Earnings news, Expected earnings and Aggregate stock returns*

Jung Ho Choi, Alon Kalay, and Gil Sadka †

August 18, 2014

Abstract

In contrast to firm-level relations, prior literature finds aggregate earnings changes and aggregate stock returns are negatively related. This paper constructs new measures of aggregate earnings news based on revisions in analyst forecasts. The findings suggest aggregate earnings news is positively related to contemporaneous stock returns. The results also show that aggregate stock returns are positively related to unexpected aggregate forecast errors, and negatively associated with expected aggregate earnings growth. Taken together, these findings suggest the negative relation between aggregate earnings changes and aggregate contemporaneous stock returns results from the expected component of aggregate earnings, rather than aggregate earnings surprises.

JEL classification: E32, G12, G14, M41

Keywords: Stock prices; Aggregate earnings; Discount rates; Expected returns; Expected Earnings

---

*We would like to thank Dan Amiram, Salman Arif, Phil Berger, Urooj Khan, Doron Nissim, Stephen Penman, Ronnie Sadka, Ayung Tseng, Jim Wahlen, Paul Zarowin, and the workshop participants at the American Accounting Association 2012 Annual Meeting, Conference of Financial Economics and Accounting 2012, European Accounting Association 2013 Annual Meeting, Columbia University, Indiana University, INSEAD, Maastricht University, Ohio State University, SAC, Stanford University, University of Delaware, University of Michigan, and University of Minnesota for their helpful comments and suggestions. Any remaining errors are our own.

†Jung Ho is from the University of Chicago Booth School of Business, Alon is from Columbia University, and Gil is from the University of Texas at Dallas *jchoi4@chicagobooth.edu, ak3318@columbia.edu, Gil.Sadka@utdallas.edu*

1 Introduction

Ever since Ball and Brown [1968], researchers have repeatedly demonstrated that positive firm-level earnings changes result in increased stock prices and positive returns. This association is commonly viewed as a price reaction to cash flow news, whereas changes in earnings represent an earnings surprise that leads to changes in expected cash flows. In addition to providing information about firm-level cash flows, earnings can inform investors about overall economic activity. Specifically, aggregate earnings changes likely represent changes in industrial production, GDP growth, and the ability of the economy as a whole to generate cash flows. However, in contrast to firm-level studies, recent work documents the opposite relation between aggregate earnings changes and aggregate (market) returns (for example: Kothari, Lewellen and Warner [2006], Sadka [2007], Hirshleifer, Hou and Teoh [2009]). These studies document that aggregate earnings changes are negatively related to contemporaneous aggregate stock returns.

If positive aggregate earnings changes do not reflect lower cash flows expectations, then this negative relation must be driven by fluctuations in discount rates. In this context, this literature stream provides two potential explanations for the negative empirical relation. The first hypothesis, which we call the return news hypothesis, suggests aggregate earnings changes proxy for an aggregate earnings surprise, and represent earnings news.[1] This hypothesis suggests investors adjust their required rate of return in response to the earnings surprise. Specifically, investors increase (decrease) the rate of return they demand on their investments when they receive positive (negative) earnings news. This may occur because positive (aggregate) earnings news implies that the riskiness of the projects pursued (in the economy) is higher than expected, which increases

[1] Kothari, Lewellen and Warner [2006] use two additional measures of aggregate earnings surprises that are based on earnings changes. An AR(1) model, and an error term of earnings changes on past earnings changes and past returns. They find a negative contemporaneous relation between returns and these measures as well.

required discount rates. Higher future (required) discount rates result in lower prices, which in turn result in lower stock returns in the current period (e.g., Kothari, Lewellen and Warner [2006], and Kang, Liu and Qi [2010]). This results in a negative contemporaneous relation between aggregate earnings and aggregate returns.

The second hypothesis, which we call the expected earnings hypothesis, suggests that aggregate earnings changes are more predictable than firm-level changes, and thus are not an ideal proxy for aggregate earnings surprises. In other words, changes in aggregate earnings contain less earnings news than firm-level earnings changes. This hypothesis suggests that the negative association between earnings and returns is due to a negative association between *expected earnings* and *expected returns* (e.g., Chen [1991], Sadka [2007], Ball Sadka and Sadka [2009], Sadka and Sadka [2009], and He and Hu [2012]). This hypothesis implies that investors demand lower discount rates when they *expect* higher earnings and cash flows.[2] If aggregate earnings are largely predictable, then returns are lower during periods of higher aggregate earnings growth because investors demand lower returns for their investments when they expect to be wealthier. The expected earnings hypothesis is consistent with consumption based asset pricing, where investors become less risk averse, and demand lower returns for their investments, when their wealth is higher.

Consistent with prior literature, the primary tests in this paper employ an indirect test to examine these hypotheses. Since it is difficult to measure expected returns directly, we cannot examine the components that give rise to the negative relation between aggregate earnings and returns directly. Therefore, we employ an indirect test to shed light on this issue. We further our understanding of the relation between expected earnings and expected returns by examining the

[2]Several studies attempt to distinguish between these hypotheses by examining the relation between earnings, accruals and the discount rate (Hirshleifer, Hou and Teoh [2009], Kang, Liu and Qi [2010], and Guo and Jiang [2011]). However, without a good proxy for expected earnings and earnings news, it is difficult to interpret the association between earnings and future returns. Furthermore, these studies struggle to distinguish between these hypothesis, because they fail to find a relation between changes in aggregate earnings and aggregate future returns.

relation between *earnings news* and stock returns. Our results can be analyzed in conjunction with prior findings regarding the relation between aggregate earnings and returns, to help understand why the later relation is negative. Specifically, we attempt to distinguish between these two hypotheses by improving the measure of earnings news. The return news hypothesis suggests that positive (negative) earnings news results in a negative (positive) stock-price reaction. Therefore, the relation between aggregate earnings news and contemporaneous returns should strengthen (become more negative) when an improved measure of earnings news is employed (due to the reduction in the error component of the earnings news variable). In contrast, the expected earnings hypothesis implies that the negative aggregate relation between earnings changes and stock returns is due to the *expected component* of earnings. Therefore, according to this hypothesis the relation between aggregate unexpected earnings (earnings news) and returns should be less negative or disappear. In sum, the two hypotheses provide different predictions with respect to the relation between earnings news (earnings surprises) and returns.

In order to test these two hypotheses, we introduce three new measures of aggregate earnings news based on analyst forecast revisions (e.g., Chen and Zhao [2009], Da and Warachka [2009]). First, we use aggregate forecast revisions. Second, to control for the fact that analysts are sluggish when responding to new information, we use serially uncorrelated forecast revisions. Finally, since prior studies show that analyst forecasts do not fully incorporate the information contained in prior stock returns, we also purge the information present in prior prices from our serially uncorrelated measure of forecast revisions. Thus, we improve our ability to measure aggregate earnings news with each proposed measure. Furthermore, by examining how our results vary with each proxy, we can test whether our measures represent earnings news, as opposed to expected changes in earnings. If our proposed measures capture earnings news, then our results should strengthen as we remove expected components from our measures.[3]

In contrast to the negative relation between aggregate earnings changes and contemporaneous stock returns, we find that aggregate earnings news is positively related to contemporaneous stock returns. These findings are consistent with firm-level results, suggesting that prices react positively (negatively) to positive (negative) aggregate earnings news. Our findings are consistent with Bonsall, Bozanic and Fischer [2013], which show that *firm-level* management forecasts of bellwether firms are positively related to contemporaneous aggregate stock returns. The results are also consistent with the expected earnings hypothesis which suggests the negative association between aggregate earnings changes and aggregate stock returns results from the negative association between *expected* (aggregate) earnings and *expected* aggregate returns (discount rates). In other words, investors demand lower discount rates when they *expect* higher earnings and cash flows.

In our secondary tests, we construct an analyst based measure of earnings surprise. Specifically, we define an aggregate earnings surprise as the unpredictable component of aggregate analyst forecast errors (unpredictable by prior forecast revisions and prior stock returns). Consistent with our primary findings using forecast revisions, we find that aggregate stock returns are positively associated with unexpected aggregate forecast errors. Finally, as part of our secondary tests we also construct a measure of expected aggregate earnings growth. Specifically, we regress aggregate earnings growth on aggregate forecasts and prior forecast revisions. We use the fitted values of this model as a measure of expected aggregate earnings growth. We find that aggregate stock returns are negatively associated with contemporaneous expected aggregate earnings growth. These findings

[3] The validation tests show that our measures of earning news are positively related to aggregate analyst forecast errors, based on the forecasts made prior to the revision. This implies that our earnings news measures are associated with the earnings news that the market learns prior to the announcement. Furthermore, we find a stronger association when we use our improved measures of earnings news. This further validates our conjecture that aggregate analyst forecast revisions measure aggregate earnings news. Additionally, we find that aggregate forecast revisions are associated with GDP growth and changes in industrial production, which are related to aggregate stock returns (e.g., Fama [1990], Schwert [1990]). Since our sample consists of a sub-sample of large firms, these findings also imply that our aggregate measures capture news related to overall economic activity.

lend further support to the hypothesis that the negative aggregate relation between earnings changes and returns is driven by expected earnings (i.e., expected earnings growth is negatively related to expected returns).

Our paper contributes to the growing literature on the relation between aggregate earnings and aggregate returns in several ways. First, we provide improved measures of aggregate earnings news based on analyst forecasts. Prior literature acknowledges the importance of measuring earnings news and focusing on the relation between aggregate returns and aggregate earnings surprises or news (e.g., Kothari, Lewellen and Warner [2006]; and Sadka and Sadka [2009]). In this paper, we employ improved measures of earnings news, and find opposite results relative to prior studies. While we are not the first to examine aggregate analyst forecasts, our paper highlights the usefulness of our forecast-based measures to this stream of literature. Second, using several new measures we provide evidence that aggregate earnings news (as opposed to aggregate earnings changes) is positively related to market returns, while contemporaneous aggregate stock returns are negatively associated with expected (aggregate) earnings growth. These results are the first to provide empirical evidence of a positive relation between aggregate earnings news and aggregate returns. Finally, we shed light on an outstanding puzzle in this literature stream; why aggregate earnings changes are negatively related to contemporaneous (aggregate) returns, a result that conflicts with the vast amount of firm-level evidence.

The remainder of the paper is organized as follows. Section 2 analyzes the relation between aggregate stock returns and earnings. Section 3 describes our measures of earnings news and tests the validity of our measures. Section 4 describes the empirical evidence on the relation between aggregate earnings news and aggregate stock returns. Section 5 presents our robustness tests. Section 6 concludes.

2 The Relation between Earnings and Returns

The earnings-returns relation can be characterized by the relation between earnings and the different components of stock returns. In this context, the Campbell [1991] return decomposition is a useful tool to understand this relation.[4] Campbell decomposes returns into three components:

$$\begin{aligned} R_t &= E_{t-1}[R_t] + (E_t - E_{t-1})\,[\sum_{j=0}^{\infty} \rho^j \Delta d_{t+j}] - (E_t - E_{t-1})\,[\sum_{j=1}^{\infty} \rho^{j-1} R_{t+j}] \\ &\equiv E_{t-1}[R_t] + N_{cf} - N_R, \end{aligned} \tag{1}$$

where R_t denotes stock returns (in logs) at time t, Δd_t denotes dividend growth (in logs) at time t, ρ is a deflator (the inverse of 1 plus the dividend yield), and $E(\cdot)$ is the expectation operator. Thus, the three components of returns are: expected returns, $E_{t-1}[R_t]$, changes in expected cash flows (cash-flow news, N_{cf}), and changes in expected returns (return news, N_R).

Since Ball and Brown [1968], researchers have studied the contemporaneous earnings-returns relation and the different factors affecting it. These studies commonly estimate the term

$$cov(R_t, \Delta X_t), \tag{2}$$

where ΔX_t denotes changes in earnings or earnings surprises. Firm-level studies generally show that $cov(R_t, \Delta X_t) > 0$. The simple and straightforward interpretation of the positive relation between earnings changes and stock returns is that higher earnings represent an earnings surprise that increases expected cash flows, $cov(N_{cf}, \Delta X_t) > 0$, resulting in a positive association between firm-level earnings changes and firm-level stock returns.

While the interpretation of the positive firm-level relation between earnings changes and stock

[4] See also, Campbell and Shiller [1988a, 1988b], and Cochrane [1991, 2001].

returns is reasonable, and supported by empirical evidence, the relation between earnings changes and stock returns is actually more complex. Hecht and Vuolteenaho [2006] note that the relation between earnings and returns depends not only on the relation between earnings and changes in expected cash flows (cash-flow news, N_{cf}), but also on the relation between earnings and the remaining components of returns. Formally:

$$cov(R_t, \Delta X_t) = cov(E_{t-1}[R_t], \Delta X_t) + cov(N_{cf}, \Delta X_t) - cov(N_R, \Delta X_t). \tag{3}$$

As noted, firm-level analyses show that there is a positive earnings-returns relation, i.e., $cov(R_t, \Delta X_t) > 0$. In terms of Equation (3), $cov(R_t, \Delta X_t) > 0$ because $cov(N_{cf}, \Delta X_t) > 0$.

In contrast to firm-level evidence, aggregate (market-level) analyses show that the relation between aggregate earnings changes and aggregate stock returns is negative, $cov(R_t, \Delta X_t) < 0$. This result is puzzling because one would expect positive cash-flow news to result in higher prices (a positive market reaction). The prior literature that examines this relation uses Equation (3) and the related derivations that follow (Equations (5) and (6)) as the accepted starting point. However, there are two alternative hypotheses presented in the literature related to why the relation between earnings changes and stock returns is negative. Several studies such as Kothari, Lewellen, and Warner [2006], and Cready and Gurun [2010], hypothesize that the negative relation is due to changes in expected returns, or return news; $cov(N_R, \Delta X_t) > 0$. We refer to this hypothesis as the return news hypothesis going forward. Other studies such as Chen [1991], Sadka [2007], and Sadka and Sadka [2009], suggest the negative relation results from a negative relation between expected earnings and expected returns; $cov(E_{t-1}[R_t], \Delta X_t) < 0$ because $cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t]) < 0$. We refer to this hypothesis as the expected earnings hypothesis. The difference between the two hypotheses relies on the extent to which aggregate earnings changes represent aggregate earnings surprises (or the extent to which they are predictable or expected).

To better understand the implication of earnings predictability, one can decompose earnings changes into expected and unexpected changes as follows:

$$\begin{aligned} \Delta X_t &= E_{t-1}[\Delta X_t] + (E_t - E_{t-1})[\Delta X_t] \\ &\equiv E_{t-1}[\Delta X_t] + UE_X. \end{aligned} \tag{4}$$

Next, since expected earnings cannot be correlated with either cash-flow news or return news (or any news for that matter), and since expected returns cannot be correlated with earnings surprises (following the same logic), Equation (3) can be rewritten as:

$$cov(R_t, \Delta X_t) = cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t]) + cov(N_{cf}, UE_X) - cov(N_R, UE_X) \tag{5}$$

$$\equiv cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t]) + cov\,(N_{cf,R}, UE_x) \tag{6}$$

Equation (6) clarifies the role of earnings predictability in understanding the earnings-returns relation. If aggregate earnings changes represent an earnings surprise, then $cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t]) = 0$, and the earnings-returns relation is determined by how investors respond to the news/surprise component of earnings, $cov\,(N_{cf,R}, UE_x)$. However, if earnings are predictable to some degree, then the earnings-returns relation is also driven by the relation between expected earnings and expected returns, $cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t])$. In this case, the empirical relation between returns and earnings changes will capture the relation between returns and both of the underlying earnings components (expected and unexpected earnings).

Equations (5) and (6) imply that there are two potential sources for the negative contemporaneous relation between aggregate earnings changes and aggregate returns. The return news hypothesis focuses on the relation between earnings news (the earnings surprise) and stock returns, $cov\left(N_{cf,R}, UE_x\right)$. Specifically, the relation between earnings news and return news. This hypothesis proposes that $cov\left(N_{cf,R}, UE_x\right) < 0$. The relation between earnings news and cash flow news is likely to be positive, $cov\left(N_{cf,}, UE_x\right) > 0$, because positive earnings surprises are not likely to represent declining cash flows (a conventional assumption supported by empirical evidence). Therefore, this hypothesis suggests the relation between earnings news and return news is positive, $cov\left(N_R, UE_x\right) > 0$, such that $\left[-cov\left(N_R, UE_x\right)\right] < 0$. In other words, investors increase the rate of return they demand on their investment when they receive positive earnings news. One possible explanation for this relation is as follows. Suppose aggregate earnings changes are largely unpredictable and represent a measure of aggregate earnings surprise. Further suppose that earnings changes are unexpectedly high in a given year. The return news hypothesis implies that investors update their beliefs about the overall risk of the projects undertaken in the economy following this surprise, and revise their estimates upwards. In other words, they attribute the unexpected growth in earnings to the success of riskier projects undertaken. This realization causes investors to increase their desired rate of return for future years, to compensate them for the increased level of risk in the economy. As a result, prices decline following the unexpected increase in aggregate earnings (earnings news), which lowers returns. This results in a negative contemporaneous relation between earnings changes and returns. It is also important to note that the price decline due to the return news needs to be sufficient to offset any potentially positive cash flow news.

The expected earnings hypothesis focuses on the relation between *expected* earnings and *expected* returns, $cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t]) < 0$. This hypothesis suggests aggregate earnings are predictable, and thus aggregate earnings changes are not an ideal measure of aggregate earnings surprises (or news). This hypothesis further suggests investors become less risk averse when they *expect (forecast)* higher earnings in the future. The intuition is as follows. Suppose aggregate earnings changes are largely predictable. Further assume that investors forecast higher earnings for the next period. This hypothesis suggests that investors lower their required (expected) rate of return today, because they expect the economy to do better going forward. This idea is consistent with a consumption based asset pricing world, where investors become less risk averse, and demand lower returns for their investments, when they expect to be wealthier. If aggregate earnings changes are indeed predictable, returns are lower during periods of high aggregate earnings growth. Therefore, there is a negative contemporaneous relation between aggregate earnings changes and aggregate returns.

To distinguish between these hypotheses we introduce an improved measure of aggregate unexpected earnings (earnings news). Empirically, it is very difficult to distinguish between expected and unexpected returns. Thus, the empirical tests in this literature examine the relation between aggregate realized returns and aggregate earnings. However, we can use the earnings decomposition discussed above to write the following equation:

$$cov(R_t, \Delta X_t) = cov(R_t, E_{t-1}[\Delta X_t]) + cov(R_t, UE_x) \tag{7}$$

If the negative aggregate relation between earnings changes and stock returns is driven by the earnings news component, $cov\left(N_{cf,R}, UE_x\right)$, then we should find a stronger negative relation between returns and earnings news, $cov\left(R_t, UE_x\right)$, using an improved measure of earnings news. In other words, by utilizing an aggregate earnings news measure that better captures news (relative to earnings changes), we should be able to estimate $cov\left(N_{cf,R}, UE_x\right)$ more accurately. Under the return news hypothesis, our new measure of earnings news solves a simple error in variables problem, where the noise in the measure of earnings news biases the estimated relation between earnings news and stock returns toward zero.

However, if the relation between returns and our improved measure of earnings news is positive, $cov\left(R_t, UE_x\right) > 0$, then $cov(R_t, E_{t-1}[\Delta X_t]) < 0$ (as the overall relation is negative, $cov(R_t, \Delta X_t) < 0$). This suggests the negative aggregate earnings-returns relation is driven by the relation between expected earnings and expected returns, $cov(E_{t-1}[R_t], E_{t-1}[\Delta X_t])$, which is negative. This result would be consistent with the expected earnings hypothesis. In this paper, we develop several improved measures of earnings news and estimate the empirical relation $cov\left(R_t, UE_x\right)$, using our improved measures of earnings news. Our results are analyzed in conjunction with prior findings that document the empirical relation between aggregate returns and aggregate earnings changes, to better understand why the latter relation is negative.

2.1 The Contemporaneous Earnings-Returns Relation

We begin our analysis by re-examining the aggregate (contemporaneous) earnings-returns relation for our sample firms (we describe our sample selection process in more detail in Section 3). Because we rely on the existence of analyst forecasts in IBES to estimate our earnings news measure, our sample is different than the aggregate market used in prior studies. Therefore, it is necessary to re-examine whether the negative relation between aggregate earnings and returns, which we are attempting to explain, is present in our sample. To examine this question, we employ two common measures of aggregate earnings changes. First, we calculate quarterly firm-level earnings changes using changes in firm-level operating income (relative to the same quarter in the prior year), scaled by price at the beginning of the period (the stock price four quarters ago), $\Delta OI_{i,t}/P_{i,t-4}$.[5]

[5] We utilize operating income as opposed to net income to exclude the effects of large goodwill write downs that occurred in 2001 -2003 (see Jorgensen, Li and Sadka [2010]). Furthermore, operating income more closely relates to the income forecasted by analysts, which we rely on to compute earnings news.

Next, we define aggregate earnings changes as the equal-weighted (EW) and value-weighted (VW) cross-sectional averages of the firm-level changes. Following prior literature, we measure returns during the three months following the fiscal quarter-end (RET_{t+1}), in addition to the returns during the fiscal quarter (RET_t).

Figure 1 plots aggregate earnings changes, aggregate stock returns, and aggregate forecast revisions. The plot highlights the effect of the recent financial crisis. To ensure that our findings are not driven by the recent financial crisis, our analysis is also conducted excluding the crisis period. Specifically, we exclude Q4 2007 - Q1 2009 (inclusive) to eliminate the effect of the crisis on the results.

Table 1 reports the estimates for the contemporaneous earnings-returns relation for our sample firms. Our primary sample is relatively short and commences in 1983, due to data availability in IBES. Therefore, for this analysis we estimate the earnings-returns relation for our sample firms (S&P 500 non-financial firms) across all available years, beginning in 1970 (Panel A), as well as for the sub-period in which our data is available (Panels B - F). The results in Panel A show a negative association between aggregate earnings changes and aggregate stock returns, consistent with prior literature. The coefficients reported in Panel A are negative and statistically significant (with t-statistics ranging from -1.88 to -2.63). The negative association between aggregate stock returns and aggregate earnings changes is attenuated somewhat in our primary sample period, due to the shorter sample period (which also includes a small number of recessions). However, all of the estimated coefficients remain negative. This is in stark contrast to the firm-level results which are overwhelmingly positive. Table 1 further shows that the negative relation exists when we exclude the effect of the recent financial crisis, and when we compute aggregate returns using the entire CRSP universe (to ensure that our sample firms represent the aggregate economy). Employing the

CRSP returns also allows for a better comparison with the results of Kothari, Lewellen and Warner [2006], who use CRSP returns in their analyses. Finally, Panels E and F reveal that the negative relation is also apparent when we employ IBES actual earnings, which represent the actual earnings forecasted by analysts (which we rely on in the analyses that follow in Section 4).[6]

Overall, we find that aggregate earnings changes are negatively related to aggregate stock returns for our sample firms, in our sample period, where we are able to estimate our improved measure of earnings news. Consistent with prior studies such as Sadka and Sadka [2009] and Bali, Demirtas and Tehranian [2008], we find that the negative relation between aggregate earnings and aggregate returns are only marginally significant in certain periods, and sometimes statistically insignificant. However, the goal of this analysis is to show that the aggregate market responses to changes in earnings is different than the typical firm level response, which is overwhelmingly positive. Therefore, the important finding is that the relation is consistently negative in all sub-periods and for all definitions of aggregate earnings and aggregate returns. To further highlight the difference between the aggregate and firm level relation, Figure 2 plots a histogram of the coefficients from firm-level time-series regressions, estimated for the sample firms that make up our aggregate sample. The figure also plots the corresponding aggregate coefficient reported in Table 1, denoted as "Market". These histograms show that the aggregate earnings-returns relation lies clearly to the left of the distribution of firm-level coefficients. Specifically, the aggregate coefficient is lower than the fifth percentile of firm-level coefficients in all panels. In other words, the aggregate relation between earnings and returns is significantly different, and more negative, than the firm level relation. This is the phenomena we aim to further examine in our setting.

[6]Following Sadka [2007], we also use aggregate earnings growth as an additional measure of aggregate earnings changes (scaling changes in earnings by lagged earnings). We find a negative contemporaneous aggregate earnings-returns relation for our sample period using this measure as well. For brevity, this additional robustness test is untabulated.

3 Sample Selection and Earnings Measures

To empirically measure earnings news, we utilize analyst forecast revisions. Specifically, we measure earnings news as the aggregate revision in analyst earnings forecasts over the quarter. Changes in analyst forecasts offer an attractive way to measure earnings news because they represent changes in the market's earnings expectations. Changes in aggregate expectations are more likely to reflect earnings news (unexpected earnings) than changes in aggregate earnings, which are likely predictable. Furthermore, analyst forecast revisions are timelier with respect to news, relative to quarterly earnings changes. This further improves their ability to measure earnings news.

To measure aggregate analyst forecast revisions, we focus on analyst forecasts issued for the quarter end months of March, June, September, and December. We define earnings news as the change in the market's earnings expectation over the period starting two quarters prior to the earnings announcement, to one quarter prior to the earnings announcement. For example, for the December forecast period we measure the change in expectation between the end of June and the end of September. We focus on forecasts for the next fiscal quarter to maximize our sample size. We measure analyst revisions that occur during the quarter prior to the earnings announcement because we believe forecast revisions contain more news when the horizon of the forecasts is longer. Therefore, we believe these revisions are more likely to capture earnings news revealed during the quarter, as opposed to revisions made during the quarter of the earnings announcement. In our robustness tests, we use an alternative (longer) forecasts horizon to measure aggregate forecast revisions. Consistent with our conjecture, we find larger coefficients using the alternative horizon (see Section 5.2). We discuss the construction of our measure in more detail in the appendix (see also Figure 3).

To implement our research design, we examine the relation between quarterly revisions and quarterly stock returns. Our analyses focus on S&P 500 non-financial firms. We select our sample firms using the S&P 500 constituents file and SIC codes from Compustat. We exclude financial firms with SIC codes in the 6000-6999 range. All analyst forecast data is obtained from IBES, and analyst forecast errors are computed using information available in the adjusted IBES detail file. Actual earnings changes are computed using Compustat and IBES actual earnings (see also Table 1). The remaining data is obtained from CRSP. A firm is included in the aggregate measure, in a specific quarter, if it meets the following requirements. First, it is a non-financial S&P 500 constituent at the end of that quarter. Second, the firm's fiscal year ends in March, June, September, or December. This ensures that all forecasts included in the aggregate measure relate to the same quarter end period. Third, the firm has at least one earnings forecast available in IBES for the following quarter, and adjusted actual earnings data available for the same quarter in IBES. Fourth, the firm's lagged, current, and future quarterly returns are available on CRSP, as well as the data required to compute market capitalizations for the same periods. Fifth, the firm has actual earnings information in Compustat to calculate its earnings changes. We exclude the top and bottom 1% of firms based on the distribution of $\Delta OI_{i,t}/P_{i,t-4}$.[7] As of the fourth quarter in 2010, these requirements result in a sample of 330 sample firms (out of a possible 500).

We focus on S&P 500 non-financial firms for several reasons. First, because we rely on the availability of analyst forecasts to compute our earnings news measure, we choose to focus on larger firms in the economy with higher levels of analyst coverage. We believe that our measures will be more accurate for these firms. Hence, we focus on S&P 500 firms. Second, by focusing on S&P 500 firms, we are able to keep the composition and number of firms relatively constant

[7] We exclude the extreme observations because we employ averages in Table 1. Aggregate measures based on averages are significantly affected by extreme observations. Therefore, we exclude observations with extreme earnings changes in our main analysis, and ensure our data is consistent across all tables. Nevertheless, additional robustness analyses verify that our results are not driven by the exclusion of these extreme observations.

over time. Using all available data in IBES would result in large increases in the number of firms present in our sample over time. S&P 500 firms represent a relatively stable portion of the aggregate economy. Third, the sample of firms included in the aggregate economy generally changes over time as some firms go public and others stop trading. However, the firms present in IBES are determined by whether they are public, and whether analysts choose to cover them. The analysts' choice could bias our results.[8] Firms in the S&P 500 are likely to be covered by analysts due to their size, and are less likely to be affected by an analyst's choice to cover a firm. Therefore, we choose to focus on S&P 500 firms to avoid any potential bias related to the inclusion of the firm in IBES. Finally, once we choose to focus on S&P 500 firms we exclude financial firms because their weight in the S&P 500 Index is much larger than in the overall economy. In untabulated robustness tests, we examine how our results change when we include financial firms. Our primary results and conclusions remain unchanged. In Section 5.1 we also re-examine our results using the entire IBES universe. We find similar results using this sample as well.[9]

3.1 Aggregate Forecast Characteristics

While analyst forecast revisions are likely to reflect new information with respect to earnings, empirical evidence suggests that analysts are both slow to incorporate information, and fail to incorporate information in stock prices (e.g., Abarbanell, [1991]; Lys and Sohn, [1990]; and Muslu and Xue [2012]). These studies suggest analyst forecasts may not fully reflect investor expectations.

[8] Firms enter and exit the IBES sample because of the coverage choices made by analysts. The analysts' 'selection' is likely to be associated with the firm's performance (market returns). If analysts are more likely to cover firms during periods of good performance (higher returns), we may find a positive association in the sample that results from the selection process. This selection process can also affect the results at the aggregate level.

[9] As a robustness test (untabulated), we re-examine our primary results using total assets and market capitalization as alternative scalars for our earnings news measures. Our results are not sensitive to the choice of scalar.

A related stream of literature (e.g., Hirshleifer, Hou, and Teoh [2009], and Arif [2011]) finds that the negative relation between aggregate earnings and aggregate returns is driven largely by a negative relation between aggregate returns and aggregate accruals. These results are interesting, and suggest that decomposing earnings news into cash flow news and accruals may further our understanding of the aggregate earnings-returns relation. Unfortunately, we lack sufficient data related to cash flow forecasts on IBES to examine this relation in our setting.

To address this concern, we evaluate a set of refined earnings news proxies that are based on aggregate revisions but are orthogonal to the information present in past prices and prior revisions. Formally, we use the following models to construct two alternative earnings news proxies

$$REV_t = a + b \cdot REV_{t-1} + \varepsilon_t \tag{8}$$

and

$$REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t \tag{9}$$

The first model in Equation (8) controls for the serial correlation in forecast revisions. We use, ε_t, as the first improved measure of earnings news. This approach addresses the concern that some analysts are slow to incorporate new information into their forecasts. Sluggish revisions create serial correlation in aggregate forecast revisions.[10] The model based on equation (8) removes the serial correlation from the forecast revisions. This model also eliminates any systematic bias in analyst forecasts which could result in an average negative revision. The average (negative) forecast revision is captured by the intercept a and will be excluded from this earnings news proxy.

The second model, based on Equation (9), further excludes changes in analyst forecasts that result from prior (expected) news which is already incorporated into prices. We purge the effect of 'stale information' on analyst revisions by including past returns in the model. Hence, we use η_t as our second refined measure of earnings news. An additional advantage of using several proxies

[10] The serial correlation may also arise from analysts revising their forecasts over different horizons, for different firms. If some firms experience more frequent forecasts, their revisions could be positively related to the future revisions of firms who have less frequent forecasts.

based on aggregate revisions is that we can empirically test how the relation between earnings news and returns varies across proxies. If our proposed measures capture earnings news as opposed to expected changes in earnings, then our results should strengthen as we remove expected components from our measures.

Summary statistics for the three earnings proxies are reported in Table 2. The results from estimating Equations (8) and (9) are reported in Table 3. The results in both tables are consistent with analysts issuing optimistic forecasts (an optimistic bias). The mean and median aggregate forecast revision is negative (-0.0219 and -0.0177, respectively), consistent with an optimistic bias in analyst forecasts. In addition, the average (median) forecast error, $OAFE$, is negative -0.0596 (-0.0229). Table 3 further reveals that a is negative and significant in both equations. This result suggests analysts' optimism results in negative future revisions.

The results in Table 3 and the correlations in Table 4 also imply that analysts are slow to incorporate new information. This is apparent from the strong serial correlation present in forecast revisions. When estimating the model in Equation (8), the slope coefficient for the lagged forecast revision is 0.63, with a t-statistic of 10.70. The coefficient for lagged forecast revisions is similar when we estimate equation (9) and include past stock returns. The slope coefficient on prior stock returns in equation (9) is 0.10 with a t-statistic of 2.38. The adjusted R^2 increases from 39% to 42% when we include prior stock returns in the model. Thus, our second improved measure of earnings news, η_t, further purges the effect of prior information that is incorporated into prices on analyst revisions. The increase in R^2 across the models suggests that η_t is a better measure of earnings news than ε_t, and that both of the improved measures capture earnings news better than analyst forecast revisions.

For our measure to capture earnings news, we need to ensure that our sample firms have sufficient levels of analyst coverage. Otherwise, our measure of earnings news will not reflect changes in expected aggregate earnings. Table 5 reports the distribution of analyst forecast coverage in our sample. The number of firms in our sample increases from 289 in 1983 to 332 in 2010. The number of forecasts increases at a faster pace, as analyst coverage in IBES increases over time. As a result, the average number of forecasts per firm increases from 1.61 in 1983 to 19.09 in 2010. As a robustness test, we estimate our primary equations during a sub-period where analyst coverage is higher. Specifically, we perform our analyses for all years where the number of forecasts per firm exceeds three (from 1989 onwards). We expect stronger results in this sub-period, as our measure of earnings news improves.

3.2 Validating the Earnings News Measure

Prior literature documents a negative aggregate earnings-returns relation using earnings changes (e.g., Kothari, Lewellen and Warner [2006], Sadka and Sadka [2009]). One potential issue that arises when measuring earnings news via earnings changes is that it is unclear to what extent aggregate earnings changes represent an earnings surprise (news). We argue that our analyst forecast revision-based proxies are more likely to capture the unexpected change in earnings, and are thus better proxies of earnings news. To test our conjecture, we test whether the forecast revisions are associated with forecast errors, an additional measure of earnings news. Specifically, we estimate the following model:

$$
\begin{aligned}
TAFE_{t+1} &= \theta_1 + \gamma_1 \cdot REV_t + \omega_{1,t+1} \\
TAFE_{t+1} &= \theta_2 + \gamma_2 \cdot \varepsilon_t + \omega_{2,t+1} \\
TAFE_{t+1} &= \theta_3 + \gamma_3 \cdot \eta_t + \omega_{3,t+1}
\end{aligned} \tag{10}
$$

where ε_t and η_t are estimated using Equations (8) and (9). The forecasting error, $TAFE_{t+1}$, is defined as the actual earnings (from IBES) for the forecast period minus the forecast consensus *prior to the forecast revision*, scaled by the consensus forecast at the beginning of the revision period (beginning of the quarter). Using the December example again, the forecast error would be computed using actual earnings for the December forecast period, and the consensus forecasts as of the end of June (Figure 3). Therefore, we test if the revision between June and September (our earnings news proxy) is associated with the earnings news that the market learns prior to the announcement. The results for this analysis are reported in Table 6.

If the revisions truly reflect information about earnings news, we expect the slope coefficients to be positive. In other words, a positive γ implies that the forecast revision is associated with the news revealed during the following quarters. The results in Table 6 imply that our measures of earnings news are indeed associated with future earnings. The slope coefficients are positive and statistically significant in all three of the estimation models. The coefficient increases monotonically from 2.64, using forecast revisions, to 2.78, when using ε_t, and to 2.91, using η_t. These results are consistent with our findings in Table 2 which imply η_t is our best proxy of earnings news. The largest increase in coefficients occurs between γ_1 and γ_2, which is also where the largest improvement in our earnings news measure is obtained (Table 3). Unlike the increase in the slope coefficient, the

R^2 declines as we improve our measure of earnings news. This is because the forecast error is not only a function of the news revealed during the quarter, but also a function of the initial bias and delayed response to news. Therefore, *the expected component of the forecast revision* (due to the bias and 'stale information') also reduces the eventual forecast error. Consequently, improving the measure of earnings news lowers the correlation between forecast revisions and future forecasts errors, reflected by the decline in R^2.

Table 6, Panel B, reports results for our sub-sample period (1989-2010). These findings are consistent with the results in Panel A. The coefficients in the two panels are very similar in both size and statistical significance.

3.2.1 Forecast Revisions and Macroeconomic Indicators

Since our analysis employs analyst forecasts for non-financial firms in the S&P 500 Index, it is necessary to test whether our measure of aggregate earnings news relates to aggregate economic activity. In order to test whether our sample is representative of the overall economy, we test whether analyst forecast revisions are associated with GDP growth and changes in industrial production.[11] The results are reported in Table 7.

Our findings suggest that our measures of earnings news relate to overall economic activity. Our measures of earnings surprises are positively (and statistically significantly) related to both GDP growth and growth in industrial production. For example, regressing GDP growth on forecast revisions yields a coefficient of 0.07 (with a t-statistic of 3.23). The adjusted-R^2 is about 14%. Regressing industrial production on forecast revisions results in a coefficient of 0.13 (with a t-statistic of 3.12). In sum, Table 7 suggests that our forecast-based measures, which we can only

[11] See also Arif [2011], Crawley [2011], and Hann, Ogneva and Sapriza [2011].

measure for a sub-sample of large firms, provide good proxies for overall economic activity and aggregate earnings news. Additionally, in unreported results we also include stock returns (RET_t) in the regression. The coefficient on our earnings news measures remain positive and statistically significant. These findings further imply that the forecast based news measures provide information about future economic activity that is incremental to the information present in stock returns.

4 Empirical Analysis

4.1 The Contemporaneous Relation between Earnings News and Aggregate Stock Returns

As we note above, prior studies document that the aggregate earnings-returns relation is negative. Since earnings have both an expected and an unexpected component, the negative relation can arise from either component. In this paper, we construct improved measures of earnings news to test whether the relation between returns and *earnings news (unexpected earnings)* is indeed negative. In order to estimate the contemporaneous relation, we employ the following regression models:

$$\begin{aligned} RET_t &= \alpha_1 + \beta_1 \cdot REV_t + \varphi_{1,t} \qquad (11) \\ RET_t &= \alpha_2 + \beta_2 \cdot \varepsilon_t + \varphi_{2,t} \\ RET_t &= \alpha_3 + \beta_3 \cdot \eta_t + \varphi_{3,t} \end{aligned}$$

The results are reported in Table 8.

In contrast to prior evidence which suggests that aggregate *earnings changes* are negatively related to aggregate stock returns, our findings imply that aggregate *earnings news* is positively related to aggregate stock returns. The results in Panel A show that the coefficient for aggregate forecast revisions is positive (0.52) and statistically significant (t-statistic of 2.07). The adjusted-R^2 is approximately 5%. These results are also apparent in Table 4. These findings are consistent with the expected earnings hypothesis, which suggests the relation between expected earnings and expected returns contributes to the negative aggregate earnings-returns relation (Table 1).

In addition to analyst forecast revisions, we employ our two improved measures of earnings news, ε_t and η_t. If the relation between aggregate earnings news and aggregate stock returns is positive, the coefficient for earnings news should increase as we refine our measure of news. As we improve the measure of aggregate earnings news, we reduce the noise in the variable, and expect an increase in the coefficient (in absolute terms). In terms of Equation (11), we expect the following inequalities to hold: $\beta_1 \leq \beta_2 \leq \beta_3$. However, it is not clear whether the R^2 will increase (Hecht and Vuolteenaho [2006]).

Our findings are consistent with a positive association between earnings news and stock returns. When we control for the serial correlation in aggregate forecast revisions (ε_t), the slope coefficient nearly doubles to 0.97, with a t-statistic of 3.80. The R^2 also doubles in magnitude to approximately 11%. When we use η_t to proxy for earnings news, the coefficient increases only marginally to 0.98, with little change in the model's explanatory power.

As discussed above, analyst coverage is higher in the later periods of our sample. Therefore, we re-estimate our model for the 1989-2010 sub-period. We expect our results to strengthen in this sample period as the earnings news measures are more likely to reflect aggregate news. The results are reported in Panel B. Our findings suggest that the positive contemporaneous relation between aggregate earnings news and aggregate stock returns is stronger in the later period of our sample. The coefficients increase, ranging from 0.62 (for REV_t) to 1.11 (for η_t). Furthermore, the coefficients are statistically significant in all our models. Finally, the R^2 increases significantly in this sub period. It varies from approximately 9% for forecast revisions to 17% using our refined measures of earnings news.

In Panel C of Table 8, we re-estimate the relation between aggregate earnings news and returns excluding the recent financial crisis. Following the approach used in Table 1, we exclude Q4 2007 - Q1 2009 (inclusive) from our analysis. Also consistent with our analysis in Table 1, we estimate aggregate returns using the entire CRSP universe in Panel D.[12] We do this to alleviate the concern that our results are driven by the recent financial crisis, or our sample selection process (related to the S&P 500). The results in Panel C and D are generally weaker, but remain positive and statistically significant. When we control for the serial correlation in aggregate forecast revisions (ε_t), the slope coefficient increases nearly four times to 0.75, with a t-statistic of 1.97. When we use η_t to proxy for earnings news, the coefficient increases only marginally to 0.79, with a t-statistic of 2.13. We find similar results when we employ the CRSP returns as our dependent variable. The improved earnings news measures are positively associated with contemporaneous aggregate returns in this specification as well.[13]

To compare the aggregate market response to earnings news reported in Table 8 with the typical firm-level response, we estimate Equation (11) using firm-level time-series regressions. Since we cannot employ the earnings forecast as a scalar in firm-level regressions, we employ the beginning of period stock values as the scalar. For comparison, we also re-estimate the equations in Table 8 using aggregate market values as the scalar. Figure 4 plots the firm-level and aggregate-level

[12] As a robustness test, we also defined the crisis period as Q3 2008 - Q1 2009, reflecting the large market decline which followed the bankruptcy of Lehman Brothers. Our results are similar using this definition.

[13] We find stronger results when we employee the CRSP returns for our entire sample period. In this specification the coefficients range from 0.56 to 1.13 and the t-statistics range from 1.83 to 3.47

(Market) coefficients. The figure shows that the aggregate response to earnings news is positive, and consistent with the firm-level responses. Furthermore, the aggregate response to earnings news is more positive than the typical firm level response. The aggregate estimate is above the 70^{th} percentile of firm-level estimates. These findings contrast the findings presented in Figure 2, related to the relation between changes in earnings and returns. While the aggregate market relation between earnings changes and stock returns is significantly more negative, relative to the firm level responses, the relation between aggregate *earnings news* and *stock returns* is marginally more positive than the typical firm level relation.

In sum, we find that in contrast to firm-level results, the aggregate earnings-returns relation is negative (see Table 1 and Figure 2). However, consistent with the firm-level results, we find that the relation between *aggregate earnings news*, measured using forecast revisions, and *aggregate stock returns* is positive. These latter findings are consistent with the considerable amount of firm-level evidence present in the literature (dating back to Ball and Brown [1968]).

4.2 Analyst Forecast Errors

In addition to analyst forecast revisions, we employ analyst forecast errors as an alternative measure of earnings news. Because actual earnings are reported at different times during the quarter, for different firms, we believe analyst forecast errors represent a noisier measure of earnings news. In other words, forecast errors measured at the same point in time (based on the consensus at the beginning of the calendar quarter) will contain different amounts of new information, for different firms. This misalignment in time creates a problem for any aggregate-based analysis, which requires an aggregate (market) measure during a specific period (as market returns must be measured in a specific window). This weakens the relation between aggregate forecast errors and contemporaneous aggregate market returns. Alternatively, the news related to forecast revisions can be measured for a specific period, such as during a calendar quarter.

We compute aggregate analyst forecast errors, $OAFE_t$, using the same methodology used to compute $TAFE_t$, except that $OAFE_t$ is computed at the end of the revision period, or one quarter prior to the earnings announcement (Figure 3). More specifically, first we compute forecast errors based on all the outstanding consensus forecasts at the beginning of the earnings announcement quarter (one quarter prior to the earnings announcement). Next, we multiply all the firm level forecast errors by the number of shares outstanding at the end of quarter. Then, we sum all the firm level errors to compute an aggregate forecast error. Finally, we scale the aggregate forecast error by the aggregate analyst forecast, computed at the beginning of the earnings announcement quarter.

Since analysts are slow to incorporate information into their forecasts, we employ two additional measures of unexpected forecast errors. Our first measure, χ_t, is defined as the error term from an OLS regression of $OAFE_t$ on the four quarterly forecast revisions experienced over the prior year. Our second measure, ψ_t, includes past stock returns in the regression model as well. The results from estimating these models are reported in Table 9, Panel A. In essence, χ_t and ψ_t are analyst based measures of aggregate earnings surprises. Therefore, the contemporaneous relation between χ_t (ψ_t) and aggregate returns is more comparable to prior findings in the literature, as it utilizes actual earnings announcements.

Following our analysis in Section 4.2 and 4.3, we analyze the contemporaneous relation between aggregate forecast errors and aggregate stock returns. Specifically, we estimate the following models:

$$\begin{aligned} RET_t &= \alpha_4 + \beta_4 \cdot OAFE_t + \varphi_{4,t} \\ RET_t &= \alpha_5 + \beta_5 \cdot \chi_t + \varphi_{5,t} \\ RET_t &= \alpha_6 + \beta_6 \cdot \psi_t + \varphi_{6,t} \end{aligned} \tag{12}$$

Our findings are reported in Table 9. We estimate the contemporaneous relation for our full sample (Panel B), for the sub-period beginning in 1989 (Panel C), excluding the financial crisis (Panel D), and using the entire CRSP universe to measure aggregate market returns (Panel E). The results show that the relation between aggregate stock returns and aggregate forecast errors is positive. The relation is statistically significant when employing χ_t and ψ_t, in the sub-periods where we have increased levels of analyst following and when excluding the crisis (Panels C - E). These results also contrast the negative relation between aggregate stock returns and aggregate earnings changes reported in Table 1 and Figure 2. The positive relation between aggregate analyst forecast errors and returns has an additional implication. If the negative relation between changes in aggregate earnings and contemporaneous returns results from an 'announcement effect', when the market learns the actual audited earnings, then the relation between aggregate analyst forecast errors and returns is expected to be negative as well. Therefore, the positive coefficients in Table 9 alleviate the concern that the results related to our measures of earnings news arise from a systematic difference between revisions in forecasts and earnings announcements.

4.3 Expected Earnings and Stock Returns

Our primary results lend support to the *expected earnings* hypothesis. The idea that the negative relation between aggregate earnings changes and aggregate returns is driven by expected earnings. To further test this hypothesis, we generate two analyst based (direct) measures of expected aggregate earnings changes. As a first step, we compute expected aggregate earnings growth (EEG_{t-1}). EEG_{t-1} equals aggregate analyst forecasts for the aggregate earnings of quarter t measured at the end of quarter $t-1$, minus aggregate earnings of quarter $t-4$. This difference is then scaled by the market capitalization at the end of quarter $t-4$, to compute EEG_{t-1}. Since analyst forecasts are biased, we use the fitted values from the following OLS models. First, we run a regression of actual earnings growth (using IBES actual earnings) on EEG_{t-1} and REV_{t-1}. Second, we run a regression of actual earnings growth (using IBES actual earnings) on EEG_{t-1} , REV_{t-1}, and REV_{t-2}. Our measures of expected aggregate earnings changes (growth) are based on the fitted values of these regression models. The results from estimating these models are reported in Table 10, Panel A. The model's adjusted-R^2 is approximately 60%, which suggests we have a good model for estimating aggregate earnings expectations.

We next proceed to examine the contemporaneous relation between aggregate stock returns and expected aggregate earnings growth (Table 10, Panels B - D). Consistent with the *expected earnings* hypothesis, the relation between expected earnings growth and aggregate stock returns is negative. The relation is statistically significant when we exclude the effects of the financial crisis (Panels C and D). Combined with the results in Tables 8 and 9, our findings suggest that: (1) expected aggregate earnings are negatively related to aggregate stock returns, and (2) investors react positively (negatively) to good (bad) aggregate earnings surprises (news).

4.4 Earnings News and Future Stock Returns

In Section 2, we discuss the return news hypothesis. The return news hypothesis suggests the negative relation between aggregate earnings and aggregate returns may be driven by a negative relation between earnings news and stock returns. More specifically, the link between earnings news and return news. In terms of Equation (6), $cov\left(N_{cf,R}, UE_x\right) < 0$. This hypothesis suggests investors adjust their required rate of return in response to aggregate earnings surprises. Specifically, investors increase (decrease) the rate of return they demand on their investments when they receive positive (negative) earnings news. In terms of Equations (5), $cov(N_R, \Delta X_t) > 0$. One implication of this hypothesis is that earnings news predicts returns with a positive sign.[14] A positive association between earnings news and future stock returns would be consistent with the conjecture that discount rates increase following positive earnings news.

To test this hypothesis, we employ the following regression models:

$$
\begin{aligned}
RET_{t+1} &= \nu_1 + \delta_1 \cdot REV_t + d_1 \cdot REV_{t+1} + \varsigma_{1,t} \qquad (13)\\
RET_{t+1} &= \nu_2 + \delta_2 \cdot \varepsilon_t + \varsigma_{2,t+1}\\
RET_{t+1} &= \nu_3 + \delta_3 \cdot \eta_t + \varsigma_{3,t+1}
\end{aligned}
$$

As forecast revisions are serially correlated, it is necessary to include REV_{t+1} in the regression model in Equation (13). In contrast, ε_t and η_t do not exhibit significant serial correlation and therefore,

[14] Several studies find that aggregate accruals are positively associated with aggregate stock returns (e.g., Hirshleifer, Hou and Teoh [2009], Kang, Liu and Qi [2010], and Guo and Jiang [2011]). These results are in contrast to firm-level findings where accruals are negatively associated with future stock returns. While the aggregate studies find an association between accruals and future aggregate stock returns, these studies do not find that earnings changes and/or earnings news predict stock returns.

we do not need to include the contemporaneous earnings news measure in these models.[15] The results are reported in Table 11.

The logic for Equation (13) is as follows. If a state variable, Z_t, predicts stock returns, then the state variable is associated with discount rates (expected returns). Consequentially, changes in the state variable should be related to changes in discount rates (N_R). Therefore, a positive slope coefficient, δ_1, implies that forecast revisions are positively related to changes in expected returns. However, it is important to note that this model does not directly test the association between earnings news and changes in discount rates, N_R, because N_R is unobservable.[16]

Our findings are inconsistent with the hypothesis that earnings news is positively related to changes in discount rates. We find that δ_1 is negative (-0.71) and statistically significant (t-statistic of -4.65). However, ε_t and η_t do not seem to predict future returns and δ_1 is negative and insignificant when we exclude REV_{t+1} from the regression. At best, our results appear to be consistent with Lamont [1998], who finds that earnings changes are negatively related to future stock returns. However, as we note, the negative association between forecast revisions and future returns holds only when future revisions are included.

In sum, we find only weak evidence that earnings news is associated with changes in expected returns. In the one specification where we do find a significant association, it is negative rather than positive, which is inconsistent with $cov(N_R, \Delta X_t) > 0$. We find similar results when we estimate Equation (13) in the sub-period with increased analyst coverage (Panel B).

[15] As robustness, we included the contemporaneous measures of ε_t and η_t, and our results do not change significantly.

[16] Campbell [1991] and Vuolteenaho [2002] estimate changes in expected returns using a VAR model. However, this estimation technique is sensitive to the VAR model employed.

4.5 Decomposing Returns into the Risk Premium and Risk-Free Rate

Prior studies suggest that the negative relation between aggregate earnings and aggregate returns is due to inflation (Shivakumar [2007]). Therefore, it is interesting to test the relation between earnings news and changes in the risk-free rate, which reflect in part changes in inflation. To examine this relation, we decompose stock returns into the risk-free rate and the risk premium (the sum of these components equals the aggregate market return). We then re-estimate the regressions in Equation (11) and (13), replacing aggregate returns with the aggregate risk premium and risk-free rate. The results are reported in Table 12.

The contemporaneous relation between earnings news and the risk premium is positive and statistically significant for all of our earnings news measures. The coefficient increases as we reduce the error in the measure of earnings news. The results are consistent with our primary results reported in Table 8. Furthermore, we find a weak association between earnings news and future risk premiums, consistent with the results in Table 11. The coefficient on forecast revisions is negative and statistically significant, but our other measures of earnings news do not predict future returns.

With respect to the risk-free rate, we find a weak association between the future risk-free rate and earnings news. The coefficient for forecast revisions is positive (0.04) and statistically significant (t-statistic of 1.92). However, our other two measures of earnings news do not predict the risk-free rate. Therefore, our findings are inconsistent with the hypothesis that the negative relation between earnings changes and aggregate stock returns is due to inflation and/or changes in the risk-free rate. The positive association between forecast revisions and the future risk-free rate is consistent with this hypothesis, but this result is offset by the negative association between forecast revisions and the risk premium (note that earnings are discounted at the risk-free rate plus a risk premium).

5 Robustness Tests

5.1 The Entire IBES Universe

Our analysis above employs the S&P 500 sample. As a robustness tests we examine the sensitivity of our results to this restriction. Table 13, Panel A, presents our results using all available firms in IBES. We employ both the CRSP returns and the aggregate returns for the firms with available analyst forecasts. We find a positive and significant relation between aggregate forecast revisions and CRSP returns using this sample. These results highlight that our primary results are not limited to S&P 500 firms.

5.2 Alternative Forecast Horizons

Our primary earnings news measures are computed using only short-term forecasts, for the next fiscal quarter. We focus on the next fiscal quarter to maximize our sample size. However, we argue that forecast revisions contain more news when the horizon of the forecasts is longer. Hence, we estimate our primary earnings measures during the quarter prior to the earnings announcement, and not during the quarter of the announcement. Following this logic, we expect to find larger coefficients if we compute our earnings news measures using longer-horizon forecasts. However, since the sample size is reduced the significance may change as well. In Table 13, Panel B, we re-estimate the contemporaneous relation between earnings news and returns using alternative earnings news measures. In this analysis, we compute our earnings news measures using forecasts for the next fiscal year (four quarters ahead). We employ both the CRSP returns, and the aggregate sample returns, as our dependent variables. Consistent with our hypothesis, the coefficients using longer-horizon forecasts are larger. Furthermore, all of our earnings news measures are positively and significantly associated with contemporaneous aggregate stock returns, and the statistical significance actually increases in this sample. Finally, the adjusted-R^2 varies between 18.5% to 24%, compared to the highest adjusted-R^2 reported in in Table 8, 17%.

5.3 S&P 500 Earnings Forecasts

Our analysis aggregates firm-level forecasts to generate aggregate forecast revisions. Prior studies suggest that forecasting aggregate macro economic activity is not the same as aggregating firm-level forecasts (e.g., Darrough and Russell [2002], and Hann, Ogneva and Sapriza [2011]). Therefore, as a robustness test, we employ the aggregate S&P 500 earnings forecasts. In this analysis we re-estimate the forecast revision based measures using analyst earnings forecasts for the S&P 500. The results are reported in Table 13, Panel C. The findings in Table 13 are consistent with the results in Table 8. The coefficients for the earnings news measures using the S&P 500 forecasts are all positive and statistically significant. It is also worth noting that the S&P 500 forecasts do not exhibit a strong serial correlation or an association with prior returns. The coefficients for ε_t and η_t are nearly identical to the one reported for REV_t (see Darrough and Russell [2002]).

6 Conclusions

Recent studies document a negative association between aggregate earnings changes and aggregate stock returns. The literature provides two possible explanations for this negative association. The first hypothesis, which we call the return news hypothesis, suggests aggregate earnings changes represent aggregate earnings surprises (news). This hypothesis suggests investors adjust their required rate of return in response to unexpected earnings. Specifically, investors increase (decrease) the rate of return they demand on their investments when they receive positive (negative) earnings news. The second hypothesis, which we call the expected earnings hypothesis, suggests that aggregate earnings changes are more predictable than firm-level changes, and thus changes in aggregate earnings are not an ideal proxy for aggregate earnings surprises (contain less earnings news). This hypothesis suggests that the negative association between aggregate earnings and returns is due to a negative association between *expected earnings* and *expected returns.*

Consistent with prior literature, the primary analysis in this paper employs an indirect test to attempt to distinguish between the hypotheses. We further our understanding of the relation between expected earnings and expected returns by examining the relation between *earnings news* and stock returns. Our results can be analyzed in conjunction with prior findings regarding the relation between aggregate earnings and returns, to help shed light on why the later relation is negative. Specifically, we attempt to distinguish between these two hypotheses by improving the measure of earnings news. The return news hypothesis suggests that positive (negative) earnings news results in a negative (positive) stock-price reaction. Therefore, the relation between aggregate earnings news and contemporaneous returns should strengthen (become more negative) when an improved measure of earnings news is employed. In contrast, the expected earnings hypothesis implies that the negative aggregate relation between earnings changes and stock returns is due to the *expected component* of earnings. Therefore, according to this hypothesis the relation between aggregate unexpected earnings (earnings news) and returns should be less negative or disappear.

Our results show the relation between aggregate *earnings news* and aggregate returns is positive. This finding is consistent with the vast amount of firm-level evidence which suggests stock prices respond positively to earnings news. Supporting these results, our secondary analyses find that unexpected forecast errors are positively related to aggregate stock returns, and aggregate stock returns are negatively associated with expected aggregate earnings growth. Taken together, Our findings support the expected earnings hypothesis; the aggregate relation between earnings and returns is driven by the negative relation between aggregate *expected* earnings and aggregate *expected* returns (discount rates). Our findings are consistent with asset pricing models that relate expected returns to macroeconomic activity (e.g., Lucas [1978], and Cox, Ingersoll, and Ross [1985]). These models imply that the risk premium is negatively related to the current state of the economy. Thus, if investors expect lower (higher) earnings, they will demand higher (lower) returns for holding risky securities.

Appendix: The earnings news measure

To measure aggregate analyst forecast revisions, we start by measuring the firm level forecast consensus. To measure the forecast consensus at each point in time, we use all outstanding forecasts for a specific forecast period. For example, the consensus at the end of June is computed using all the outstanding forecasts for the December fiscal period (of the same year), as of June 30th (that year). Given that we are interested in aggregate earnings news, we do not restrict the age of the forecasts included in the consensus. In other words, at any point in time we use the most recent forecasts issued by an analyst for a specific forecast period. In our setting, stale forecasts bias our measure of earnings news towards zero. This point is important, because we do not want to measure aggregate earnings news conditional on a revision. This would likely overstate our estimate of aggregate earnings news, as analysts update their forecasts when news occurs. So while the revision we measure is a result of news that occurs during the period, its relative magnitude in the economy is based on the news (or lack thereof) for all firms in the economy.

Once we compute the consensus at each point in time, we multiply the per share consensus by the number of shares outstanding at the beginning of the period (quarter) to compute firm level earnings expectations. We then sum across all the firms in our sample to compute the market-wide earnings expectation (for our sample). Finally, to measure forecast revisions, we examine the percentage change in market wide expectations across the three months. Formally, our process is as follows

$$EPS\_Consensus_{j,t} = \frac{\sum_i^N AF_{i,j,t}}{N} \quad , t = \{Mar, June, Sep, Dec\} \tag{14}$$

$$Firm\_Level\_Earnings\_Exp_{j,t} = EPS\_Consensus_{j,t} * Shares\_outstanding_j \tag{15}$$

$$Aggregate\_EarnExp_t = \sum_J Firm\_Level\_Earnings\_Exp_{j,t} \tag{16}$$

$$REV_t = \frac{Aggregate\_EarnExp_t - Aggregate\_EarnExp_{t-1}}{Aggregate\_EarnExp_{t-1}} \tag{17}$$

$$t = \text{End of quarter periods } \{Mar, June, Sep, Dec\}$$

References

Abarbanell, Jeffrey S., 1991, Do analysts' earnings forecasts incorporate information in prior stock price changes? *Journal of Accounting and Economics* 14, 147–165.

Arif, Salman, 2011, Aggregate investment and its consequences, Working paper - Indiana University.

Bali, Tarun G., K. Ozgur Demirtas, and Hassan Tehranian, 2008, Aggregate earnings, firm-level earnings, and expected stock returns, *Journal of Financial and Quantitative Analysis*, 43 (3), 657-684.

Ball, Ray, and Philip Brown, 1968, An empirical evaluation of accounting income numbers, *Journal of Accounting Research* 6, 159-178.

Ball, Ray, Gil Sadka, and Ronnie Sadka, 2009, Aggregate earnings and asset prices, *Journal of Accounting Research* 47, 1097–1133.

Bonsall, Samuel B. IV, Zahn Bozanic and Paul E. Fischer, 2013, What do management earnings forecasts convey about the macroeconomy? *Journal of Accounting Research* 51, 225-266.

Campbell, John, 1991, A variance decomposition for stock returns, *Economic Journal* 101, 157-179.

Campbell, John, and Robert Shiller, 1988a, The dividend-price ratio and expectations of future dividends and discount factors, *Review of Financial Studies* 1, 195-227.

Campbell, John, and Robert Shiller, 1988b, Stock prices, earnings, and expected dividends, *The Journal of Finance* 43, 661-676.

Chen, Long, and Xinlei Zhao, 2009, Return Decomposition, *Review of Financial Studies*, 22 (12) 5213-5249.

Chen, Nai Fu, 1991, Financial investment opportunities and the macroeconomy, *Journal of Finance* 46, 529-554.

Cochrane, John H., 1991, Explaining the variance of price-dividend ratios, *Review of Financial Studies* 5, 243–280.

Cochrane, John H., 2001, Asset pricing, Princeton University Press, New Jersey.

Cox, John C., Jonathan E. Ingersoll, Jr., and Stephen A. Ross, 1985, An intertemporal general equilibrium model of asset prices, *Econometrica* 53, 363-384.

Cready, William M., Umit G. Gurun, 2010, Aggregate market reaction to earnings announcements, *Journal of Accounting Research*, 48 (2), 289-334.

Crawley, Michael J., 2011, Macroeconomic consequences of accounting: the effect of accounting conservatism on macroeconomic indicators and the money supply, Working paper - Indiana University.

Da, Zhi, Mitchell C. Warachka, 2009, Cashflow risk, systematic earnings revisions, and the cross-section of stock returns. *Journal of Financial Economics* 94, 448-468.

Darrough, N. Masako, and Thomas Russell, 2002, A positive model of earnings forecasts: Top down versus bottom up, *Journal of Business*, 75 (1), 127-152.

Guo, Hui and Xiaowen Jiang, 2011, Accruals and the conditional equity premium, *Journal of Accounting Research* 49, 187-221.

Fama, Eugene F., 1990, Stock returns, expected returns, and real activity, *Journal of Finance* 45, 1089–1108.

Hann, Rebecca N., Maria Ogneva, and Horacio Sapriza, 2011, Forecasting the macroeconomy: Analysts versus economists, Working paper - Stanford University.

Hecht, Peter, and Tuomo Vuolteenaho, 2006, Explaining returns with cash-flow proxies, *Review of Financial Studies* 19, 159-194.

He, Wen, Maggie Rong Hu, 2012, Aggregate earnings and market returns: International Evidence, Forthcoming *Journal of Financial and Quantitative Analysis.*

Hirshleifer, David, Kewei Hou, and Siew Hong Teoh, 2009, Accruals, cash flows, and aggregate stock market returns, *Journal of Financial Economics* 91, 389-406.

Jorgensen, Bjorn, Jing Li, and Gil Sadka, 2010, Are accounting standards diversifiable? Evidence of the aggregate valuation effects of standards, Working paper - Columbia University.

Kang, Qiang, Qiao Liu, and Rong Qi, 2010, Predicting stock market returns with aggregate discretionary accruals, *Journal of Accounting Research*, 48 (4), 815-858.

Kothari, S.P., Jonathan Lewellen, Jerold B. Warner, 2006, Stock returns, aggregate earnings surprises, and behavioral finance, *Journal of Financial Economics* 79, 537-568.

Lamont, Owen, 1998, Earnings and expected returns, *Journal of Finance* 53, 1563-1587.

Lucas, Robert E., Jr., 1978, Asset prices in an exchange economy, *Econometrica* 46, 1429-1445.

Lys, Thomas and Sungkyu Sohn, 1990, The association between revisions of financial analysts' earnings forecasts and security-price changes, *Journal of Accounting and Economics* 13, 341–363.

Muslu, Volkan, and Yanfeng Xue, 2012, Analysts' momentum recommendations, Working Paper - University of Houston.

Sadka, Gil, 2007, Understanding stock price volatility: the role of earnings, *Journal of Accounting research* 48, 199-228.

Sadka, Gil and Ronnie Sadka, 2009, Predictability and the earnings-returns relation, *Journal of Financial Economics* 94, 87–106.

Schwert, W., 1990, Stock returns and real activity: A century of evidence, *Journal of Finance* 45, 1237–1257.

Shivakumar, Lakshmanan, 2007, Aggregate earnings, stock market returns and macroeconomic activity: A discussion of does earnings guidance affect market returns? The nature and information content of aggregate earnings guidance, *Journal of Accounting and Economics* 44, 64-73.

Sloan, G. Richard, 1996, Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71, 289–315.

Vuolteenaho, Tuomo, 2002, What drives firm-level stock returns? *Journal of Finance* 57, 233-264.

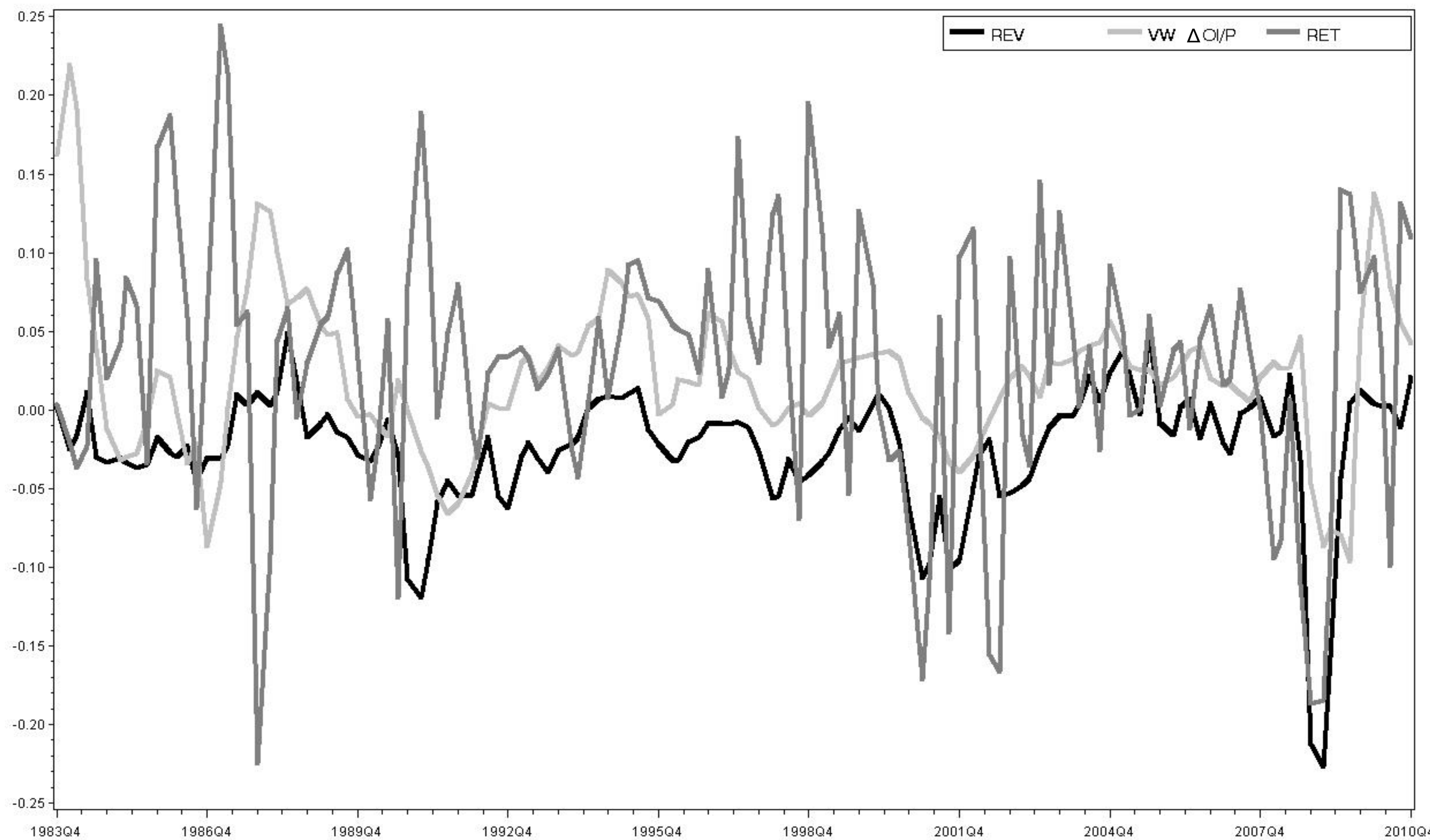

Figure 1: This figure plots the time series of aggregate forecast revisions, aggregate earnings changes, and aggregate stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample during quarter t. The aggregate analyst forecast revision (REV_t) equals the percentage change in aggregate analyst forecasts over the quarter. The ratio VW $\Delta\mathrm{OI}_t/\mathrm{P}_{t-4}$ denotes value-weighted changes in operating income after depreciation, relative to the same quarter in the prior year. Changes are scaled by the market capitalization of the firm at the end of quarter t-4. For exposition purposes, the values of VW $\Delta\mathrm{OI}_t/\mathrm{P}_{t-4}$ are multiplied by 10 in the figure. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data.

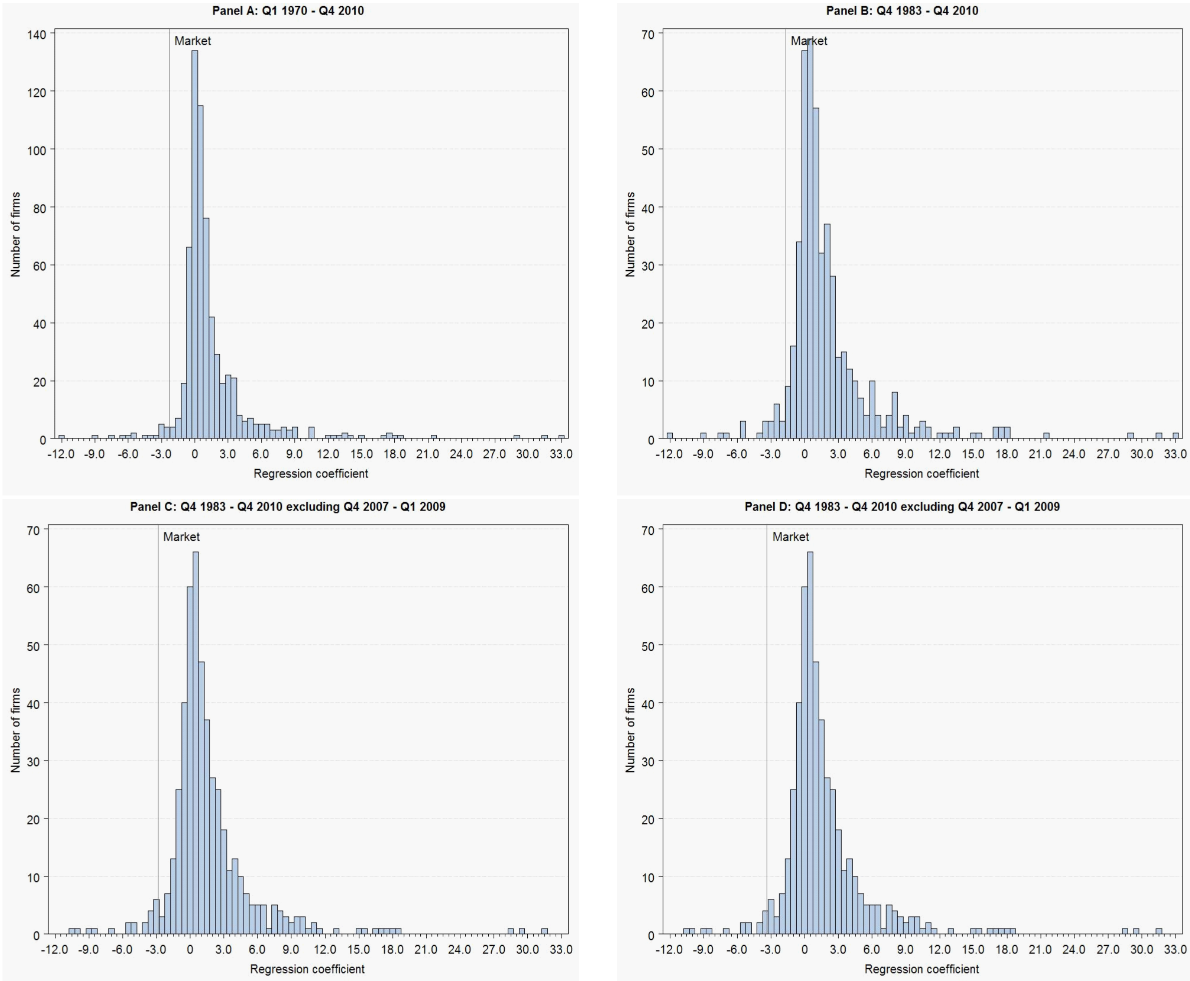

Figure 2: This figure plots histograms of regression coefficients from firm-level time-series regressions of stock returns on earnings changes. The regressions are estimated for our sample firms. Panel A reports results for all available years, starting in 1970. Panel B reports results for our primary sample period, starting in 1983. Panels C and D report results for our primary sample period excluding the recent financial crisis, Q4 2007 - Q1 2009 (inclusive). $\mathrm{RET}_{i,t}$ is the quarterly return of firm i during quarter t. $\Delta\mathrm{OI}_{i,t}/\mathrm{P}_{i,t-4}$ is the change in operating income after depreciation of firm i from quarters t-4 to t, scaled by the market capitalization at the end of quarter t-4. The coefficients are calculated from the regression: $RET_{i,t} = \tau_i + \kappa_i \cdot \Delta OI_{i,t}/P_{i,t-4} + \xi_{i,t}$. The degrees of freedom in the firm-level time-series regressions are required to be greater than or equal to 20. The market-level coefficients (labeled "Market") are calculated using aggregate quarterly returns and VW $\Delta\mathrm{OI}_t/\mathrm{P}_{t-4}$ in Panels A, B, and C. Panel D employs the CRSP value-weighted index returns and VW $\Delta\mathrm{OI}_t/\mathrm{P}_{t-4}$. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. The ratio VW $\Delta\mathrm{OI}_t/\mathrm{P}_{t-4}$ denotes value-weighted changes in operating income after depreciation from quarters t-4 to t scaled by market capitalization at the end of quarter t-4. The primary sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst forecasts available on IBES. The analysis is based on quarterly data.

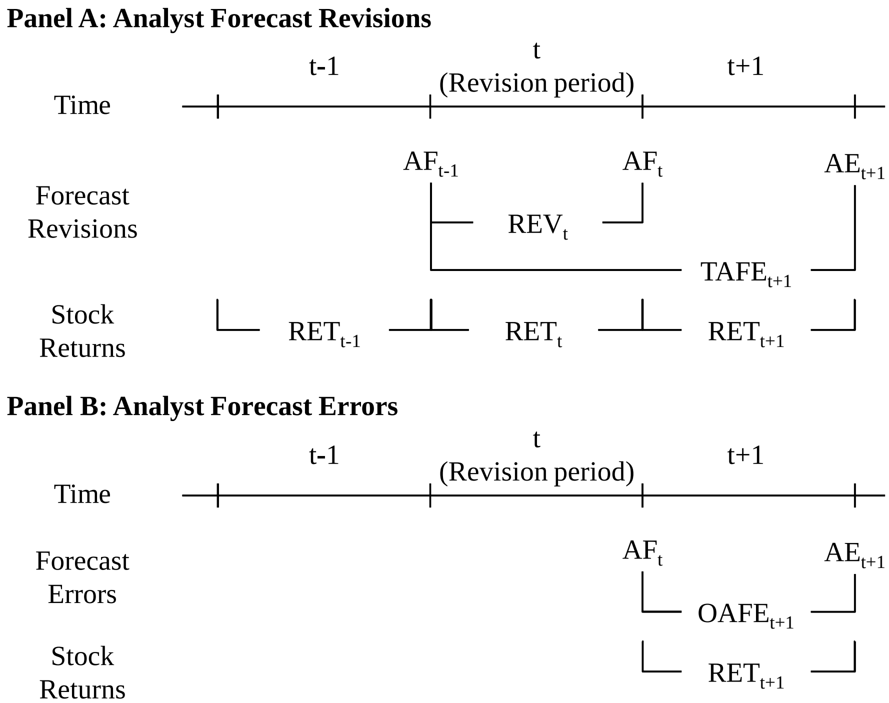

Figure 3: This figure illustrates the time-line used to construct our earnings news measures: aggregate forecast revisions and aggregate forecast errors. The aggregate analyst forecast revision (REV_t) equals the percentage change in aggregate analyst forecasts over the quarter. Aggregate analyst forecasts at the beginning and end of the quarter (AF_{t-1} and AF_t, respectively) equal the cross-sectional sum of the firm-level consensus analyst forecasts at each point in time, multiplied by the number of shares outstanding at the beginning of the quarter. TAFE_{t+1} is the cross-sectional sum of the firm-level analyst forecast errors based on the consensus at the beginning of the revision period (quarter), scaled by the aggregate consensus at the beginning of the revision period. OAFE_{t+1} equals the cross-sectional sum of the firm-level analyst forecast errors based on the consensus as of the end of the revision period (quarter), scaled by the aggregate consensus at the end of the revision period. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns for all firms in our sample, during quarter t. The analysis is based on quarterly data.

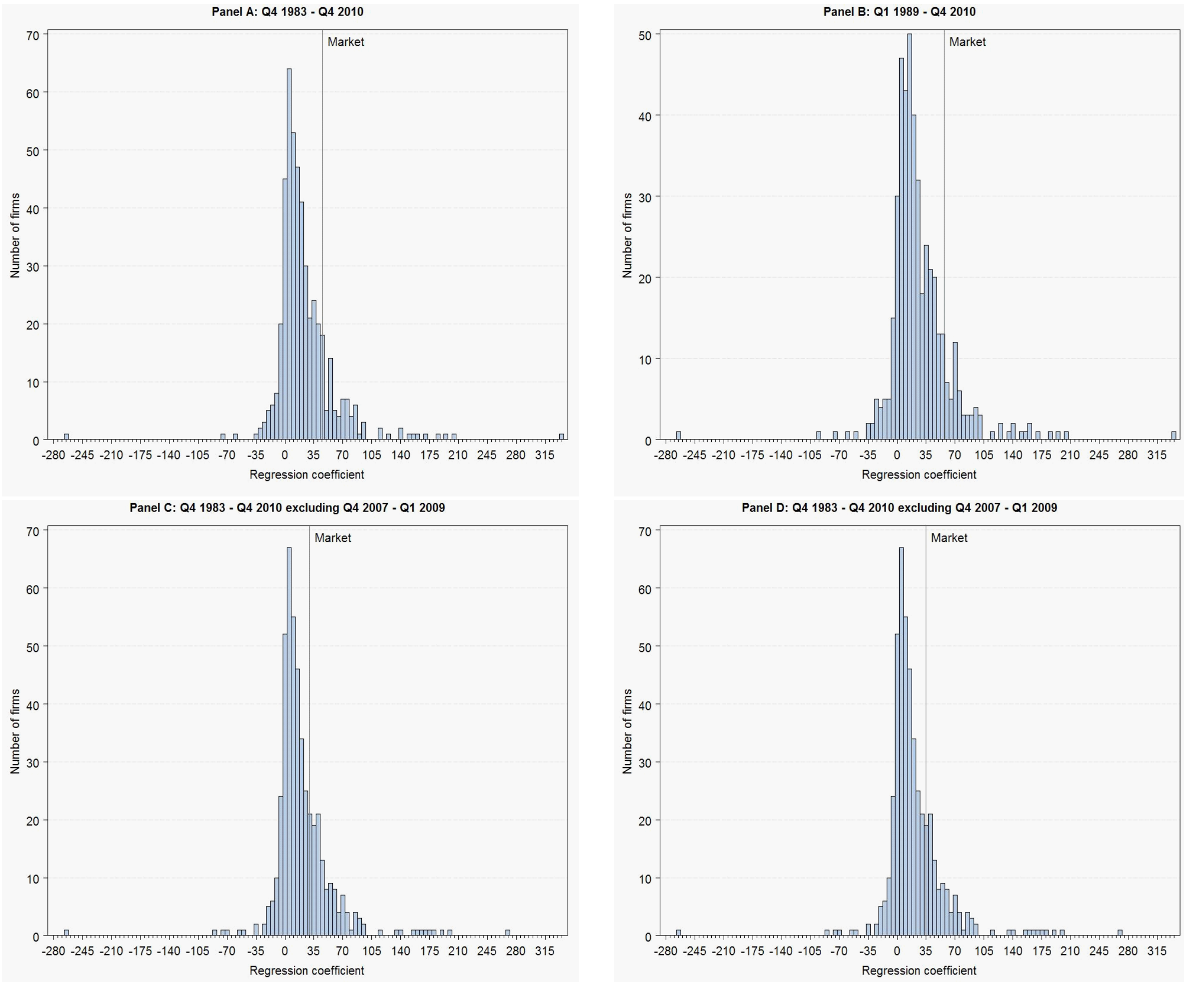

Figure 4: This figure plots histograms of regression coefficients from firm-level time-series regressions of stock returns on the earnings news measure, $\eta_{i,t}$, for our sample firms. The analyst forecast revision (REV$_{i,t}$) is the change in analyst forecasts for firm i over quarter t, scaled by market capitalization at the end of quarter t-1. RET$_{i,t}$ is the quarterly return of firm i during quarter t. The earnings news measure, $\eta_{i,t}$, is the residual from the regression: $REV_{i,t} = a_i + b_i \cdot REV_{i,t-1} + c_i \cdot RET_{i,t-1} + \eta_{i,t}$. The coefficients are calculated from the regression: $RET_{i,t} = \alpha_{3,i} + \beta_{3,i} \cdot \eta_{i,t} + \varphi_{3,i,t}$. The degrees of freedom in the firm-level time-series regressions are required to be greater than or equal to 20. In Panels A, B, and C the market-level coefficients (labeled "Market") are calculated using a refined aggregate earnings news measure η_t (similar to Table 8) where the forecast revisions are scaled by lagged market capitalization, and the aggregate quarterly returns. Panel D employs the quarterly cumulative CRSP value-weighted index and the refined aggregate earnings news measure, η_t. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Panel A reports results for the full sample, while Panel B reports results for the period with increased analyst coverage. Panels C and D report results excluding the recent financial crisis, Q4 2007 - Q1 2009.

Table 1: Aggregate Earnings Changes and Aggregate Stock Returns: This table reports the relation between aggregate earnings changes and aggregate stock returns, for our sample firms. Panel A reports results for all available years, starting in 1970. Panel B reports results for our primary sample period, starting in 1983. Panel C and D report results for our primary sample excluding the recent financial crisis, Q4 2007 - Q1 2009. Panel E and F report results for the primary sample and sub-sample, respectively, using actual earnings available on IBES. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. Weights are assigned based on the market capitalization at the beginning of the quarter. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. The ratios EW $\Delta OI_t/P_{t-4}$ and VW $\Delta OI_t/P_{t-4}$ (EW $\Delta NI_t/P_{t-4}$ and VW $\Delta NI_t/P_{t-4}$) denote equal- and value-weighted changes in operating income after depreciation (net income), relative to the same quarter in the prior year. Changes are scaled by the market capitalization of the firm at the end of quarter t-4. The primary sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. t-statistics are reported in parentheses below the coefficients.

		Panel A: Q1 1970 - Q4 2010		
Dependent variable	Independent variables: Intercept	EW $\Delta OI_t/P_{t-4}$	VW $\Delta OI_t/P_{t-4}$	Adj. R^2
RET_t	0.03	-1.43		0.0265
	(5.02)	(-2.33)		
	0.03		-2.31	0.0351
	(5.17)		(-2.63)	
RET_{t+1}	0.03	-1.34		0.0220
	(5.12)	(-2.16)		
	0.03		-1.68	0.0154
	(5.04)		(-1.88)	
		Panel B: Q4 1983 - Q4 2010		
Dependent variable	Independent variables: Intercept	EW $\Delta OI_t/P_{t-4}$	VW $\Delta OI_t/P_{t-4}$	Adj. R^2
RET_t	0.03	-0.78		-0.0066
	(3.48)	(-0.54)		
	0.03		-1.69	0.0004
	(3.80)		(-1.02)	
RET_{t+1}	0.03	-0.83		-0.0062
	(3.62)	(-0.58)		
	0.03		-1.78	0.0015
	(3.95)		(-1.08)	
		Panel C: Q4 1983 - Q4 2010 excluding Q4 2007 - Q1 2009		
Dependent variable	Independent variables: Intercept	EW $\Delta OI_t/P_{t-4}$	VW $\Delta OI_t/P_{t-4}$	Adj. R^2
RET_t	0.04	-1.94		0.0090
	(4.68)	(-1.39)		
	0.04		-2.85	0.0206
	(4.97)		(-1.77)	
RET_{t+1}	0.04	-0.98		-0.0049
	(4.31)	(-0.71)		
	0.04		-1.50	-0.0013
	(4.57)		(-0.93)	

continued on next page

continued from previous page

Panel D: Q4 1983 - Q4 2010 excluding Q4 2007 - Q1 2009				
Dependent	Independent variables			
variable	Intercept	EW $\Delta OI_t/P_{t-4}$	VW $\Delta OI_t/P_{t-4}$	Adj. R^2
$CRSPRET_t$	0.04	-2.42		0.0148
	(4.60)	(-1.59)		
	0.04		-3.35	0.0252
	(4.83)		(-1.91)	
$CRSPRET_{t+1}$	0.04	-1.22		-0.0035
	(4.07)	(-0.80)		
	0.04		-1.64	-0.0013
	(4.26)		(-0.93)	

Panel E: Q4 1983 - Q4 2010				
Dependent	Independent variables			
variable	Intercept	EW $\Delta NI_t/P_{t-4}$	VW $\Delta NI_t/P_{t-4}$	Adj. R^2
RET_t	0.03	-0.60		-0.0014
	(3.77)	(-0.92)		
	0.03		-2.26	0.0061
	(3.89)		(-1.29)	
RET_{t+1}	0.03	-1.39		0.0328
	(4.06)	(-2.16)		
	0.03		-4.16	0.0418
	(4.29)		(-2.39)	

Panel F: Q4 1983 - Q4 2010 excluding Q4 2007 - Q1 2009				
Dependent	Independent variables			
variable	Intercept	EW $\Delta NI_t/P_{t-4}$	VW $\Delta NI_t/P_{t-4}$	Adj. R^2
RET_t	0.04	-0.75		0.0048
	(4.72)	(-1.22)		
	0.04		-3.08	0.0227
	(4.96)		(-1.84)	
RET_{t+1}	0.04	-1.42		0.0414
	(4.85)	(-2.32)		
	0.04		-4.00	0.0443
	(5.01)		(-2.39)	

Table 2: Summary Statistics: This table reports summary statistics for all variables in the paper. The aggregate analyst forecast revision (REV$_t$) equals the percentage change in aggregate analyst forecasts over the quarter. Aggregate analyst forecasts at the beginning and end of the quarter equal the cross-sectional sum of firm-level analyst forecasts (consensus forecasts) at each point in time, multiplied by the number of shares at the beginning of the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. OAFE$_{t+1}$ equals the cross-sectional sum of firm-level analyst forecast errors based on the consensus as of the end of the revision period, scaled by the aggregate consensus at the end of the revision period. The unexpected OAFE$_t$, χ_t and ψ_t, are residuals from the regressions, $OAFE_t = a + b \cdot REV_{t-1} + c \cdot REV_{t-2} + d \cdot REV_{t-3} + e \cdot REV_{t-4} + \chi_t$ and $OAFE_t = a + b \cdot REV_{t-1} + c \cdot REV_{t-2} + d \cdot REV_{t-3} + e \cdot REV_{t-4} + f \cdot RET_{t-1} + \psi_t$, respectively. TAFE$_{t+1}$ is the cross-sectional sum of firm-level analyst forecast errors based on the consensus as of the beginning of the revision period, scaled by the aggregate consensus at the beginning of the revision period. The ratios EW ΔOI$_t$/P$_{t-4}$ and VW ΔOI$_t$/P$_{t-4}$ (EW ΔNI$_t$/P$_{t-4}$ and VW ΔNI$_t$/P$_{t-4}$) denote equal- and value-weighted changes in operating income after depreciation (net income) from quarters t-4 to t scaled by market capitalization at the end of quarter t-4. The expected aggregate earnings growth (EEG$_{t-1}$) is calculated as aggregate analyst forecasts for aggregate earnings of quarter t at the end of quarter t-1 minus aggregate earnings of quarter t-4, scaled by the market capitalization at the end of quarter t-4. The expected VW ΔNI$_t$/P$_{t-4}$, E$_{1,t-1}$(ΔNI$_t$/P$_{t-4}$) and E$_{2,t-1}$(ΔNI$_t$/P$_{t-4}$), are predicted values from the regressions, VW ΔNI$_t$/P$_{t-4}$ $= a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + \phi_{1,t}$ and VW ΔNI$_t$/P$_{t-4}$ $= a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + d \cdot REV_{t-2} + \phi_{2,t}$, respectively. Aggregate quarterly returns (RET$_t$) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. The primary sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The firms in the sample for E$_{1,t-1}$(ΔNI$_t$/P$_{t-4}$) and E$_{2,t-1}$(ΔNI$_t$/P$_{t-4}$) also have actual earnings information available on IBES. The analysis is based on quarterly data.

Variable	Number of observations	Mean	Std. Dev.	Q1	Median	Q3
REV$_t$	109	-0.0219	0.0367	-0.0333	-0.0177	0.0021
ε_t	109	0.0000	0.0286	-0.0107	0.0036	0.0137
η_t	109	0.0000	0.0276	-0.0115	0.0013	0.0138
OAFE$_t$	106	-0.0596	0.1117	-0.1234	-0.0229	0.0194
χ_t	106	0.0000	0.0876	-0.0507	0.0111	0.0542
ψ_t	106	0.0000	0.0875	-0.0457	0.0103	0.0535
TAFE$_{t+1}$	109	-0.0761	0.1299	-0.1632	-0.0418	0.0132
EW ΔOI$_t$/P$_{t-4}$	109	0.0030	0.0053	0.0007	0.0028	0.0054
VW ΔOI$_t$/P$_{t-4}$	109	0.0021	0.0046	-0.0003	0.0021	0.0041
E$_{1,t-1}$(ΔNI$_t$/P$_{t-4}$)	107	0.0010	0.0020	0.0005	0.0013	0.0019
E$_{2,t-1}$(ΔNI$_t$/P$_{t-4}$)	107	0.0010	0.0020	0.0005	0.0013	0.0020
RET$_t$	109	0.0282	0.0792	-0.0048	0.0388	0.0747
CRSPRET$_t$	109	0.0285	0.0873	-0.0109	0.0370	0.0800

Table 3: Time-Series Properties of Analyst Forecast Revisions: This table reports results for the AR(1) model of aggregate analyst forecast revisions, and the relation between aggregate revisions and lagged (aggregate) stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. The aggregate analyst forecast revision (REV_t) equals the percentage change in aggregate analyst forecasts over the quarter. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Dependent	Independent variables			
variable	Intercept	REV_{t-1}	RET_{t-1}	Adj. R^2
REV_t	-0.01	0.63		0.3876
	(-2.76)	(10.70)		
REV_t	-0.01	0.58	0.10	0.4238
	(-2.75)	(7.17)	(2.38)	

Table 4: Correlation Matrix: This table reports the correlation matrix for our variables. The upper diagonal reports the Pearson correlations and the lower diagonal reports the Spearman correlations. The aggregate analyst forecast revision (REV_t) equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The ratios EW $\Delta\text{NI}_t/\text{P}_{t-4}$ and VW $\Delta\text{NI}_t/\text{P}_{t-4}$ denote equal- and value-weighted changes in net income from quarters t-4 to t scaled by market capitalization at the end of quarter t-4. The expected aggregate earnings growth (EEG_{t-1}) is calculated as aggregate analyst forecasts for aggregate earnings of quarter t at the end of quarter t-1 minus aggregate earnings of quarter t-4, scaled by the market capitalization at the end of quarter t-4. The expected VW $\Delta\text{NI}_t/\text{P}_{t-4}$, $\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$ and $\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$, are predicted values from the regressions, VW $\Delta\text{NI}_t/\text{P}_{t-4} = a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + \phi_{1,t}$ and VW $\Delta\text{NI}_t/\text{P}_{t-4} = a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + d \cdot REV_{t-2} + \phi_{2,t}$, respectively. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. The primary sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The firms in the sample for $\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$ and $\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$ also have actual earnings information available on IBES. The analysis is based on quarterly data. The p-values are reported in parentheses.

	REV_t	ε_t	η_t	$\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	$\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	RET_t	RET_{t+1}	RET_{t-1}
REV_t		0.7789	0.7520	0.5083	0.4742	0.2394	-0.0419	0.3400
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0122)	(0.6651)	(0.0003)
ε_t	0.7115		0.9654	-0.0808	-0.1125	0.3504	0.0107	0.2538
	(0.0001)		(0.0001)	(0.4083)	(0.2486)	(0.0002)	(0.9118)	(0.0078)
η_t	0.6832	0.9369		-0.0772	-0.0948	0.3422	-0.0056	0.0000
	(0.0001)	(0.0001)		(0.4293)	(0.3316)	(0.0003)	(0.9539)	(1.0000)
$\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	0.5164	-0.0611	-0.0328		0.9768	-0.0908	-0.0803	0.1832
	(0.0001)	(0.5322)	(0.7375)		(0.0001)	(0.3521)	(0.4111)	(0.0590)
$\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	0.5851	-0.0072	0.0271	0.9501		-0.1162	-0.1042	0.1245
	(0.0001)	(0.9410)	(0.7816)	(0.0001)		(0.2335)	(0.2853)	(0.2015)
RET_t	0.0875	0.1973	0.2253	-0.0963	-0.1002		0.0721	0.0629
	(0.3658)	(0.0398)	(0.0186)	(0.3237)	(0.3047)		(0.4560)	(0.5156)
RET_{t+1}	-0.0683	-0.0980	-0.1069	0.0540	0.0031	-0.0107		0.0422
	(0.4805)	(0.3109)	(0.2688)	(0.5804)	(0.9746)	(0.9120)		(0.6634)
RET_{t-1}	0.1697	0.1400	-0.1580	0.0323	-0.0070	-0.0183	0.0892	
	(0.0777)	(0.1466)	(0.1008)	(0.7416)	(0.9429)	(0.8502)	(0.3564)	

Table 5: Summary of Analyst Forecasts: This table summarizes the analyst forecast data for our sample. The table reports the number of firms and forecasts that appear in our sample each year. The table also reports the average number of forecasts per firm in a given year. Our sample period is between the fourth quarter of 1983 and the fourth quarter of 2010. The yearly data represents the average number of firms and analysts during the year, based on four quarters. The average number of analyst forecasts per firm-quarter is calculated as the average number of forecasts divided by the average number of firms. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES.

	Average number for a quarter		
Year	Firms	Forecasts	Forecasts per a firm
1983	289	466	1.61
1984	308	598	1.94
1985	326	820	2.52
1986	333	682	2.05
1987	311	645	2.07
1988	296	871	2.94
1989	305	1,069	3.50
1990	295	929	3.15
1991	316	1,334	4.22
1992	316	1,334	4.23
1993	312	1,479	4.74
1994	317	1,698	5.35
1995	314	1,901	6.05
1996	317	1,991	6.28
1997	317	2,174	6.86
1998	310	2,829	9.12
1999	310	2,981	9.61
2000	310	2,663	8.59
2001	322	4,215	13.09
2002	320	4,149	12.97
2003	323	4,498	13.94
2004	324	4,756	14.67
2005	322	4,902	15.21
2006	316	4,762	15.07
2007	315	4,816	15.28
2008	325	5,544	17.07
2009	332	6,070	18.28
2010	332	6,340	19.09

Table 6: Validation of Earnings News Measures: This table reports the relation between the aggregate analyst forecast revision (REV_t), the earnings news measures, ε_t and η_t, and TAFE_{t+1}. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. TAFE_{t+1} is the cross-sectional sum of firm-level analyst forecast errors based on the consensus as of the beginning of the revision period, scaled by the aggregate consensus at the beginning of the revision period. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Panel A: Q4 1983 - Q4 2010					
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
TAFE_{t+1}	-0.02	2.64			0.5510
	(-1.36)	(6.15)			
	-0.08		2.78		0.3681
	(-4.74)		(6.28)		
	-0.08			2.91	0.3756
	(-4.83)			(6.27)	
Panel B: Q1 1989 - Q4 2010					
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
TAFE_{t+1}	0.00	2.62			0.6315
	(-0.36)	(6.06)			
	-0.07		2.73		0.4179
	(-3.94)		(6.17)		
	-0.07			2.84	0.4095
	(-3.96)			(6.01)	

Table 7: Future GDP, Industrial Production Growth Rates, and Aggregate Earnings News Measures: This table reports the relation between aggregate earnings news measures and future GDP and Industrial Production (IP) growth rates. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The GDP growth rate (ΔGDP_{t+1}) is the quarterly percentage change in seasonally-adjusted nominal GDP from quarter t to t+1. The IP growth rate (ΔIP_{t+1}) is the quarterly percentage change in seasonally-adjusted IP from the last month of quarter t, to the last month of quarter t+1. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
ΔGDP_{t+1}	0.01	0.07			0.1387
	(16.37)	(3.23)			
	0.01		0.08		0.0931
	(13.89)		(2.47)		
	0.01			0.07	0.0692
	(13.47)			(2.15)	
ΔIP_{t+1}	0.01	0.13			0.1070
	(4.19)	(3.12)			
	0.01		0.20		0.1592
	(3.26)		(4.75)		
	0.01			0.17	0.1079
	(3.07)			(3.14)	

Table 8: Contemporaneous Relation between Aggregate Earnings News Measures and Aggregate Stock Returns: This table reports the contemporaneous relation between the aggregate earnings news measures and aggregate stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Panel A reports results for the full sample, while Panel B reports results for the period with increased analyst coverage. Panels C and D report results excluding the recent financial crisis, Q4 2007 - Q1 2009. Newey-West adjusted t-statistics are reported in parentheses.

	Panel A: Q4 1983 - Q4 2010				
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
RET_t	0.04	0.52			0.0485
	(4.79)	(2.07)			
	0.03		0.97		0.1146
	(3.93)		(3.80)		
	0.03			0.98	0.1088
	(3.65)			(3.81)	
	Panel B: Q1 1989 - Q4 2010				
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
RET_t	0.04	0.62			0.0887
	(4.87)	(2.67)			
	0.03		1.07		0.1700
	(3.55)		(4.45)		
	0.03			1.11	0.1679
	(3.26)			(4.62)	
	Panel C: Q1 1983 - Q4 2010 excluding Q4 2007 - Q1 2009				
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
RET_t	0.04	0.21			-0.0035
	(4.91)	(0.72)			
	0.03		0.75		0.0393
	(4.53)		(1.97)		
	0.03			0.79	0.0429
	(4.37)			(2.13)	
	Panel D: Q1 1983 - Q4 2010 excluding Q4 2007 - Q1 2009				
Dependent	Independent variables				
variable	Intercept	REV_t	ε_t	η_t	Adj. R^2
$CRSPRET_t$	0.04	0.17			-0.0062
	(4.97)	(0.53)			
	0.03		0.84		0.0413
	(4.65)		(1.87)		
	0.03			0.89	0.0463
	(4.47)			(2.02)	

Table 9: Contemporaneous Relation between Aggregate Analyst Forecast Errors and Aggregate Stock Returns: This table reports the contemporaneous relation between aggregate analyst forecast errors and aggregate stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. $OAFE_t$ equals the cross-sectional sum of firm-level analyst forecast errors based on the consensus one quarter prior to the earnings announcement, scaled by the aggregate consensus during the same period. Unexpected $OAFE_t$, χ_t and ψ_t, are residuals from the following regressions: $OAFE_t = a + b \cdot REV_{t-1} + c \cdot REV_{t-2} + d \cdot REV_{t-3} + e \cdot REV_{t-4} + \chi_t$ and $OAFE_t = a + b \cdot REV_{t-1} + c \cdot REV_{t-2} + d \cdot REV_{t-3} + e \cdot REV_{t-4} + f \cdot RET_{t-1} + \psi_t$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Panel A reports the results from estimating the expected analyst forecast error regressions. Panels B - E report results for the relation between $OAFE_t$, unexpected forecast errors and stock returns. Panel B reports results for the full sample. Panel C reports results for the period with increased analyst coverage. Panels D and E report results for the period with increased analyst coverage excluding the recent financial crisis, Q4 2007 - Q1 2009. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Panel A: Expected analyst forecast errors

Dependent variable	Independent variable						
	Intercept	REV_{t-1}	REV_{t-2}	REV_{t-3}	REV_{t-4}	RET_{t-1}	Adj. R^2
$OAFE_t$	-0.02	2.13	-0.82	0.83	-0.28		0.3608
	(-1.28)	(5.58)	(-2.08)	(1.88)	(-0.94)		
	-0.02	2.10	-0.80	0.82	-0.28	0.04	0.3550
	(-1.40)	(5.64)	(-2.04)	(1.91)	(-0.93)	(0.32)	

Panel B: Q3 1984 - Q4 2010

Dependent variable	Independent variables				
	Intercept	$OAFE_t$	χ_t	ψ_t	Adj. R^2
RET_t	0.03	0.05			-0.0055
	(4.13)	(0.71)			
	0.03		0.11		0.0045
	(3.59)		(1.23)		
	0.03			0.11	0.0040
	(3.58)			(1.21)	

Panel C: Q1 1989 - Q4 2010

Dependent variable	Independent variables				
	Intercept	$OAFE_t$	χ_t	ψ_t	Adj. R^2
RET_t	0.03	0.07			-0.0014
	(3.47)	(0.97)			
	0.02		0.19		0.0236
	(2.49)		(2.04)		
	0.02			0.18	0.0226
	(2.48)			(2.02)	

Panel D: Q1 1989 - Q4 2010 excluding Q4 2007 - Q1 2009

Dependent variable	Independent variables				
	Intercept	$OAFE_t$	χ_t	ψ_t	Adj. R^2
RET_t	0.03	0.02			-0.0115
	(4.14)	(0.45)			
	0.03		0.17		0.0180
	(3.76)		(1.89)		
	0.03			0.17	0.0180
	(3.75)			(1.89)	

Panel E: Q1 1989 - Q4 2010 excluding Q4 2007 - Q1 2009

Dependent variable	Independent variables				
	Intercept	$OAFE_t$	χ_t	ψ_t	Adj. R^2
$CRSPRET_t$	0.04	0.01			-0.0123
	(4.29)	(0.18)			
	0.03		0.20		0.0235
	(3.87)		(1.87)		
	0.03			0.20	0.0236
	(3.86)			(1.86)	

Table 10: Relation Between Expected Aggregate Earnings Changes and Aggregate Stock Returns: This table reports the relation between expected aggregate earnings changes and aggregate stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns of all firms in our sample, during quarter t. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. The ratio VW $\Delta\text{NI}_t/\text{P}_{t-4}$ denotes value-weighted changes in net income, relative to the same quarter in the prior year. Changes are scaled by the market capitalization of the firm at the end of quarter t-4. Expected aggregate earnings growth (EEG_{t-1}) is calculated as aggregate analyst forecasts for aggregate earnings of quarter t, at the end of quarter t-1, minus aggregate earnings of quarter t-4. The difference is scaled by the market capitalization at the end of quarter t-4. The analyst forecast revision (REV_t) is the change in aggregate analyst forecasts over quarter t, scaled by the market capitalization at the end of quarter t-1. Expected VW $\Delta\text{NI}_t/\text{P}_{t-4}$ denoted as $\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$ and $\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$, equals the fitted values from the following regressions: VW $\Delta\text{NI}_t/\text{P}_{t-4} = a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + \phi_{1,t}$ and VW $\Delta\text{NI}_t/\text{P}_{t-4} = a + b \cdot EEG_{t-1} + c \cdot REV_{t-1} + d \cdot REV_{t-2} + \phi_{2,t}$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts and actual earnings available on IBES. The analysis is based on quarterly data. Panel A reports the results from estimating the expected aggregate earnings growth regressions. Panel B reports results for the relation between expected aggregate earnings changes and aggregate stock returns, for the full sample. Panels C and D report results for the same relation while excluding the recent financial crisis, Q4 2007 - Q1 2009. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Panel A: Expected aggregate earnings changes

Dependent variable	Intercept	EEG_{t-1}	REV_{t-1}	REV_{t-2}	Adj. R^2
VW $\Delta\text{NI}_t/\text{P}_{t-4}$	0.001	0.426	2.205		0.5993
	(2.77)	(3.12)	(4.27)		
	0.001	0.294	1.816	0.800	0.6080
	(3.48)	(2.03)	(5.74)	(2.40)	

Panel B: Q2 1984 - Q4 2010

Dependent variable	Intercept	$\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	$\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	Adj. R^2
RET_t	0.03	-3.50		-0.0017
	(3.35)	(-0.96)		
	0.03		-4.54	0.0035
	(3.62)		(-1.43)	

Panel C: Q2 1984 - Q4 2010 excluding Q4 2007 - Q1 2009

Dependent variable	Intercept	$\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	$\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	Adj. R^2
RET_t	0.04	-8.27		0.0273
	(4.76)	(-2.23)		
	0.04		-7.47	0.0235
	(4.84)		(-2.20)	

Panel D: Q2 1984 - Q4 2010 excluding Q4 2007 - Q1 2009

Dependent variable	Intercept	$\text{E}_{1,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	$\text{E}_{2,t-1}(\Delta\text{NI}_t/\text{P}_{t-4})$	Adj. R^2
CRSPRET_t	0.05	-11.25		0.0471
	(5.07)	(-2.83)		
	0.05		-10.17	0.0414
	(5.19)		(-2.77)	

Table 11: Relation Between Aggregate Earnings News Measures and Future Aggregate Stock Returns: This table reports the relation between the aggregate earnings news measures and future aggregate stock returns. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns for all firms in our sample, during quarter t. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Panel A reports results for the full sample, while Panel B reports results for the period with increased analyst coverage. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Panel A: Q4 1983 - Q4 2010						
Dependent	Independent variables					
variable	Intercept	REV_{t+1}	REV_t	ε_t	η_t	Adj. R^2
RET_{t+1}	0.03	0.97	-0.71			0.1095
	(4.15)	(3.85)	(-4.65)			
	0.03			0.03		-0.0092
	(3.64)			(0.08)		
	0.03				-0.02	-0.0093
	(3.63)				(-0.04)	
Panel B: Q1 1989 - Q4 2010						
Dependent	Independent variables					
variable	Intercept	REV_{t+1}	REV_t	ε_t	η_t	Adj. R^2
RET_{t+1}	0.03	1.05	-0.71			0.1579
	(3.78)	(4.38)	(-4.66)			
	0.03			0.01		-0.0116
	(2.88)			(0.03)		
	0.03				-0.07	-0.0109
	(2.86)				(-0.15)	

Table 12: Risk Premiums and Earnings News Measures: This table reports the relation between the aggregate earnings news measures and the two components of aggregate stock returns; the risk premium and the risk-free rate. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns for all firms in our sample, during quarter t. The risk premium (Rp_t) is defined as the aggregate quarterly returns (RET_t) minus the risk-free rate (Rf_t). Rf_t equals the cumulative 90 day T-bill return from the first month to the last month of quarter. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. The sample consists of S&P 500 non-financial firms, between 1983 and 2010, with analyst earnings forecasts available on IBES. The analysis is based on quarterly data. Newey-West adjusted t-statistics are reported in parentheses.

Panel A: Contemporaneous stock returns

Dependent Variable	Independent variables: Intercept	REV_t	ε_t	η_t	Adj. R^2
Rp_t	0.03	0.51			0.0471
	(3.43)	(2.17)			
	0.02		0.99		0.1201
	(2.49)		(4.06)		
	0.02			1.01	0.1158
	(2.31)			(4.08)	
Rf_t	0.01	0.01			-0.0065
	(9.12)	(0.37)			
	0.01		-0.02		-0.0032
	(9.86)		(-0.56)		
	0.01			-0.02	0.0024
	(9.90)			(-0.79)	

Panel B: Future stock returns

Dependent Variable	Independent variables: Intercept	REV_{t+1}	REV_t	ε_t	η_t	Adj. R^2
Rp_{t+1}	0.02	0.99	-0.75			0.1172
	(2.83)	(4.14)	(-5.10)			
	0.02			0.03		-0.0092
	(2.35)			(0.07)		
	0.02				-0.01	-0.0093
	(2.34)				(-0.04)	
Rf_{t+1}	0.01	-0.02	0.04			0.0197
	(9.14)	(-0.59)	(1.92)			
	0.01			0.00		-0.0092
	(9.67)			(0.11)		
	0.01				0.00	-0.0092
	(9.67)				(-0.09)	

Table 13: Robustness Tests: This table reports the contemporaneous relation between the aggregate earnings news measures and aggregate stock returns, using different samples and data selection criteria. Aggregate quarterly returns (RET_t) are defined as the value-weighted cumulative returns for all firms in the specific sample, during quarter t. CRSPRET equals the quarterly cumulative CRSP value-weighted index return. SPRET equals the quarterly cumulative S&P 500 value-weighted index return. REV_t equals the percentage change in aggregate analyst forecasts over the quarter. The earnings news measures, ε_t and η_t, are residuals from the regressions, $REV_t = a + b \cdot REV_{t-1} + \varepsilon_t$ and $REV_t = a + b \cdot REV_{t-1} + c \cdot RET_{t-1} + \eta_t$, respectively. Panel A reports results for the sample consisting of US firms, between 1983 and 2010, with analyst forecasts for next quarter's earnings available on IBES. Panel B reports results for the sample consisting of S&P 500 non-financial firms, between 1993 and 2009, with analyst forecasts for the next fiscal year (four quarters ahead) available on IBES. Panel C reports results using analyst forecasts for next quarter's S&P 500 (overall) operating income, between 1996 and 2010, available on IBES. The analysis is based on quarterly data. Newey-West adjusted t-statistics are reported in parentheses below the coefficients.

Dependent variable	Independent variables: Intercept	REV_t	ε_t	η_t	Adj. R^2	Dependent variable	Independent variables: Intercept	REV_t	ε_t	η_t	Adj. R^2
Panel A: US firms with analyst forecasts											
$CRSPRET_t$	0.05	0.64			0.0745	RET_t	0.05	0.65			0.0814
	(5.34)	(2.66)					(5.26)	(2.71)			
	0.03		0.98		0.1209		0.03		0.96		0.1206
	(3.93)		(2.86)				(3.86)		(2.77)		
	0.03			1.06	0.1268		0.03			1.02	0.1242
	(3.61)			(3.08)			(3.55)			(2.94)	
Panel B: Analyst forecasts for one-year-ahead earnings											
$CRSPRET_t$	0.04	1.11			0.1850	RET_t	0.04	1.03			0.1953
	(3.75)	(5.19)					(3.77)	(6.17)			
	0.02		1.48		0.2340		0.02		1.35		0.2396
	(2.48)		(5.04)				(2.44)		(6.34)		
	0.02			1.53	0.2200		0.02			1.38	0.2207
	(2.10)			(4.50)			(2.09)			(5.48)	
Panel C: Analyst forecasts for S&P 500 earnings											
$CRSPRET_t$	0.03	0.82			0.1523	$SPRET_t$	0.03	0.76			0.1504
	(3.11)	(5.76)					(2.94)	(5.69)			
	0.02		0.81		0.1316		0.02		0.73		0.1234
	(2.19)		(5.01)				(2.07)		(4.84)		
	0.02			0.85	0.1391		0.02			0.77	0.1278
	(2.04)			(4.37)			(1.93)			(4.24)	