Analysts, Macroeconomic News, and the Benefit of In-House Economists*

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JEL Classification: G12, G14, G24.

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Abstract

Although macroeconomic news has a major impact on corporate earnings, anecdotal evidence suggests that financial analyst research is inefficient with respect to such news. Examining analysts' earnings research, we find that they under-react to negative macroeconomic news. Analysts are not all equal though, as analysts employed at the same firm as an active macroeconomist under-react much less. In addition, analysts who are more experienced or more focused (i.e., cover fewer firms), or who are exposed to more accurate or award-winning in-house macroeconomists are even more efficient. Investors appear to recognize the benefit of access to macroeconomists, reacting more strongly to these analysts' forecast revisions. Overall, our results suggest that the presence of an in-house macroeconomist improves the efficiency and credibility of analyst research.

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1. INTRODUCTION

Although the macroeconomy materially affects corporate earnings, anecdotal evidence suggests that analysts' earnings forecasts are inefficient with respect to macroeconomic news, especially when economic growth declines. For example, a report by McKinsey & Company concludes:

> "Analysts … [are] typically overoptimistic, slow to revise their forecasts to reflect new economic conditions, and prone to making increasingly inaccurate forecasts when economic growth decline[s]." (McKinsey 2010, p. 14)

As is common, this anecdote speaks of analysts as a homogeneous group, ignoring the considerable variation in resources across research firms. In reality, of course, analysts do not produce research in isolation; they leverage in-house expertise in a wide variety of forms (Bradshaw 2012).[1] In the setting of macroeconomic news, we examine if analysts improve their research efficiency when they are employed at the same firm as an active macroeconomist; we investigate when analysts improve more; and, finally, whether there is a payoff to investment firms for employing macroeconomists in terms of research credibility.

In our empirical implementation, we focus on quarterly earnings forecasts issued during the 1998 to 2011 period, and consider analysts' efficiency in incorporating GDP news.[2] We

[1] This broader view of analyst research is evident in recent papers investigating how equity research can benefit from interactions with commercial banking (Chen and Martin 2010), as well as industry strategists (Kadan et al. 2012).

[2] GDP (gross domestic product) is the market value of goods and services produced by labor and property in the United States, regardless of nationality. http://www.bea.gov/glossary.

focus on GDP since it is arguably the most comprehensive indicator of macroeconomic activity, and we show that it has a material impact on corporate earnings.[3] We measure macroeconomic news as the most recent consensus real GDP growth forecast for the current quarter minus the real GDP growth realization for the same quarter last year (i.e., $FGDP_t$ – GDP_{t-4}); our measurement choice is meant to allow the GDP news to be observable to the analyst at the time the analyst's earnings forecast is made. However, our results are similar if we base our analyses on alternative measures of news, e.g., based on either GDP growth revisions ($FGDP_t$ - $FGDP_{t-4}$) or actual growth realizations (GDP_t - GDP_{t-4}).

Consistent with the anecdotal evidence, as well as findings in concurrent work by Hann et al. (2012), we find that analysts under-react to negative macroeconomic news but not to positive macroeconomic news. This result holds after controlling for a variety of analyst, broker, and firm-level variables. In economic terms, a one standard deviation increase in negative GDP news results in an expected $0.04 increase in forecast error, which is approximately 15% of the median firm EPS of $0.27 in the corresponding negative GDP news sample.[4]

Beyond documenting analyst under-reaction to negative macroeconomic news, it is important to understand the underpinnings of their behavior. There are two common,

[3] As evidence of the material impact, in regressions of earnings news on GDP news, we find the mean of industry R^2s to be 14.6% and 18.5% in negative and positive GDP news samples, respectively. In terms of individual industries, the strongest link between earnings and GDP news is found in Consumer durables, where R^2s range from 17.8% to 27.6%; however, even in Utilities, the industry with the weakest association, the mean R^2s range from 6.7% to 10.3%. See Table 2 for complete results.

[4] A one standard deviation increase in bad NEWS (2.02%) * coefficient estimate from Table 4 (0.0731) = 0.15% increase in the price-deflated forecast error. Based on the median beginning price in the bad news sample ($24.4), the increase in forecast error is approximately $24.4 * 0.15% = $0.04.

non-mutually exclusive reasons in the literature for why analysts are too optimistic. First, a significant part of analyst optimism is a carryover from coverage initiation (McNichols and O'Brien 1997, Das et al. 2006). That is, analysts select to cover firms that they are optimistic about since better performing firms are more likely to produce trading commissions, access the capital markets, and acquire other firms. In this scenario, the analyst initiates coverage based on a positive perception of future firm performance, and without convincing evidence to the contrary, the analyst persists in this positive outlook. In this scenario, the presence of an active in-house macroeconomist can mitigate analysts' excess optimism and serve as a viable source of "evidence to the contrary," especially relevant during economic downturns.

To elaborate, as economic conditions shift, an analyst is likely to benefit from an in-house macroeconomist in several ways.[5] First, in-house macroeconomists update their research outlooks quite frequently, often on a daily basis, yielding more timely predictions and insights than those publicly available from sources such as Bloomberg that are disseminated on a fixed schedule. Second, economists aid analysts in understanding the underlying determinants of changing economic conditions which are critical to understanding the macroeconomic impact on specific industries and companies of interest. Consistent with this view, one of the buy-side clients of Nancy Lazar, an award winning economist at ISI

[5] Our insights on analyst and macroeconomist interaction are based on institutional periodicals such as *Institutional Investor*, as well as direct conversations and email contact with two macroeconomists and one former analyst. As one anecdote, the former analyst maintained a spreadsheet with GDP and other macro-level estimates linked to individual spreadsheets for each followed company. When the in-house macroeconomist updated his forecasts, she updated her central 'macro' spreadsheet which flowed through to the individual company spreadsheets. As a benefit of having an in-house macroeconomist, she could ask follow-up questions to better understand the drivers behind changes in GDP estimates, allowing greater insight as to effects on followed companies and industries.

Group, remarked, “Nancy is helpful for focusing on cyclical drivers and explaining macro events” (Institutional Investor 2011). Third, in-house macroeconomists are available for follow-up questions and can provide additional context through morning conference calls, internal reports, as well as meetings.

Finally, beyond mere macroeconomic expertise, economists also provide an objectivity benefit. That is, analysts are highly dependent on management for much of their information (Brown et al. 2013). This interdependency can often result in analysts taking on managers’ optimistic mindsets. Economists, on the other hand, function at the aggregate level, and therefore, do not have the same close relationship with managers. Consequently, not only do the economists have macroeconomic expertise, but they are more likely to be more objective concerning how economic news affects followed companies.

A second reason that analysts may respond inefficiently to bad economic news is due to direct conflicts of interest. Under this rationale, an analyst knowingly ignores bad economic news in order to curry favor with management. While good relations with management can lead to a number of potential economic benefits, perhaps the most common one examined in the literature pertains to maintaining or winning underwriting business (e.g., Dugar and Nathan 1995, Lin and McNichols 1998, Michaely and Womack 1999, Chan et al. 2007).

Thus, both explanations potentially explain why analysts would under-react to bad but not good macroeconomic news. The primary difference is that the former explanation based on lack of economic advice/expertise entertains the possibility of good-faith (i.e., analysts maintain a positive outlook unless presented with credible counterevidence), while the latter one centers on analyst opportunism (i.e., analysts strategically ignore bad macroeconomic news).

Our results indicate that analysts are more efficient in incorporating negative macroeconomic news when they are employed at the same firm as an active macroeconomist.[6] In particular, analysts with access to an economist are able to incorporate roughly 15% more negative macroeconomic news into their earnings forecasts. In contrast, we do not find evidence of inefficiency due to underwriting conflicts (we also look at M&A advisory conflicts and find similar results). Thus, lack of exposure to macroeconomic expertise rather than response to economic incentives appears to be a stronger determinant of persistence in analyst optimism in an adverse economic environment.

Of course, macroeconomists are not randomly assigned to investment firms. Therefore, we take a number of steps to limit potential endogeneity concerns. First, we control for investment firm resources with investment firm size and status variables. Second, we demonstrate cross-sectional variation *within* investment firms employing active macroeconomists, revealing that more accurate and award-winning macroeconomists result in greater forecast efficiency. And finally, we use two natural experiments to exploit changes in the availability of active macroeconomists to analysts to corroborate our results.[7] In all instances, we find results consistent with our baseline results and in some instances stronger. For example, we find that the improvement in forecast efficiency increases from 15% to about 28% when the in-house macroeconomist is an *Institutional Investor* award winner.

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[6] We define an 'active' macroeconomist as an economist that has submitted a current quarter GDP forecast to Bloomberg—for more on this measure and the Bloomberg survey see Section 3.2. At firms with an active macroeconomist, we find that analysts tend to forecast more frequently, cover more firms, and have greater firm-specific forecasting experience; also, we find research firms with active macroeconomists are significantly larger—therefore, we control for these variables, as well as other analyst and broker characteristics in all models.

[7] Details of the latter tests are found in Section 5.

While an in-house macroeconomist appears to improve analyst research efficiency, it is not likely that all analysts covering all firms benefit equally. To benefit from the presence of the in-house macroeconomist, analysts presumably need a certain threshold of expertise to understand the nuanced linkages between GDP news and the covered-firm's production factors and product markets. In addition, there is likely to be variation in macroeconomist quality across firms. With such factors in mind, we conduct cross-sectional tests and demonstrate that analysts with greater firm-specific experience, and those who cover fewer firms (i.e., more focused coverage) increase their forecast efficiency with access to a macroeconomist. Furthermore, we find that analysts employed at the same firms as award-winning or more accurate macroeconomists realize greater efficiency benefits.

Although an in-house macroeconomist improves analyst research efficiency, it is not clear if this translates to direct payoffs for the investment firms in terms of research credibility. Using several sample variations to address confounding events within our return windows, we find that the market reacts 13% more strongly to forecast revisions made by analysts linked to an active in-house macroeconomist.

Our findings make several contributions to the literature. First, while anecdotal evidence portrays analysts as inefficient with respect to changing economic conditions—particularly downturns, little formal evidence of this phenomenon exists. Using over 300,000 observations during the 1998 to 2011 time period, we find that analysts under-react to bad news but do not react inefficiently to good macroeconomic news. Our finding of analyst inefficiency with respect to GDP news is consistent with the Basu et al. (2010) finding of analyst inefficiency with respect to inflation news, and, more directly, the Hann et al. (2012) finding that analysts are inefficient with respect to economists' negative forecast revisions.

Second, in contrast to these related studies on analyst macroeconomic inefficiency, we examine an important, potential mitigating factor—exposure to timely economic expertise. Given that analyst forecasts are important benchmarks of a firm's financial performance, our findings suggest the possibility of locating a subset of analysts who are relatively more efficient. We believe that documenting the benefit of an in-house macroeconomist is particularly important given the strong link between the macroeconomic environment and corporate earnings.

Third, we demonstrate that employing an active in-house macroeconomist leads to greater forecast efficiency, but it is not clear how investment firms benefit from this result per se. Thus, we provide evidence that employing an active in-house macroeconomist is also associated with greater earnings research credibility. Research credibility enhances an investment firm's reputation and ability to provide research support to its clients, both of which should be important determinants of their financial performance.

We organize the rest of the paper as follows. Section 2 summarizes the related papers. Section 3 describes the data and key variables, and reports descriptive statistics. Sections 4 and 5 present the main empirical results, and Section 6 concludes.

2. RELATED LITERATURE

Given the importance of the macroeconomy for corporate earnings, there are surprisingly few papers at the intersection of macroeconomic news and analyst earnings research. Ackert and Hunter (1995) examine 3,640 forecasts from 1984 to 1990, finding that

analysts' forecasts are inefficient with respect to GNP news.[8] Darrough and Russell (2002) compare the *aggregation* of individual analysts' forecasts to market strategists' forecasts of aggregate earnings (where the latter is assumed to be based on macroeconomic factors) for the S&P500 and the Dow Jones Industrial Average. Overall, they find that analysts are more optimistic than the market strategists. Basu et al. (2010) find that analysts' earnings forecasts are inefficient with respect to expected inflation proxies; the authors proxy for expected inflation with a time-series forecast of inflation, as well as an inflation forecast reported by the Michigan Survey of Consumers.

Most recently, Hann et al. (2012) view aggregated earnings forecasts and consensus GDP forecasts as competing sources of macroeconomic information. They evaluate the extent to which these two sources contain common information, the efficiency of each forecast source with respect to the other, and how efficient the market is with respect to each forecast source.

Relative to our study, Ackert and Hunter (1995) do not distinguish between positive and negative news and, therefore, cannot conclude that analysts under-react to bad macroeconomic news. Darrough and Russell (2002) and Basu et al. (2010) do not investigate GDP (or the related GNP measure) nor do they distinguish between positive and negative news. Most importantly, however, these papers to do not delve into potential mitigating factors as we do with the advancement of the in-house macroeconomist as a resource for better understanding macroeconomic news.

[8] GNP (gross national product) is the market value of goods and services produced by labor and property supplied by U.S. residents, regardless of where they are located. It was used as the primary measure of U.S. production prior to 1991, when it was replaced by GDP. Source: http://www.bea.gov/glossary.

Of the papers, most close to our paper, Hann et al. (2012) evaluate *aggregate* earnings forecasts and GDP forecasts as competing sources of macroeconomic news; however, our objective is to evaluate analyst efficiency in incorporating recent, observable macroeconomic news. This difference in objectives leads to different research designs and empirical tests.

Hann et al. (2012) find, as we do, that analysts under-react to negative macroeconomic news but not to positive news. Germane for our study, they find no similar inefficiency on the part of macroeconomists. Although we overlap with Hann et al. (2012) on the base-line analyst inefficiency finding, we depart significantly in our investigation into potential mitigating factors. In this regard, we introduce the in-house macroeconomist, as well as related cross-sectional tests (e.g., macroeconomist accuracy). Thus, the direction of our paper is best viewed as an exploration of broker resource allocation and implications for earnings research, rather than a paper on inefficiency per se.

3. DATA SOURCES, SAMPLE SELECTION, AND KEY VARIABLES

3.1. Sample selection

The empirical tests employ data from several sources. Analyst earnings forecast data are obtained from the Thomson Reuters' Institutional Brokers' Estimate System (I/B/E/S) US Detail file for the 1998 to 2011 period. Financial statement data are obtained from the Compustat quarterly database, and stock return data are obtained from the Center for Research on Security Prices (CRSP) daily stock return files. Information regarding the timing and underwriter of equity offering are obtained from Thomson Reuters' Security Data

Company (SDC) Platinum database. Finally, real gross domestic product (GDP) growth forecasts are obtained from the Bloomberg macroeconomic survey.[9]

Table 1 shows the sample selection procedure. While the Bloomberg macroeconomic survey data have become available since 1997, our sample period begins in 1998 as we require prior-year data to measure macroeconomic news. We focus on analysts' initial one-quarter ahead quarterly earnings forecasts occurring after the release of the prior quarter's earnings announcement.[10] Since the GDP forecasts used in our study are on a calendar-quarter basis, we retain firms reporting on a calendar-quarter basis to synchronize GDP and analysts' earnings forecasts. In addition, we require that the first macroeconomic survey for the quarter is available to ensure that analysts have access to the macroeconomic forecasts.

3.2. Key variables

3.2.1. Dependent variable

The dependent variable in our main analyses is the signed analyst forecast error, FE, defined as actual EPS minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. Accordingly, a negative analyst forecast error indicates analyst optimism, whereas a positive analyst forecast error indicates analyst pessimism.

[9] Most participants of the Bloomberg macroeconomic survey are economists from investment banks or security firms, which enables us to identify whether or not an analyst has access to in-house macroeconomist's research.

[10] Using analyst forecasts issued after prior earnings announcement not only ensures that the financial information and forecast error from last quarter are known to analysts but also alleviates the impact of stale forecasts.

3.2.2. Macroeconomic news variable

We measure macroeconomic news, NEWS, as the most recent median consensus real GDP growth forecast for the current quarter seasonally adjusted by the actual real GDP growth for the same quarter last year (i.e., $FGDP_t - GDP_{t-4}$). We require FGDP to precede the analyst earnings forecast, allowing the GDP news variable to be observable to the analyst. Our results are similar if we base our analyses on alternative measures of news, e.g., based on either GDP growth revisions ($FGDP_t$ - $FGDP_{t-4}$) or actual growth realizations (GDP_t - GDP_{t-4}).

3.2.3. Macroeconomist variables

We are interested in whether or not access to an 'active' in-house macroeconomist can improve analyst efficiency with respect to macroeconomic news. We measure the economist variable, MACRO, with an indicator set to 1 if the in-house macroeconomist's GDP forecast is included in the most recent Bloomberg macroeconomic survey, and 0 otherwise.

An important consideration is how economists come to be included in the Bloomberg survey. To gain insight, we contacted two macroeconomists who have participated in the Bloomberg survey. In brief, journalists at Bloomberg develop networks in the markets and when they encounter an economist they deem as a credible source, they contact that person for participation. As to the macroeconomists incentives to participate, career concerns and name recognition appear to be the key motivations. Thus, in terms of selection, it is likely that we are capturing better, more motivated macroeconomists. However, we do not view this as problematic since our thesis is that access to economic expertise benefits analysts' earnings research, and the participants in the Bloomberg survey should, on average, proxy for greater

economic expertise than either research firms without macroeconomists or those with economists that are not active in the Bloomberg survey.

Within the set of Bloomberg economists, we measure the quality of their research both by their GDP forecast accuracy and by their *Institutional Investor* award status. Specifically, we measure GDP forecast accuracy, MACRO_ACCURACY, by the economist's absolute GDP forecast error in the most recent survey, scaled by the absolute median consensus GDP forecast error, and then multiplied by (-1) so that higher value of the variable means greater accuracy.[11] As accuracy is not the only determinant of a high quality economic research (Lamont 1995), we also measure the quality of research with the economist's award status during the year, MACRO_AWARD, which is an indicator variable set to 1 if the economist is ranked in the top three or as a runner-up by the *Institutional Investor* magazine, and 0 otherwise.[12]

3.2.4. Equity underwriting incentives variables

An additional set of variables is related to analysts' equity underwriting incentives, since we are interested in whether or not the presence of economic incentives would influence analysts' efficiency in incorporating macroeconomic news. Specifically, the indicator variable EQ_AFFIL represents the existing (1-year) underwriter-client relationship, which is set to 1 if an investment firm acts as the lead manager or co-manager of the firm's equity

[11] The scaling procedure controls for the difficulty in forecasting GDP for a specific quarter and ensures the comparability of the measure across different quarters. If the median consensus GDP forecast error is zero, we replace the denominator with 0.1%.

[12] Specifically, we wish to proxy for the better quality research *underlying* the award; therefore, we set MACRO_AWARD = 1 for the year leading up to the award. For example, if an economist receives the award in the October, 2001 issue, we set MACRO_AWARD = 1 for the period Nov. 2000 - Oct. 2001.

underwriting team in the year prior to its analyst's earnings forecast for the firm, and 0 otherwise (Lin and McNichols 1998). The indicator variable EQ_OPPORT represents a potential, future equity underwriting opportunity for an investment firm, which is set to 1 if a firm announces an equity offering in the year following an analyst's earnings forecast for the firm, and 0 otherwise (Feng and McVay 2010).

3.3. Descriptive statistics

Table 2 presents the descriptive statistics for the variables used in our study. Panel A reports the statistics of key variables and other control variables separately for the negative and positive macroeconomic news samples. Panel B reports the statistics of additional variables used in the short-window market response tests.

In Panel A, focusing on the key variables in our study, we find that the mean price-deflated analyst forecast error (FE) is optimistic for both bad and good news samples. We report that 27.9% (30.1%) of earnings forecasts in the negative (positive) macroeconomic news sample are supplied by analysts who have access to in-house macroeconomist’s research, 3.8% (4.4%) of earnings forecasts are supplied by analysts with existing equity underwriter-client relationship, and 6.4% (5.3%) of earnings forecasts are issued by analysts in the year prior to a firm’s SEO announcement.

In Panel B, the number of observations available for the short-window market response tests is reduced due to the calculation of price-deflated analyst forecast revision, REV, which requires a benchmark earnings expectation (consensus analyst forecast within [-30,-2]). The mean and median revisions are depressed due to the price-deflation. In untabulated tests, we find that the mean REV is significantly different from zero for both bad and good news

samples, and the mean REV is significantly less for the bad news sample than for the good news sample. The mean (median) market capitalization for our sample is approximately $11 ($3) billion. Since the distribution of firm size is skewed, we use the natural logarithm of firm size in our short-window market reaction tests.

4. EMPIRICAL RESULTS

In this section, we present our main empirical results. First, we quantify the intuitive link between GDP and firm earnings. Next, we examine analyst efficiency with respect to macroeconomic news, and then investigate whether the availability of in-house macroeconomists' research is associated with analyst forecast efficiency. We then examine economist-specific and analyst-specific factors that influence the economic impact of an in-house macroeconomist. Last, we investigate whether there is evidence of direct economic payoffs to an investment firm's economic sophistication in terms of research credibility.

4.1. Link between GDP and firm earnings

Implicit in this study's motivation is the existence of a meaningful link between GDP and firm earnings. That is, in the absence of a material association, there is little reason for analysts to incorporate GDP news into their firm-specific earnings forecasts. Thus, before presenting our main results, we verify that GDP news materially affects corporate earnings.

Table 3 presents R^2 descriptives from estimating firm-specific OLS regressions of earnings changes on GDP news for all sample firms during the 1998 to 2011 period. Earnings changes are seasonally-adjusted changes in earnings, calculated as income before extraordinary items for quarter t minus income before extraordinary items for quarter t-4, scaled by average total assets for quarter t. GDP news is defined as actual real GDP growth

for quarter t minus the actual real GDP growth for quarter t-4. Industries are based on the Fama-French 12 industry classification.

We present results from samples based on both negative and positive changes in GDP. We find the mean of individual firm R^2s to be 0.146 and 0.185 in the negative and positive GDP news samples, respectively. Individual industry mean R^2s range from 0.067 in the negative GDP news sample to 0.276 in the positive news sample. Examining the heterogeneity across industries, we find that the weakest association across samples is Utilities (mean R^2s ranging from 0.067 to 0.103), while the strongest is Consumer durables (R^2s ranging from 0.178 to 0.276).

These findings support our key assumption and indicate that GDP news has a material effect on firm earnings. Thus, analysts should incorporate this information in their earnings forecasts. In the remaining part of the paper, we investigate whether certain analysts are more likely to incorporate GDP news in their forecasts. In particular, we examine whether access to an in-house macroeconomist improves forecast efficiency.

4.2. Analyst efficiency with respect to macroeconomic news

4.2.1. Model specification

We examine analyst efficiency with respect to macroeconomic news by regressing the price-deflated forecast error, FE, on the macroeconomic news variable, NEWS, and control variables. To ensure that the inferences derived from the empirical tests are not specific to our measure of macroeconomic news, we use two alternative NEWS measures, defined as (1) the most recent median consensus real GDP growth forecast for the quarter minus the final median consensus real GDP growth for the same quarter last year (i.e. $FGDP_t - FGDP_{t-4}$), and

(2) the actual real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year (i.e., $GDP_t - GDP_{t-4}$), respectively.

There are three classes of controls that are relevant to our setting. First, there are analyst-specific variables that are known to be associated with forecast error, including forecast horizon, HORIZON, forecast frequency, FREQ, the number of industries covered, NIND, number of firms covered, NFIRM, firm-specific experience, FEXP, and the analyst's prior forecast error, LAG_FE (e.g., Mikhail et al. 1997, Clement 1999, Jacob et al. 1999).

Second, investment firm resources have been shown to affect the quality of analyst research. To capture those effects, we use investment firm size, BSIZE, a categorical measure of investment firm size, TOP_BROKER, and the magnitude of underwriting activity, UW_RANK. Finally, our controls for firm-specific variables likely to affect the forecast error include total accruals, LAG_TACC, prior abnormal buy-and-hold returns, PRIOR_BHR, and earnings sensitivity to macroeconomic news, CYCLICALITY (e.g., Bradshaw et al. 2001, Mikhail et al. 2003, Hutton et al. 2012).

Based on the preceding discussion, we specify the following OLS regression model, where indexes for analyst, firm, and quarter are omitted for brevity:

$$\begin{aligned} FE = {} & \alpha_0 + \alpha_1 \cdot NEWS + Analyst\ Controls + Broker\ Controls + Firm\ Controls \\ & + Industry\ Effects + Year\ Effects + \varepsilon_{1.} \end{aligned} \tag{1}$$

Here, the variables are defined as follows.

FE	Forecast error, calculated as firm j's actual EPS for quarter t minus analyst i's earnings forecast for firm j in quarter t, scaled by the stock price at the beginning of quarter t.

NEWS — Macroeconomic news, defined as the median consensus real GDP growth forecast for quarter t in the Bloomberg survey most recent to analyst i's earnings forecast for firm j in quarter t, minus the actual real GDP growth for quarter t-4. The two alternative measures (i.e. $FGDP_t - FGDP_{t-4}$ and $GDP_t - GDP_{t-4}$, respectively) are as previously defined.

Analyst-specific controls:

HORIZON — Forecast horizon, defined as the natural logarithm of the days between analyst i's earnings forecast for firm j in quarter t and firm j's earnings announcement for quarter t.

FREQ — Forecast frequency, defined as the number of earnings forecasts issued by analyst i for firm j in quarter t.

NIND — Number of Fama-French 48 industries that analyst i follows in quarter t.

NFIRM — Number of firms that analyst i follows in quarter t.

FEXP — Analyst's firm-specific experience, defined as the number of quarters that analyst i has issued at least one earnings forecast for firm j prior to quarter t.

LAG_FE — Lagged analyst forecast error, calculated as firm j's actual EPS for quarter t-1 minus analyst i's last earnings forecast for firm j in quarter t-1, scaled by the stock price at the beginning of quarter t-1.

Broker-specific controls:

BSIZE	Investment firm size, calculated as the natural logarithm of the number of unique analysts employed by analyst i's investment firm in quarter t.
TOP_BROKER	An indicator that is set to 1 if analyst i's investment firm size is within top 10% in a given calendar year, and 0 otherwise.
UW_RANK	Investment firm's underwriting rank, measured by the percentile rank of total equity underwriting dollar amounts of analyst i's investment firm in the year prior to analyst i's earnings forecast for firm j in quarter t.

Firm-specific controls:

LAG_TACC	Lagged total accruals, calculated as firm j's income before extraordinary items minus total cash flow from operations in quarter t-1, scaled by average total assets of quarter t-1.
PRIOR_BHR	Prior abnormal buy-and-hold return, defined as the size-adjusted abnormal buy-and-hold return for firm j within [-90,-2] of analyst i's earnings forecast for firm j in quarter t.
CYCLICALITY	Earnings sensitivity to GDP news, measured as the R^2 from the regression of the firm's seasonal change in quarterly earnings on the corresponding quarterly GDP news over the sample period.
Industry Effects	Industry indicator variables based on the Fama-French 48 industry group classification.
Year Effects	Year indicator variables.

ε_1 Error term.

Based on our definition of analyst forecast error, FE, a negative (positive) FE indicates analyst optimism (pessimism). Since the macroeconomic news variable is signed, a negative (positive) coefficient estimate on NEWS, α_1, indicates analyst overreaction (under-reaction) to macroeconomic news. For example, both analyst under-reaction to negative macroeconomic news (i.e., positive α_1 times negative NEWS) and overreaction to positive macroeconomic news (i.e., negative α_1 times positive NEWS) would increase analyst optimism (i.e., result in a more negative forecast error).

If the anecdotal evidence cited in the introduction is valid, we expect individual analysts to under-react to negative macroeconomic news; therefore, we expect $\alpha_1 > 0$ for the negative news sample.

4.2.2. Multivariate results

Table 4 reports the results of OLS regressions of Eq. (1). For all regressions in this study, continuous variables are winsorized at the top and bottom 1%, and the t-statistics reported in parenthesis are clustered by firm and quarter to address cross-sectional and time-series dependence (Gow et al. 2010).[13] We find that the coefficient estimate on NEWS is positive and significant across the negative news sample and is not significantly different from zero for the positive news sample, regardless of the NEWS measure used. These estimates suggest

[13] For the market tests in Table 7, standard errors are clustered by firm and day; the statistical significance is stronger when clustered by firm and quarter.

that individual analysts under-react to negative macroeconomic news but neither under-react nor over-react to positive macroeconomic news.[14]

Given that individual analysts are inefficient only with respect to negative macroeconomic news, we focus our subsequent analyses and discussions on the negative news sample. In addition, for brevity, we include but do not tabulate the results of the analyst-specific, broker-specific, and firm-specific controls in the subsequent analyses.

4.3. In-house macroeconomists and analyst forecast efficiency

4.3.1. Model specification

After observing analysts' under-reaction to negative macroeconomic news, a natural focus is on what underpins the inefficiency. One reason for analyst research optimism is that analysts normally initiate coverage with optimistic research (McNichols and O'Brien 1997, Das et al. 2006), and without convincing evidence to the contrary, the analysts persist in this positive outlook. With respect to bad economic news, we use an active in-house macroeconomist as a potential provider of "evidence to the contrary." Although the empirical measure is limited to the mere occurrence of an active economist, the analyst is likely to benefit from not only a timely in-house GDP forecast, but also from broader economic details conveyed through morning conference calls, internal reports, and various meetings.

[14] To ensure that the relation between FE and NEWS is not influenced by any bias in the macro-consensus forecast (from which the NEWS variable is constructed), we modify Eq. (1) to include the unsigned macro-consensus forecast error, GDP_FE, and interact this variable with NEWS. The coefficient estimate on NEWS x GDP_FE is not significant in any of our models (i.e., with or without controls, negative or positive news samples), indicating that the relation between FE and NEWS is not influenced by any macro-consensus forecast error.

A second reason put forth for analyst optimism is direct conflicts of interest. Under this rationale, an analyst knowingly ignores bad economic news in order to curry favor with management. Although a number of economic conflicts have been examined in prior literature, arguably the most common one involves an underwriting conflict due to either maintaining or winning an underwriting relationship (e.g., Dugar and Nathan 1995, Lin and McNichols 1998, Michaely and Womack 1999).

To investigate these two non-mutually exclusive explanations, we specify the following OLS regression model:

$$\begin{aligned} FE = {} & \beta_0 + \beta_1 \cdot NEWS + \beta_2 \cdot MACRO + \beta_3 \cdot MACRO * NEWS + \beta_4 \cdot EQ\_AFFIL \\ & + \beta_5 \cdot EQ\_AFFIL * NEWS + \beta_6 \cdot EQ\_OPPORT + \beta_7 \cdot EQ\_OPPORT * NEWS \\ & + \text{Analyst Controls} + \text{Broker Controls} + \text{Firm Controls} + \text{Industry Effects} \\ & + \text{Year Effects} + \varepsilon_{2,} \end{aligned} \tag{2}$$

where the variables not previously defined are as follows:

MACRO	Availability of an active in-house macroeconomist, an indicator variable that is set to 1 if the real GDP growth forecast for quarter t, made by the economist employed by analyst i's investment firm, is included in the Bloomberg macroeconomic survey most recent to analyst i's earnings forecast for firm j in quarter t, and 0 otherwise.

EQ_AFFIL	Equity underwriter-client relationship, an indicator variable that is set to 1 if analyst i is employed by the investment firm that acted as the lead manager or co-manager of firm j's equity underwriting team in the year prior to analyst i's earnings forecast for firm j in quarter t, and 0 otherwise.
EQ_OPPORT	Equity underwriting opportunity, an indicator variable that is set to 1 if firm j announces an equity offering in the year following analyst i's earnings forecast for firm j in quarter t, and 0 otherwise.
ε_2	Error term.

If analyst inefficiency with respect to negative macroeconomic news can be at least partly attributed to the lack of macroeconomic sophistication and in-house macroeconomist's research can help improve such inefficiency, we expect the estimate of β_3 to be negative, indicating that analysts with access to an active in-house macroeconomists' research under-react less to negative macroeconomic news. Similarly, if part of analyst inefficiency with respect to negative macroeconomic news stems from their equity underwriting incentives, we expect the estimates of either or both β_5 and β_7 to be positive, meaning that analysts under-react more to negative macroeconomic news in the presence of such economic incentives.

4.3.2. Multivariate results

In Panel A of Table 5, we provide some descriptives on research firms that employ an active macroeconomist versus those that do not. Although most differences are statistically significant, only a few appear economically meaningful. In particular, analysts at firms with

access to a macroeconomist tend to forecast more frequently, cover more firms, and have greater firm-specific forecasting experience. In addition, research firms with active macroeconomists are significantly larger, emphasizing the need to control for broker resources across multivariate models.

Panel B of Table 5 reports the results based on Eq. (2). Focusing on the full model in Column 1, we find a significant estimate on the macroeconomic news variable ($\beta_1 = 0.0772$, $p < 0.01$). Germane to our analysis, we find the estimate on MACRO * NEWS to be negative and significant ($\beta_3 = -0.0117$, $p < 0.05$). This evidence suggests that analysts under-react less to negative macroeconomic news in the presence of an active in-house macroeconomist. Specifically, when analysts have access to an in-house macroeconomist, on average, they incorporate approximately 15% (= 0.0117 ÷ 0.0772) more negative macroeconomic news into their earnings forecasts.

Regarding analysts' equity underwriting incentives, we find no evidence that analysts' under-reaction to negative macroeconomic news is driven by existing equity underwriter-client relationship, EQ_AFFIL, or future equity underwriting opportunities, EQ_OPPORT, as estimates of both β_5 and β_7 are not significantly different from zero.[15] Although underwriting incentives are a commonly mentioned conflict, it may be that the verifiable nature of forecast accuracy combined with the importance of accuracy for reputation (e.g., Stickel 1992) weakens this effect, at least in our short-term quarterly forecast setting.

Important to our inferences, due to the nature of the Bloomberg data, it is possible that in-house macroeconomists may selectively submit their GDP forecasts to Bloomberg only at

[15] In untabulated results, we also examine M&A advisory affiliation and opportunities and find similar effects.

certain times, e.g., when they are more confident in their forecast accuracy. As a result, our MACRO measure may simply capture quarters for which there are better GDP forecasts, rather than more active macroeconomists in general. To address this issue, we conduct two additional tests aimed at excluding macroeconomists who may 'jump in and out' of the survey.

In column 2, we base the sample on consistent economists, defined as those who submit forecasts to Bloomberg in the four consecutive quarters preceding the same-firm's analyst earnings forecast. In column 3, we define consistent economists as those who submit forecasts in the 12 consecutive months preceding the same-firm's analyst earnings forecast. This analysis provides two insights. First, the sample size does not drop as much as one might suspect, indicating that macroeconomists that are part of the Bloomberg survey are fairly consistent forecasters. This empirical finding is consistent with anecdotal evidence on forecasting consistency gathered from the two macroeconomists we contacted. Second, as a result of the first point, these findings are very similar in economic magnitude and significance to those based on the full sample.

In sum, our findings in Table 5 suggest that analysts' under-reaction to negative macroeconomic news is due to their lack of macroeconomic sophistication rather than underwriting incentives, and that analysts with access to in-house macroeconomists are more efficient with respect to negative macroeconomic news.

4.4. Factors affecting the benefit of access to a macroeconomist

4.4.1. Model specification

Thus far, we find that the availability of in-house macroeconomist's research is positively associated with analyst forecast efficiency in the negative macroeconomic news environment. However, it is not likely that all in-house macroeconomists provide the same amount of benefit to the analysts at the same investment firm. Specifically, analyst exposure to higher quality macroeconomists may result in incremental improvement to forecast efficiency.

We proxy for the quality of an in-house macroeconomist's research both by their GDP forecast accuracy, as well as their All-American Research Team award status. Regarding award status, each year, the *Institutional Investor* magazine polls institutional investors to determine the top Wall Street macroeconomists. Anecdotally, regarding a recent award winning economist at ISI Group, Nancy Lazar, one of her buy-side clients related, "Nancy is helpful for focusing on cyclical drivers and explaining macro events" (Institutional Investor 2011). With respect to her long-time, award-winning colleague, Ed Hyman, buy-side clients remarked that they value his industry surveys of staffing companies and manufacturers which provide "a timely read on business sentiments" (Institutional Investor 2011). Assuming such economic insights are also communicated internally, award-winning macroeconomists should lead to greater incremental improvements in their analysts' forecast efficiency.

In addition to economist-specific factors, it is not likely that all analysts at the same firm benefit equally from a given in-house macroeconomist. To benefit, analysts presumably need a certain threshold of expertise to understand the nuanced linkages between GDP news and the followed-firms' production factors and product markets. In addition, more focused

analysts may benefit more because they are more likely to possess the time to analyze the content of the economic research report and make inquiries with their in-house macroeconomists. We proxy for the expertise element with firm-specific experience, FEXP, and for the necessary focus on followed companies with the number of firms covered, NFIRM, where we assume fewer firms covered will allow greater focus.

To simplify the models and interpretation, we restrict the sample to only analysts with access to a macroeconomist (MACRO = 1), and replace MACRO in Eq. (2) with the economist-specific and analyst-specific variables, and their interactions with NEWS. Retaining all control variables from the prior models leads to the following specification.

$$\begin{aligned} FE = {} & \gamma_0 + \gamma_1 \cdot NEWS + \gamma_2 \cdot X + \gamma_3 \cdot X * NEWS + \gamma_4 \cdot EQ\_AFFIL \\ & + \gamma_5 \cdot EQ\_AFFIL * NEWS + \gamma_6 \cdot EQ\_OPPORT + \gamma_7 \cdot EQ\_OPPORT * NEWS \\ & + Analyst\ Controls + Broker\ Controls + Firm\ Controls + Industry\ Effects \\ & + Year\ Effects + \varepsilon_{3,} \end{aligned} \quad (3)$$

where $X \in$ {MACRO_ACCURACY, MACRO_AWARD, FEXP, NFIRM}, and the variables not previously defined are as follows.

MACRO_ ACCURACY	In-house macroeconomist's forecast accuracy, calculated as the economist's absolute GDP forecast error in the most recent research, scaled by the absolute median consensus GDP forecast error in the most recent Bloomberg macroeconomic survey, and then multiplied by (-1)

MACRO_AWARD	In-house macroeconomist's All-American Research Team award status, an indicator variable that is set to 1 if the economist employed by analyst i's investment firm is ranked in the top three or as a runner-up by *Institutional Investor* during the year, and 0 otherwise.
ε_3	Error term.

Regarding economist-specific variables, we expect analysts' efficiency in incorporating negative macroeconomic news to be positively associated with both the accuracy and the award status of their in-house macroeconomists. Specifically, we expect the γ_3 estimate to be negative for the interactions of these two economist-specific variables with NEWS. As for the analyst-specific variables, we expect the γ_3 estimate to be negative for the FEXP interaction and positive for the NFIRM interaction, suggesting more experienced and more focused analysts benefit more from an active in-house macroeconomist.

4.4.2. Multivariate results

Table 6 reports the results based on Eq. (3). Focusing on the results of the economist-specific variables in Columns 1 and 2, we find a negative and significant coefficient estimate on the MACRO_ACCURACY interaction in Column 1, and a negative and significant estimate on the MACRO_AWARD interaction in Column 2, respectively suggesting that more accurate and higher-quality in-house macroeconomists improve analyst efficiency with respect to negative macroeconomic news to a greater extent. Specifically, a one standard deviation increase in MACRO_ACCURACY in negative macroeconomic news quarters is associated with approximately 18% increase in analyst efficiency with respect to

negative macroeconomic news (= 1.13% * 0.0091 ÷ 0.0576); similarly, if an in-house macroeconomist receives the All-American Research Team award from *Institutional Investor*, the analysts at the same firm, on average, incorporate approximately 28% (= 0.0212 ÷ 0.0744) more negative macroeconomic news into their earnings forecasts.

Focusing on the results of the analyst-specific variables in Columns 3 and 4, we find a negative and significant coefficient estimate on the FEXP interaction in Column 3, and a positive and significant estimate on the NFIRM interaction in Column 4, respectively. This evidence suggests that more experienced and more focused analysts benefit more from the availability of an in-house macroeconomist's research. Assessing the economic significance of these analyst-specific variables, a one standard deviation increase in FEXP is associated with approximately 13% increase in analyst efficiency with respect to negative macroeconomic news (= 7.83 * 0.0014 ÷ 0.0866), and a one standard deviation increase in NFIRM is associated with approximately 41% (= 6.49 * 0.0024 ÷ 0.0382) decrease in analyst efficiency.

To summarize, our findings in Table 6 suggest that the benefits of access to an active in-house macroeconomist vary with the quality of the in-house macroeconomist's research, analyst experience, and number of firms followed.

4.5. In-house macroeconomists and research credibility.

4.5.1. Model specification

If analysts with access to in-house macroeconomists' research are more efficient in incorporating negative macroeconomic news, their forecasts should be more accurate and thus more informative to investors (e.g., Park and Stice 2000, Mikhail et al. 2004, Chen et al.

2005). However, it has been shown that investors often fail to weight or underweight accuracy related cues (e.g., Gleason and Lee 2003, Clement and Tse 2003, Bonner et al. 2007). Therefore, whether the market rewards access to a macroeconomist with enhanced earnings research credibility is an empirical question which we examine by estimating the following model:

$$\begin{aligned} CAR = {} & \theta_0 + \theta_1 \cdot REV + \theta_2 \cdot MACRO + \theta_3 \cdot MACRO * REV + \theta_4 \cdot SIZE \\ & + \theta_5 \cdot SIZE * REV + \theta_6 \cdot BM + \theta_7 \cdot BM * REV + \theta_8 \cdot BETA \\ & + \theta_9 \cdot BETA * REV + Analyst\ Controls + Analyst\ Controls * REV \\ & + Broker\ Controls + Broker\ Controls * REV + Firm\ Controls \\ & + Firm\ Controls * REV + Industry\ Effects + Year\ Effects + \varepsilon_{4.} \end{aligned} \quad (4)$$

The variables not previously defined are as follows.

CAR	Three-day cumulative size-adjusted abnormal return surrounding analyst i's earnings forecast for firm j in quarter t.
REV	Analyst forecast revision, defined as analyst i's earnings forecast for firm j in quarter t minus the most recent mean consensus forecast (within [-30,-2]), scaled by the stock price at the beginning of quarter t.
SIZE	The natural logarithm of the market value of firm j's common stock at the beginning of quarter t.
BM	Book-to-market ratio of firm j at the beginning of quarter t.
BETA	Market beta, defined as firm j's market beta in the calendar year preceding analyst i's earnings forecast for firm j in quarter t.
ε_4	Error term.

To address the impact of confounding information events within the return window, we consider four different sample selection criteria: (1) all forecasts from our primary sample (i.e., no restrictions other than the availability of short-window returns, forecast revision, and control variables), (2) all forecasts excluding those issued within the event window of an earnings announcement, (3) all forecasts excluding those issued within the event window of management guidance, and (4) all forecasts excluding those issued within the event window of either earnings announcement or management guidance.

The coefficient estimate θ_1 is expected to be positive given prior research that finds the analyst forecast revision is informative to the market (e.g., Givoly and Lakonishok 1979, Frankel et al. 2006). If the greater forecast efficiency with respect to negative macroeconomic news enhances the credibility of analyst research and improves price efficiency, we expect the θ_3 estimate to be positive, indicating that there is an incremental market reaction for analysts who have access to an active in-house macroeconomist.

4.5.2. Multivariate results

Table 7 reports the results. Focusing on the full sample of forecasts, we find that the coefficient estimate on REV is positive and significant ($\theta_1 = 4.777$, $p < 0.01$), indicating that the lower-order forecast revision variable is informative to market participants. More importantly, we find the estimate on the interaction of interest, MACRO * REV, be positive and significant ($\theta_3 = 0.610$, $p < 0.01$), suggesting that investors consider the forecasts issued by analysts with access to in-house macroeconomists' research more credible. Specifically, the market reaction is approximately 13% (= 0.610 ÷ 4.777) greater for analysts with access to in-house macroeconomists' research.

Overall, the market seems to attribute greater credibility to analysts with access to in-house macroeconomists during negative macroeconomic news periods. This improvement in credibility subsequently increases the efficiency of market prices.

5. TWO NATURAL EXPERIMENTS

5.1. Analyst change and forecast efficiency

Our results so far indicate that analysts with access to in-house macroeconomists' research are more efficient with respect to negative macroeconomic news. However, one might argue that these results are driven by unmodeled analyst-specific variables.

To address this issue, we identify when an analyst moves from an investment firm without an active macroeconomist to a firm with an active in-house macroeconomist (here, a change to macroeconomist availability), as well as the opposite scenario, when an analyst moves from a firm with an active in-house macroeconomist to a firm without an active macroeconomist (here, a change away from macroeconomist availability). We then compare the earnings forecasts issued by the same analyst for the same firms one year before and one year after the change. We re-estimate Eq. (2) where the slope estimate on the NEWS term captures analysts *without* macroeconomist availability, and the incremental slope on the MACRO * NEWS interaction represents the additional effect of the same analysts *with* macroeconomist availability. All other variables are as previously defined.

Column 1 of Table 8 reports the results. We find that the same analysts under-react to negative macroeconomic news when they are without macroeconomist availability (β_1 = 0.0607, $p < 0.05$), and that their forecast efficiency improves significantly when they have access to an active in-house macroeconomist (β_3 = -0.0376, $p < 0.05$). Since this change in

analyst forecast efficiency occurs around analyst turnover within a relatively short window, the improved forecast efficiency is unlikely to reflect unmodeled analyst characteristics.

5.2. Macroeconomist forecast availability change and forecast efficiency

A similar concern relates to unmodeled broker-specific variables. To address this issue, we identify when an investment firm changes from not having an active in-house macroeconomist to having one (a change to active macroeconomist availability), as well as the opposite scenario, when the firm changes from having an active in-house macroeconomist to not having one (a change away from active macroeconomist availability). We then compare the earnings forecasts issued by analysts forecasting for the same firms one year before and one year after the change in availability.

Column 2 of Table 8 reports the results. Again, the NEWS term captures an analyst without an active macroeconomist, and the MACRO * NEWS interaction represents the incremental effect of an analyst with active macroeconomist availability. We find that analysts under-react to negative macroeconomic news when their investment firm does not have an active in-house macroeconomist (β_1 = 0.0773, $p < 0.01$) and that their forecast efficiency improves significantly when the investment firm has an active macroeconomist (β_3 = -0.2080, $p < 0.1$). Overall, the results from these two experiments indicate that the results are unlikely to reflect the presence of either unmodeled analyst or broker-level variables.

6. SUMMARY AND CONCLUSION

Anecdotal evidence suggests that financial analysts are too optimistic during economic downturns. Consistent with this assertion, we demonstrate that analysts under-react to negative macroeconomic news, but not to positive news. As to the explanation behind this

inefficiency, we find that analyst inefficiency with respect to negative macroeconomic news is explained, at least in part, by lack of availability of an active in-house macroeconomist. Moreover, we find several factors that affect the degree of improvement. In particular, analysts who are more experienced or more focused (i.e., cover fewer firms) benefit more from an in-house macroeconomist; we also find that analyst forecast efficiency is better in the presence of more accurate or award-winning in-house macroeconomists.

Examining the impact of in-house macroeconomists on market prices, we find that investors act as if they recognize this benefit to analysts' forecast efficiency. That is, they react more strongly to earnings research from analysts who have access to in-house macroeconomists. This is important since research credibility enhances an investment firm's reputation and ability to provide research support to its clients, both of which should be important determinants of their financial performance.

These findings make several contributions to the literature. First, while prior literature on analyst efficiency almost exclusively focuses on firm-level information, our paper investigates analyst efficiency with respect to an important determinant of corporate earnings, macroeconomic news. Second, within a macroeconomic news setting, we document the benefit of in-house macroeconomists for analyst earnings research. Given that analyst forecasts are important benchmarks of a firm's financial performance, our findings suggest the possibility of indentifying a set of analysts who are relatively more sensitive to macroeconomic changes. Finally, our findings not only suggest that in-house macroeconomists play an important role in analysts' forecast efficiency, but also influence the market credibility of analyst research.

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Table 1
Sample Selection

Sample Selection Criteria	Firm-Quarter Forecasts	Firm-Quarters	Distinct Firms
I/B/E/S initial one-quarter ahead earnings forecasts, 1998 – 2011.	1,169,236	212,095	11,678
Retain: earnings forecasts with actual EPS to calculate forecast errors.	1,159,760	208,274	11,444
Retain: earnings forecasts with unique I/B/E/S analyst identifiers.	1,153,101	207,777	11,432
Retain: earnings forecasts issued between prior and current actual earnings announcement dates.	919,114	146,528	6,653
Retain: earnings forecasts for firms with calendar fiscal quarters to synchronize GDP and earnings forecasts.	797,857	129,796	6,056
Retain: earnings forecasts with non-missing Compustat financial data to calculate lagged total accruals and cyclicality.	760,910	121,083	5,776
Retain: earnings forecasts with non-missing CRSP price to calculate prior abnormal buy-and-hold returns.	705,544	110,994	5,391
Retain: earnings forecasts with individual analysts' prior-period forecast errors.	535,784	105,122	5,326
Retain: earnings forecasts issued after availability of first real GDP growth forecast for quarter t.	315,962	83,231	5,238
Primary Sample	315,962	83,231	5,238

Table 2
Descriptive Statistics

Panel A. Key Variables

	Negative News			Positive News		
Variable	N	Mean	Median	N	Mean	Median
FE	185,678	-0.002	0.000	130,284	-0.001	0.000
NEWS	185,678	-0.024	-0.020	130,284	0.033	0.019
HORIZON	185,678	75.584	83.000	130,284	74.094	83.000
FREQ	185,678	1.397	1.000	130,284	1.377	1.000
NIND	185,678	5.029	4.000	130,284	5.083	4.000
NFIRM	185,678	12.720	12.000	130,284	12.641	12.000
FEXP	185,678	8.701	6.000	130,284	8.644	6.000
LAG_FE	185,678	-0.001	0.000	130,284	0.000	0.000
BSIZE	185,678	42.187	36.000	130,284	41.231	35.000
TOP_BROKER	185,678	0.116	0.000	130,284	0.113	0.000
UW_RANK	185,678	0.479	0.510	130,284	0.477	0.500
LAG_TACC	185,678	-0.040	-0.025	130,284	-0.037	-0.025
PRIOR_BHR	185,678	-0.001	-0.009	130,284	-0.002	-0.009
CYCLICALITY	185,678	0.092	0.033	130,284	0.091	0.032
MACRO	185,678	0.279	0.000	130,284	0.301	0.000
EQ_AFFIL	185,678	0.038	0.000	130,284	0.044	0.000
EQ_OPPORT	185,678	0.064	0.000	130,284	0.053	0.000
MACRO_ACCURACY	51,934	-1.334	-1.000	39,253	-1.247	-1.000
MACRO_AWARD	51,934	0.120	0.000	39,253	0.132	0.000

Panel B. Additional Variables for Market Tests

	Negative News			Positive News		
Variable	N	Mean	Median	N	Mean	Median
CAR	61,187	-0.002	-0.001	46,208	-0.002	-0.001
REV	61,187	-0.000	0.000	46,208	-0.000	0.000
SIZE	61,187	10.757	2.987	46,208	10.797	3.175
BM	61,187	0.532	0.453	46,208	0.515	0.454
BETA	61,187	1.124	1.055	46,208	1.146	1.062

Table Notes:

This table presents descriptive statistics for the 1998 to 2011 period. FE = Analyst's forecast error, calculated as

actual EPS minus analyst earnings forecast, scaled by the stock price at the beginning of the quarter. NEWS = Macroeconomic news, defined as the most recent median consensus real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year. HORIZON = Analyst's forecast horizon, defined as the days between the analyst's earnings forecast date and the firm's earnings announcement date for the quarter. FREQ = Analyst's forecast frequency, defined as the number of earnings forecasts issued by the analyst for the firm during the quarter. NIND = The number of Fama-French 48 industries that the analyst follows during the quarter. NFIRM = The number of firms that the analyst follows during the quarter. FEXP = Analyst's firm-specific experience, defined as the number of quarters that the analyst has issued at least one earnings forecast for the firm prior to the quarter. LAG_FE = Analyst's prior-period forecast error, calculated as actual EPS minus analyst's last earnings forecast for the prior quarter, scaled by the stock price at the beginning of the prior quarter. BSIZE = Investment firm size, calculated as the number of unique analysts employed by the analyst's investment firm during the quarter. TOP_BROKER = An indicator that is set to 1 if the analyst's investment firm size is within top 10% in a given calendar year, and 0 otherwise. UW_RANK= Investment firm's underwriting rank, measured by the percentile rank of total equity underwriting dollar amounts of the analyst's investment firm in the year prior to the analyst's earnings forecast for the firm. LAG_TACC = Lagged total accruals, calculated as the firm's income before extraordinary items minus total cash flow from operations for the prior quarter, scaled by average total assets of the prior quarter. PRIOR_BHR = Prior abnormal buy-and-hold return, defined as the size-adjusted abnormal buy-and-hold return for the firm within [-90,-2] of the analyst's earnings forecast. CYCLICALITY= Earnings sensitivity to GDP news, measured as the R^2 from the regression of the firm's seasonal change in quarterly earnings on the corresponding quarterly GDP news over the entire sample period. MACRO = Availability of an active in-house macroeconomist, an indicator variable that is set to 1 if the analyst has access to in-house macroeconomist's most recent research, and 0 otherwise. EQ_AFFIL = Equity underwriter-client relationship, an indicator variable that is set to 1 if the analyst is employed by the investment firm that acted as the lead manager or co-manager of the firm's equity underwriting team in the year prior to the analyst's earnings forecast, and 0 otherwise. EQ_OPPORT = Equity underwriting opportunity, an indicator variable that is set to 1 if the firm announces an equity offering in the year following the analyst's earnings forecast, and 0 otherwise. MACRO_ACCURACY = In-house macroeconomist's forecast accuracy, calculated as an economist's absolute GDP forecast error in the most recent research, scaled by the absolute median consensus GDP forecast error in the most recent Bloomberg macroeconomic survey, and then multiplied by (-1). MACRO_AWARD = In-house macroeconomist's All-American Research Team award status, an indicator variable that is set to 1 if the economist is ranked in the top three or as a runner-up by *Institutional Investor* during the year, and 0 otherwise. CAR = Three-day cumulative size-adjusted abnormal return surrounding the analyst's earnings forecast date. REV = Analyst's forecast revision, calculated as the analyst's earnings forecast for the firm minus the most recent mean consensus analyst forecast (within [-30,-2]), scaled by the stock price at the beginning of the quarter. SIZE = The market value of the firm's common stock at the beginning of the quarter. BM = Book-to-market ratio of the firm at the beginning of the quarter. BETA = Market beta, defined as the firm's market beta in the calendar year preceding the analyst's earnings forecast.

Table 3
Earnings Sensitivity to Macroeconomic News

	Earnings Sensitivity to Negative News						Earnings Sensitivity to Positive News				
Industry	N	Mean	StDev	25%	50%	75%	N	Mean	StDev	25%	50%	75%
Consumer nondurables	195	0.151	0.209	0.012	0.055	0.212	194	0.193	0.250	0.015	0.083	0.288
Consumer durables	84	0.178	0.230	0.014	0.091	0.236	85	0.276	0.284	0.026	0.184	0.484
Manufacturing	411	0.133	0.187	0.014	0.056	0.178	416	0.174	0.232	0.015	0.068	0.237
Energy	236	0.152	0.207	0.015	0.059	0.194	236	0.215	0.246	0.031	0.116	0.327
Chemicals	98	0.165	0.249	0.010	0.041	0.204	97	0.192	0.250	0.013	0.084	0.242
Business equipment	1,102	0.156	0.222	0.014	0.063	0.198	1,092	0.193	0.264	0.014	0.067	0.265
Telecom	174	0.169	0.243	0.010	0.055	0.233	172	0.204	0.271	0.013	0.065	0.338
Utilities	131	0.067	0.129	0.005	0.027	0.067	131	0.103	0.191	0.007	0.029	0.082
Wholesale, retail, and services	314	0.173	0.233	0.011	0.071	0.235	318	0.215	0.270	0.018	0.085	0.325
Healthcare	684	0.121	0.194	0.008	0.039	0.145	679	0.182	0.247	0.014	0.071	0.250
Financial	1,034	0.149	0.205	0.014	0.061	0.192	1,021	0.164	0.219	0.014	0.064	0.233
Others	637	0.144	0.207	0.012	0.052	0.182	644	0.187	0.246	0.020	0.089	0.255
Overall	5,100	0.146	0.210	0.012	0.056	0.184	5,085	0.185	0.247	0.016	0.073	0.260

Table Notes:

This table presents the R^2s from estimating the firm-specific OLS regressions of earnings changes on GDP news for all sample firms during the 1998 to 2011 period. Earnings changes are seasonally-adjusted changes in quarterly earnings, calculated as income before extraordinary items for quarter t minus income before extraordinary items for quarter t-4, scaled by average total assets for quarter t. GDP news is defined as actual real GDP growth for quarter t minus the actual real GDP growth for quarter t-4. Industries are based on Fama-French 12 industry classification.

Table 4
Analysts' Efficiency in Incorporating Macroeconomic News

NEWS =	*Primary News Measure:*		*Alternative Macroeconomic News Measures:*			
	$FGDP_t - GDP_{t-4}$		$FGDP_t - FGDP_{t-4}$		$GDP_t - GDP_{t-4}$	
	Neg News	Pos News	Neg News	Pos News	Neg News	Pos News
	(1)	(2)	(3)	(4)	(5)	(6)
DEP. VAR. =	FE	FE	FE	FE	FE	FE
INTERCEPT	0.0063***	0.0103***	0.0066***	-0.0011	0.0065***	-0.0005
	(2.95)	(3.16)	(3.08)	(-0.40)	(3.29)	(-0.13)
NEWS	0.0731***	-0.0023	0.0763***	-0.0057	0.0747***	0.0001
	(3.17)	(-0.38)	(3.29)	(-0.81)	(3.62)	(0.02)
Analyst-specific controls:						
HORIZON	-0.0012***	-0.0008***	-0.0012***	-0.0008***	-0.0011***	-0.0009***
	(-4.75)	(-5.68)	(-4.70)	(-5.43)	(-5.13)	(-4.71)
FREQ	-0.0018***	-0.0011***	-0.0018***	-0.0011***	-0.0017***	-0.0011***
	(-5.54)	(-3.73)	(-5.37)	(-3.72)	(-5.54)	(-3.48)
NIND	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(1.12)	(0.92)	(1.02)	(0.88)	(1.23)	(0.47)
NFIRM	-0.0000**	-0.0000**	-0.0000**	-0.0000***	-0.0000***	-0.0000**
	(-2.55)	(-2.36)	(-2.54)	(-2.58)	(-2.68)	(-2.06)
FEXP	0.0000	0.0000**	0.0000	0.0000**	0.0000	0.0000***
	(0.91)	(2.01)	(0.97)	(2.04)	(0.77)	(3.25)
LAG_FE	0.2740***	0.2590***	0.2750***	0.2580***	0.2740***	0.2600***
	(10.40)	(8.54)	(10.43)	(8.45)	(10.50)	(8.29)
Broker-specific controls:						
BSIZE	0.0005***	0.0002**	0.0005***	0.0002**	0.0005***	0.0002***
	(5.33)	(2.53)	(5.18)	(2.52)	(4.93)	(2.65)
TOP_BROKER	0.0002	0.0003**	0.0002	0.0003**	0.0003	0.0003*
	(1.23)	(2.19)	(1.14)	(2.27)	(1.41)	(1.88)
UW_RANK	-0.0005***	0.0000	-0.0005***	0.0000	-0.0005**	-0.0000
	(-3.09)	(0.14)	(-3.07)	(0.04)	(-2.54)	(-0.10)
Firm-specific controls:						
LAG_TACC	-0.0040**	-0.0026**	-0.0041**	-0.0026**	-0.0042**	-0.0021*
	(-2.29)	(-2.10)	(-2.25)	(-2.06)	(-2.54)	(-1.93)
PRIOR_BHR	0.0055***	0.0050***	0.0055***	0.0051***	0.0056***	0.0049***
	(5.90)	(4.98)	(5.67)	(5.02)	(6.14)	(4.72)
CYCLICALITY	-0.0036	-0.0009	-0.0037	-0.0008	-0.0035	-0.0008
	(-1.17)	(-0.61)	(-1.16)	(-0.54)	(-1.21)	(-0.52)
Industry FE	Included	Included	Included	Included	Included	Included
Year FE	Included	Included	Included	Included	Included	Included
Observations	185,678	130,284	179,806	128,485	194,937	121,025
Adjusted R^2	0.078	0.065	0.078	0.065	0.077	0.065

Table Notes:

This table presents the results from estimating the OLS regression of Equation (1). FE = Analyst's forecast error, calculated as actual EPS minus analyst earnings forecast, scaled by the stock price at the beginning of the quarter. NEWS = Macroeconomic news, defined as (1) the most recent median consensus real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year (i.e. $FGDP_t - GDP_{t-4}$), (2) the most recent median consensus real GDP growth forecast for the quarter minus the final median consensus real GDP growth for the same quarter last year (i.e. $FGDP_t - FGDP_{t-4}$), or (3) the actual real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year (i.e. $GDP_t - GDP_{t-4}$). HORIZON = Analyst's forecast horizon, defined as the natural logarithm of the days between the analyst's earnings forecast date and the firm's earnings announcement date for the quarter. FREQ = Analyst's forecast frequency, defined as the number of earnings forecasts issued by the analyst for the firm during the quarter. NIND = The number of Fama-French 48 industries that the analyst follows during the quarter. NFIRM = The number of firms that the analyst follows during the quarter. FEXP = Analyst's firm-specific experience, defined as the number of quarters that the analyst has issued at least one earnings forecast for the firm prior to the quarter. LAG_FE = Analyst's prior-period forecast error, calculated as actual EPS minus analyst's last earnings forecast for the prior quarter, scaled by the stock price at the beginning of the prior quarter. BSIZE = Investment firm size, calculated as the natural logarithm of the number of unique analysts employed by the analyst's investment firm during the quarter. TOP_BROKER = An indicator that is set to 1 if the analyst's investment firm size is within top 10% in a given calendar year, and 0 otherwise. UW_RANK= Investment firm's underwriting rank, measured by the percentile rank of total equity underwriting dollar amounts of the analyst's investment firm in the year prior to the analyst's earnings forecast for the firm. LAG_TACC = Lagged total accruals, calculated as the firm's income before extraordinary items minus total cash flow from operations for the prior quarter, scaled by average total assets of the prior quarter. PRIOR_BHR = Prior abnormal buy-and-hold return, defined as the size-adjusted abnormal buy-and-hold return for the firm within [-90,-2] of the analyst's earnings forecast. CYCLICALITY= Earnings sensitivity to GDP news, measured as the R^2 from the regression of the firm's seasonal change in quarterly earnings on the corresponding quarterly GDP news over the entire sample period. Analyst earnings forecasts are classified into negative macroeconomic news or positive macroeconomic news samples based on the sign of NEWS. For the dependent variable, FE, a negative (positive) value indicates analyst optimism (pessimism); for the independent variable NEWS, a positive (negative) coefficient estimate indicates analyst under-reaction (overreaction). Two-tailed *t*-statistics (in parenthesis) are calculated using two-way clustered standard errors, clustered by firm and quarter. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5
In-House Macroeconomist with a Timely GDP Forecast and Analysts' Efficiency in Incorporating Negative Macroeconomic News

Panel A. Descriptive Statistics

	Negative News					
	MACRO = 0		MACRO = 1		t-test	Wilcoxon rank-sum test
Variable	Mean	Median	Mean	Median	t-stats	z-stats
FE	-0.002	0.000	-0.001	0.000	***	***
HORIZON	75.478	83.000	75.854	83.000	***	***
FREQ	1.377	1.000	1.447	1.000	***	***
NIND	5.031	4.000	5.024	4.000	n.s.	**
NFIRM	12.282	11.000	13.848	13.000	***	***
FEXP	8.380	6.000	9.529	7.000	***	***
LAG_FE	-0.001	0.000	-0.000	0.000	***	***
BSIZE	29.968	24.000	73.655	77.000	***	***
TOP_BROKER	0.046	0.000	0.297	0.000	***	***
UW_RANK	0.368	0.380	0.767	0.830	***	***
N	133,744		51,934			

Panel B. Empirical Tests

	Negative News		
		MACRO=1 only if associated with in-house economist who forecasted for the prior:	
	(1)	(2)	(3)
	Full sample	4 consecutive quarters	12 consecutive months
DEP. VAR. =	FE	FE	FE
INTERCEPT	0.0064***	0.0049**	0.0051**
	(2.96)	(2.19)	(2.17)
NEWS	0.0772***	0.0779***	0.0791***
	(3.40)	(3.37)	(3.47)
MACRO	-0.0003	-0.0003	-0.0003
	(-1.62)	(-1.46)	(-1.54)
MACRO * NEWS	-0.0117**	-0.0107**	-0.0088*
	(-2.07)	(-2.04)	(-1.73)
EQ_AFFIL	0.0001	0.0001	-0.0000
	(0.26)	(0.19)	(-0.02)
EQ_AFFIL * NEWS	-0.0050	-0.0051	-0.0094
	(-0.30)	(-0.30)	(-0.54)

EQ_OPPORT	0.0003	0.0002	0.0003
	(0.57)	(0.49)	(0.54)
EQ_OPPORT * NEWS	-0.0070	-0.0068	-0.0052
	(-0.79)	(-0.76)	(-0.52)
Analyst-specific controls	Included	Included	Included
Broker-specific controls	Included	Included	Included
Firm-specific controls	Included	Included	Included
Industry fixed effects	Included	Included	Included
Year fixed effects	Included	Included	Included
Observations	185,678	179,021	168,492
Adjusted R^2	0.078	0.079	0.078

Table Notes:

This table presents the results from estimating the OLS regression of Equation (2) for the negative macroeconomic news sample. FE = Analyst's forecast error, calculated as actual EPS minus analyst earnings forecast, scaled by the stock price at the beginning of the quarter. NEWS = Macroeconomic news, defined as the most recent median consensus real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year. MACRO = Availability of an active in-house macroeconomist, an indicator variable that is set to 1 if the analyst has access to in-house macroeconomist's most recent research, and 0 otherwise. EQ_AFFIL = Equity underwriter-client relationship, an indicator variable that is set to 1 if the analyst is employed by the investment firm that acted as the lead manager or co-manager of the firm's equity underwriting team in the year prior to the analyst's earnings forecast, and 0 otherwise. EQ_OPPORT = Equity underwriting opportunity, an indicator variable that is set to 1 if the firm announces an equity offering in the year following the analyst's earnings forecast, and 0 otherwise. Analyst-specific controls (HORIZON, FREQ, NIND, NFIRM, FEXP, and LAG_FE), broker-specific controls (BSIZE, TOP_BROKER, and UW_RANK), and firm-specific controls (LAG_TACC, PRIOR_BHR, and CYCLICALITY) are as previously defined. For the dependent variable, FE, a negative (positive) value indicates analyst optimism (pessimism); for the independent variable NEWS, a positive (negative) coefficient estimate indicates analyst under-reaction (overreaction). Two-tailed t-statistics (in parenthesis) are calculated using two-way clustered standard errors, clustered by firm and quarter. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6
In-House Macroeconomist with a Timely GDP Forecast Sample:
Factors Affecting Analysts' Efficiency in
Incorporating Negative Macroeconomic News

	Negative News (MACRO = 1)			
	(1)	(2)	(3)	(4)
DEP. VAR. =	FE	FE	FE	FE
	Macroeconomist Factors:		*Analyst Factors:*	
X =	MACRO ACCURACY	MACRO AWARD	FEXP	NFIRM
INTERCEPT	0.0273***	0.0279***	0.0055*	0.0269***
	(10.52)	(10.80)	(1.90)	(10.12)
NEWS	0.0576***	0.0744***	0.0866***	0.0382
	(2.66)	(3.24)	(3.95)	(1.10)
X	-0.0001	-0.0004	0.0000	-0.0000
	(-0.71)	(-1.00)	(0.68)	(-1.09)
X * NEWS	-0.0091**	-0.0212***	-0.0014*	0.0024**
	(-2.36)	(-2.73)	(-1.66)	(2.28)
EQ_AFFIL	0.0002	0.0002	0.0001	0.0001
	(0.46)	(0.41)	(0.21)	(0.30)
EQ_AFFIL * NEWS	-0.0057	-0.0070	-0.0084	-0.0101
	(-0.29)	(-0.35)	(-0.44)	(-0.52)
EQ_OPPORT	0.0002	0.0002	0.0001	0.0002
	(1.06)	(1.09)	(0.55)	(0.84)
EQ_OPPORT * NEWS	-0.0074	-0.0067	-0.0098	-0.0092
	(-1.37)	(-1.12)	(-1.23)	(-1.57)
Analyst-specific controls	Included	Included	Included	Included
Broker-specific controls	Included	Included	Included	Included
Firm-specific controls	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included
Observations	51,934	51,934	51,934	51,934
Adjusted R^2	0.083	0.083	0.083	0.084

Table Notes:

This table presents the results from estimating the OLS regression of Equation (3) for the negative macroeconomic news sample. FE = Analyst's forecast error, calculated as actual EPS minus analyst earnings forecast, scaled by the stock price at the beginning of the quarter. NEWS = Macroeconomic news, defined as the most recent median consensus real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year. MACRO_ACCURACY = In-house macroeconomist's forecast accuracy, calculated as an economist's absolute GDP forecast error in the most recent research, scaled by the absolute median consensus GDP forecast error in the most recent Bloomberg macroeconomic survey, and then multiplied by (-1). MACRO_AWARD = In-house

macroeconomist's All-American Research Team award status, an indicator variable that is set to 1 if the economist is ranked in the top three or as a runner-up by *Institutional Investor* during the year, and 0 otherwise. FEXP = Analyst's firm-specific experience, defined as the number of quarters that the analyst has issued at least one earnings forecast for the firm prior to the quarter. NFIRM = The number of firms that the analyst follows during the quarter. EQ_AFFIL = Equity underwriter-client relationship, an indicator variable that is set to 1 if the analyst is employed by the investment firm that acted as the lead manager or co-manager of the firm's equity underwriting team in the year prior to the analyst's earnings forecast, and 0 otherwise. EQ_OPPORT = Equity underwriting opportunity, an indicator variable that is set to 1 if the firm announces an equity offering in the year following the analyst's earnings forecast, and 0 otherwise. Analyst-specific controls (HORIZON, FREQ, NIND, NFIRM, FEXP, and LAG_FE), broker-specific controls (BSIZE, TOP_BROKER, and UW_RANK), and firm-specific controls (LAG_TACC, PRIOR_BHR, and CYCLICALITY) are as previously defined. For the dependent variable, FE, a negative (positive) value indicates analyst optimism (pessimism); for the independent variable NEWS, a positive (negative) coefficient estimate indicates analyst under-reaction (overreaction). Two-tailed *t*-statistics (in parenthesis) are calculated using two-way clustered standard errors, clustered by firm and quarter. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7
Market Credibility of Analysts' Earnings Research

	Negative News			
	(1) = All forecasts from primary sample	(2) = (1), excluding forecasts within EA window	(3) = (1), excluding forecasts within MG window	(4) = (1), excluding forecasts within EA or MG window
DEP. VAR. =	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]
INTERCEPT	-0.0426***	-0.0436***	-0.0376***	-0.0384***
	(-4.06)	(-4.14)	(-3.61)	(-3.67)
REV	4.7770***	4.8590***	2.5850***	2.6270***
	(6.56)	(6.60)	(3.92)	(3.94)
MACRO	-0.0004	-0.0004	-0.0009	-0.0009
	(-0.57)	(-0.54)	(-1.27)	(-1.27)
MACRO * REV	0.6100***	0.6090***	0.4880**	0.4900**
	(2.89)	(2.87)	(2.45)	(2.45)
SIZE	0.0004	0.0004	0.0002	0.0002
	(1.36)	(1.35)	(0.75)	(0.75)
SIZE * REV	-0.1600***	-0.1620***	-0.1160**	-0.1170**
	(-3.12)	(-3.14)	(-2.53)	(-2.55)
BM	0.0048***	0.0049***	0.0049***	0.0050***
	(2.81)	(2.89)	(2.90)	(2.95)
BM * REV	-0.5590***	-0.5650***	-0.4240***	-0.4290***
	(-4.41)	(-4.46)	(-3.58)	(-3.62)
BETA	-0.0004	-0.0004	0.0003	0.0002
	(-0.42)	(-0.44)	(0.28)	(0.24)
BETA * REV	0.0661	0.0667	0.1110	0.1120
	(0.52)	(0.52)	(0.98)	(0.99)
Analyst-specific controls	Included	Included	Included	Included
Broker-specific controls	Included	Included	Included	Included
Firm-specific controls	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included
Observations	61,187	60,794	58,974	58,710
Adjusted R^2	0.030	0.030	0.023	0.023

Table Notes:

This table presents the results from estimating the OLS regression of Equation (4) for the negative macroeconomic news sample. CAR = Three-day cumulative size-adjusted abnormal return surrounding the analyst's earnings forecast date. REV = Analyst's forecast revision, calculated as the analyst's earnings forecast for the firm minus the most recent mean consensus analyst forecast (within [-30,-2]), scaled by the stock price at the beginning of the quarter.

MACRO = Availability of an active in-house macroeconomist, an indicator variable that is set to 1 if the analyst has access to in-house macroeconomist's most recent research, and 0 otherwise. SIZE = The natural logarithm of the market value of the firm's common stock at the beginning of the quarter. BM = Book-to-market ratio of the firm at the beginning of the quarter. BETA = Market beta, defined as the firm's market beta in the calendar year preceding the analyst's earnings forecast. Analyst-specific controls (HORIZON, FREQ, NIND, NFIRM, FEXP, and LAG_FE), broker-specific controls (BSIZE, TOP_BROKER, and UW_RANK), and firm-specific controls (LAG_TACC, PRIOR_BHR, and CYCLICALITY) are as previously defined. Two-tailed *t*-statistics (in parenthesis) are calculated using two-way clustered standard errors, clustered by firm and day. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 8
Analyst Change, Active Economist Change, and Analyst Efficiency in Incorporating Negative Macroeconomic News

	Negative News	
	(1)	(2)
	Analyst Change	Economist Change
DEP. VAR. =	FE	FE
INTERCEPT	0.0030	0.0088
	(1.04)	(1.48)
NEWS	0.0607**	0.0773***
	(2.20)	(3.97)
MACRO	-0.0011	-0.0062
	(-1.04)	(-1.33)
MACRO * NEWS	-0.0376**	-0.2080*
	(-2.19)	(-1.67)
EQ_AFFIL	0.0028	0.0009
	(0.79)	(0.97)
EQ_AFFIL * NEWS	0.2600	0.0729***
	(1.51)	(6.23)
EQ_OPPORT	-0.0016	0.0034***
	(-0.89)	(2.63)
EQ_OPPORT * NEWS	-0.0244	0.1090***
	(-0.71)	(9.49)
Analyst-specific controls	Included	Included
Broker-specific controls	Included	Included
Firm-specific controls	Included	Included
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
Observations	2,604	2,200
Adjusted R^2	0.066	0.115

Table Notes:

This table presents the results from re-estimating the OLS regression of Equation (2) for the robustness check. FE = Analyst's forecast error, calculated as actual EPS minus analyst earnings forecast, scaled by the stock price at the beginning of the quarter. NEWS = Macroeconomic news, defined as the most recent median consensus real GDP growth forecast for the quarter minus the actual real GDP growth for the same quarter last year. MACRO = Availability of an active in-house macroeconomist, an indicator variable that is set to 1 if the analyst has access to in-house macroeconomist's most recent research, and 0 otherwise. EQ_AFFIL = Equity underwriter-client relationship, an indicator variable that is set to 1 if the analyst is employed by the investment firm that acted as the lead manager or co-manager of the firm's equity underwriting team in the year prior to the analyst's earnings forecast, and 0 otherwise. EQ_OPPORT = Equity underwriting opportunity, an indicator variable that is set to 1 if

the firm announces an equity offering in the year following the analyst's earnings forecast, and 0 otherwise. Analyst-specific controls (HORIZON, FREQ, NIND, NFIRM, FEXP, and LAG_FE), broker-specific controls (BSIZE, TOP_BROKER, and UW_RANK), and firm-specific controls (LAG_TACC, PRIOR_BHR, and CYCLICALITY) are as previously defined. For the dependent variable, FE, a negative (positive) value indicates analyst optimism (pessimism); for the independent variable NEWS, a positive (negative) coefficient estimate indicates analyst under-reaction (overreaction). Two-tailed *t*-statistics (in parenthesis) are calculated using two-way clustered standard errors, clustered by firm and quarter. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively.