: Regressions of future earnings on large and middle cap EA

This table presents the regression results for the future earnings explaining the EA that derives from either middle or large cap firms. The dependent variable $E_{i.t+1}$ is operating income after depreciation for firm i in t + 1 scaled by total assets at the end of year t. EA_{LARGE} is the EA for the large and EA_{MIDDLE} is the EA for the middle cap subsample. All the other variables are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model				Model (6a2)				Model (6b2)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.072	24.78***	0.069	13.85***	0.064	22.02***	0.060	6.81***	0.061	20.91***	0.057	7.58***
Earnings	?	0.157	6.10***	0.215	3.82***	0.164	6.39***	0.228	3.75***	0.152	5.64***	0.228	4.04***
Neg. Earnings	?	(0.262)	(4.20)***	(0.567)	(1.64)*	(0.325)	(5.09)***	(0.640)	(1.71)*	(0.317)	(4.90)***	(0.636)	(1.73)*
ΔEarnings	?	(0.052)	(2.29)**	(0.078)	(1.87)*	(0.107)	(4.06)***	(0.185)	(2.23)**	(0.125)	(4.61)***	(0.207)	(2.50)**
Neg. ΔEarnings	?	0.071	1.79*	0.047	1.00	0.215	4.57***	0.270	2.70***	0.265	5.38***	0.285	3.55***
EA	?	0.088	2.83***	(0.090)	(0.85)								
PEA - Positive EA	?					0.302	5.49***	0.124	3.74***				
NEA - Negative EA	?					(0.110)	(2.13)**	(0.262)	(1.47)				
EA1 - More positive	?									0.884	5.61***	0.495	5.18***
EA2 - Revert to positive	?									0.256	5.27***	0.137	3.85***
EA3 - Less negative	?									(1.044)	(3.27)***	(0.544)	(2.32)**
EA4 - Less positive	?									0.772	3.98***	0.629	5.20***
EA5 - Revert to negative	?									(0.132)	(2.91)***	(0.274)	(1.44)
EA6 - More negative	?									(0.355)	(2.01)**	(0.198)	(1.49)
ΔLagged equity BV	?	(0.038)	(2.29)**	(0.054)	(2.53)**	(0.051)	(3.00)***	(0.065)	(2.58)***	(0.049)	(2.72)***	(0.062)	(2.38)**
Neg. ΔLagged equity BV	?	0.042	1.63	(0.047)	(0.58)	0.061	2.38**	(0.025)	(0.34)	0.047	1.79*	(0.032)	(0.46)
ΔDividends	?	(0.072)	(1.29)	(0.345)	(1.59)	(0.054)	(0.97)	(0.348)	(1.61)	(0.044)	(0.78)	(0.346)	(1.64)
Book-to-market	?	(0.032)	(6.46)***	(0.035)	(4.35)***	(0.027)	(5.77)***	(0.029)	(5.04)***	(0.026)	(5.39)***	(0.029)	(4.88)***
Adjusted R^2		10.4%		3.2%		12.9%		3.9%		15.2%		4.1%	
Number of observations		3 678		6 986		3 678		6 986		3 678		6 986	

(6a2) : $E_{i.t+1} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_5PEA_{LARGE/MIDDLE} + a_6NEA_{LARGE/MIDDLE} + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(6b2) : $E_{i.t+1} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

5.2.2.2.1 Large and middle cap firm EA explaining future earnings with quarterly data

The Appendix Table 30 presents the large and middle cap firm quarterly EA association with the future period earnings. The annual and quarterly results are mainly similar with the exception that while the annual data for the large cap sample suggests that all the different EA patterns are informative, the quarterly data does not find the extreme patterns EA1 (more positive) and EA6 (more negative) informative, but is more concentrated on the information of the EA reversals; EA2 (revert to positive) and EA5 (revert to negative), and overall on the mean reverting EA patterns EA3 (less positive) and EA4 (less negative). For the middle cap firms, the annual data assumes a positive and highly significant association between the future earnings and PEA (positive EA), and between the positive or increasing earnings growth partitions; EA1 (more positive), EA2 (revert to positive), EA3 (less negative), and EA4 (less positive).

Also, the quarterly results show moderately significant coefficients in the model (6a1), for the NEA (negative EA), and in the model (6b2), for the EA4 (less positive) and EA5 (revert to negative). Based on the annual and quarterly sample sizes and the regression model R^2, even though the number of observations decreases for the middle cap sample between the annual and quarterly models, the overall explanatory power increases. The concluding remarks for this model are that the quarterly and annual EA data explain mainly similarly the future earnings for both large and middle cap firms with the emphasis slightly more in the mean reversal information with the quarterly sample. Within the quarterly results, there are no major differences between the large and middle cap firms, which shows support the H6b

5.2.2.3 Large and middle cap firm EA explaining forecast revisions

Table 14 presents the associations between the subsamples of large and middle cap firm EA and the revisions of the long-term earnings growth rate forecasts. The number of observations is fairly small for both large cap (889) and middle cap (820) samples, and due to the low availability of the forecast revision data, I expect the results to be somewhat noisy. The control variables are mainly insignificant, but the value of this model lies on the interpretation of the EA variables in models (6a3) and (6b3). The results show moderate evidence that only the extreme EA patterns (EA1 (more positive) and EA6 (more negative)) affect the revisions of the middle cap firms' growth forecasts. For the large cap firms the results are similar to the previous models of future earnings and annual returns that only the negative EA patterns EA5 (revert to negative) and EA6 (more negative), and the negative earnings growth pattern EA3 (less negative) affect the forecast revisions. The large cap coefficient for the NEA (negative EA) in (6a3) is negative and significant in 5% level.

Conclusively, the EA is informative for both firm sizes, but the large cap companies are more affected by the negative EA information than are the middle cap companies. This finding is also in line with the theory of for example Kothari (1987), which states that there is more valuable information available, and more effort spent on assessing the forecasted earnings of larger than smaller firms. Hence, I find only moderate support for H63 with the annual data that the EA conveys similar information to the large and middle cap firms.

Table 14: Regressions of analysts' forecast revisions on large and middle cap EA

This table presents the regression results for the analyst forecast revisions explaining the EA that derives from either middle or large cap firms. The dependent variable, ΔLTG is the change in mean analysts' forecast of long-term growth in EPS immediately after earnings announcement minus the last available forecast immediately before the announcement. EA_{LARGE} is the EA for the large and EA_{MIDDLE} is the EA for the middle cap subsample. All the other variables are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model				Model (6a3)				Model (6b3)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.002	0.18	0.006	0.56	(0.007)	(0.71)	0.004	0.35	(0.011)	(1.07)	0.003	0.26
Earnings	?	(0.079)	(0.69)	(0.201)	(2.24)**	(0.059)	(0.51)	(0.200)	(2.23)**	(0.047)	(0.40)	(0.213)	(2.34)**
Neg. Earnings	?	0.120	0.36	0.546	1.99**	0.049	0.15	0.530	1.87*	(0.001)	0.00	0.557	2.06**
ΔEarnings	?	(0.049)	(0.47)	0.009	0.10	(0.089)	(0.80)	(0.008)	(0.09)	(0.080)	(0.71)	0.039	0.39
Neg. ΔEarnings	?	0.042	0.21	(0.268)	(1.35)	0.142	0.65	(0.232)	(1.03)	0.163	0.75	(0.243)	(1.10)
EA	?	(0.097)	(1.36)	0.004	0.06								
PEA - Positive EA	?					0.058	0.62	0.036	0.50				
NEA - Negative EA	?					(0.264)	(2.23)**	(0.026)	(0.30)				
EA1 - More positive	?									(0.055)	(0.26)	(0.702)	(2.08)**
EA2 - Revert to positive	?									0.080	0.84	0.045	0.63
EA3 - Less negative	?									(1.730)	(2.56)**	(0.476)	(1.05)
EA4 - Less positive	?									0.152	0.59	0.311	0.67
EA5 - Revert to negative	?									(0.272)	(2.21)**	0.022	0.25
EA6 - More negative	?									(0.411)	(2.06)**	(0.581)	(1.82)*
ΔLagged equity BV	?	(0.087)	(1.66)*	(0.099)	(1.16)	(0.091)	(1.74)*	(0.099)	(1.17)	(0.085)	(1.66)*	(0.090)	(1.12)
Neg. ΔLagged equity BV	?	(0.078)	(0.72)	0.145	1.28	(0.075)	(0.70)	0.143	1.28	(0.080)	(0.75)	0.115	1.08
ΔDividends	?	(0.280)	(1.26)	0.308	1.51	(0.253)	(1.15)	0.313	1.52	(0.274)	(1.22)	0.252	1.22
Book-to-market	?	0.012	1.53	0.028	2.16**	0.016	2.03**	0.029	2.14**	0.016	2.11**	0.027	1.99**
Adjusted R^2		3.9%		4.6%		4.5%		4.7%		5.3%		6.5%	
Number of observations		889		820		889		820		889		820	

(6a3) : $\Delta LTG_{i.t} = a_0 + a_1 E_{i.t} + a_2(D1 * E_{i.t}) + a_3 \Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5 PEA_{LARGE/MIDDLE} + a_6 NEA_{LARGE/MIDDLE} + a_7 \Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9 \Delta D_{i.t} + a_{10} BM_{i.t} + \varepsilon_{i.t}$

(6b3) : $\Delta LTG_{i.t} = a_0 + a_1 E_{i.t} + a_2(D1 * E_{i.t}) + a_3 \Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7 \Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9 \Delta D_{i.t} + a_{10} BM_{i.t} + \varepsilon_{i.t}$

5.2.2.3.1 Large and middle cap EA explaining forecast revisions with quarterly data

The Appendix Table 31 presents the quarterly results for the large and middle cap firm EA explaining the revisions in the long-term growth rates. The first remark is that the results are generally rather insignificant and the adjusted R^2 drops from the annual 5% to the quarterly less than 2%. Moreover, the number of observations is very low (1 206 middle cap, and 1 373 large cap observations). Hence, the quarterly model also suffers from the data availability challenges deteriorating the credibility of the inferences. However, despite the totally insignificant annual and quarterly control variables, there seems to be weak evidence of positive EA information value in the quarterly results for both large and middle cap firms. This is slightly contradictive to the annual results, where the weak association between the large cap EA and forecast revisions derives from the negative EA, and for the middle cap firms from the extreme EA patterns. Overall, the somewhat noisy results suggest that the EA information is not quite similar for the large and middle cap firms, which is in contradiction with the H63.

5.2.3 EA information differing over time before and after 2008 (H7)

Before reporting how the EA information value has changed before and after 2008, Table 15 presents how the amount of observations in each category has remained relatively stable during the observation period 2004-2011. The only exception is the financial crisis 2007-08, which temporarily increases the number of observations in the negative EA partitions.

Table 15: Annual distribution of observations between EA partitions

This table presents the annual distribution of observations in each EA category. Besides the years of economic crisis in 2007-2008, the category sizes have remained relatively stable from 2004 to 2011.

Year	PEA	NEA	EA1	EA2	EA3	EA4	EA5	EA6
2004	51%	49%	8%	31%	6%	12%	39%	5%
2005	37%	63%	6%	26%	10%	5%	40%	12%
2006	65%	35%	9%	49%	6%	7%	24%	5%
2007	43%	57%	9%	21%	6%	12%	45%	6%
2008	23%	77%	1%	18%	14%	4%	40%	22%
2009	54%	46%	5%	45%	14%	4%	17%	15%
2010	62%	38%	9%	39%	5%	14%	31%	3%
2011	35%	65%	6%	22%	9%	8%	47%	10%
Average	46%	54%	7%	31%	9%	8%	35%	10%

After discovering that the EA information preconditions have not altered during my observation period, I present the results of the regression equations (7a) and (7b) in Table 16, explaining the EA association with the stock returns over time. The cut-off point between my two subsamples is the year 2008, during which the financial crisis and IFRS implementation takes place. The sample size for the Pre-2008 (3 968) is slightly smaller than for the Post-2008 (5 975), and the adjusted R^2 in (7a) increases roughly 5% between the samples from 15.4% to 20.7%, suggesting that the overall financial statement information value has increased over time.

The control variables are mainly highly significant, with a fist remark that the change in dividends has become highly significant over time for all of the models. The second remark is the adverse effect with the earnings change coefficients, which have become insignificant in the Post-2008 for all of the models. Lev (1989) suggests that the low correlation between earnings changes and returns is often attributed to deficiencies in the accounting measurement system. Hence, the IFRS implementation could partially explain the change in the coefficient significances. Concerning the change in EA information value, the results are fairly similar over time. Overall, I do not consider that the EA information value has changed during my observation period. I also perform similar non-tabulated tests for the time-effects on the future earnings and revisions in analyst forecasts, but the results show no differences between the samples. Hence, based on the reported results I find strong support for H7 stating the EA information has not changed over time. Also, I do not present the quarterly results for H7, because the Pre-2008 data sample is not large enough for meaningful analysis due to the skewed data.

At this point, I have presented and analyzed all the annual and quarterly results for the eight hypotheses, with the summarizing conclusions that the EA conveys valuable information to the investors, based on stock returns and the capability of predicting future earnings and analyst forecast revisions. In the second research question, I discover that the information value is driven by the cash flow component of earnings, signaling the market’s ability to differentiate the real operating earnings growth from the earnings growth derived from the accounting items that may contain managerial discretion. I also conclude that without minor differences, the results are applicable irrespective of the company size, and over time. Finally, I conclude that the quarterly data EA conveys similarly valuable and partially complementary information to the markets than does the annual EA. In the following section I present the various robustness checks to show that my results hold also in a broader setting.

Table 16: Regressions of annual stock returns on EA before and after 2008

This table presents the regression results explaining the long-window stock returns for the EA that takes place before and after 2008. The dependent variable $R_{i,t}$ is the annual buy-and-hold return for firm i. EA_{BEFORE} is the EA for the subsample before 2008 and EA_{AFTER} is the EA subsample after 2008. All other variables are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model				Model (7a3)				Model (7b3)			
		BEFORE		AFTER		BEFORE		AFTER		BEFORE		AFTER	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.147	12.24***	0.151	10.34***	0.171	13.65***	0.177	11.81***	0.177	13.93***	0.173	11.31***
Earnings	?	0.782	5.53***	1.346	6.17***	0.752	5.34***	1.317	5.93***	0.727	5.22***	1.316	5.90***
Neg. Earnings	?	(1.150)	(3.58)***	(1.397)	(3.60)***	(0.980)	(3.08)***	(1.170)	(2.99)***	(0.982)	(3.12)***	(1.165)	(2.97)***
ΔEarnings	?	0.434	2.71***	(0.326)	(1.32)	0.642	3.58***	(0.050)	(0.19)	0.559	3.18***	(0.213)	(0.81)
Neg. ΔEarnings	?	(0.322)	(1.49)	(0.106)	(0.36)	(0.819)	(3.07)***	(0.688)	(1.95)*	(0.782)	(2.97)***	(0.636)	(1.76)*
EA	?	0.163	1.53	0.312	2.89***								
PEA - Positive EA	?					(0.320)	(1.75)*	(0.360)	(1.66)*				
NEA - Negative EA	?					0.688	5.25***	0.785	6.80***				
EA1 - More positive	?									0.390	0.71	1.481	1.62
EA2 - Revert to positive	?									(0.371)	(2.26)**	(0.166)	(0.84)
EA3 - Less negative	?									3.727	2.13**	1.421	1.73*
EA4 - Less positive	?									0.126	0.16	1.622	1.69*
EA5 - Revert to negative	?									0.634	4.79***	0.693	6.24***
EA6 - More negative	?									2.680	5.34***	2.393	6.98***
ΔLagged equity BV	?	0.807	11.12***	0.164	1.90*	0.809	11.26***	0.225	2.53**	0.813	11.45***	0.219	2.44**
Neg. ΔLagged equity BV	?	(0.830)	(5.73)***	(0.878)	(5.40)***	(0.831)	(5.83)***	(0.999)	(5.81)***	(0.837)	(5.98)***	(0.970)	(5.63)***
ΔDividends	?	(0.045)	(0.13)	2.176	5.01***	(0.024)	(0.07)	2.139	5.04***	0.001	0.00	2.178	5.09***
Book-to-market	?	(0.177)	(11.15)***	(0.232)	(12.42)***	(0.188)	(11.91)***	(0.249)	(12.29)***	(0.186)	(11.91)***	(0.245)	(12.24)***
Adjusted R^2		14.7%		19.9%		15.4%		20.7%		15.8%		21.3%	
Number of observations		3 968		5 975		3 968		5 975		3 968		5 975	

(7a) : $R_{i,t} = a_0 + a_1E_{i,t} + a_2(D1*E_{i,t}) + a_3\Delta E_{i,t} + a_4(D2*\Delta E_{i,t}) + a_5PEA_{BEFORE/AFTER} + a_6NEA_{BEFORE/AFTER} + a_7\Delta B_{i,t-1} + a_8(D3*\Delta B_{i,t-1}) + a_9\Delta D_{i,t} + a_{10}BM_{i,t} + \varepsilon_{i,t}$

(7b) : $R_{i,t} = a_0 + a_1E_{i,t} + a_2(D1*E_{i,t}) + a_3\Delta E_{i,t} + a_4(D2*\Delta E_{i,t}) + a_{5,k}[EA_{BEFORE/AFTER}\ (k)_{i,t}] + a_7\Delta B_{i,t-1} + a_8(D3*\ \Delta B_{i,t-1}) + a_9\Delta D_{i,t} + a_{10}BM_{i,t} + \varepsilon_{i,t}$

6. Robustness checks

In this section I perform the following robustness checks to verify that my results hold also in a more general setting. My robustness checks are divided into two main categories based on whether the concern is on the EA variable definition or whether the robustness checks test for the results in general. Moreover, I test my results with three different regression types; the standard linear regression with Huber-White robust standard errors, with the different lags of Newey-West estimator, and finally with the Fama MacBeth (1973) method. The results between the Huber-White and Newey-West methods are effectively equally significant, but the Fama Macbeth (1973) method that Cao et al. (2011) use in studying the EA, provide very low significances with my data due to the shorter time window from 1995 to 2012. Hence, I conclude that my results are robust for the different regression methods. Secondly, I follow Cao et al. (2011) in dropping the outlier observations with very low stock price, < 2USD, but my results are also robust for alternative cut-off points such as 1USD and 3USD. Thirdly, my data is winsorized at the 0.5% level, and this cut-off is also robust to alternative figures such as 1% or 5%, with the remark that the more the extreme observations are smoothed, the more significant the results relatively become. However, the overall interpretation of the results remains the same. Next, I present the two categories of more specified robustness checks.

6.1 General robustness checks

6.1.1 Earnings variable valuation being conditional on the level of profitability

My research questions analyze the unconditional valuation of EA, but it is possible that the valuation of EA is conditional on some fundamental variables. I follow Chen and Zhang (2007), who show that the valuation of earnings variables is conditional on the level of profitability, which is measured by ROE, and which is calculated as the earnings scaled by the book value of equity at the beginning of the year ($ROE_t = OI_t / BV_{t-1}$). The ROE_t figures are partitioned into low, medium and high levels, which I interact with the change in earnings (ΔE_t) and with different EA variables in the long-window returns regressions. The ROE partitions are $ROE_{(L/M/H)t}$ describing the low, medium and high earnings levels. Below, I describe the regression equation to analyze the EA association being conditional on the profitability.

$$R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3(ROE_{(L/M/H)} * \Delta E_{i.t}) + a_4(D2 * \Delta E_{i.t}) + a_5(ROE_{(L/M/H)} * EA_t) + a_6\Delta B_{i.t-1} + a_7(D3 * \Delta B_{i.t-1}) + a_8\Delta D_{i.t} + a_9BM_{i.t} + \varepsilon_{i.t} \qquad (11)$$

The results suggest small differences in the significances of the different EA variables, but the overall results hold that EA is a highly significant explanatory factor in the long-window returns irrespective of the profitability of the firm.

6.1.2 The returns being sensitive to the analyst forecast estimation period

I test the analyst forecast estimation period sensitiveness to the first research question hypotheses H4 and H5. I study my results with the EPS forecast periods of one quarter, one year, and the forecast of earnings growth rate for five years. I also attempt to use the EBIT forecasts, but the I/B/E/S data availability for EBIT forecasts is extremely low. Overall, the results between the different forecast periods are generally similar, despite the small differences in the coefficient significances. These small differences can derive both from the differences in the variable informativeness, and from the differences in the variable data availability. My results are in line with the literature of Cao et al. (2011), and do not find support that the forecast estimation period would significantly affect the results.

6.1.3 Using alternative measures of earnings

Income before extraordinary items is the principal earnings measure in my study. However, prior studies of for example Daniel and Titman (2006) and Chan et al. (2003, 2004) use also net income as their earnings measure, which is why I test, whether the earnings change measure from earnings before extraordinary item to net income after taxes would affect my results. The results are very similar with both earnings measures for both annual and quarterly data, which is also in line with the prior literature of Cao et al. (2011).

6.1.4 Controlling for the lagged change in earnings

EA represents the change in earnings growth from t-1 to t, and these terms are comprised of earnings in t, t-1 and t-2. I assume that the pattern is informative in a way that the lagged changes in earnings are not as informative as the current ones. I test this by replacing the current EA with the lagged one in the regressions (1a) and (1b). The results suggest that the EA with one lag is still informative, but the two-lag EA starts already losing the significance to some extent especially for the negative EA.

6.1.5 Using squared earnings variables

I examine whether the inclusion of squared earnings and squared changes in earnings in the contemporaneous long-window returns model would affect the results. The squared earnings are meant to control for nonlinearities, but the outcome is that the EA coefficients are still highly significant, and the overall results remain unchanged.

6.1.6 Predicting earnings beyond t+1

I redefine the dependent variable in the earnings prediction tests in H2 by replacing the future earnings in t+1 with the future earnings in t+2 and t+3, and test whether this affects the EA information value. Like Cao et al. (2011), I also find consistent results that the current period EA affects also the future earnings in t+2 and t+3.

6.2 Robustness checks for using alternative measures of EA

6.2.1 Deflating EA by market value of equity

In order to measure how the EA deflator affects the results, I calculate the EA as the change in total dollar earnings in year t minus the change in total dollar earnings in year t-1, deflated by the market value of equity at the beginning of year t. Cao et al. (2011) report weaker statistical significances for dollar change earnings regressions, which are similar to my own results and suggest that the dollar-deflated positive EA coefficient is not significant.

6.2.2 Measuring EA over a longer window

I prolong the EA measurement period to the change in five-year earnings growth rates. According to the hypothesis, this should weaken mostly the short-window results, because the EA information would in this case be fairly old. My short-window results are not significant in the original setting, which is why I cannot draw inferences from the prolonged setting. For the long-window returns, the positive EA is not significant, which supports that the most recent EA information is the most valuable, as expected.

Up to this point, I have presented and analyzed all the research questions and performed an exhaustive set of robustness checks, which confirms my reported results also in a more general setting. In the next chapter, I present the conclusions for my study.

7. Conclusions

In my thesis, I empirically study what drives current earnings acceleration, which is defined as the change in earnings growth, and whether it conveys valuable information to the investors in the European setting. The results strongly support the prior findings that the EA incrementally explains the annual long-window returns, future earnings, and analyst forecast revisions. My first research questions build on the prior work of Ohlson and Juettner-Nauroth (2005) and Cao et al. (2011), whereas my second research questions expands the existing literature and attempts to bring new insights by finding strong evidence that the EA information value derives from the cash flow and not from the accruals component of earnings. I also discover that the EA information is generally non-dependent on the company size and does not change over time.

The prior EA literature studies only annual earnings reports. Whereas, in my study, I extend the analyses to cover also the quarterly data and I find significant results that the overall annual and quarterly information value is very similar. However, based on my results, there are small differences in the specific EA patterns that convey this information, and the evidence suggests that the quarterly and annual information may have complementary value. Below, in the Table 17, I report summarized the results of all of my hypotheses for the two research questions.

Finally, the EA literature remains still very scarce, and offers several interesting and unexploited topics for further research. One suggested topic would be to further analyze the variables that the EA information is conditional on, and to study the possibility of constructing a profitable EA trading strategy. Conclusively, my study extends the academic literature of EA information value to the investors and contributes to the body of justifications, why in practice, so many investment managers and financial analysts take the EA information into consideration.

Table 17: Summary results of the hypotheses

In this table, I summarize the results for each of the eight hypotheses and their sub-hypotheses based on both annual and quarterly evidence. The short-window results show NBE = no base for evaluation, but otherwise my results are in general in line with those of prior literature, especially Cao et al. (2011).

Hypothesis	▨ Strong support ▧ Moderate support ☐ No support / No base for evaluation (NBE) **Summary description**	**Annual Results**	**Quarterly Results**
H1a	EA is a significant explanatory factor for the contemporaneous returns in long-window	Strong support	Strong support
H1b	EA is a significant explanatory factor for the contemporaneous returns in short-window	NBE	NBE
H2	EA is a significant explanatory factor for the next period reported earnings	Strong support	Strong support
H3	EA is a significant explanatory factor for analyst 1- year earnings per share (EPS) forecast revisions around earnings report dates	Moderate support	No support
H4a	Both EA and analyst long-term EPS growth revision variables are significant explanatory factors for the contemporaneous returns in long-window	Strong support	Strong support
H4b	Both EA and analyst long-term EPS growth revision variables are significant explanatory factors for the contemporaneous returns in short-window	NBE	NBE
H5a	EA from the cash flow is more significant explanatory factor for the contemporaneous returns in long-window than EA from the accruals	Strong support	Strong support
H5b	EA from the cash flow is more significant explanatory factor for the contemporaneous returns in short-window than EA from the accruals	NBE	NBE
H6a1	EA is a similarly significant explanatory factor for the contemporaneous returns in long-window for both large and middle cap companies	Strong support	No support
H6a2	EA is a similarly significant explanatory factor for the contemporaneous returns in short-window for both large and middle cap companies	NBE	NBE
H6b	EA is a similarly significant explanatory factor for explaining next period reported earnings for both large and middle cap companies	Moderate support	Strong support
H6c	EA is a similarly significant explanatory factor for explaining analyst 5-year earnings per share (EPS) growth rate forecast revisions for both large and middle cap companies	Moderate support	No support
H7	EA is a similarly significant explanatory factor for the contemporaneous returns in long-window before and after the year 2008	Strong support	NBE
H8	EA is a similarly significant explanatory factor for the quarterly and annual data analyses	Strong support	

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9. APPENDIX

9.1 APPENDIX A. List of variables and their sources

Table 18: Data availability justifying my sample period of 1995-2012

Item	**Database**	**1990**	**1995**	**2000**	**2005**	**2010**
Stock Price	Datastream	55%	64%	77%	88%	95%
Total Assets	Worldscope	61%	73%	87%	94%	99%
EBIT	Worldscope	61%	73%	86%	94%	99%
Equity Book Value	Worldscope	62%	73%	87%	94%	99%
Annual Dividends	Reuters	7%	47%	72%	85%	91%
Shares Outstanding	Worldscope	57%	70%	83%	93%	99%
Operating income	Reuters	10%	66%	85%	94%	99%
Operating Cash Flow	Reuters	7%	53%	79%	94%	99%

Table 19: List of variables and their sources

Symbol	**Name**	**Database**	**Definition**
TA	Total assets	Worldscope	TF.FN.TotalAssets
BV	Book value of equity	Worldscope	TF.FN.TotalCommonEquity
EBIT	EBIT	Worldscope	TF.FN.OperatingIncome
D	Dividends	Reuters	TF.RF.TotalCashDividendsPaid
Shares	Shares outstanding	Worldscope	TF.FN.CommonSharesOutstanding
OI_1	Net income before extraordinary items	Reuters	TF.RF.NetIncomeBeforeExtraItems
OI_2	Net income after taxes	Reuters	TF.RF.NetIncomeAfterTaxes
FCAST	Mean analyst EPS forecast	I/B/E/S	TF.ES.EPS.Mean
OCF	Operating cash flow	Reuters	TF.RF.CashFromOperatingActivities
P_{Close}	Stock closing price	Datastream	Adjusted closing price in USD

Table 20: Annual distribution of annual and quarterly observations

This table illustrates how the number of observations in the sample decreases as the distance from the end period year 2012, increases. The historical data availability issue is more severe with the quarterly than with the annual data, making the quarterly data distribution very skewed to the right

Year	**% Annual**	**% Quarterly**
1995	4.0%	1.0%
1996	4.4%	1.0%
1997	4.7%	1.0%
1998	4.9%	1.2%
1999	5.1%	2.1%
2000	5.3%	0.9%
2001	5.5%	3.6%
2002	5.7%	5.7%
2003	5.9%	6.6%
2004	6.1%	7.3%
2005	6.4%	7.6%
2006	6.5%	8.4%
2007	6.6%	8.9%
2008	6.7%	9.2%
2009	6.8%	9.5%
2010	6.8%	9.7%
2011	6.9%	10.1%
2012	1.6%	6.0%

9.2 APPENDIX B. Quarterly data regression tables

Table 21: Descriptive statistics and correlations for quarterly data

This table presents the descriptive statistics and Pearson correlation coefficients for the quarterly data sample. The sample consists of 23 596 firm-quarter observations from 1995 to 2012. The variables are defined in the Table 4 and the EA partitions in the Figure 3. The EA partition statistics reported in Panels A-C are based on non-zero EAs in each partition. For example the mean of EA2 is based on 4 522 observations. All variables are winsorized at the top and the bottom 0.5% to control for outliers. ***, **, and * indicate significances at 1, 5, and 10% levels based on two-tailed t-tests. The *t* statistics are based on the means and standard errors of the yearly values as in Newey-West (1987), and they are adjusted for serial correlation.

	EA	EA1	EA2	EA3	EA4	EA5	EA6
Panel A: Distribution of earnings acceleration							
N	16 107	1 070	5 405	1 074	1 522	5 922	1 114
N%	100%	7%	34%	7%	9%	37%	7%
Mean	(0.000)	0.022	0.027	(0.007)	0.011	(0.026)	(0.021)
Standard deviation	0.042	0.036	0.044	0.012	0.021	0.045	0.029
Minimum	(0.224)	0.000	0.000	(0.087)	0.000	(0.336)	(0.210)
Q1	(0.010)	0.004	0.004	(0.008)	0.001	(0.028)	(0.025)
Median	(0.000)	0.011	0.012	(0.003)	0.004	(0.012)	(0.012)
Q3	0.010	0.024	0.030	(0.001)	0.012	(0.004)	(0.005)
Max	0.225	0.274	0.338	(0.000)	0.175	(0.000)	(0.000)

Panel B: Key variables	EA	EA1	EA2	EA3	EA4	EA5	EA6
ST-RETURN							
N	13 120	688	3 678	741	939	3 994	751
Mean	0.002	0.011	0.005	(0.002)	0.004	(0.002)	(0.005)
Median	0.000	0.008	0.002	(0.002)	0.003	(0.002)	(0.003)
Std	0.062	0.060	0.063	0.065	0.061	0.062	0.070
LT-RETURN							
N	22 066	1 032	5 212	1 031	1 415	5 655	1 071
Mean	0.163	0.146	0.150	0.172	0.197	0.162	0.141
Median	0.113	0.101	0.108	0.116	0.150	0.108	0.078
Std	0.502	0.470	0.498	0.552	0.499	0.504	0.586
MARKET VALUE. (M$)							
N	15 626	1 038	5 255	1 044	1 463	5 746	1 080
Mean	8010	7520	8160	8440	6420	8150	8710
Median	1940	1850	1940	2070	1900	1930	1970
Std	17600	15000	17700	19300	13600	18000	19900
EARNINGS							
N	15 584	1 036	5 248	1 044	1 450	5 730	1 076
Mean	0.019	0.042	0.024	0.010	0.029	0.015	-0.008
Median	0.018	0.027	0.019	0.013	0.021	0.016	0.011
Std	0.046	0.068	0.039	0.037	0.044	0.046	0.088
CHANGE IN EARNINGS							
N	15 584	1 036	5 248	1 044	1 450	5 730	1 076
Mean	0.002	0.043	0.023	(0.018)	0.017	(0.018)	(0.045)
Median	0.001	0.015	0.007	(0.007)	0.007	(0.005)	(0.015)
Std	0.056	0.100	0.063	0.034	0.040	0.049	0.116
EARNINGS GROWTH							
N	16 107	1 070	5 405	1 074	1 522	5 922	1 114
Mean	0.001	0.020	0.011	(0.009)	0.010	(0.010)	(0.017)
Median	0.000	0.010	0.004	(0.004)	0.005	(0.003)	(0.009)
Std	0.025	0.033	0.025	0.016	0.017	0.023	0.026
BOOK-TO-MARKET							
N	15 626	1 038	5 255	1 044	1 463	5 746	1 080
Mean	0.788	0.841	0.784	0.811	0.743	0.781	0.836
Median	0.582	0.610	0.581	0.603	0.565	0.578	0.587
Std	0.770	0.937	0.752	0.739	0.676	0.757	0.923
ROA (T+1)							
N	20221	1011	5089	1023	1399	5569	1072
Mean	0.015	0.015	0.018	0.012	0.014	0.013	0.014
Median	0.011	0.011	0.013	0.010	0.011	0.010	0.011
Std	0.028	0.028	0.029	0.028	0.026	0.029	0.027
CHANGE IN DIVIDENDS							
N	6 272	368	1 872	419	527	2 116	488
Mean	(0.001)	(0.001)	0.001	(0.001)	(0.003)	(0.002)	(0.003)
Median	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	0.000
Std	0.023	0.026	0.026	0.018	0.019	0.021	0.020

Panel C: Pearson correlations	EA	EA1	EA2	EA3	EA4	EA5	EA6
ST-RETURN	0.038***	(0.029)	0.014	0.005	0.010	0.007	0.002
LT-RETURN	(0.010)	0.008	(0.009)	(0.057)*	0.069***	(0.014)	(0.014)
MARKET VALUE. (M$)	(0.001)	(0.118)***	(0.083)***	0.088***	(0.087)***	0.084***	0.112***
EARNINGS	0.200***	0.248***	0.031***	0.157***	0.137***	0.208***	0.331***
CHANGE IN EARNINGS	0.569***	0.575***	0.541***	0.529***	0.333***	0.438***	0.505***
EARNINGS GROWTH	0.829***	0.924***	0.838***	0.787***	0.635***	0.764***	0.842***
BOOK-TO-MARKET	0.004	(0.046)	(0.047)***	0.020	(0.075)***	0.072***	0.017
ROA (T+1)	0.095***	0.118***	0.205***	(0.056)*	0.043	(0.004)	(0.139)***
CHG IN DIVIDENDS	0.034***	(0.082)	(0.005)	0.053	0.002	0.015	0.000

Table 22: Regression of three-day cumulative raw returns on EA

This table presents the regression results of short-window returns around earnings announcement on EA. The dependent variable, $R_{i.t}$ is three-day [-1; +1] cumulative stock return around annual earnings announcement for firm *i* in each fiscal year t. The results are obtained from 19 051 firm-year observations. All the other variables and regression characteristics are defined as in Table 7.

Independent variable	Pred. Sign	Benchmark model		Model (1a)		Model (1b)	
		Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	(0.002)	(0.28)	(0.001)	(0.23)	(0.001)	(0.14)
Earnings	+	(0.043)	(1.46)	(0.040)	(1.38)	(0.044)	(1.43)
Neg. Earnings	-	(0.091)	(0.80)	(0.079)	(0.76)	(0.076)	(0.76)
ΔEarnings	+	(0.000)	0.00	(0.017)	(0.79)	(0.022)	(0.97)
Neg. ΔEarnings	-	0.026	0.73	0.014	0.33	0.011	0.22
PEA - Positive EA	+			0.042	1.56		
NEA - Negative EA	+			0.060	1.31		
EA1 - More positive	+					0.214	2.42**
EA2 - Revert to positive	+					0.028	1.22
EA3 - Less negative	+					0.224	0.73
EA4 - Less positive	+					0.034	0.26
EA5 - Revert to negative	+					0.038	1.00
EA6 - More negative	+					0.203	1.40
ΔLagged equity BV	-	0.081	1.26	0.090	1.20	0.086	1.18
Neg. ΔLagged equity BV	?	(0.052)	(0.99)	(0.062)	(0.96)	(0.056)	(0.90)
ΔDividends	?	(0.002)	(0.03)	(0.016)	(0.32)	(0.007)	(0.12)
Book-to-market	?	0.005	0.97	0.004	0.87	0.005	0.95
Adjusted R^2		3.2%		3.4%		3.6%	
Number of observations		3 211		3 173		3 173	

(1a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

(1b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

Table 23: Quarterly regressions of annual raw returns on EA

This table presents the regression results of quarterly buy-and-hold returns for firm i over the period 9 months before to 3 months after the firm's t fiscal quarter end. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred.	Benchmark model		Model (1a)		Model (1b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.174	14.49***	0.185	14.23***	0.188	14.10***
Earnings	+	2.711	7.79***	2.669	7.67***	2.686	7.66***
Neg. Earnings	-	(3.088)	(5.56)***	(3.077)	(5.46)***	(3.072)	(5.42)***
ΔEarnings	+	0.029	0.12	0.331	0.98	0.320	0.97
Neg. ΔEarnings	-	0.728	1.79*	0.252	0.48	0.159	0.30
PEA - Positive EA	+			(0.746)	(2.15)**		
NEA - Negative EA	+			0.631	2.07**		
EA1 - More positive	+					(2.697)	(1.96)*
EA2 - Revert to positive	+					(0.685)	(1.94)*
EA3 - Less negative	+					2.246	0.78
EA4 - Less positive	+					(0.432)	(0.18)
EA5 - Revert to negative	+					0.661	2.15**
EA6 - More negative	+					2.147	1.85*
ΔLagged equity BV	-	(0.788)	(6.47)***	(0.729)	(5.97)***	(0.737)	(5.98)***
Neg. ΔLagged equity BV	?	(0.167)	(0.93)	(0.357)	(1.89)*	(0.341)	(1.80)*
ΔDividends	?	(0.527)	(2.22)**	(0.563)	(2.34)**	(0.562)	(2.32)**
Book-to-market	?	(0.147)	(11.14)***	(0.160)	(11.40)***	(0.161)	(11.41)***
Adjusted R^2		9.9%		10.3%		10.3%	
Number of observations		5 928		5 747		5 747	

(1a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

(1b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + u_{i.t}$

Table 24: Quarterly regressions of future earnings on EA

This table presents the regression results of one-year ahead future earnings on EA. The dependent variable $E_{i.t+1}$ = $ROA_{i \cdot t+1}$. or operating income after depreciation for firm i in t + 1 scaled by total assets at the end of quarter t; D1 = an indicator set to 1 if $ROA_{i.t}$ is negative. 0 otherwise; D2 = an indicator set to 1 if $\Delta ROA_{i.t}$ is negative, 0 otherwise. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred.	Benchmark model		Model (1a)		Model (1b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.020***	23.77	0.017	17.74***	0.017	17.26***
Earnings	+	0.189***	7.66	0.196	8.15***	0.191	7.91***
Neg. Earnings	-	(0.060)	(1.22)	(0.100)	(1.77)*	(0.094)	(1.62)
ΔEarnings	-	(0.030)	(1.23)	(0.120)	(4.39)***	(0.116)	(4.21)***
Neg. ΔEarnings	+	(0.011)	(0.29)	0.172	3.56***	0.158	3.25***
PEA - Positive EA	+			0.175	4.83***		
NEA - Negative EA	?			(0.144)	(3.42)***		
EA1 - More positive	+					0.424	3.34***
EA2 - Revert to positive	+					0.165	4.72***
EA3 - Less negative	+					0.133	0.68
EA4 - Less positive	+					0.479	2.73***
EA5 - Revert to negative	+					(0.147)	(3.33)***
EA6 - More negative	+					(0.132)	(1.44)
ΔLagged equity BV	?	0.017	1.93*	0.015	1.64	0.016	1.71*
Neg. ΔLagged equity BV	?	(0.025)	(1.99)**	(0.019)	(1.35)	(0.021)	(1.44)
ΔDividends	+	(0.008)	(0.70)	(0.010)	(0.85)	(0.010)	(0.84)
Book-to-market	-	(0.012)	(12.09)***	(0.010)	(9.34)***	(0.010)	(9.40)***
Adjusted R^2		9.3%		11.3%		11.4%	
Number of observations		5 675		5 492		5 492	

(2a) : $E_{i.t+1} = b_0 + b_1E_{i.t} + b_2(D1 * E_{i.t}) + b_3\Delta E_{i.t} + b_4(D2 * \Delta E_{i.t}) + b_5PEA_{i.t} + b_6NEA_{i.t} + b_7\Delta B_{i.t-1} + b_8(D3 * \Delta B_{i.t-1}) + b_9\Delta D_{i.t} + b_{10}BM_{i.t} + e_{i.t}$

(2b) : $E_{i.t+1} = b_0 + b_1E_{i.t} + b_2(D1 * E_{i.t}) + b_3\Delta E_{i.t} + b_4(D2 * \Delta E_{i.t}) + b_{5.k}[EA(k)_{i.t}] + b_7\Delta B_{i.t-1} + b_8(D3 * \Delta B_{i.t-1}) + b_9\Delta D_{i.t} + b_{10}BM_{i.t} + e_{i.t}$

Table 25: Quarterly regressions of analyst forecast revision on EA

This table presents the regression results of analyst one-year-ahead earnings forecast revision on EA. The dependent variable, analyst 1-year-ahead earnings forecast revision (FRY1) is defined as the natural logarithm of the percentage mean (consensus) analysts' earnings forecast (EPS) revision of firm i for year t + 1 that becomes available to the market as soon as the quarterly earnings of year t are announced. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred.	Benchmark model		Model (1a)		Model (1b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	(2.786)	(24.03)***	(2.865)	(22.19)***	(2.916)	(22.28)***
Earnings	?	(0.091)	(0.03)	0.397	0.12	(0.247)	(0.08)
Neg. Earnings	?	(0.430)	(0.08)	(0.704)	(0.12)	(0.721)	(0.12)
ΔEarnings	?	4.701	1.39	1.173	0.31	0.808	0.22
Neg. ΔEarnings	?	(4.665)	(0.82)	(0.600)	(0.10)	1.361	0.22
PEA - Positive EA	?			7.004	1.72*		
NEA - Negative EA	?			(2.110)	(0.68)		
EA1 - More positive	?					2.014	1.55
EA2 - Revert to positive	?					7.194	1.69*
EA3 - Less negative	?					(6.359)	(2.14)**
EA4 - Less positive	?					5.335	1.45
EA5 - Revert to negative	?					(2.986)	(0.93)
EA6 - More negative	?					(1.395)	(1.52)
ΔLagged equity BV	?	1.575	1.33	1.730	1.43	1.882	1.54
Neg. ΔLagged equity BV	?	(3.793)	(1.94)*	(3.916)	(1.95)*	(4.281)	(2.10)**
ΔDividends	?	0.346	0.14	0.288	0.12	0.617	0.25
Book-to-market	?	0.390	3.30***	0.432	3.57***	0.443	3.66***
Adjusted R^2		9.3%		11.3%		11.4%	
Number of observations		640		634		634	

(3a) : $FRY_{i.t} = c_0 + c_1E_{i.t} + c_2(D1 * E_{i.t}) + c_3\Delta E_{i.t} + c_4(D2 * \Delta E_{i.t}) + c_5PEA_{i.t} + c_6NEA_{i.t} + c_7\Delta B_{i.t-1} + c_8(D3 * \Delta B_{i.t-1}) + c_9\Delta D_{i.t} + c_{10}BM_{i.t} + ς_{i.t}$

(3b) : $FRY_{i.t} = c_0 + c_1E_{i.t} + c_2(D1 * E_{i.t}) + c_3\Delta E_{i.t} + c_4(D2 * \Delta E_{i.t}) + c_{5.k}[EA(k)_{i.t}] + c_7\Delta B_{i.t-1} + c_8(D3 * \Delta B_{i.t-1}) + c_9\Delta D_{i.t} + c_{10}BM_{i.t} + ς_{i.t}$

Table 26: Regressions of three-day returns on EA and the change in forecasts

This table presents the regression results of short-window stock returns on earnings acceleration and the change in analysts' long-term-growth forecasts. The dependent variable, $R_{i,t}$ is three-day [-1; +1] cumulative stock return around annual earnings announcement for firm *i* in each fiscal year t and the ΔLTG is the mean (consensus) analysts' forecast of long-term growth in earnings (5y EPS growth rate) immediately after earnings announcement minus the last available forecast immediately before the announcement. The results are obtained from 19 051 firm-year observations. All the other variables and regression characteristics are defined as in Table 7

Independent variable	Pred.	Benchmark model		Model (4a)		Model (4b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	(0.014)	(1.03)	(0.014)	(0.99)	(0.013)	(1.00)
Earnings	+	0.004	0.11	0.001	0.02	0.006	0.18
Neg. Earnings	-	(0.399)	(1.11)	(0.379)	(1.09)	(0.391)	(1.13)
ΔEarnings	+	(0.076)	(1.35)	(0.102)	(1.39)	(0.119)	(1.62)
Neg. ΔEarnings	-	0.161	1.24	0.169	1.17	0.178	1.26
PEA - Positive EA	+			0.061	1.12		
NEA - Negative EA	+			0.035	0.75		
EA1 - More positive	+					0.347	2.21**
EA2 - Revert to positive	+					0.054	1.00
EA3 - Less negative	+					0.193	0.56
EA4 - Less positive	+					(0.064)	(0.29)
EA5 - Revert to negative	+					0.015	0.33
EA6 - More negative	+					0.231	1.57
ΔLagged equity BV	-	0.174	1.13	0.187	1.11	0.182	1.09
Neg. ΔLagged equity BV	?	(0.159)	(0.99)	(0.177)	(0.99)	(0.167)	(0.95)
ΔDividends	?	(0.034)	(0.40)	(0.055)	(0.69)	(0.044)	(0.55)
Book-to-market	?	0.011	1.22	0.011	1.16	0.011	1.20
ΔLT-forecast growth	+	0.068	2.48**	0.069	2.51**	0.076	2.71***
Adjusted R^2		9.4%		9.6%		10.1%	
Number of observations		1 682		1 665		1 665	

(4a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

(4b) :$R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

Table 27: Quarterly regressions of annual returns on EA and the change in forecasts

This table presents the regression results of analyst one-year-ahead earnings forecast revision on EA. The dependent variable, $R_{i.t}$ is annual buy-and-hold return for firm i over the period 9 months before to 3 months after the firm's t fiscal quarter end, and the ΔLTG is the mean (consensus) analysts' forecast of long-term growth in earnings (5y EPS growth rate) immediately after earnings announcement minus the last available forecast immediately before the announcement. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred.	Benchmark model		Model (4a)		Model (4b)	
	Sign	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.170	7.41***	0.192	7.52***	0.195	7.35***
Earnings	+	1.997	2.97***	1.919	2.73***	2.004	2.83***
Neg. Earnings	-	(5.507)	(4.99)***	(5.145)	(4.39)***	(5.255)	(4.54)***
ΔEarnings	+	1.513	2.63***	2.174	2.81***	2.281	2.88***
Neg. ΔEarnings	-	1.426	1.54	0.230	0.20	0.024	0.02
PEA - Positive EA	+			(1.183)	(2.02)**		
NEA - Negative EA	+			0.773	1.42		
EA1 - More positive	+					(3.979)	(2.05)**
EA2 - Revert to positive	+					(1.205)	(1.97)**
EA3 - Less negative	+					1.227	0.29
EA4 - Less positive	+					(3.156)	(0.73)
EA5 - Revert to negative	+					0.707	1.34
EA6 - More negative	+					2.753	1.40
ΔLagged equity BV	-	(1.321)	(4.56)***	(1.304)	(4.46)***	(1.328)	(4.42)***
Neg. ΔLagged equity BV	?	(0.513)	(0.94)	(0.514)	(0.94)	(0.465)	(0.84)
ΔDividends	?	(1.495)	(3.55)***	(1.506)	(3.50)***	(1.526)	(3.53)***
Book-to-market	?	(0.205)	(8.34)***	(0.221)	(8.48)***	(0.222)	(8.41)***
ΔLT-forecast growth	+	0.536	4.24***	0.543	4.22***	0.546	4.21***
Adjusted R^2		14.0%		14.3%		14.3%	
Number of observations		2 462		2 604		2 604	

(4a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{i.t} + a_6NEA_{i.t} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

(4b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + a_{11}\Delta LTG_{i.t} + \varepsilon_{i.t}$

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Table 28: Quarterly regressions of annual returns on EA of cash flow and accruals

This table presents the regression results for the EA that derives from either cash flow or accruals component of earnings. The dependent variable $R_{i.t}$ is the annual buy-and-hold return for firm i. EA_{OCF} is the cash flow component, and $EA_{ACCRUALS}$ is the accruals EA component. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred. Sign	Benchmark model				Model (5a)				Model (5b)			
		CASH		ACCRUALS		CASH		ACCRUALS		CASH		ACCRUALS	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.172	13.98***	0.170	13.56***	0.184	13.13***	0.178	11.98***	0.174	12.01***	0.177	11.42***
Earnings	?	2.641	7.61***	2.574	7.30***	2.647	7.63***	2.593	7.37***	2.607	7.65***	2.593	7.37***
Neg. Earnings	?	(3.221)	(5.73)***	(3.231)	(5.54)***	(3.219)	(5.72)***	(3.235)	(5.54)***	(3.188)	(5.71)***	(3.238)	(5.56)***
ΔEarnings	?	(0.024)	(0.09)	(0.062)	(0.23)	(0.008)	(0.03)	(0.047)	(0.18)	(0.005)	(0.02)	(0.039)	(0.14)
Neg. ΔEarnings	?	1.043	2.49**	1.098	2.48**	1.026	2.44**	1.057	2.38**	1.031	2.46**	1.057	2.38**
EA	?	0.004	0.06	0.031	0.42								
PEA - Positive EA	?					(0.193)	(1.53)	(0.077)	(0.61)				
NEA - Negative EA	?					0.197	1.69*	0.151	1.17				
EA1 - More positive	?									0.175	0.31	0.242	0.91
EA2 - Revert to positive	?									(0.353)	(2.74)***	(0.155)	(1.19)
EA3 - Less negative	?									8.142	2.77***	(0.151)	(0.28)
EA4 - Less positive	?									1.547	2.69***	(0.528)	(1.14)
EA5 - Revert to negative	?									0.193	1.45	0.206	1.57
EA6 - More negative	?									(0.091)	(0.50)	(0.075)	(0.16)
ΔLagged equity BV	?	(0.767)	(6.00)***	(0.745)	(5.67)***	(0.773)	(6.00)***	(0.746)	(5.67)***	(0.783)	(6.04)***	(0.745)	(5.67)***
Neg. ΔLagged equity BV	?	(0.309)	(1.61)	(0.391)	(1.96)**	(0.308)	(1.60)	(0.396)	(1.98)**	(0.307)	(1.58)	(0.400)	(2.01)**
ΔDividends	?	(0.543)	(2.04)**	(0.611)	(2.30)**	(0.504)	(1.89)*	(0.590)	(2.21)**	(0.567)	(2.11)**	(0.644)	(2.37)**
Book-to-market	?	(0.149)	(11.05)***	(0.151)	(10.90)***	(0.152)	(11.08)***	(0.154)	(10.88)***	(0.148)	(10.99)***	(0.153)	(10.81)***
Adjusted R^2		10.1%		9.8%		10.2%		9.9%		10.7%		9.9%	
Number of observations		5 718		5 557		5 718		5 557		5 718		5 557	

(5a) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{OCF/ACCRUALS} + a_6NEA_{OCF/ACCRUALS} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(5b) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_{5.k}[EA_{OCF/ACCRUALS}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

Table 29: Quarterly regressions of annual raw returns on large and middle cap EA

This table presents the regression results for the EA that derives from either middle or large cap firms. The dependent variable $E_{i.t+1}$ is operating income after depreciation for firm i in t + 1 scaled by total assets at the end of year t. EA_{LARGE} is the EA for the large and EA_{MIDDLE} is the EA for the middle cap subsample. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred. Sign	Benchmark model				Model (6a2)				Model (6b2)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.190	12.35***	0.156	8.53***	0.181	11.11***	0.184	9.42***	0.183	11.06***	0.187	9.20***
Earnings	?	1.970	5.50***	3.240	5.54***	1.982	5.56***	3.252	5.52***	2.008	5.54***	3.280	5.54***
Neg. Earnings	?	(1.491)	(2.50)**	(4.460)	(5.11)***	(1.620)	(2.69)***	(4.224)	(4.94)***	(1.662)	(2.73)***	(4.212)	(4.90)***
ΔEarnings	?	(0.289)	(0.83)	0.004	0.01	(0.603)	(1.52)	0.683	1.43	(0.524)	(1.34)	0.658	1.40
Neg. ΔEarnings	?	0.756	1.54	1.439	2.28**	1.399	2.19**	(0.026)	(0.03)	1.255	1.95*	(0.131)	(0.17)
EA	?	0.048	0.14	(0.103)	(0.44)								
PEA - Positive EA	?					0.765	1.37	(1.354)	(3.15)***				
NEA - Negative EA	?					(0.604)	(0.98)	1.005	2.80***				
EA1 - More positive	?									(0.046)	(0.02)	(3.985)	(2.33)**
EA2 - Revert to positive	?									0.688	1.22	(1.239)	(2.90)***
EA3 - Less negative	?									2.831	0.50	1.851	0.57
EA4 - Less positive	?									(0.236)	(0.08)	0.310	0.09
EA5 - Revert to negative	?									(0.598)	(0.96)	1.076	2.87***
EA6 - More negative	?									(0.182)	(0.08)	2.775	2.04**
ΔLagged equity BV	?	(0.654)	(4.08)***	(0.745)	(4.30)***	(0.665)	(4.16)***	(0.727)	(4.24)***	(0.670)	(4.11)***	(0.736)	(4.27)***
Neg. ΔLagged equity BV	?	(0.063)	(0.27)	(0.650)	(2.33)**	(0.041)	(0.18)	(0.697)	(2.50)**	(0.032)	(0.13)	(0.677)	(2.42)**
ΔDividends	?	(0.135)	(0.48)	(1.079)	(2.75)***	(0.157)	(0.56)	(1.146)	(2.91)***	(0.159)	(0.56)	(1.139)	(2.87)***
Book-to-market	?	(0.121)	(6.90)***	(0.167)	(9.00)***	(0.115)	(6.57)***	(0.191)	(9.47)***	(0.116)	(6.65)***	(0.191)	(9.46)***
Adjusted R^2		7.3%		12.1%		7.4%		12.6%		7.5%		12.6%	
Number of observations		2 355		3 392		2 355		3 392		2 355		3 392	

(6a1) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1 * E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2 * \Delta E_{i.t}) + a_5PEA_{LARGE/MIDDLE} + a_6NEA_{LARGE/MIDDLE} + a_7\Delta B_{i.t-1} + a_8(D3 * \Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(6b1) : $R_{i.t} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

Table 30: Quarterly regressions of future earnings on large and middle cap EA

This table presents the regression results for the earnings acceleration that derives from either middle or large cap firms. The dependent variable $R_{i,t}$ is the annual buy-and-hold return for firm i. EA_{LARGE} is the EA for the large cap subsample and EA_{MIDDLE} is the EA for the middle cap subsample. The results are obtained from 23 596 firm-quarter observations. All other variables and regression characteristics in are defined as in Table 7

Independent variable	Pred. Sign	Benchmark model				Model (6a2)				Model (6b2)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	0.019	19.68***	0.020	15.13***	0.016	14.92***	0.018	11.64***	0.015	14.34***	0.017	11.17***
Earnings	?	0.182	5.65***	0.214	5.59***	0.191	6.15***	0.212	5.78***	0.191	6.53***	0.203	5.36***
Neg. Earnings	?	(0.063)	(1.02)	(0.087)	(1.21)	(0.112)	(1.63)	(0.108)	(1.41)	(0.125)	(1.76)*	(0.096)	(1.23)
ΔEarnings	?	(0.007)	(0.19)	(0.054)	(1.40)	(0.125)	(3.41)***	(0.122)	(3.11)***	(0.123)	(3.32)***	(0.127)	(3.32)***
Neg. ΔEarnings	?	(0.033)	(0.56)	0.022	0.41	0.195	2.71***	0.168	2.55**	0.195	2.74***	0.168	2.55**
EA	?	(0.015)	(0.42)	0.009	0.29								
PEA - Positive EA	?					0.247	3.42***	0.138	3.59***				
NEA - Negative EA	?					(0.236)	(4.81)***	(0.101)	(1.79)*				
EA1 - More positive	?									0.336	1.16	0.459	3.19***
EA2 - Revert to positive	?									0.249	3.89***	0.133	3.42***
EA3 - Less negative	?									(0.651)	(1.71)*	0.319	1.42
EA4 - Less positive	?									0.545	2.63***	0.467	1.92*
EA5 - Revert to negative	?									(0.263)	(4.94)***	(0.110)	(1.89)*
EA6 - More negative	?									(0.211)	(1.54)	(0.122)	(1.07)
ΔLagged equity BV	?	(0.011)	(1.00)	0.039	2.98***	(0.013)	(1.29)	0.037	2.78***	(0.014)	(1.37)	0.039	2.80***
Neg. ΔLagged equity BV	?	0.019	1.25	(0.063)	(2.84)***	0.025	1.67*	(0.058)	(2.54)**	0.027	1.76*	(0.060)	(2.57)***
ΔDividends	?	(0.002)	(0.21)	(0.015)	(0.66)	(0.009)	(0.83)	(0.008)	(0.36)	(0.007)	(0.65)	(0.008)	(0.37)
Book-to-market	?	(0.010)	(7.58)***	(0.013)	(9.80)***	(0.008)	(6.17)***	(0.011)	(7.58)***	(0.008)	(6.30)***	(0.011)	(7.45)***
Adjusted R^2		11.4%		9.3%		15.7%		10.3%		16.2%		10.7%	
Number of observations		2 225		3 267		2 225		3 267		2 225		3 267	

(6a2) : $E_{i.t+1} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_5PEA_{LARGE/MIDDLE} + a_6NEA_{LARGE/MIDDLE} + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(6b2) : $E_{i.t+1} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

Table 31: Quarterly regressions of growth forecasts on large and middle cap EA

This table presents the regression results for the EA that derives from either middle or large cap firms. The dependent variable ΔLTG is the change in mean analysts' forecast of long-term growth in EPS immediately after earnings announcement minus the last available forecast immediately before the announcement. EA_{LARGE} is the EA for the large and EA_{MIDDLE} is the EA for the middle cap subsample. The results are obtained from 23 596 firm-quarter observations.

Independent variable	Pred. Sign	Benchmark model				Model (6a3)				Model (6b3)			
		LARGE		MIDDLE		LARGE		MIDDLE		LARGE		MIDDLE	
		Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat	Coef.	t stat
Intercept	?	(0.003)	(0.53)	0.001	0.15	0.002	0.37	(0.003)	(0.40)	0.000	0.04	(0.006)	(0.82)
Earnings	?	0.006	0.02	(0.261)	(1.37)	(0.046)	(0.19)	(0.241)	(1.26)	(0.017)	(0.07)	(0.250)	(1.23)
Neg. Earnings	?	(0.172)	(0.63)	0.102	0.33	(0.079)	(0.29)	0.009	0.03	(0.116)	(0.40)	0.035	0.11
ΔEarnings	?	0.043	0.23	(0.150)	(0.83)	0.181	0.87	(0.264)	(1.28)	0.170	0.81	(0.271)	(1.28)
Neg. ΔEarnings	?	0.041	0.16	0.314	1.01	(0.215)	(0.72)	0.555	1.50	(0.113)	(0.39)	0.607	1.61
EA	?	(0.139)	(0.91)	0.129	1.42								
PEA - Positive EA	?					(0.422)	(1.68)*	0.293	1.97**				
NEA - Negative EA	?					0.108	0.42	(0.023)	(0.17)				
EA1 - More positive	?									(0.691)	(1.11)	0.504	0.94
EA2 - Revert to positive	?									(0.388)	(1.52)	0.249	1.74*
EA3 - Less negative	?									(1.520)	(1.45)	(1.643)	(0.91)
EA4 - Less positive	?									(0.419)	(0.47)	2.689	1.14
EA5 - Revert to negative	?									0.063	0.24	0.011	0.07
EA6 - More negative	?									(0.520)	(1.06)	(0.811)	(1.17)
ΔLagged equity BV	?	0.024	0.23	0.007	0.09	0.021	0.20	0.009	0.13	0.019	0.18	0.021	0.28
Neg. ΔLagged equity BV	?	0.086	0.55	(0.044)	(0.33)	0.097	0.61	(0.050)	(0.39)	0.097	0.62	(0.071)	(0.54)
ΔDividends	?	0.302	1.31	(0.147)	(1.29)	0.309	1.34	(0.142)	(1.24)	0.316	1.37	(0.144)	(1.25)
Book-to-market	?	0.008	1.25	0.012	1.51	0.005	0.81	0.014	1.74*	0.006	0.99	0.015	1.87*
Adjusted R^2		1.7%		0.7%		2.0%		0.8%		2.2%		1.4%	
Number of observations		1 206		1 373		1 206		1 373		1 206		1 373	

(6a3) : $\Delta LTG_{i.t} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_5PEA_{LARGE/MIDDLE} + a_6NEA_{LARGE/MIDDLE} + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$

(6b3) : $\Delta LTG_{i.t} = a_0 + a_1E_{i.t} + a_2(D1*E_{i.t}) + a_3\Delta E_{i.t} + a_4(D2*\Delta E_{i.t}) + a_{5.k}[EA_{LARGE/MIDDLE}(k)_{i.t}] + a_7\Delta B_{i.t-1} + a_8(D3*\Delta B_{i.t-1}) + a_9\Delta D_{i.t} + a_{10}BM_{i.t} + \varepsilon_{i.t}$