

Analysts' Forecast Accuracy in the United States: Optimistic and Pessimistic Bold Forecasts

A Study on Bold Sell-side Analysts' Forecast Accuracy between 1987-2012
and the Impact of Regulation Fair Disclosure and The Global Settlement

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Abstract:

This thesis examines earnings per share forecasts for U.S. companies, issued by sell-side analysts, within the time frame 1987-2012. We classify forecasts as herding or bold (non-herding), before dividing the latter into optimistic or pessimistic. We find that (i) bold last revision forecasts are more accurate than herding; (ii) optimistic bold last revision forecasts are more accurate than pessimistic; (iii) the implementation of Regulation Fair Disclosure, in 2000, had an uncertain effect on the accuracy of optimistic bold last revision forecasts, compared to pessimistic; and (iv) the relative accuracy of optimistic bold last revision forecasts has increased since the Global Settlement, in 2003. In conclusion, investors may find a more accurate consensus by restricting it to optimistic bold forecast revisions, since such revisions appear to incorporate more private information than pessimistic or herding forecasts.

Keywords: Earnings per share forecasts, Sell-side analysts, Bold, Herding, Optimism, Regulation Fair Disclosure, the Global Settlement

JEL Classification: G24, G28

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1. Introduction

In 2012, sell-side analysts (financial analysts who are employed by brokerage firms) issued nearly 200,000 one-year earnings per share forecasts for U.S. companies. The mean or median of all available forecasts, for each company, is usually referred to as the consensus forecast. Consensus forecasts are often seen as proxies for market expectations, and stock prices are affected by whether companies beat, meet, or fail to beat the consensus (American Association of Individual Investors, 2014).

Consensus forecasts can supplement investors' own research, by allowing them to gauge market expectations. The fact that consensus expectations affect stock prices suggests that investors do, indeed, listen to analysts' joint belief.

Investors' reliance on consensus forecasts has led researchers to seek a more informative consensus than one that is based on all forecasts. Clement and Tse (2005) find that a consensus based solely on bold (both above the consensus and above the analyst's previous forecast, or below both) forecast revisions is, in fact, more accurate. Parallel research by Chen and Jiang (2006) shows that optimists give a greater weight to their private information and a lower weight to public information, compared to pessimists. The two research findings motivate further investigation as to whether a consensus that is based on optimistic bold forecasts is more accurate than the ordinary consensus, which is based on all forecasts. To the best of our knowledge, no previous study has addressed this issue, and the purpose of this thesis is to fill this gap.

We also address two recent changes that have affected sell-side analysts. The Securities and Exchange Commission (SEC) implemented Regulation Fair Disclosure in August 2000, and it reached a settlement in December 2002 that is known as the Global Settlement. The settlement came shortly after two self-imposed regulations by the industry (NASD Rule 2711 and NYSE Rule 472).

Since the adoption of Regulation Fair Disclosure, corporate managers are forbidden to disclose private information to stock analysts without making the information public. Prior research suggests that the regulation was effective at reducing analysts' access to private information from company management, thereby reducing the conflict of interest that arises when analysts want to please corporate managers for access to such information (e.g. Gintschel and Markov (2004) and Mohanram and Sunder (2006)).

The early 2000s stock market crash raised further concern about bias in analyst research. This led to two pieces of self-imposed regulation (Rule 2711 and Rule 472) in an attempt to reduce the conflict of interest that career concerns cause (Kadan et al. (2009)). Later on, the SEC announced that it had reached a settlement with ten of the largest U.S. investment banks, addressing the conflict of interest between stock analysts and investment banking. The settlement, known as the Global Analyst Research Settlement (the Global Settlement), required the banks to pay 1.4 billion USD in total, while also forcing them to comply with new restrictions on their future practices (e.g. a required physical separation of research and investment banking departments). These restrictions are closely related to the two aforementioned rules.

In summary, this thesis attempts to re-affirm the earlier finding that bold forecasts are more accurate than herding. Second, it compares the accuracy of optimistic and pessimistic bold forecasts. Finally, it analyzes the impact of Regulation Fair Disclosure and the Global Settlement.

We use data from I/B/E/S and CRSP for the time period 1987-2012 and (i) employ the method of Clement and Tse (2005), who examine the association between last revision one-year earnings per share forecast accuracy and whether a forecast is bold or herding, while controlling for analyst and forecast characteristics – e.g. experience and the number of days since the last forecast for the same company and fiscal year by any analyst; (ii) develop Clement and Tse's method by classifying bold last forecast revisions as optimistic or pessimistic, depending on if they are above (optimistic) or below (pessimistic) both the announcement consensus and their previous forecast; and (iii) divide our sample into three time periods: 1987-1999, 2000-2002, and 2003-2012, based on the implementation of Regulation Fair Disclosure in 2000 and the Global Settlement in December 2002.

We re-affirm the finding of Clement and Tse, which suggests that a consensus based solely on bold forecast revisions is more accurate, for our entire time frame (1987-2012) and its three periods. The explanation for this finding is, most likely, that bold forecasts reflect private information to a higher extent, as Clement and Tse reason.

Second, we find that, among bold forecasts, those that are optimistic are more accurate than pessimistic forecasts. The higher accuracy of optimistic bold forecasts can be explained by Chen and Jiang's (2006) finding that optimistic forecasts tend to be based on a greater weight of private

information. This implies that restricting the consensus to optimistic bold forecasts renders it even more accurate than just restricting it to bold forecasts.

Third, our finding is not clear-cut with regards to the effect of Regulation Fair Disclosure. We find that optimistic bold forecast revisions have become less accurate after the Regulation, compared to those that are pessimistic. However, the finding appears to be affected by imperfect multicollinearity. Furthermore, the finding is only significant at the 5% level, and there is a lack of support from the descriptive statistics. The uncertainty in our finding reflects Mohanram and Sunder's (2006) discovery that while analysts receive less private information from corporate managements after Regulation Fair Disclosure, analysts compensate by looking harder for private information; the net effect is uncertain.

Lastly, we find that optimistic bold forecast revisions have become relatively more accurate after the Global Settlement. The increase in accuracy can be explained by a decrease in the relative number of optimistic forecasts that are driven by career concerns, resulting in an increased share of bold optimistic forecasts that are based on private information.

In conclusion, while Clement and Tse's findings "[...] suggest that consensus forecasts that are restricted to bold forecasts may be more accurate than consensus forecasts that weight all forecasts equally", we can further nuance their statement: Our findings suggest that an investor could find an even more accurate consensus by restricting the consensus to only optimistic bold forecasts, especially after the Global Settlement.

This thesis has the following structure: Section 2 features prior literature and our hypotheses. Section 3 presents our dataset. Section 4 explains how we construct our variables and regressions. Section 5 presents the results, both descriptive statistics and regressions. Section 6 concludes the thesis by discussing the implications of our findings, and provides suggestions for future research. All tables are found in the Appendix.

2. Prior literature

2.1 Herding behavior and boldness

Herding behavior is similar to conformity, a tendency that was first studied by social psychologists (e.g. Jenness (1932) and Asch (1951)). Scharfstein and Stein (1990) were among the first to examine herding behavior in a financial context. They develop a model that shows how managers might ignore their own expectations and rather mimic the investment decisions of other managers, in order to protect their reputation in the event of an inferior investment decision, as the blame is then shared among the herders.

Trueman (1994) looks at herding behavior among financial analysts and finds that analysts might ignore private information and issue earnings forecasts that are close to other analysts' prior forecasts to "[...] favorably affect investors' assessment of the analyst's forecasting ability".

Clement and Tse (2005) – whose study provides the theoretical basis for this thesis – further examine the differences between herding and non-herding (referred to as *bold*) accuracy of one-year earnings per share forecasts. They analyze sell-side analysts' last forecast revisions per company and fiscal year (firm-year). To classify forecasts as herding or bold, Clement and Tse use Gleason and Lee's (2003) earlier method (although Gleason and Lee refer to herding forecasts as low-information and bold forecasts as high-information). According to this classification, last forecast revisions are bold if they are both above an analyst's previous forecast and above the analyst consensus or if they are both below an analyst's previous forecast and below the analyst consensus. All other last forecast revisions are classified as herding.

Clement and Tse run a regression with scaled absolute forecast error (forecast compared to actual earnings per share) as the dependent variable and boldness as an independent dummy variable. They control for other factors, that previous studies have shown affect forecast accuracy, namely: general experience (Hong, Kubik, and Solomon (2000)), firm-specific experience (Brown (2001)), forecast horizon (Mikhail, Walther, and Willis (1999)), employer size, number of companies followed, number of industries followed (Clement (1999)), previous accuracy (Sinha, Brown and Das (1997)), forecast frequency (Jacob, Lys, and Neale (1999)), and days elapsed (Clement and Tse (2003)).

Using data from 1989-1998, Clement and Tse (2005) "[...] find that bold forecasts are more accurate than herding forecasts. This suggests that bold forecasts impound more private information about upcoming earnings than do herding forecasts, and, therefore, consensus

earnings forecasts that are based on bold forecasts may be more accurate than consensus estimates based on all forecasts, whether bold or herding.”

We expect to re-affirm their finding for a longer time span, 1987-2012 (hypothesis one). Prior literature on optimism and pessimism is presented next, before we hypothesize on whether optimistic bold forecasts are more accurate than pessimistic bold forecasts, or vice versa.

2.2 Optimism and pessimism

Easterwood and Nutt (1999) find evidence of systematic optimism in that “[...] analysts underreact to negative information, but overreact to positive information”. In a later study, Hong and Kubik (2003) provide an explanation for the occurrence of systematic optimism: career concerns. They find that “Controlling for accuracy, analysts who are optimistic relative to the consensus are more likely to experience favorable job separations [becoming employed by a brokerage firm with a higher status than the analyst’s previous employer].” Hong and Kubik write that their “[...] finding is most likely due to investment bankers and stockbrokers at brokerage houses wanting analysts to promote stocks so as to generate underwriting business and trading commissions.”

Ke and Yu (2006) find that – before recent regulatory changes, which are explained in the next subsection – analysts who follow an optimistic/pessimistic pattern (optimistic forecasts early on in the fiscal year, followed by pessimistic forecasts closer to the earnings announcement) “[...] produce more accurate earnings forecasts and are less likely to be fired by their employers.” They conclude: “These results are consistent with the hypothesis that analysts use biased earnings forecasts [optimistic forecasts, in this case] to curry favor with [gain support from] firm management in order to obtain better access to management’s private information.”

Libby et al. (2008) conduct an experiment on analysts and find evidence of an optimistic-pessimistic pattern, even after recent regulatory changes. Furthermore, they find that the analysts are aware of the pattern and that the analysts believe the pattern improves their relationships with investment clients and management. Their findings thus support those of Hong and Kubik (2003) and Ke and Yu (2006).

Chen and Jiang (2006) find that analysts who issue more favorable forecasts (optimistic) relative to the consensus weigh their private information higher and their public information lower than analysts who are less favorable (pessimistic) than the consensus. Their result can be explained by prior literature: Pessimistic analysts risk worsening their relationships with

corporate managers, thereby receiving less private information (Ke and Yu (2006)). Moreover, pessimistic analysts are less likely to receive positive job separations, as optimism can reward institutions that also conduct investment banking (Hong and Kubik (2003)).

Our second hypothesis is that optimistic bold last revision forecasts are more accurate than pessimistic bold last revision forecasts, because they are likely to be based on a greater weight of private information (Chen and Jiang (2006)). Recent regulation is presented next, before we hypothesize on its effects.

2.3 Recent regulation

2.3.1 Regulation Fair Disclosure

In August 2000, the Securities and Exchange Commission (SEC) adopted Regulation Fair Disclosure. The regulation forbids corporate managers from the practice of disclosing private information to stock analysts without making that information public. Gintschel and Markov (2004) examine earnings forecasts before and after Regulation Fair Disclosure and conclude that the regulation “[...] has been effective in curtailing selective disclosure”. Likewise, Mohanram and Sunder (2006) find support for the effectiveness of Regulation Fair Disclosure and that analysts seem to have compensated for the loss of private information from managers by “[...] investing more effort in idiosyncratic information discovery”.

We assume that the private information uncovered through an increased search effort does not outweigh the loss of such information from corporate managers, resulting in a net loss of private information. A reduction in private information should affect optimists more than pessimists, as optimists give private information a greater weight (Chen and Jiang (2006)). Our third hypothesis is that optimistic bold last revision forecasts have become less accurate after 2000³, relative to pessimistic bold last revision forecasts.

2.3.2 The Global Settlement

In July 2002, the National Association of Securities Dealers adopted Rule 2711 and the New York Stock Exchange amended Rule 472. Both of these self-imposed regulations were intended to reduce conflicts of interest (described by Hong and Kubik (2003)) between analysts and investment banking. The rules affected “[...] virtually all brokerage houses operating in the

³ As two thirds of listed U.S. companies’ fiscal years end in December (Wong (2011)), we choose a whole year to break as few fiscal years as possible. We pick the year 2000 (and not 2001) to keep forecasts issued between August 2000 and December 2000

United States” (Kadan et al. (2009)).

In December 2002, the SEC (and other institutions⁴) announced that they had reached a settlement, known as the Global Settlement, with ten of the largest investment firms in the US⁵, who agreed to a payment of 1.4 billion USD. The settlement addressed the conflict of interest between stock analysts and investment banking. In addition to the payment, the firms were “[...] required to comply with significant requirements that dramatically reform their future practices, including separating the research and investment banking departments at the firms, how research is reviewed and supervised, and making independent research available to investors” (SEC (2003)).

We reason that the Global Settlement, as well as Rule 2711 and Rule 472, should have reduced the number of analysts who are optimistic because of career concerns, leaving a greater share of optimistic analysts with private information. Indeed, Kadan et al. (2009) look at the effects of the Global Settlement, Rule 2711, and Rule 472 on analyst recommendations and find that “Optimistic recommendations have become less frequent and more informative [...]”. They also “[...] document a significant change in how conflicts of interest influence stock recommendations”, and they find that “[...] in the Post-Reg [Post-Regulation Fair Disclosure] period, affiliated analysts are as likely to issue optimistic recommendations as unaffiliated analysts.” Our fourth hypothesis is that optimistic bold last forecast revisions have become more accurate after 2003⁶, compared to pessimistic bold last revision forecasts.

⁴ Other institutions: NASD, NYSE, NASSA, and the New York State Attorney General

⁵ Bear Stearns, Credit Suisse, Goldman Sachs, Lehman Brothers, J.P. Morgan, Merrill Lynch, Morgan Stanley, Citigroup, UBS, and Piper Jaffray

⁶ As two thirds of listed U.S. companies’ fiscal years end in December (Wong (2011)), we choose a whole year to break as few fiscal years as possible. We pick the year 2003 to focus on the effect of the Global Settlement in particular

3. Data

We gather data on sell-side analysts' forecasts of annual earnings per share for U.S. companies from the Institutional Brokers' Estimate System's (I/B/E/S) database Detail History. In addition to the forecast values, we also gather: the date and time of the forecast announcement, a code to track each analyst, a code to identify the brokerage firm that employs the analyst, a CUSIP code to identify the company analyzed, the fiscal year, and the actual reported earnings.

The Detail History is updated on a quarterly basis and contains individual analysts' ("analyst-by-analyst") annual, quarterly, semi-annual, and long-term forecasts⁷. The database completely adjusts for forecasts in different currencies (than the company reports by) and for forecasts using different earnings per share measures (primary or diluted). The initial data range consisted of all available data – that is, from 1982 to 2013 – to first calculate some of our variables (namely, general and firm-specific experience in years). However, we limit our final sample to the years 1987-2012 for the following reasons:

Since 1985, I/B/E/S has excluded "[...] certain nonrecurring items (such as one-time charges or gains associated with acquisitions), other special items, and nonoperating items", when reporting earnings per share. These corrections are supposed to reflect items that most analysts do not account for in their forecasts (Abarbanell and Lehavy (2007)). Because reported earnings per share is a component of forecast accuracy, it follows that comparing accuracies based on street earnings (post-1985) to those based on GAAP-earnings would be to compare apples and oranges. Therefore, we exclude the years before 1986⁸.

The independent control variable lagged accuracy is missing for the first year (1986), by definition. Therefore, the year 1986 is excluded as well.

We exclude the year 2013, because of the high percentage of 2013 forecasts that lack reported earnings. While there are 194,321 forecasts from 2013, 50,876 of these (26%) lacked reported earnings per share. This can be compared to the 4,043 out of 196,206 forecasts (2%) that lacked reported earnings per share the previous year, 2012⁹.

We include the years between 1987 and 1992 in our sample, although I/B/E/S did not update analyst forecasts on a daily basis, but rather weekly or even monthly, before 1993 (Cooper, Day,

⁷ As per the publication of this thesis, the data was updated through February 2014

⁸ The year 1985 is excluded in its entirety because it is uncertain if the change in reported earnings was applied at the start of 1985 or later during the year

⁹ The number of reported earnings per share as of March 28, 2014, at 11 a.m. CET

and Lewis (2001)). In light of this, we test the validity of our results, by excluding the years before 1993 in section 5.3 Potential issues.

We acquire end-of-day prices and two-digit SIC codes (major industry groups) of all listed NYSE, Amex, and NASDAQ common stocks from the Center for Research in Security Prices (CRSP). After having calculated some of the required variables using the I/B/E/S dataset, we merge the two datasets based on company and date, following Moussawi's (2007)¹⁰ approach.

Out of 3,453,090 unique observations from I/B/E/S, 883,650 are dropped as they cannot be matched with CRSP prices and industry major group codes. An additional 1,596,117 observations are dropped as we only keep analysts' last forecast revisions for each firm-year, in accordance with Clement and Tse's method (2005). Further observations are dropped, following Clement and Tse's method: forecasts that were issued more than one year ahead or within 30 days of the fiscal period end date, outlier forecast revisions that are greater than 10 percent in absolute terms, outlier forecast errors that are greater than 40 percent in absolute terms, and observations that lack lagged accuracy (e.g. observations from 1986). After all of these steps, we are left with 271,364 last forecast revisions for the years 1987-2012.

¹⁰ CUSIP (I/B/E/S) with NCUSIP (CRSP) and date

4. Method

We begin by repeating the method of Clement and Tse (2005), in order to test whether their finding – that bold forecasts are more accurate than herding forecasts – holds for our longer time span, 1987-2012, as we hypothesize¹¹.

To test our second hypothesis, we further develop Clement and Tse’s method by introducing a new dummy variable that classifies bold forecasts as optimistic or pessimistic. Finally, hypotheses three and four are tested by dividing our sample into three time periods.

4.1 Clement and Tse’s method

We run a multivariate linear ordinary least squares (OLS) regression with *Accuracy* as the dependent variable and *Bold* as an independent dummy variable, while controlling for other analyst and forecast characteristics (see Regression 1). The subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*.

$$\begin{aligned} \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} \\ & + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} + \beta_6 \text{FirmExperience}_{ijt} \\ & + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} \\ & + \beta_{10} \text{FiscalYearEndDistance}_{ijt} + \beta_{11} \text{YearToDateDistance}_{ijt} + \beta_{12} \text{Bold}_{ijt} \\ & + \varepsilon_{ijt} \end{aligned}$$

(Regression 1)

The variables in the regression are created in two steps. First, we derive raw variables (e.g. experience in years) from our data. In order to reduce the effects of outliers and allow for comparisons across companies and fiscal years, we then scale the raw variables so that they assume values between zero and one.

¹¹ Clement and Tse look at the years 1989-1998

4.1.1 Raw variables

We calculate 12 raw variables from our data:

Absolute Forecast Error is the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast¹².

Days Elapsed is the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year.

Forecast Horizon is the number of days between the forecast announcement and the end of the fiscal year.

Broker Size is the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts.

Forecast Frequency is the number of forecasts that an analyst has issued for the same company and fiscal year.

Firm Experience is the number of years that an analyst has reported forecasts for the particular company.

General Experience is the number of years an analyst has released forecasts for any company.

Companies is the number of companies that an analyst have made forecasts for during the year.

Industries is the number of industries that an analyst have made forecasts for during the year. An industry is defined as having the same two-digit Standard Industrial Classification (SIC) code.

Fiscal-Year-End Distance is the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year.

Year-To-Date Distance is the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date

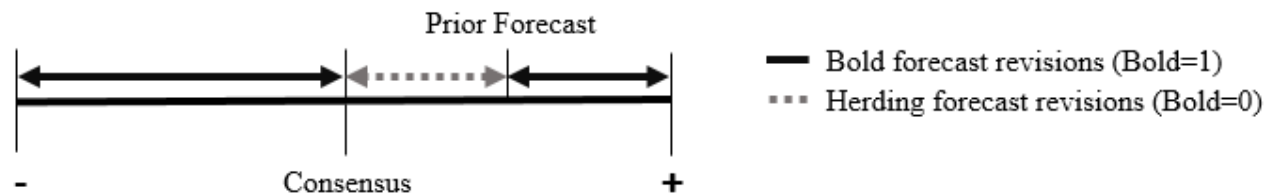
¹² Three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday

of the forecast^{13 14}. The consensus at the announcement is defined as the mean of the forecasts for the preceding 90 days.

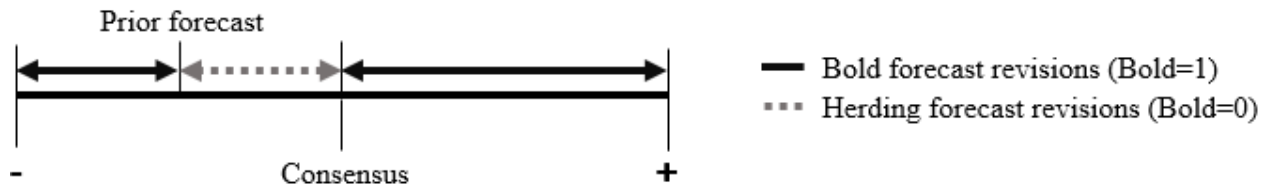
Bold is a dummy variable that takes the value of one if the forecast is above the consensus at the announcement and above the analyst's previous forecast or below the consensus at the announcement and below the analyst's previous forecast. Otherwise it is set to zero, which would correspond to a herding forecast (see Figure 1). As before, the consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days.

Figure 1: How the dummy variable *Bold* is constructed

If an analyst's prior forecast is above the current consensus:



If an analyst's prior forecast is below the current consensus:



4.1.2 Scaled variables

We scale each of the raw variables (except for the dummy variable *Bold*) to values between zero and one. The scaling is done in such a way as to maintain the relative distances within firm-years (the same company and fiscal year). As previously mentioned, the scaling reduces the effects of outliers and allows for comparisons of observations across firm-years.

¹³ Three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday

¹⁴ YTD_Dist2 in Clement and Tse (2005)

All of the variables – apart from *Absolute Forecast Error* (scaled into *Accuracy* in Equation 2) and the dummy variable *Bold* – are scaled using Equation 1, where i , j , and t correspond to analyst i following company j in fiscal year t :

$$\textbf{Scaled Variable}_{ijt} = \frac{\text{Raw Variable}_{ijt} - \text{Raw Variable Minimum}_{jt}}{\text{Raw Variable Maximum}_{jt} - \text{Raw Variable Minimum}_{jt}} \quad (\text{Equation 1})$$

In Equation 1, the minimum observation of the raw variable within a firm-year is subtracted from the analyst's raw variable, and that difference is divided by the range of the raw variable within the firm-year, i.e. the difference between the maximum and the minimum observation.

For example, suppose there are five forecasts within a firm-year, made by analysts A, B, C, D, and E. The analysts have 1, 2, 5, 6, and 10 years of general experience, respectively. Using Equation 1, scaled general experience for each of the analysts equal:

$$\textbf{General Experience (Scaled)}_A = \frac{1 - 1}{10 - 1} = 0$$

$$\textbf{General Experience (Scaled)}_B = \frac{2 - 1}{10 - 1} = \frac{1}{9}$$

$$\textbf{General Experience (Scaled)}_C = \frac{5 - 1}{10 - 1} = \frac{4}{9}$$

$$\textbf{General Experience (Scaled)}_D = \frac{6 - 1}{10 - 1} = \frac{5}{9}$$

$$\textbf{General Experience (Scaled)}_E = \frac{10 - 1}{10 - 1} = 1$$

In order for zero to correspond to the lowest accuracy (highest absolute forecast error) and for one to correspond to the highest accuracy (least absolute forecast error), a slightly different equation is used to scale *Accuracy* (see Equation 2). The subscripts i , j , and t refer to analyst i following company j in fiscal year t :

$$\textbf{Accuracy}_{ijt} = \frac{\text{AbsoluteForecastError Maximum}_{jt} - \text{AbsoluteForecastError}_{ijt}}{\text{AbsoluteForecastError Maximum}_{jt} - \text{AbsoluteForecastError Minimum}_{jt}} \quad (\text{Equation 2})$$

That is, *Accuracy* is calculated by taking the maximum absolute forecast error of all analysts following the same company in the same fiscal year minus the absolute forecast error of an observation, scaled by the range of absolute forecast errors.

4.2 Classifying bold forecasts as optimistic or pessimistic

To test our second hypothesis that optimistic bold forecasts are more accurate than pessimistic bold forecasts, we develop Clement and Tse's regression model (Regression 1): For all bold forecasts, we replace *Bold* with a new dummy variable – *Bold2* – that classifies the bold forecasts as either optimistic or pessimistic (see Regression 2). The subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*.

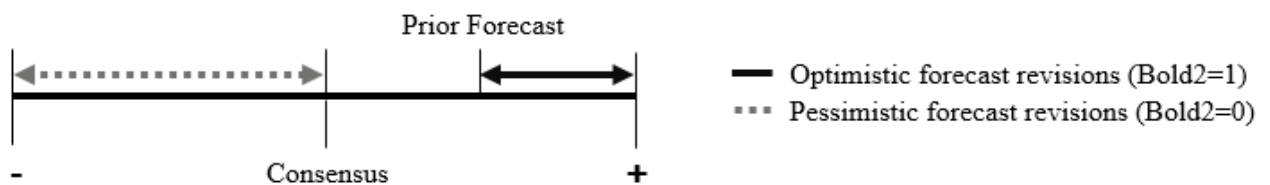
$$\begin{aligned}
 \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} \\
 & + \beta_3 \text{Lagged Accuracy}_{ijt} + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} \\
 & + \beta_6 \text{FirmExperience}_{ijt} + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} \\
 & + \beta_9 \text{Industries}_{ijt} + \beta_{10} \text{FiscalYearEndDistance}_{ijt} \\
 & + \beta_{11} \text{YearToDateDistance}_{ijt} + \beta_{12} \text{Bold2}_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

(Regression 2)

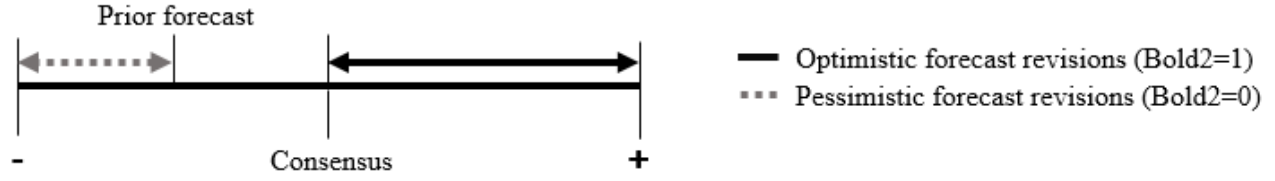
Bold2 is a dummy variable that assumes the value of one – optimistic – if the forecast is above both the consensus at the announcement and the analyst's previous forecast for the same company and fiscal year. If the forecast is below both the consensus at the announcement and the analyst's previous forecast for the same company and fiscal year, *Bold2* assumes the value of zero – pessimistic (see Figure 2). The consensus at the announcement is defined as the mean of the forecasts for the preceding 90 days.

Figure 2. How the dummy variable *Bold2* is constructed

If an analyst's prior forecast is above the current consensus:



If an analyst's prior forecast is below the current consensus:



4.3 Testing for differences between time periods

In order to test our third hypothesis (that optimistic bold last revision forecasts have become relatively less accurate after Regulation Fair Disclosure in 2000) and our fourth hypothesis (that optimistic bold last forecast revisions have become relatively more accurate after the Global Settlement in 2003), we run Regression 2 on three different time periods: 1987-1999, 2000-2002, and 2003-2012.

To test if *Bold2* is significantly different between the three time periods, we introduce the dummy variable *Period* and interaction terms between it and each of the independent variables (see Regression 3). *Period* assumes the value of one for forecasts issued in 2000-2002; otherwise, it is set to zero. The subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*.

$$\begin{aligned}
 \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} \\
 & + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} + \beta_6 \text{FirmExperience}_{ijt} \\
 & + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} \\
 & + \beta_{10} \text{FiscalYearEndDistance}_{ijt} + \beta_{11} \text{YearToDateDistance}_{ijt} + \beta_{12} \text{Bold2}_{ijt} \\
 & + \beta_{13} \text{Period}_{ijt} + \beta_{14} \text{DaysElapsed} \times \text{Period}_{ijt} \\
 & + \beta_{15} \text{ForecastHorizon} \times \text{Period}_{ijt} + \beta_{16} \text{Lagged Accuracy} \times \text{Period}_{ijt} \\
 & + \beta_{17} \text{BrokerSize} \times \text{Period}_{ijt} + \beta_{18} \text{ForecastFrequency} \times \text{Period}_{ijt} \\
 & + \beta_{19} \text{FirmExperience} \times \text{Period}_{ijt} + \beta_{20} \text{GeneralExperience} \times \text{Period}_{ijt} \\
 & + \beta_{21} \text{Companies} \times \text{Period}_{ijt} + \beta_{22} \text{Industries} \times \text{Period}_{ijt} \\
 & + \beta_{23} \text{FiscalYearEndDistance} \times \text{Period}_{ijt} + \beta_{24} \text{YearToDateDistance} \times \text{Period}_{ijt} \\
 & + \beta_{25} \text{Bold2} \times \text{Period}_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

(Regression 3)

5. Results

All of the tables, referred to in this section, can be found in the appendix. The most important results are highlighted in bold.

5.1 Descriptive statistics

5.1.1 Descriptive statistics of raw variables

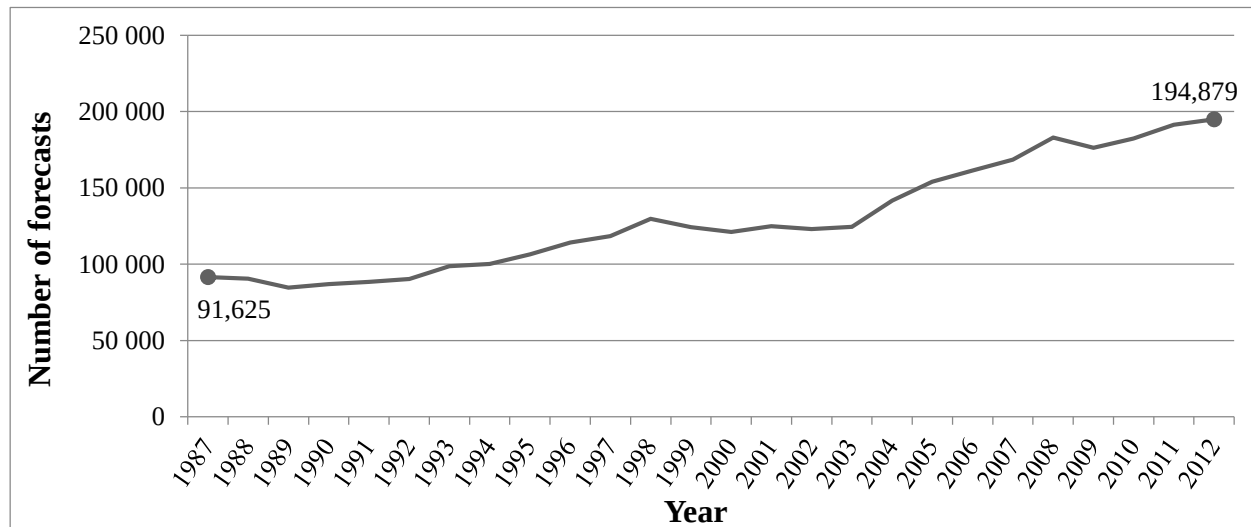
Table 1 Panel A reports descriptive statistics of selected raw variables for our entire sample, 1987-2012. Compared to Clement and Tse (2005), the means for *Companies* (18.5) and *Industries* (4.0) are slightly smaller in our entire sample¹⁵.

As would be expected, our sample has larger means for both *General experience* (8.0) and *Firm-specific experience* (4.0) than Clement and Tse's sample, since it covers more years¹⁶.

Forecast frequency has a larger mean (5.0) in our sample, compared to Clement and Tse; whereas the means for *Days elapsed* (5.3) and *Forecast horizon* (90.0) are smaller in our sample¹⁷. These three deviations can be explained by an increase in the number of forecasts over time (see Diagram 1).

Diagram 1. The number of earnings per share forecasts, per year (1987-2012)

This diagram shows the number of one-year earnings per share forecasts by sell-side analysts, per year from 1987 to 2012. The forecasts are derived from the database I/B/E/S Detail History. The two data labels (91,625 and 194,879) correspond to 1987 and 2012.



¹⁵ Clement and Tse's means are 21.2 for *Companies* and 5.9 for *Industries*

¹⁶ The means are 5.7 for *General experience* and 3.8 for *Firm-specific experience*

¹⁷ The means are 3.8 for *Forecast frequency*, 13.6 for *Days elapsed*, and 97.9 for *Forecast horizon*

The mean *Brokerage size* is a weighted average, where the weight is the share of forecasts issued by a brokerage firm. A greater share of forecasts from larger brokerage firms will thus make the mean *Brokerage size* larger. The mean is more than twice as large in our sample (70.0) as the mean that Clement and Tse report¹⁸. In contrast, Hong and Kubik (2003), whose mean is not a weighted average, report a value that is less than half that of Clement and Tse for the same time period, 1989-1998¹⁹.

We believe that the most likely explanation for the discrepancy between our mean *Brokerage size* and Clement and Tse's mean is that a larger proportion of the forecasts in our sample – which covers a longer time span, 1987-2012 – are made by analysts who are employed by larger brokerage firms. Indeed, when we compare the mean for the raw variable *Brokerage size* for the period 1987-1999 (54.3) with the corresponding means for the periods 2000-2002 (95.6) and 2003-2012 (71.5), we find that the mean *Brokerage size* is higher for the two most recent periods (see Tables 2-4 Panel A).

We classify 76.84% of the forecast revisions in our sample as *Bold*; Clement and Tse classify 73.31% of their sample forecast revisions as *Bold*.

5.1.2 Descriptive statistics of scaled variables

Descriptive statistics of the scaled variables are reported for our entire sample in Table 1 Panel B. The parameter that has the highest mean is *Accuracy* (0.637), while *Days Elapsed* has the lowest mean (0.219).

Table 1 Panel C shows that all of the differences between analyst and forecast characteristics for herding and bold forecasts are statistically significant at a 1% level, except for *Forecast frequency* (statistically significant at a 5% level), *General experience* and *Companies* (both statistically insignificant at a 5% level).

As might be expected by the way the dummy variable bold is constructed, bold forecasts are on average further away from the announcement consensus and the fiscal year end consensus, compared to herding forecasts. Other noticeable differences are that herding forecasts are issued later in the fiscal year than bold forecasts on average, when there are more forecasts to herd by.

¹⁸ The mean is 29.8 for *Brokerage size*

¹⁹ Hong and Kubik report a mean brokerage size below 13 for each of the years, 1989-1998

On average, bold forecasts are issued fewer days after prior forecasts by any analyst, which could reflect the type of companies that tend to have bold forecasts – larger, more frequently analyzed, companies.

The difference between herding and bold forecasts is smaller for *Lagged accuracy* than *Accuracy*, which reflect the fact that it is the forecast – not the analyst – that is either bold or herding. An analyst can issue a herding last revision forecast for a company, and then issue a bold last forecast revision for the same company next year.

The parameter *Accuracy* has a mean of 0.6498 for bold forecasts, which is larger than the corresponding mean for herding forecasts of 0.5957, and the difference between the two means is significant at the 1% level. Furthermore, the same result is found for each of the time periods 1987-1999, 2000-2002, and 2003-2012 (see Tables 2-4 Panel C). This supports the finding of Clement and Tse (2005) “[...] that bold forecasts are more accurate than herding forecasts” and our first hypothesis.

In support of our second hypothesis, we find that optimistic bold forecasts are indeed more accurate on average than pessimistic bold forecasts, as is evident from Table 1 Panel D. The parameter *Accuracy* has a mean of 0.6736 for optimistic forecasts, which is larger than the corresponding mean for pessimistic forecasts of 0.6238, and the difference between the two means is significant at the 1% level. Moreover, the finding applies to each of the time periods 1987-1999, 2000-2002, and 2003-2012 (see Tables 2-4 Panel C).

The number of *Days elapsed*, since the most recent forecast by any analyst, are on average fewer for optimistic forecasts than pessimistic (see Table 1 Panel D). This could reflect the type of companies that tend to have optimistic forecasts – larger, more frequently analyzed, companies.

On average, those who issue optimistic forecasts have less *General experience*, slightly less *Firm experience*, work for smaller brokerage firms, and follow more *Companies* than those who issue pessimistic forecasts. Additionally, optimistic forecasts are on average closer to both the consensus at the announcement date and the fiscal year end consensus (see Table 1 Panel D). The above supports Hong and Kubik (2003), who find that career concerns can fuel above-consensus forecasts – optimism.

Table 1 Panel C shows that there are more optimistic than pessimistic bold forecasts, for our entire sample. However, there is a noticeable difference between the three time periods (see

Tables 2-4 Panel C): There are more pessimistic forecasts than optimistic forecasts in the first two periods, but the opposite is true for the third.

The difference in average accuracy for optimistic bold forecasts between the periods 1987-1999 and 2000-2002 is not significant at any reasonable level (see Table 5 Panel A). Thus, we do not find support for our third hypothesis that optimistic bold last revision forecasts have become less accurate after 2000, relative to pessimistic bold last revision forecasts.

The average accuracy (0.6831) of optimistic bold forecasts is higher for the last period 2003-2013 than for the two previous ones, and the increase is statistically significant both compared to the period 2000-2002 and to the period 1987-2002 (see Table 5 Panels B and C). This supports our fourth hypothesis that optimistic bold last forecast revisions have become more accurate after 2003, compared to pessimistic bold last revision forecasts.

5.2 Regressions

In Table 6 Column 2, all of the control variables assume the same signs as in Clement and Tse's (2005) sample, except for *Broker size* and *Companies*²⁰. The coefficient on *Companies* is, however, the smallest of our statistically significant control variables at 0.0067. The different sign for *Broker size* is most likely explained by the differences found in the raw variable *Broker size* (see 5.1.1 Descriptive statistics of raw variables). Finally, *Firm experience* is not statistically significant in our sample; whereas it has a positive coefficient that is statistically significant at the 1% level in Clement and Tse's sample.

The coefficient of the dummy variable *Bold* is positive and statistically significant at the 1% level. This re-affirms Clement and Tse's finding "[...] that bold forecasts are more accurate than herding forecasts" and supports our first hypothesis.

The regression in the Table 6 Column 4 is where we deviate from Clement and Tse, by replacing *Bold* with *Bold2*. All of the control variables that are statistically significant in the second column regression are also statistically significant at the same levels in the fourth column regression, and the signs are unchanged. The coefficient on *Bold2* is positive and statistically significant (the fourth column) at the 1% level, which supports our second hypothesis that optimistic bold last revision forecasts are more accurate than pessimistic bold last revision forecasts.

²⁰ See Table IV in Clement and Tse (2005)

Table 7 Column 4 shows that only the interaction terms of *Forecast horizon* and *Fiscal year end distance* with *Period* are different between the periods 1987-1999 and 2000-2002, at the 1% significance level. The coefficient of the interaction term between *Bold2* and *Period* has a negative coefficient and is statistically significant at the 5% level, which supports our third hypothesis that optimistic bold last revision forecasts have become less accurate after Regulation Fair Disclosure in 2000, relative to pessimistic bold last revision forecasts.

Table 7 Column 5 shows that the dummy variable *Period* and its interactions with *Days elapsed*, *Forecast horizon*, *Lagged accuracy*, *Fiscal year end distance*, and *Bold2* are statistically significant at the 1% level. Moreover, the coefficient of the interaction term between *Bold2* and *Period* is negative (the dummy variable *Period* assumes the value of one for forecasts issued in 2000-2002). This supports our fourth hypothesis that optimistic bold last revision forecasts have become more accurate after 2003, compared to pessimistic bold last revision forecasts.

5.3 Potential issues

We notice that there are four pairs of independent variables that have absolute correlations above 0.25: *Forecast horizon* & *Forecast frequency*, *Firm experience* & *General experience*, *Companies* & *Industries*, and *Fiscal-year-end distance* & *Year-to-date distance* (see Table 1 Panel E). The correlation among these pairs of independent variables could affect the results of our regressions (section 5.2), through imperfect multicollinearity.

We test the validity of our findings by repeating the four regressions that relate to our hypotheses (Table 6, Columns 2 and 4 and Table 7 Columns 4 and 5) in Tables 8, 9, 10, and 11. In these tables, we exclude each of the eight, aforementioned, independent variables (including each corresponding interaction term with *Period* in Tables 10 and 11) in turn.

The coefficient of *Bold* is still positive and statistically significant at the 1% level for all eight regressions, in support of our first hypothesis (see Table 8). Furthermore, *Bold2* is still positive and statistically significant at the 1% level for all eight regressions, in support of our second hypothesis (see Table 9).

The interaction term between *Period* and *Bold2* (i.e. the difference between the coefficient of *Bold2* for the time period in question, 1987-1999 or 2003-2012, and the time period 2000-2002) has the same sign and significance level as before for 15 out of 16 regressions (see Tables 10 and 11). The exception is when we compare the time periods 1987-1999 and 2000-2002 and exclude *Forecast horizon* (see Table 10). In other words, we still find support for our fourth

hypothesis, but the third hypothesis appears to be affected by imperfect multicollinearity between *Forecast horizon* and *Forecast frequency*.

We find support for our first three hypotheses in the regressions (see Table 6 Columns 2 and 4 and Table 7 Column 4); however, these three regressions could be affected by the fact that before 1993 I/B/E/S did not update analyst forecasts on a daily basis (Cooper, Day, and Lewis (2001)). In light of this, we run three regressions to test the validity of our findings on a sample that excludes the years before 1993 in Table 12. We still find that the coefficient of *Bold* is positive and statistically significant at the 1% level, in support of our first hypothesis (see Table 12 Column 1). We also find that the coefficient of *Bold2* is still positive and significant at the 1% level, in support of our second hypothesis (see Table 12 Column 2). We still find that the interaction term between *Bold2* and *Period* (i.e. the difference between the coefficient of *Bold2* for the time periods 1987-1999 and 2000-2002) has a negative sign and is statistically significant at the 1% level, which is an improvement to the previous 5% level, in support of our third hypothesis (see Table 12 Column 3).

6. Conclusions and implications

The purpose of this study has been to test whether a consensus that consists solely of optimistic bold forecasts is more accurate than one that consists of pessimistic bold forecasts. Our findings suggest that the former is, indeed, more accurate.

We derive our findings from regressions that control for – and are therefore not biased by – several analyst and forecast characteristics, such as the absolute distance of the forecast from the consensus of the last 90 days (*Year-to-date distance*). The results pertain to last revision one-year earnings per share forecasts for U.S. companies, issued by sell-side analysts within the time span 1987-2012. Forecast revisions are classified as bold if they are both above the analyst’s previous forecast and above the consensus of the last 90 days, or below both. Bold forecast revisions that are above both are classified as optimistic.

We re-affirm Clement and Tse’s (2005) finding that bold forecast revisions are more accurate than herding forecast revisions, for a longer and more recent time period, thereby confirming our first hypothesis. This can be explained by private information: Clement and Tse find that “[...] bold forecasts appear to reflect analysts’ relevant private information to a greater extent than herding forecasts”, which explains the higher accuracy of bold forecasts that we observe.

We also find that optimistic bold revisions are more accurate than those that are pessimistic, which confirms our second hypothesis. This is explained by Chen and Jiang’s (2006) finding that optimistic forecasts tend to give a greater weight to private information. The systematic optimism that Easterwood and Nutt (1999) describe should dilute the informational value of optimistic forecasts; however, this effect is mitigated by the fact that we use Clement and Tse’s method of analyzing only an analyst’s last forecast revision per firm-year. The optimism/pessimism pattern (optimistic forecasts early on in the fiscal year, followed by pessimistic forecasts closer to the earnings announcement) that Ke and Yu (2006) and Libby et al. (2008) find should thus lean toward pessimistic for our dataset of last forecast revisions, reducing the effect of systematic optimism that Easterwood and Nutt observed.

We find support for our third hypothesis that optimistic bold forecast revisions have become less accurate after Regulation Fair Disclosure, compared to pessimistic bold forecast revisions. However, the finding appears to be affected by imperfect multicollinearity between *Forecast horizon* and *Forecast frequency*. Furthermore, the support from the regression is weaker

(significant at the 5% level, whereas our other three findings are significant at the 1% level), and there is no support from the descriptive statistics. Ultimately, there is no clear-cut finding with regards to our third hypothesis. This ambiguity is reflected in prior literature, as well: Mohanram and Sunder (2006) find that while analysts receive less private information from company management after Regulation Fair Disclosure, analysts compensate by looking harder for private information; the net effect is uncertain. Furthermore, there were only three years between Regulation Fair Disclosure and the Global Settlement, which makes it difficult to isolate the impact of the former. Moreover, the 36 month period featured an eight month long recession in 2001 (NBER, 2010). In addition, Rule 2711 and Rule 472 were adopted in July 2002, which might have countered the impact of Regulation Fair Disclosure. We encourage future studies to address these issues by (i) adjusting for the effect of business cycles (e.g. by using a dummy variable, based on NBER's classification) and (ii) excluding the effect of Rule 2711 and Rule 472, by examining the time period between the adoption of Regulation Fair Disclosure and the implementation of the rules.

Finally, we find that optimistic bold forecast revisions have become more accurate after the Global Settlement, as well as Rule 2711 and Rule 472, which confirms our fourth hypothesis. Indeed, the positive effect that optimism has on accuracy among bold forecasts is more pronounced in the most recent period, 2003-2012. The increased relative accuracy can be explained by a decreased share of optimistic forecasts that are driven by career concerns, leaving a greater proportion of optimistic forecasts that are based on private information. The explanation above assumes that the Global Settlement, Rule 2711, and Rule 472 were effective at reducing career concerns, which Kadan et al. (2009) find support for. We pick the year 2003 to separate our second and third time periods (2000-2002 and 2003-2012) to focus on the effect of the Global Settlement in particular. As Rule 2711 and Rule 472 were adopted in July 2002, forecasts issued between July and December 2002 – which are affected by the two rules – fall within the second time period. This does not affect our confirmation of the fourth hypothesis, however; if anything, it should render the hypothesis more difficult to prove.

We observe that the share of optimistic bold forecasts increased after 2003. This change seems puzzling, as the Global Settlement, Rule 2711, and Rule 472 should have reduced career concern incentives to issue optimistic forecasts. Furthermore, Kadan et al. report less frequent issuing of optimistic recommendations after these changes. However, information asymmetry

between investors and analysts provides a plausible explanation: Investors might not have been able to distinguish between optimistic forecasts that were motivated by career concerns and optimistic forecasts based on the analyst's private information – driving the latter out of the market, as their private information is mistaken for career concerns. This resembles Akerlof's (1970) famous example, where bad cars ("lemons") compel good cars to exit the market. The Global Settlement, Rule 2711, and Rule 472 then reduced the number of forecasts motivated by career concerns. Consequently, the analysts who were optimistic because of private information re-entered the market. Although we provide a plausible explanation above, we encourage future studies to investigate this puzzling finding further.

Clement and Tse write that their results "[...] suggest that consensus forecasts that are restricted to bold forecasts may be more accurate than consensus forecasts that weight all forecasts equally." Our findings suggest that an investor could find an even more accurate consensus by restricting it to only optimistic bold forecasts. This holds especially true today, after the Global Settlement, Rule 2711 and Rule 472. Hence, it might be possible to develop a profitable trading strategy, based upon our findings. We encourage future studies to investigate whether such a strategy can be constructed.

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Table 1

Descriptive statistics of selected raw (unscaled) and scaled variables (1987-2012)

This table reports descriptive statistics for entire our sample of 271,364 analyst forecast revisions. The variables are based on forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. **Panel A** reports descriptive statistics for eight raw (unscaled) variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for a particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; and *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code. **Panel B** reports descriptive statistics for the eight variables above, scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. The panel also lists *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. **Panel C** reports differences between scaled variable means for bold and herding forecasts. Forecasts revisions are classified as *Bold* if they are above the consensus at the announcement and above an analyst's previous forecast, or below both. The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. In addition to the earlier scaled variables, Panel C also lists the variables *Fiscal-Year-End Distance* and *Year-To-Date Distance*. Both of these variables are scaled to assume values between 0 and 1, in the same manner as the eight variables before, and they are based on the raw variables *Fiscal-Year-End Distance* (the absolute distance between an analyst's forecast and the consensus [mean] forecast at the end of the fiscal year) and *Year-To-Date Distance* (the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast [three days for Mondays and four days for Tuesdays]). The difference between the means is calculated as difference=mean(bold)-mean(herding), and we test for H0: difference=0. **Panel D** reports differences between scaled variable means (the same variables as in Panel C) for optimistic bold and pessimistic bold forecasts. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus, and they are classified as pessimistic if they are below the announcement consensus. The difference between the means is calculated as difference=mean(optimistic)-mean(pessimistic), and we test for H0: difference=0. **Panel E** reports the correlations between all of our scaled variables. Pairs with absolute correlations higher than 0.25 are highlighted in bold.

Panel A. Descriptive statistics of selected raw variables

	Mean	25th Percentile	Median	75th Percentile	Std.	Min	Max
DaysElapsed	5.3	0	0	4	13.3	0	217
ForecastHorizon	90.0	58	68	90	56.3	30	357
BrokerSize	70.0	23	51	104	64.3	1	387
ForecastFrequency	5.0	3	4	6	2.6	2	178
FirmExperience	4.0	2	3	5	3.2	0	29
GeneralExperience	8.0	4	7	11	5.2	1	30
Companies	18.5	13	17	22	12.0	1	370
Industries	4.0	2	3	5	2.7	1	31

Panel B. Descriptive statistics of selected scaled variables

	Mean	25th Percentile	Median	75th Percentile
Accuracy	0.637	0.374	0.759	0.951
DaysElapsed	0.219	0.000	0.000	0.286
ForecastHorizon	0.332	0.018	0.143	0.600
LaggedAccuracy	0.620	0.333	0.727	0.949
BrokerSize	0.358	0.068	0.259	0.546
ForecastFrequency	0.447	0.154	0.400	0.714
FirmExperience	0.411	0.050	0.333	0.750
GeneralExperience	0.421	0.115	0.333	0.708
Companies	0.430	0.145	0.375	0.680
Industries	0.396	0.000	0.333	0.667

Panel C. Differences in the means of scaled variables between bold and herding forecasts

	Bold Forecasts N = 208 524	Herding Forecasts N = 62 840	t-Value for Difference	Significance
Accuracy	0.6498	0.5957	32.87**	<0.001
DaysElapsed	0.2114	0.2434	-19.39**	<0.001
ForecastHorizon	0.3391	0.3067	19.14**	<0.001
LaggedAccuracy	0.6208	0.6153	3.36**	0.001
BrokerSize	0.3607	0.3497	7.14**	<0.001
ForecastFrequency	0.4463	0.4499	-2.28*	0.022
FirmExperience	0.4126	0.4065	3.57**	<0.001
GeneralExperience	0.4219	0.4192	1.66	0.097
Companies	0.4296	0.4320	-1.56	0.119
Industries	0.3947	0.3998	-3.09**	0.002
FiscalYearEndDistance	0.4796	0.3672	70.31**	<0.001
YearToDateDistance	0.4954	0.3302	110.00**	<0.001

* Significant at the 5% level

**Significant at the 1% level

Panel D. Differences in the means of scaled variables between optimistic bold and pessimistic bold forecasts

	Optimistic Bold Forecasts N = 108 882	Pessimistic Bold Forecasts N = 99 642	t-Value for Difference	Significance
Accuracy	0.6736	0.6238	32.56**	<0.001
DaysElapsed	0.1959	0.2284	-21.08**	<0.001
ForecastHorizon	0.3307	0.3483	-10.47**	<0.001
LaggedAccuracy	0.6274	0.6135	8.92**	<0.001
BrokerSize	0.3561	0.3657	-6.47**	<0.001
ForecastFrequency	0.4449	0.4478	-1.89	0.058
FirmExperience	0.4102	0.4151	-3.01**	0.003
GeneralExperience	0.4167	0.4275	-7.02**	<0.001
Companies	0.4327	0.4262	4.42**	<0.001
Industries	0.3942	0.3953	-0.71	0.475
FiscalYearEndDistance	0.4734	0.4863	-8.14**	<0.001
YearToDateDistance	0.4729	0.5200	-30.79**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Panel E. Correlations among scaled variables

Significance levels are in parentheses

	Accuracy	Days Elapsed	Forecast Horizon	Lagged Accuracy	Broker Size	Forecast Frequency	Firm Experience	General Experience	Companies	Industries	FiscalYearEnd Distance
Days Elapsed	-0.070 (<0.001)										
Forecast Horizon	-0.275 (<0.001)	0.025 (<0.001)									
Lagged Accuracy	0.082 (<0.001)	-0.047 (<0.001)	-0.041 (<0.001)								
Broker Size	-0.016 (<0.001)	0.039 (<0.001)	0.031 (<0.001)	-0.011 (<0.001)							
Forecast Frequency	0.107 (<0.001)	0.037 (<0.001)	-0.339 (<0.001)	0.008 (<0.001)	0.062 (<0.001)						
Firm Experience	0.000 (0.921)	0.027 (<0.001)	-0.001 (0.751)	-0.017 (<0.001)	0.043 (<0.001)	0.004 (0.038)					
General Experience	-0.002 (0.242)	0.024 (<0.001)	0.006 (0.001)	-0.012 (<0.001)	0.042 (<0.001)	-0.036 (<0.001)	0.485 (<0.001)				
Companies	0.010 (<0.001)	0.009 (<0.001)	-0.044 (<0.001)	-0.017 (<0.001)	0.051 (<0.001)	0.033 (<0.001)	0.122 (<0.001)	0.197 (<0.001)			
Industries	-0.016 (<0.001)	0.024 (<0.001)	-0.002 (0.212)	-0.025 (<0.001)	-0.058 (<0.001)	0.003 (0.113)	0.074 (<0.001)	0.118 (<0.001)	0.472 (<0.001)		
FiscalYearEnd Distance	-0.004 (0.040)	0.013 (<0.001)	-0.086 (<0.001)	-0.029 (<0.001)	0.025 (<0.001)	0.061 (<0.001)	0.009 (<0.001)	0.003 (0.165)	0.009 (<0.001)	0.007 (<0.001)	
YearToDate Distance	0.047 (<0.001)	-0.016 (<0.001)	0.006 (0.004)	-0.023 (<0.001)	0.045 (<0.001)	0.042 (<0.001)	0.014 (<0.001)	0.008 (<0.001)	0.011 (<0.001)	0.002 (0.336)	0.714 (<0.001)

Table 2
Descriptive statistics of selected raw (unscaled) and scaled variables (1987-1999)

This table reports descriptive statistics for 61,011 analyst forecast revisions between the years 1987 and 1999. The variables are based on forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. **Panel A** reports descriptive statistics for eight raw (unscaled) variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; and *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code. **Panel B** reports descriptive statistics for the eight variables above, scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. The panel also lists *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. **Panel C** reports differences between scaled variable means for optimistic bold and pessimistic bold forecasts. Forecasts revisions are classified as *Bold* if they are above the consensus at the announcement and above the analyst's previous forecast, or below both. The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus, and they are classified as pessimistic if they are below the announcement consensus. In addition to the earlier scaled variables, Panel C also lists the variables *Fiscal-Year-End Distance* and *Year-To-Date Distance*. Both of these variables are scaled to assume values between 0 and 1, in the same manner as the eight variables before, and they are based on the raw variables *Fiscal-Year-End Distance* (the absolute distance between an analyst's forecast and the consensus [mean] forecast at the end of the fiscal year) and *Year-To-Date Distance* (the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast [three days for Mondays and four days for Tuesdays]). The difference between the means is calculated as $\text{difference} = \text{mean}(\text{optimistic}) - \text{mean}(\text{pessimistic})$, and we test for $H_0: \text{difference} = 0$.

Panel A. Descriptive statistics of selected raw variables

	Mean	25th Percentile	Median	75th Percentile	Std.	Min	Max
DaysElapsed	7.8	0	3	8	13.8	0	189
ForecastHorizon	96.0	57	71	129	59.6	30	346
BrokerSize	54.3	18	43	73	50.3	1	291
ForecastFrequency	4.3	3	4	5	2.0	2	24
FirmExperience	3.5	2	3	5	2.5	0	16
GeneralExperience	6.9	4	6	10	3.9	1	17
Companies	22.3	13	18	26	19.5	1	370
Industries	4.3	2	4	5	3.0	1	31

Panel B. Descriptive statistics of selected scaled variables

	Mean	25th Percentile	Median	75th Percentile
Accuracy	0.612	0.288	0.733	0.963
DaysElapsed	0.308	0.000	0.122	0.545
ForecastHorizon	0.376	0.045	0.203	0.726
LaggedAccuracy	0.600	0.256	0.711	0.963
BrokerSize	0.383	0.059	0.289	0.640
ForecastFrequency	0.441	0.000	0.400	0.750
FirmExperience	0.454	0.000	0.400	1.000
GeneralExperience	0.494	0.111	0.500	0.900
Companies	0.392	0.082	0.286	0.667
Industries	0.391	0.000	0.286	0.667

Panel C. Differences in the means of scaled variables between optimistic bold and pessimistic bold forecasts

	Optimistic Bold Forecasts N = 21 078	Pessimistic Bold Forecasts N = 26 221	t-Value for Difference	Significance
Accuracy	0.6498	0.6105	11.60**	<0.001
DaysElapsed	0.2943	0.3050	-3.08**	0.002
ForecastHorizon	0.3762	0.3899	-3.89**	<0.001
LaggedAccuracy	0.6151	0.5913	6.89**	<0.001
BrokerSize	0.3879	0.3912	-0.99	0.320
ForecastFrequency	0.4417	0.4420	-0.09	0.926
FirmExperience	0.4568	0.4577	-0.26	0.793
GeneralExperience	0.4903	0.4994	-2.55*	0.011
Companies	0.3906	0.3896	0.31	0.751
Industries	0.3866	0.3899	-0.96	0.335
FiscalYearEndDistance	0.4905	0.5101	-5.63**	<0.001
YearToDateDistance	0.4837	0.5472	-19.17**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Table 3
Descriptive statistics for selected raw (unscaled) and scaled variables (2000-2002)

This table reports descriptive statistics for 27,065 analyst forecast revisions between the years 2000 and 2002. The variables are based on forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. **Panel A** reports descriptive statistics for eight raw (unscaled) variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; and *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code. **Panel B** reports descriptive statistics for the eight variables above, scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. The panel also lists Accuracy and its lagged term (prior fiscal year). Accuracy is scaled Absolute Forecast Error – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum Absolute Forecast Error and 0 corresponds to the maximum Absolute Forecast Error, within each company and fiscal year. Panel C reports differences between scaled variable means for optimistic bold and pessimistic bold forecasts. Forecasts revisions are classified as Bold if they are above the consensus at the announcement and above the analyst's previous forecast, or below both. The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus, and they are classified as pessimistic if they are below the announcement consensus. In addition to the earlier scaled variables, Panel C also lists the variables Fiscal-Year-End Distance and Year-To-Date Distance. Both of these variables are scaled to assume values between 0 and 1, in the same manner as the eight variables before, and they are based on the raw variables Fiscal-Year-End Distance (the absolute distance between an analyst's forecast and the consensus [mean] forecast at the end of the fiscal year) and Year-To-Date Distance (the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast [three days for Mondays and four days for Tuesdays]). The difference between the means is calculated as $\text{difference} = \text{mean}(\text{optimistic}) - \text{mean}(\text{pessimistic})$, and we test for $H_0: \text{difference} = 0$.

Panel A. Descriptive statistics of selected raw variables

	Mean	25th Percentile	Median	75th Percentile	Std.	Min	Max
DaysElapsed	6.2	0	0	5	13.8	0	211
ForecastHorizon	102.2	64	74	143	63.3	30	357
BrokerSize	95.6	27	71	142	83.8	1	387
ForecastFrequency	4.7	3	4	6	2.3	2	32
FirmExperience	3.8	2	3	5	3.1	1	19
GeneralExperience	7.8	4	6	12	5.1	1	20
Companies	16.7	11	15	20	9.0	1	99
Industries	3.6	2	3	5	2.3	1	21

Panel B. Descriptive statistics of selected scaled variables

	Mean	25th Percentile	Median	75th Percentile
Accuracy	0.626	0.324	0.755	0.965
DaysElapsed	0.228	0.000	0.000	0.308
ForecastHorizon	0.350	0.011	0.155	0.700
LaggedAccuracy	0.606	0.288	0.708	0.959
BrokerSize	0.364	0.057	0.274	0.559
ForecastFrequency	0.457	0.111	0.444	0.750
FirmExperience	0.410	0.000	0.333	0.750
GeneralExperience	0.428	0.100	0.333	0.750
Companies	0.430	0.127	0.368	0.700
Industries	0.406	0.000	0.333	0.667

Panel C. Differences in the means of scaled variables between optimistic bold and pessimistic bold forecasts

	Optimistic Bold Forecasts N = 9 975	Pessimistic Bold Forecasts N = 11 307	t-Value for Difference	Significance
Accuracy	0.6498	0.6249	4.98**	<0.001
DaysElapsed	0.2132	0.2272	-2.81**	0.005
ForecastHorizon	0.3523	0.3661	-2.56*	0.011
LaggedAccuracy	0.6065	0.6060	0.11	0.916
BrokerSize	0.3681	0.3695	-0.29	0.771
ForecastFrequency	0.4558	0.4549	0.17	0.867
FirmExperience	0.4095	0.4141	-0.87	0.375
GeneralExperience	0.4216	0.4343	-2.56**	0.010
Companies	0.4304	0.4294	0.20	0.840
Industries	0.4993	0.4052	-1.17	0.240
FiscalYearEndDistance	0.5072	0.5231	-3.12**	0.002
YearToDateDistance	0.4898	0.5597	-14.20**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Table 4
Descriptive statistics of selected raw (unscaled) and scaled variables (2003-2012)

This table reports descriptive statistics for 183,288 analyst forecast revisions between the years 2003 and 2012. The variables are based on forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. **Panel A** reports descriptive statistics for eight raw (unscaled) variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; and *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code. **Panel B** reports descriptive statistics for the eight variables above, scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. The panel also lists *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. **Panel C** reports differences between scaled variable means for optimistic bold and pessimistic bold forecasts. Forecasts revisions are classified as Bold if they are above the consensus at the announcement and above the analyst's previous forecast, or below both. The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus, and they are classified as pessimistic if they are below the announcement consensus. In addition to the earlier scaled variables, Panel C also lists the variables Fiscal-Year-End Distance and Year-To-Date Distance. Both of these variables are scaled to assume values between 0 and 1, in the same manner as the eight variables before, and they are based on the raw variables Fiscal-Year-End Distance (the absolute distance between an analyst's forecast and the consensus [mean] forecast at the end of the fiscal year) and Year-To-Date Distance (the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast [three days for Mondays and four days for Tuesdays]). The difference between the means is calculated as $\text{difference} = \text{mean}(\text{optimistic}) - \text{mean}(\text{pessimistic})$, and we test for $H_0: \text{difference} = 0$.

Panel A. Descriptive statistics of selected raw variables

	Mean	25th Percentile	Median	75th Percentile	Std.	Min	Max
DaysElapsed	4.4	0	0	2	12.7	0	217
ForecastHorizon	86.1	58	66	77	53.6	30	350
BrokerSize	71.5	24	52	109	63.7	1	321
ForecastFrequency	5.3	2	5	6	2.8	2	178
FirmExperience	4.2	2	3	6	3.4	0	29
GeneralExperience	8.4	4	7	11	5.6	1	30
Companies	17.5	13	16	21	8.2	1	104
Industries	4.0	2	3	5	2.6	1	23

Panel B. Descriptive statistics of selected scaled variables

	Mean	25th Percentile	Median	75th Percentile
Accuracy	0.647	0.407	0.768	0.946
DaysElapsed	0.188	0.000	0.000	0.167
ForecastHorizon	0.314	0.013	0.127	0.548
LaggedAccuracy	0.628	0.364	0.735	0.944
BrokerSize	0.349	0.071	0.245	0.514
ForecastFrequency	0.448	0.167	0.400	0.667
FirmExperience	0.397	0.071	0.308	0.667
GeneralExperience	0.396	0.118	0.318	0.625
Companies	0.443	0.178	0.400	0.681
Industries	0.396	0.000	0.333	0.667

Panel C. Differences in the means of scaled variables between optimistic bold and pessimistic bold forecasts

	Optimistic Bold Forecasts N = 77 829	Pessimistic Bold Forecasts N = 62 114	t-Value for Difference	Significance
Accuracy	0.6831	0.6291	29.41**	<0.001
DaysElapsed	0.1671	0.1963	-16.10**	<0.001
ForecastHorizon	0.3155	0.3274	-5.79**	<0.001
LaggedAccuracy	0.6335	0.6243	4.91**	<0.001
BrokerSize	0.3459	0.3542	-4.67**	<0.001
ForecastFrequency	0.4444	0.4489	-2.50*	0.012
FirmExperience	0.3977	0.3973	0.20	0.840
GeneralExperience	0.3962	0.3959	0.15	0.880
Companies	0.4443	0.4411	1.87	0.062
Industries	0.3956	0.3958	-0.10	0.918
FiscalYearEndDistance	0.4645	0.4695	-2.65**	0.008
YearToDateDistance	0.4678	0.5012	-18.07**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Table 5

Differences in the means of selected scaled variables for optimistic bold forecasts between different time periods (1987-1999, 2000-2002, 2003-2012, and 1987-2002)

This table reports the differences in descriptive statistics between different time periods. The variables are based on 271,364 forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. **Panel A** reports differences in the means of the scaled variables between the periods 1987-1999 and 2000-2002, for optimistic bold forecast revisions. Forecasts revisions are classified as *Bold* if they are above the consensus at the announcement and above the analyst's previous forecast, or below both. The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus, and they are classified as pessimistic if they are below the announcement consensus. The difference is defined by the equation $\text{difference} = \text{mean}(\text{optimistic 2000-2002}) - \text{mean}(\text{optimistic 1987-1999})$, when testing for $H_0: \text{difference} = 0$. **Panel B** reports differences in the means of the scaled variables between the periods 2000-2002 and 2003-2012, for optimistic bold forecast revisions. The difference is defined by the equation $\text{difference} = \text{mean}(\text{optimistic 2003-2012}) - \text{mean}(\text{optimistic 2000-2002})$, when testing for $H_0: \text{difference} = 0$. **Panel C** reports differences in the means of the scaled variables between the periods 1987-2002 and 2003-2012, for optimistic bold forecast revisions. The difference is defined by the equation $\text{difference} = \text{mean}(\text{optimistic 2003-2012}) - \text{mean}(\text{optimistic 1987-2002})$, when testing for $H_0: \text{difference} = 0$.

Panel A. Differences between the periods 1987-1999 and 2000-2002

	Optimistic Bold Forecasts 2000-2002 N = 9 975	Optimistic Bold Forecasts 1987-1999 N = 21 078	t-Value for Difference	Significance
Accuracy	0.6498	0.6498	-0.02	0.985
DaysElapsed	0.2132	0.2943	-18.24**	<0.001
ForecastHorizon	0.3523	0.3762	-5.05**	<0.001
LaggedAccuracy	0.6065	0.6151	-1.93	0.054
BrokerSize	0.3681	0.3879	-4.69**	<0.001
ForecastFrequency	0.4558	0.4417	3.16**	0.002

FirmExperience	0.4095	0.4568	-10.07**	<0.001
GeneralExperience	0.4216	0.4903	-15.47**	<0.001
Companies	0.4304	0.3906	9.53**	<0.001
Industries	0.4993	0.3866	2.86**	0.004
FiscalYearEndDistance	0.5072	0.4905	3.69**	<0.001
YearToDateDistance	0.4898	0.4837	1.41	0.160

*Significant at the 5% level

**Significant at the 1% level

Panel B. Differences between the periods 2000-2002 and 2003-2012

	Optimistic Bold Forecasts 2003-2012 N = 77 829	Optimistic Bold Forecasts 2000-2002 N = 9 975	t-Value for Difference	Significance
Accuracy	0.6831	0.6498	8.77**	<0.001
DaysElapsed	0.1671	0.2132	-12.12**	<0.001
ForecastHorizon	0.3155	0.3523	-8.79**	<0.001
LaggedAccuracy	0.6335	0.6065	7.00**	<0.001
BrokerSize	0.3459	0.3681	-6.08**	<0.001
ForecastFrequency	0.4444	0.4558	-2.98**	0.003
FirmExperience	0.3977	0.4095	-2.91**	0.004
GeneralExperience	0.3962	0.4216	-6.73**	<0.001
Companies	0.4443	0.4304	3.89**	<0.001
Industries	0.3956	0.4993	-0.95	0.341
FiscalYearEndDistance	0.4645	0.5072	-10.89**	<0.001
YearToDateDistance	0.4678	0.4898	-5.83**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Panel C. Differences between the periods 1987-2002 and 2003-2012

	Optimistic Bold Forecasts 2003-2012 N = 77 829	Optimistic Bold Forecasts 1987-2002 N = 31 053	t-Value for Difference	Significance
Accuracy	0.6831	0.6498	14.04**	<0.001
DaysElapsed	0.1671	0.2683	-41.86**	<0.001
ForecastHorizon	0.3155	0.3685	-20.58**	<0.001
LaggedAccuracy	0.6335	0.6123	8.72**	<0.001
BrokerSize	0.3459	0.3815	-15.43**	<0.001
ForecastFrequency	0.4444	0.4462	-0.77	0.442
FirmExperience	0.3977	0.4416	-17.09**	<0.001
GeneralExperience	0.3962	0.4682	-29.64**	<0.001
Companies	0.4443	0.4034	17.97**	<0.001
Industries	0.3956	0.3906	2.05*	0.041
FiscalYearEndDistance	0.4645	0.4959	-12.76**	<0.001
YearToDateDistance	0.4678	0.4857	-7.59**	<0.001

*Significant at the 5% level

**Significant at the 1% level

Table 6

The relationship between Accuracy and Boldness and the relationship between Accuracy and Optimism among Bold forecasts, controlling for Analyst and Forecast variables

$$Accuracy_{ijt} = \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} \mathbf{Bold}_{ijt} + \varepsilon_{ijt}$$

$$Accuracy_{ijt} = \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} \mathbf{Bold2}_{ijt} + \varepsilon_{ijt}$$

This table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. **The two most important regressions are those in the second and fourth columns. They are based on the two regression models that are presented above (the subscripts i , j , and t correspond to analyst i following company j in fiscal year t).** The variables are based on 271,364 forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at Accuracy and its lagged term (prior fiscal year). Accuracy is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* ($Bold=1$) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, $Bold=0$). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus ($Bold2=1$), and they are classified as pessimistic if they are below the announcement consensus ($Bold2=0$). Coefficients are presented for each observation, and t-values can be found within parentheses.

	All Observations N = 271 364		Bold Forecasts N = 208 524		Optimistic Bold Forecasts N = 108 882	Pessimistic Bold forecasts N = 99 642	Herding Forecasts N = 62 480
Intercept	0.6834 (281.55)**	0.6488 (247.14)**	0.6994 (252.65)**	0.6722 (232.83)**	0.7050 (190.76)**	0.6845 (166.20)**	0.6503 (129.15)**
DaysElapsed	-0.0557 (-30.44)**	-0.0535 (-29.27)**	-0.0598 (-28.77)**	-0.0567 (-27.33)**	-0.0568 (-20.14)**	-0.0562 (-18.50)**	-0.0352 (-9.25)**
ForecastHorizon	-0.2561 (-140.13)**	-0.2582 (-141.49)**	-0.2640 (-128.93)**	-0.2631 (-128.78)**	-0.2876 (-104.87)**	-0.2368 (-77.99)**	-0.2199 (-54.51)**
LaggedAccuracy	0.0666 (36.70)**	0.0660 (36.41)**	0.0583 (28.47)**	0.0573 (28.03)**	0.0607 (22.05)**	0.0528 (17.49)**	0.0887 (23.07)**
BrokerSize	-0.0110 (-5.73)**	-0.0114 (-5.90)**	-0.0080 (-3.68)**	-0.0074 (-3.42)**	-0.0147 (-5.02)**	0.0008 (0.25)	-0.0201 (-4.85)**
ForecastFrequency	0.0179 (9.02)**	0.0179 (9.02)**	0.0150 (6.68)**	0.0156 (6.97)**	0.0111 (3.69)**	0.0218 (6.59)**	0.0304 (7.19)**
FirmExperience	0.0013 (0.65)	0.0010 (0.49)	0.0003 (0.13)	0.0001 (0.04)	-0.0024 (-0.81)	0.0028 (0.85)	0.0027 (0.63)
GeneralExperience	0.0021 (0.98)	0.0021 (0.96)	0.0015 (0.62)	0.0026 (1.10)	0.0016 (0.49)	0.0036 (1.01)	0.0034 (0.73)
Companies	0.0065 (2.92)**	0.0067 (2.99)**	0.0078 (3.10)**	0.0066 (2.62)**	0.0093 (2.74)**	0.0043 (1.15)	0.0019 (0.39)
Industries	-0.0168 (-8.15)**	-0.0166 (-8.04)**	-0.0135 (-5.78)**	-0.0130 (-5.59)**	-0.0161 (-5.14)**	-0.0099 (-2.85)**	-0.0270 (-6.18)**
FiscalYearEndDistance	-0.1218 (-47.07)**	-0.1210 (-46.87)**	-0.0862 (-29.61)**	-0.0901 (-30.99)**	-0.0226 (-5.76)**	-0.1631 (-38.07)**	-0.2480 (-44.05)**
YearToDateDistance	0.1385 (52.36)**	0.1253 (46.97)**	0.1113 (37.37)**	0.1186 (39.81)**	0.1065 (26.31)**	0.1362 (31.10)**	0.1780 (29.76)**
Bold		0.0534 (34.19)**					
Bold2				0.0469 (32.19)**			
R-squared	0.094	0.098	0.097	0.102	0.122	0.083	0.100

*Significant at the 5% level

**Significant at the 1% level

Table 7

The relationship between Accuracy and Optimism among Bold forecasts, controlling for Analyst and Forecast variables, in different time periods (1987-1999, 2000-2002, 2003-2012)

$$\begin{aligned}
 Accuracy_{ijt} = & \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} \\
 & + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} \\
 & + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} Bold2_{ijt} + \beta_{13} Period_{ijt} + \beta_{14} DaysElapsed \times Period_{ijt} + \beta_{15} ForecastHorizon \times Period_{ijt} \\
 & + \beta_{16} Lagged\ Accuracy \times Period_{ijt} + \beta_{17} BrokerSize \times Period_{ijt} + \beta_{18} ForecastFrequency \times Period_{ijt} \\
 & + \beta_{19} FirmExperience \times Period_{ijt} + \beta_{20} GeneralExperience \times Period_{ijt} + \beta_{21} Companies \times Period_{ijt} + \beta_{22} Industries \times Period_{ijt} \\
 & + \beta_{23} FiscalYearEndDistance \times Period_{ijt} + \beta_{24} YearToDateDistance \times Period_{ijt} + \beta_{25} Bold2 \times Period_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

This table reports the relationship between forecast accuracy and optimism, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. **The two most important regressions are those in the fourth and fifth columns. They both follow the regression model that is presented above (the subscripts i , j , and t correspond to analyst i following company j in fiscal year t).** The variables are based on 271,364 forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at Accuracy and its lagged term (prior fiscal year). Accuracy is scaled Absolute Forecast Error – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* ($Bold=1$) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, $Bold=0$). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus ($Bold2=1$), and they are classified as pessimistic if they are below the announcement consensus ($Bold2=0$). The fourth and fifth columns introduce a new variable: *Period* – a dummy variable that takes the value of 1 if the forecast was made in 2000-2002 and otherwise it equals 0. All of the other variables are tested with interaction terms against *Period*. Coefficients are presented for each observation, and t-values can be found within parentheses.

	1987-1999 N = 47 299	2000-2002 N = 21 282	2003-2012 N = 139 943	1987-2002 N = 68 581	2000-2012 N = 161 225
Intercept	0.6590 (104.04)**	0.6437 (69.79)**	0.6776 (195.14)**	0.6590 (105.16)**	0.6776 (193.95)**
DaysElapsed	-0.0496 (-11.53)**	-0.0560 (-8.75)**	-0.0579 (-22.44)**	-0.4970 (-11.66)**	-0.0579 (-22.30)**
ForecastHorizon	-0.2709 (-59.71)**	-0.3010 (-46.00)**	-0.2510 (-102.81)**	-0.2710 (-60.36)**	-0.2510 (-102.19)**
LaggedAccuracy	0.0318 (7.37)**	0.0266 (4.22)**	0.0704 (28.26)**	0.0318 (7.45)**	0.0704 (28.09)**
BrokerSize	0.0192 (4.19)**	0.0169 (2.50)*	-0.0227 (-8.53)**	0.0192 (4.24)**	-0.0227 (-8.48)**
ForecastFrequency	0.0116 (2.54)*	0.0193 (2.74)**	0.0165 (6.03)**	0.0116 (2.57)**	0.0165 (5.99)**
FirmExperience	0.0022 (0.48)	-0.0061 (-0.88)	0.0006 (0.23)	0.0022 (0.48)	0.0006 (0.23)
GeneralExperience	0.0059 (1.23)	0.0094 (1.26)	-0.0004 (-0.14)	0.0059 (1.24)	-0.0004 (-0.14)
Companies	-0.0081 (-1.53)	0.0071 (0.90)	0.0121 (3.92)**	-(0.0081) (-1.55)	0.0121 (3.89)**
Industries	-0.0143 (-2.84)**	-0.0037 (-0.51)	-0.0120 (-4.25)**	-0.0143 (-2.87)**	-0.0120 (-4.23)**
FiscalYearEndDistance	-0.0423 (-7.19)**	-0.0110 (-1.42)	-0.1259 (-33.73)**	-0.0423 (-7.27)**	-0.1259 (-33.53)**
YearToDateDistance	0.0061 (20.15)	0.1351 (16.88)**	0.1200 (31.54)**	0.1230 (20.37)**	0.1200 (31.35)**
Bold2	0.0413 (12.72)**	0.0292 (6.28)**	0.0518 (29.79)**	0.0413 (12.86)**	0.0519 (29.61)**
Period				-0.0153 (-1.35)	-0.0339 (-3.56)**
DaysElapsed x Period				-0.0063 (-0.81)	0.0019 (0.28)
ForecastHorizon x Period				-0.0300 (-3.71)**	-0.0499 (-7.39)**
LaggedAccuracy x Period				-0.0052 (-0.67)	-0.0437 (-6.66)**
BrokerSize x Period				-0.0024 (-0.28)	0.0396 (5.62)**
ForecastFrequency x Period				0.0077 (0.90)	0.0027 (0.37)
FirmExperience x Period				-0.0082 (-0.98)	-0.0067 (-0.93)
GeneralExperience x Period				0.0036 (0.40)	0.0099 (1.26)

Companies x Period				0.0152	-0.0050
				(1.58)	(-0.62)
Industries x Period				0.0106	0.0083
				(1.19)	(1.10)
FiscalYearEndDistance x Period				0.0312	0.1148
				(3.16)**	(13.67)**
YearToDateDistance x Period				0.0121	0.0151
				(1.19)	(1.76)
Bold2 x Period				-0.0121	-0.0226
				(-2.10)*	(-4.69)**
R-squared	0.097	0.141	0.101	0.111	0.108

*Significant at the 5% level

**Significant at the 1% level

Table 8

Test for imperfect multicollinearity: The relationship between Accuracy and Boldness, controlling for Analyst and Forecast variables

$$\begin{aligned} Accuracy_{ijt} = & \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} \\ & + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} \\ & + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} \mathbf{Bold}_{ijt} + \varepsilon_{ijt} \end{aligned}$$

This table repeats the regression of Table 6 Column 2, but excludes the eight independent variables *Forecast horizon*, *Forecast frequency*, *Firm experience*, *General experience*, *Companies*, *Industries*, *Fiscal-year-end distance*, and *Year-to-date distance* in turn (Columns 1-8) to test whether the finding in Table 6 Column 2 is affected by imperfect multicollinearity. Each of these eight independent variables has an absolute correlation above 0.25 with another independent variable, as is shown in Table 1 Panel E. **The regressions follow the regression model that is presented above (the subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*).** As Table 6 Column 2, this table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. The variables are based on 271,364 forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* (*Bold*=1) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, *Bold*=0). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus (*Bold2*=1), and they are classified as pessimistic if they are below the announcement consensus (*Bold2*=0). Coefficients are presented for each observation, and t-values can be found within parentheses.

	1	2	3	4	5	6	7	8
Intercept	0.520 (203.78)**	0.658 (270.83)**	0.649 (249.08)**	0.649 (250.19)**	0.650 (250.62)**	0.646 (248.90)**	0.630 (241.84)**	0.654 (248.34)**
DaysElapsed	-0.064 (-33.94)**	-0.053 (-28.88)**	-0.053 (-29.27)**	-0.053 (-29.26)**	-0.054 (-29.30)**	-0.054 (-29.46)**	-0.057 (-30.91)**	-0.057 (-30.87)**
ForecastHorizon		-0.264 (-153.63)**	-0.258 (-141.49)**	-0.258 (-141.50)**	-0.258 (-141.75)**	-0.259 (-141.69)**	-0.248 (-136.23)**	-0.250 (-137.09)**
LaggedAccuracy	0.077 (40.81)**	0.066 (36.38)**	0.066 (36.41)**	0.066 (36.41)**	0.066 (36.40)**	0.066 (36.56)**	0.068 (37.30)**	0.066 (36.20)**
BrokerSize	-0.026 (-13.20)**	-0.010 (-5.26)**	-0.011 (-5.89)**	-0.011 (-5.88)**	-0.011 (-5.67)**	-0.010 (-5.15)**	-0.011 (-5.59)**	-0.009 (-4.38)**
ForecastFrequency	0.113 (58.46)**		0.018 (9.03)**	0.018 (8.98)**	0.018 (9.08)**	0.018 (9.02)**	0.018 (9.01)**	0.021 (10.41)**
FirmExperience	0.000 (0.11)	0.001 (0.68)		0.002 (1.07)	0.001 (0.56)	0.001 (0.44)	0.001 (0.50)	0.002 (0.78)
GeneralExperience	0.004 (1.58)	0.001 (0.52)	0.003 (1.35)		0.003 (1.36)	0.002 (0.77)	0.002 (1.09)	0.002 (1.08)
Companies	0.020 (8.81)**	0.007 (3.18)**	0.007 (3.00)**	0.007 (3.14)**		-0.002 (-0.84)	0.008 (3.36)**	0.008 (3.43)**
Industries	-0.023 (-10.74)**	-0.017 (-8.04)**	-0.017 (-8.03)**	-0.017 (-8.02)**	-0.014 (-7.51)**		-0.018 (-8.45)**	-0.017 (-8.29)**
FiscalYearEndDistance	-0.076 (-28.72)**	-0.121 (-46.87)**	-0.121 (-46.87)**	-0.121 (-46.88)**	-0.121 (-46.90)**	-0.121 (-46.95)**		-0.035 (-19.09)**
YearToDateDistance	0.089 (32.48)**	0.126 (47.26)**	0.125 (46.97)**	0.125 (46.97)**	0.125 (47.00)**	0.125 (47.01)**	0.036 (19.32)**	
Bold	0.046 (28.47)**	0.053 (34.19)**	0.053 (34.19)**	0.053 (34.19)**	0.053 (34.19)**	0.053 (34.22)**	0.054 (34.45)**	0.064 (41.26)**
R-squared	0.03	0.10	0.10	0.10	0.10	0.10	0.09	0.09

*Significant at the 5% level

**Significant at the 1% level

Table 9

Test for imperfect multicollinearity: The relationship between Accuracy and Optimism among Bold forecasts, controlling for Analyst and Forecast variables

$$\begin{aligned} \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} \\ & + \beta_6 \text{FirmExperience}_{ijt} + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} + \beta_{10} \text{FiscalYearEndDistance}_{ijt} \\ & + \beta_{11} \text{YearToDateDistance}_{ijt} + \beta_{12} \text{Bold2}_{ijt} + \varepsilon_{ijt} \end{aligned}$$

This table repeats the regression of Table 6 Column 4, but excludes the eight independent variables *Forecast horizon*, *Forecast frequency*, *Firm experience*, *General experience*, *Companies*, *Industries*, *Fiscal-year-end distance*, and *Year-to-date distance* in turn (Columns 1-8) to test whether the finding in Table 6 Column 4 is affected by imperfect multicollinearity. Each of these eight independent variables has an absolute correlation above 0.25 with another independent variable, as is shown in Table 1 Panel E. **The regressions follow the regression model that is presented above (the subscripts i, j , and t correspond to analyst i following company j in fiscal year t).** As Table 6 Column 4, this table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. The variables are based on 271,364 forecasts issued between 1987 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* (*Bold*=1) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, *Bold*=0). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus (*Bold2*=1), and they are classified as pessimistic if they are below the announcement consensus (*Bold2*=0). Coefficients are presented for each observation, and t-values can be found within parentheses.

	1	2	3	4	5	6	7	8
Intercept	0.531 (191.41)**	0.680 (256.28)**	0.672 (234.69)**	0.673 (236.01)**	0.673 (235.93)**	0.670 (234.93)**	0.659 (230.26)**	0.689 (240.18)**
DaysElapsed	-0.067 (-31.32)**	-0.056 (-27.03)**	-0.057 (-27.34)**	-0.057 (-27.32)**	-0.057 (-27.36)**	-0.057 (-27.46)**	-0.059 (-28.55)**	-0.060 (-28.85)**
ForecastHorizon		-0.268 (-139.04)**	-0.263 (-128.78)**	-0.263 (-128.79)**	-0.263 (-129.01)**	-0.263 (-128.93)**	-0.253 (-125.09)**	-0.253 (-124.28)**
LaggedAccuracy	0.068 (32.15)**	0.057 (28.01)**	0.057 (28.03)**	0.057 (28.03)**	0.057 (28.02)**	0.057 (28.13)**	0.058 (28.55)**	0.057 (27.86)**
BrokerSize	-0.024 (-10.57)**	-0.006 (-2.92)**	-0.007 (-3.42)**	-0.007 (-3.39)**	-0.007 (-3.21)**	-0.006 (-2.89)**	-0.007 (-3.20)**	-0.005 (-2.23)*
ForecastFrequency	0.111 (50.93)**		0.016 (6.97)**	0.015 (6.93)**	0.016 (7.03)**	0.016 (6.98)**	0.015 (6.87)**	0.017 (7.68)**
FirmExperience	-0.001 (-0.30)	0.000 (0.19)		0.001 (0.63)	0.000 (0.10)	0.000 (0.01)	0.000 (0.02)	0.001 (0.32)
GeneralExperience	0.003 (1.30)	0.002 (0.75)	0.003 (1.27)		0.003 (1.45)	0.002 (0.98)	0.003 (1.10)	0.003 (1.15)
Companies	0.020 (7.76)**	0.007 (2.77)**	0.007 (2.62)**	0.007 (2.78)**		0.000 (0.01)	0.007 (2.82)**	0.008 (3.02)**
Industries	-0.020 (-8.18)**	-0.013 (-5.60)**	-0.013 (-5.59)**	-0.013 (-5.57)**	-0.010 (-4.94)**		-0.014 (-5.92)**	-0.014 (-5.86)**
FiscalYearEndDistance	-0.028 (-9.44)**	-0.090 (-30.97)**	-0.090 (-30.99)**	-0.090 (-30.99)**	-0.090 (-31.01)**	-0.090 (-31.06)**		-0.007 (-3.61)**
YearToDateDistance	0.070 (22.83)**	0.119 (39.94)**	0.119 (39.81)**	0.119 (39.81)**	0.119 (39.84)**	0.119 (39.85)**	0.053 (25.19)**	
Bold2	0.050 (32.74)**	0.047 (32.13)**	0.047 (32.19)**	0.047 (32.18)**	0.047 (32.23)**	0.047 (32.22)**	0.045 (30.86)**	0.043 (29.13)**
R-squared	0.03	0.10	0.10	0.10	0.10	0.10	0.1	0.1

*Significant at the 5% level

**Significant at the 1% level

Table 10

Test for imperfect multicollinearity: The relationship between Accuracy and Optimism among Bold forecasts, controlling for Analyst and Forecast variables, comparing the time periods 1987-1999 and 2000-2002

$$\begin{aligned}
 Accuracy_{ijt} = & \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} \\
 & + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} \\
 & + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} Bold2_{ijt} + \beta_{13} Period_{ijt} + \beta_{14} DaysElapsed \times Period_{ijt} + \beta_{15} ForecastHorizon \times Period_{ijt} \\
 & + \beta_{16} Lagged\ Accuracy \times Period_{ijt} + \beta_{17} BrokerSize \times Period_{ijt} + \beta_{18} ForecastFrequency \times Period_{ijt} \\
 & + \beta_{19} FirmExperience \times Period_{ijt} + \beta_{20} GeneralExperience \times Period_{ijt} + \beta_{21} Companies \times Period_{ijt} + \beta_{22} Industries \times Period_{ijt} \\
 & + \beta_{23} FiscalYearEndDistance \times Period_{ijt} + \beta_{24} YearToDateDistance \times Period_{ijt} + \beta_{25} Bold2 \times Period_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

This table repeats the regression of Table 7 Column 4, but excludes the eight independent variables *Forecast horizon*, *Forecast frequency*, *Firm experience*, *General experience*, *Companies*, *Industries*, *Fiscal-year-end distance*, and *Year-to-date distance* in turn (Columns 1-8) to test whether the finding in Table 7 Column 4 is affected by imperfect multicollinearity. Each of these eight independent variables has an absolute correlation above 0.25 with another independent variable, as is shown in Table 1 Panel E. **The regressions follow the regression model that is presented above (the subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*).** As Table 7 Column 4, this table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. The variables are based on 88,076 forecasts issued between 1987 and 2002, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* (*Bold*=1) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, *Bold*=0). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus (*Bold2*=1), and they are classified as pessimistic if they are below the announcement consensus (*Bold2*=0). *Period* is a dummy variable that takes the value of 1 if the forecast was made in 2000-2002 and otherwise it equals 0. All of the other variables are tested with interaction terms against *Period*. Coefficients are presented for each observation, and t-values can be found within parentheses.

	1	2	3	4	5	6	7	8
Intercept	0.506 (84.86)**	0.665 (114.28)**	0.659 (106.20)**	0.660 (107.25)**	0.658 (105.49)**	0.656 (106.59)**	0.651 (105.40)**	0.679 (109.26)**
DaysElapsed	-0.054 (-12.16)**	-0.049 (-11.59)**	-0.050 (-11.66)**	-0.050 (-11.69)**	-0.050 (-11.72)**	-0.050 (-11.71)**	-0.051 (-11.88)**	-0.053 (-12.36)**
ForecastHorizon		-0.275 (-64.30)**	-0.271 (-60.36)**	-0.271 (-60.36)**	-0.271 (-60.36)**	-0.271 (-60.43)**	-0.265 (-60.07)**	-0.260 (-58.09)**
LaggedAccuracy	0.04 (9.12)**	0.032 (7.48)**	0.032 (7.45)**	0.032 (7.45)**	0.032 (7.51)**	0.032 (7.49)**	0.032 (7.47)**	0.032 (7.48)**
BrokerSize	0.010 (2.14)*	0.020 (4.31)**	0.019 (4.25)**	0.020 (4.32)**	0.019 (4.20)**	0.021 (4.76)**	0.020 (4.41)**	0.024 (5.36)**
ForecastFrequency	0.096 (21.46)**		0.012 (2.58)**	0.011 (2.52)*	0.011 (2.52)*	0.012 (2.56)*	0.011 (2.54)*	0.013 (2.95)**
FirmExperience	0.003 (0.54)	0.002 (0.55)		0.005 (1.14)	0.002 (0.44)	0.002 (0.47)	0.003 (0.57)	0.004 (0.81)
GeneralExperience	0.007 (1.43)	0.005 (1.14)	0.007 (1.61)		0.005 (1.03)	0.006 (1.23)	0.006 (1.18)	0.005 (0.98)
Companies	-0.008 (-1.55)	-0.008 (-1.47)	-0.008 (-1.53)	-0.007 (-1.38)		-0.015 (-3.34)**	-0.008 (-1.61)	-0.008 (-1.42)
Industries	-0.021 (-4.02)**	-0.014 (-2.86)**	-0.014 (-2.87)**	-0.014 (-2.86)**	-0.018 (-4.12)**		-0.015 (-2.91)**	-0.015 (-3.04)**
FiscalYearEndDistance	0.026 (4.46)**	-0.042 (-7.26)**	-0.042 (-7.28)**	-0.042 (-7.26)**	-0.042 (-7.29)**	-0.042 (-7.29)**		0.038 (8.81)**
YearToDateDistance	0.080 (12.89)**	0.123 (20.42)**	0.123 (20.38)**	0.123 (20.35)**	0.123 (20.36)**	0.123 (20.39)**	0.093 (20.98)**	
Bold2	0.043 (12.99)**	0.041 (12.85)**	0.041 (12.86)**	0.041 (12.84)**	0.041 (12.85)**	0.041 (12.88)**	0.040 (12.56)**	0.035 (10.95)**
Period	-0.055 (-5.24)**	-0.011 (-1.07)	-0.017 (-1.48)	-0.015 (-1.35)	-0.013 (-1.19)	-0.013 (-1.14)	-0.010 (-0.93)	-0.006 (-0.56)
DaysElapsed x Period	-0.011 (-1.3)	-0.006 (-0.73)	-0.006 (-0.83)	-0.006 (-0.78)	-0.006 (-0.78)	-0.006 (-0.80)	-0.006 (-0.72)	-0.008 (-1.08)
ForecastHorizon x Period		-0.033 (-4.44)**	-0.030 (-3.71)**	-0.030 (-3.71)**	-0.030 (-3.74)**	-0.030 (-3.68)**	-0.035 (-4.38)**	-0.035 (-4.34)**
LaggedAccuracy x Period	-0.004 (-0.47)	-0.006 (-0.71)	-0.005 (-0.67)	-0.005 (-0.66)	-0.005 (-0.71)	-0.005 (-0.68)	-0.005 (-0.67)	-0.004 (-0.55)
BrokerSize x Period	-0.004 (-0.51)	-0.002 (-0.19)	-0.003 (-0.32)	-0.002 (-0.29)	-0.002 (-0.19)	-0.004 (-0.48)	-0.003 (-0.37)	-0.004 (-0.49)
ForecastFrequency x Period	0.049		0.008	0.007	0.008	0.008	0.008	0.013

	(5.97)**		(0.89)	(0.88)	(0.95)	(0.91)	(0.93)	(1.56)
FirmExperience x Period	-0.008	-0.008		-0.007	-0.008	-0.008	-0.009	-0.011
	(-0.93)	(-0.99)		(-0.88)	(-0.93)	(-0.97)	(-1.05)	(-1.36)
GeneralExperience x Period	0.003	0.003	0.000		0.006	0.004	0.004	0.006
	(0.31)	(0.35)	(0.06)		(0.64)	(0.39)	(0.46)	(0.66)
Companies x Period	0.027	0.016	0.015	0.016		0.021	0.015	0.016
	(2.73)**	(1.62)	(1.55)	(1.66)		(2.43)*	(1.60)	(1.66)
Industries x Period	0.014	0.011	0.011	0.011	0.017		0.011	0.010
	(1.47)	(1.18)	(1.19)	(1.23)	(2.19)*		(1.21)	(1.17)
FiscalYearEndDistance x Period	0.024	0.031	0.031	0.031	0.031	0.031		0.028
	(2.35)*	(3.12)**	(3.15)**	(3.13)**	(3.17)**	(3.17)**		(3.57)**
YearToDateDistance x Period	0.036	0.013	0.012	0.012	0.012	0.012	0.035	
	(3.42)**	(1.30)	(1.20)	(1.21)	(1.21)	(1.18)	(4.40)**	
Bold2 x Period	-0.011	-0.012	-0.012	-0.012	-0.012	-0.012	-0.011	-0.014
	(-1.77)	(-2.09)*	(-2.10)*	(-2.11)*	(-2.09)*	(-2.11)*	(-1.98)*	(-2.47)*
R-squared	0.04	0.11	0.11	0.11	0.11	0.11	0.11	0.1

*Significant at the 5% level

**Significant at the 1% level

Table 11

Test for imperfect multicollinearity: The relationship between Accuracy and Optimism among Bold forecasts, controlling for Analyst and Forecast variables, comparing the time periods 2000-2002 and 2003-2012

$$\begin{aligned}
 Accuracy_{ijt} = & \beta_0 + \beta_1 DaysElapsed_{ijt} + \beta_2 ForecastHorizon_{ijt} + \beta_3 Lagged\ Accuracy_{ijt} + \beta_4 BrokerSize_{ijt} + \beta_5 ForecastFrequency_{ijt} \\
 & + \beta_6 FirmExperience_{ijt} + \beta_7 GeneralExperience_{ijt} + \beta_8 Companies_{ijt} + \beta_9 Industries_{ijt} + \beta_{10} FiscalYearEndDistance_{ijt} \\
 & + \beta_{11} YearToDateDistance_{ijt} + \beta_{12} Bold2_{ijt} + \beta_{13} Period_{ijt} + \beta_{14} DaysElapsed \times Period_{ijt} + \beta_{15} ForecastHorizon \times Period_{ijt} \\
 & + \beta_{16} Lagged\ Accuracy \times Period_{ijt} + \beta_{17} BrokerSize \times Period_{ijt} + \beta_{18} ForecastFrequency \times Period_{ijt} \\
 & + \beta_{19} FirmExperience \times Period_{ijt} + \beta_{20} GeneralExperience \times Period_{ijt} + \beta_{21} Companies \times Period_{ijt} + \beta_{22} Industries \times Period_{ijt} \\
 & + \beta_{23} FiscalYearEndDistance \times Period_{ijt} + \beta_{24} YearToDateDistance \times Period_{ijt} + \beta_{25} Bold2 \times Period_{ijt} + \varepsilon_{ijt}
 \end{aligned}$$

This table repeats the regression of Table 7 Column 5, but excludes the eight independent variables *Forecast horizon*, *Forecast frequency*, *Firm experience*, *General experience*, *Companies*, *Industries*, *Fiscal-year-end distance*, and *Year-to-date distance* in turn (Columns 1-8) to test whether the finding in Table 7 Column 5 is affected by imperfect multicollinearity. Each of these eight independent variables has an absolute correlation above 0.25 with another independent variable, as is shown in Table 1 Panel E. **The regressions follow the regression model that is presented above (the subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*).** As Table 7 Column 5, this table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. The variables are based on 210,353 forecasts issued between 2000 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* (*Bold*=1) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, *Bold*=0). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus (*Bold2*=1), and they are classified as pessimistic if they are below the announcement consensus (*Bold2*=0). *Period* is a dummy variable that takes the value of 1 if the forecast was made in 2000-2002 and otherwise it equals 0. All of the other variables are tested with interaction terms against *Period*. Coefficients are presented for each observation, and t-values can be found within parentheses.

	1	2	3	4	5	6	7	8
Intercept	0.548 (162.10)**	0.686 (214.43)**	0.678 (195.51)**	0.678 (196.38)**	0.680 (197.35)**	0.675 (195.45)**	0.662 (190.51)**	0.692 (198.99)**
DaysElapsed	-0.068 (-25.13)**	-0.057 (-22.03)**	-0.058 (-22.30)**	-0.058 (-22.30)**	-0.058 (-22.33)**	-0.058 (-22.38)**	-0.061 (-23.62)**	-0.061 (-23.53)**
ForecastHorizon		-0.256 (-110.49)**	-0.251 (-102.19)**	-0.251 (-102.19)**	-0.252 (-102.51)**	-0.251 (-102.29)**	-0.238 (-97.72)**	-0.240 (-98.35)**
LaggedAccuracy	0.081 (31.12)**	0.070 (28.05)**	0.070 (28.09)**	0.070 (28.09)**	0.070 (28.10)**	0.071 (28.17)**	0.072 (28.82)**	0.070 (27.86)**
BrokerSize	-0.042 (-15.14)**	-0.021 (-7.96)**	-0.023 (-8.47)**	-0.023 (-8.48)**	-0.022 (-8.10)**	-0.022 (-8.22)**	-0.023 (-8.43)**	-0.021 (-7.90)**
ForecastFrequency	0.111 (40.90)**		0.017 (6.00)**	0.017 (6.01)**	0.017 (6.05)**	0.017 (6.01)**	0.016 (5.82)**	0.017 (6.28)**
FirmExperience	0.000 (0.15)	0.001 (0.36)		0.000 (0.18)	0.001 (0.29)	0.001 (0.19)	0.001 (0.20)	0.001 (0.45)
GeneralExperience	0.003 (0.99)	-0.001 (-0.48)	0.000 (0.04)		0.001 (0.39)	-0.001 (-0.24)	0.000 (0.00)	0.000 (0.05)
Companies	0.028 (8.79)**	0.012 (3.99)**	0.012 (3.90)**	0.012 (3.91)**		0.006 (2.20)*	0.013 (4.28)**	0.014 (4.36)**
Industries	-0.018 (-6.10)**	-0.012 (-4.25)**	-0.012 (-4.22)**	-0.012 (-4.23)**	-0.007 (-2.74)**		-0.013 (-4.64)**	-0.013 (-4.42)**
FiscalYearEndDistance	-0.064 (-16.64)**	-0.126 (-33.50)**	-0.126 (-33.53)**	-0.126 (-33.53)**	-0.126 (-33.58)**	-0.126 (-33.58)**		-0.038 (-15.10)**
YearToDateDistance	0.065 (16.42)**	0.120 (31.41)**	0.120 (31.35)**	0.120 (31.35)**	0.120 (31.41)**	0.120 (31.38)**	0.024 (9.38)**	
Bold2	0.053 (29.21)**	0.052 (29.56)**	0.052 (29.61)**	0.052 (29.61)**	0.052 (29.64)**	0.052 (29.62)**	0.049 (28.08)**	0.048 (27.54)**
Period	-0.098 (-11.02)**	-0.032 (-3.68)**	-0.035 (-3.69)**	-0.032 (-3.41)**	-0.035 (-3.72)**	-0.033 (-3.47)**	-0.021 (-2.21)*	-0.019 (-2.01)*
DaysElapsed x Period	0.003 (0.47)	0.002 (0.31)	0.002 (0.26)	0.002 (0.30)	0.002 (0.29)	0.002 (0.30)	0.005 (0.78)	0.000 (0.01)
ForecastHorizon x Period		-0.052	-0.050	-0.050	-0.050	-0.050	-0.062	-0.055

		(-8.33)**	(-7.39)**	(-7.39)**	(-7.35)**	(-7.36)**	(-9.22)**	(-8.17)**
LaggedAccuracy x Period	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.046	-0.042
	(-6.48)**	(-6.67)**	(-6.65)**	(-6.65)**	(-6.67)**	(-6.68)**	(-6.94)**	(-6.41)**
BrokerSize x Period	0.048	0.039	0.039	0.040	0.039	0.039	0.040	0.042
	(6.52)**	(5.58)**	(5.59)**	(5.66)**	(5.58)**	(5.63)**	(5.60)**	(5.88)**
ForecastFrequency x Period	0.035		0.003	0.002	0.003	0.003	0.003	0.009
	(4.93)**		(0.36)	(0.32)	(0.38)	(0.37)	(0.45)	(1.27)
FirmExperience x Period	-0.005	-0.007		-0.002	-0.007	-0.007	-0.007	-0.009
	(-0.68)	(-0.95)		(-0.38)	(-0.92)	(-0.91)	(-0.94)	(-1.25)
GeneralExperience x Period	0.007	0.010	0.006		0.009	0.010	0.010	0.011
	(0.84)	(1.27)	(0.94)		(1.20)	(1.28)	(1.23)	(1.37)
Companies x Period	-0.010	-0.005	-0.005	-0.004		-0.001	-0.006	-0.005
	(-1.12)	(-0.56)	(-0.65)	(-0.43)		(-0.12)	(-0.78)	(-0.63)
Industries x Period	0.011	0.008	0.008	0.009	0.006		0.009	0.008
	(1.37)	(1.11)	(1.10)	(1.16)	(0.93)		(1.26)	(1.03)
FiscalYearEndDistance x Period	0.114	0.114	0.115	0.115	0.115	0.115		0.104
	(13.29)**	(13.63)**	(13.66)**	(13.65)**	(13.70)**	(13.70)**		(15.65)**
YearToDateDistance x Period	0.052	0.016	0.015	0.015	0.015	0.015	0.105	
	(5.83)**	(1.89)	(1.77)	(1.77)	(1.74)	(1.75)	(15.45)**	
Bold2 x Period	-0.02	-0.022	-0.023	-0.023	-0.023	-0.023	-0.020	-0.027
	(-4.06)**	(-4.67)**	(-4.70)**	(-4.71)**	(-4.70)**	(-4.69)**	(-4.21)**	(-5.68)**
R-squared	0.04	0.11	0.11	0.11	0.11	0.11	0.1	0.1

*Significant at the 5% level

**Significant at the 1% level

Table 12

Excluding the years 1987-1992 and controlling for Analyst and Forecast variables: The relationship between Accuracy and Boldness; the relationship between Accuracy and Optimism among Bold forecasts; and the relationship between Accuracy and Optimism among Bold forecasts, comparing the time periods 1993-1999 and 2000-2002

$$\begin{aligned} \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} \\ & + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} + \beta_6 \text{FirmExperience}_{ijt} \\ & + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} \\ & + \beta_{10} \text{FiscalYearEndDistance}_{ijt} + \beta_{11} \text{YearToDateDistance}_{ijt} + \beta_{12} \text{Bold}_{ijt} \\ & + \varepsilon_{ijt} \end{aligned}$$

$$\begin{aligned} \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} \\ & + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} + \beta_6 \text{FirmExperience}_{ijt} \\ & + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} \\ & + \beta_{10} \text{FiscalYearEndDistance}_{ijt} + \beta_{11} \text{YearToDateDistance}_{ijt} \\ & + \beta_{12} \text{Bold2}_{ijt} + \varepsilon_{ijt} \end{aligned}$$

$$\begin{aligned} \text{Accuracy}_{ijt} = & \beta_0 + \beta_1 \text{DaysElapsed}_{ijt} + \beta_2 \text{ForecastHorizon}_{ijt} + \beta_3 \text{Lagged Accuracy}_{ijt} \\ & + \beta_4 \text{BrokerSize}_{ijt} + \beta_5 \text{ForecastFrequency}_{ijt} + \beta_6 \text{FirmExperience}_{ijt} \\ & + \beta_7 \text{GeneralExperience}_{ijt} + \beta_8 \text{Companies}_{ijt} + \beta_9 \text{Industries}_{ijt} \\ & + \beta_{10} \text{FiscalYearEndDistance}_{ijt} + \beta_{11} \text{YearToDateDistance}_{ijt} \\ & + \beta_{12} \text{Bold2}_{ijt} + \beta_{13} \text{Period}_{ijt} + \beta_{14} \text{DaysElapsed} \times \text{Period}_{ijt} \\ & + \beta_{15} \text{ForecastHorizon} \times \text{Period}_{ijt} + \beta_{16} \text{Lagged Accuracy} \times \text{Period}_{ijt} \\ & + \beta_{17} \text{BrokerSize} \times \text{Period}_{ijt} + \beta_{18} \text{ForecastFrequency} \times \text{Period}_{ijt} \\ & + \beta_{19} \text{FirmExperience} \times \text{Period}_{ijt} + \beta_{20} \text{GeneralExperience} \times \text{Period}_{ijt} \\ & + \beta_{21} \text{Companies} \times \text{Period}_{ijt} + \beta_{22} \text{Industries} \times \text{Period}_{ijt} \\ & + \beta_{23} \text{FiscalYearEndDistance} \times \text{Period}_{ijt} \\ & + \beta_{24} \text{YearToDateDistance} \times \text{Period}_{ijt} + \beta_{25} \text{Bold2} \times \text{Period}_{ijt} + \varepsilon_{ijt} \end{aligned}$$

This table repeats the regressions of Table 6 Column 2, Table 6 Column 4, and Table 7 Column 4, but excludes forecasts that were issued before 1993. **The regressions follow the three regression models that are presented above (the subscripts *i*, *j*, and *t* correspond to analyst *i* following company *j* in fiscal year *t*).** This table reports the relationship between forecast accuracy and boldness, while controlling for scaled analyst and forecast variables, through a multivariate linear ordinary least squares regression. The variables are based on 257,917 forecasts issued between 1993 and 2012, and the data was gathered from I/B/E/S Detail History and CRSP. The sample has been restricted to forecasts issued within one year of the end of the fiscal year, and at least 30 days before it. Only an analyst's last forecast revision per company and fiscal year is included. Outlier forecast revisions that are greater than 10 percent in absolute terms and outlier forecast errors that are greater than 40 percent in absolute terms have been excluded from our sample. The table looks at the variables: *Days Elapsed* – the number of days that have elapsed since the most recent forecast by any analyst for the same company, during the same fiscal year; *Forecast Horizon* – the number of days between the forecast announcement and the end of the fiscal year; *Broker Size* – the size of the brokerage firm that employs an analyst, calculated for each year and brokerage firm as the number of unique analysts that have made forecasts; *Forecast Frequency* – the number of forecasts that an analyst has issued for the same company and fiscal year; *Firm Experience* – the number of years that an analyst has reported forecasts for the particular company; *General Experience* – the number of years an analyst has released forecasts for any company; *Companies* – the number of companies that an analyst have made forecasts for during the year; *Industries* – the number of industries that an analyst have made forecasts for during the year, where an industry is defined as having the same two-digit Standard Industrial Classification (SIC) code; *Fiscal-Year-End Distance* – the absolute distance between an analyst's forecast and the consensus (mean) forecast at the end of the fiscal year; and *Year-To-Date Distance* – the absolute distance between an analyst's forecast and the consensus when the forecast was announced, divided

by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays). The variables above are scaled to assume values between 0 and 1. The variables have been scaled by the range of forecasts within each company and fiscal year, such that the maximum observation assumes the value 1 and the minimum observation assumes the value 0, while maintaining the relative distances within each company and fiscal year. This table also lists at *Accuracy* and its lagged term (prior fiscal year). *Accuracy* is scaled *Absolute Forecast Error* – the absolute difference between forecasted and reported earnings per share, divided by the price two days before to the announcement date of the forecast (three days for Mondays and four days for Tuesdays, such that the price is that of the preceding Friday). As before, the scaled variable assumes values between 0 and 1. Unlike before, 1 corresponds to the minimum *Absolute Forecast Error* and 0 corresponds to the maximum *Absolute Forecast Error*, within each company and fiscal year. Forecasts revisions are classified as *Bold* (*Bold*=1) if they are above the consensus at the announcement and above the analyst's previous forecast, or below both (else, *Bold*=0). The consensus at the announcement is defined as the mean of the forecasts of the preceding 90 days. Bold forecast revisions are classified as optimistic bold if they are above the announcement consensus (*Bold2*=1), and they are classified as pessimistic if they are below the announcement consensus (*Bold2*=0). *Period* is a dummy variable that takes the value of 1 if the forecast was made in 2000-2002 and otherwise it equals 0. All of the other variables are tested with interaction terms against *Period*. Coefficients are presented for each observation, and t-values can be found within parentheses.

	All Observations 1993-2012 N = 257 917	Bold Forecasts 1993-2012 N = 198 116	All observations 1993-2002 N = 58 173
Intercept	0.6500 (241.91)**	0.6715 (227.16)**	0.6564 (92.71)**
DaysElapsed	-0.0530 (-28.20)**	-0.0569 (-26.65)**	-0.0509 (-10.57)**
ForecastHorizon	-0.2584 (-138.45)**	-0.2633 (-126.15)**	-0.2767 (-54.83)**
LaggedAccuracy	0.0680 (36.59)**	0.0590 (28.18)**	0.0336 (6.99)**
BrokerSize	-0.0136 (-6.85)**	-0.0095 (-4.27)**	0.0171 (3.36)**
ForecastFrequency	0.0180 (8.81)**	0.0162 (7.05)**	0.0116 (2.28)*
FirmExperience	0.0012 (0.59)	0.0004 (0.16)	0.0035 (0.69)
GeneralExperience	0.0013 (0.58)	0.0023 (0.91)	0.0055 (1.03)
Companies	0.0084 (3.64)**	0.0087 (3.35)**	-0.0024 (-0.40)
Industries	-0.0173 (-8.17)**	-0.0138 (-5.80)**	-0.0204 (-3.63)**
FiscalYearEndDistance	-0.1218 (-46.07)**	-0.0909 (-30.57)**	-0.0348 (-5.41)**
YearToDateDistance	0.1244 (45.59)**	0.1183 (38.82)**	0.1236 (18.50)**
Bold	0.0529 (33.16)**		
Bold2		0.0481 (32.24)**	0.0461 (12.76)**
Period			-0.0127 (-1.08)
DaysElapsed x Period			-0.0051 (-0.63)
ForecastHorizon x Period			-0.0243 (-2.90)**
LaggedAccuracy x Period			-0.0070 (-0.87)
BrokerSize x Period			-0.0003 (-0.03)
ForecastFrequency x Period			0.0077 (0.87)
FirmExperience x Period			-0.0096 (-1.10)
GeneralExperience x Period			0.039 (0.42)

Companies x Period			0.0094 (0.95)
Industries x Period			0.0167 (1.80)
FiscalYearEndDistance x Period			0.0238 (2.32)*
YearToDateDistance x Period			0.0115 (1.09)
Bold2 x Period			-0.0168 (-2.82)**
R-squared	0.099	0.103	0.117
*Significant at the 5% level			
**Significant at the 1% level			