On Guidance and Volatility

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Abstract

Survey evidence suggests that managers voluntarily disclose information, particularly earnings guidance, with an aim toward dampening share price volatility. Yet, consultants and influential institutions advise against providing guidance — citing concerns with litigation and market penalties associated with missed earnings targets, as well as a lack of evidence that disclosure curbs volatility. Furthermore, recent research links guidance to increased volatility and heightened crash risk. Hence, some argue that guidance not only fails to promote tranquility but may actually prompt turbulence. In this paper, we consider the interplay between guidance and volatility. Consistent with the notion that volatility does indeed factor into managers' decisions to provide earnings guidance, we document a link between increased volatility prior to an earnings release and the likelihood that a manager chooses to "bundle" a forecast with the firm's earnings announcement. In particular, our findings indicate that firms in more volatile information environments exhibit a general reticence to offer guidance, but given a recent spike in volatility, managers are more likely to issue a forecast in an effort to calm the market. Subsequent tests indicate that managers' efforts do not go unrewarded, as we document a greater post-announcement decline in volatility for guiding firms. Taken collectively, this evidence supports the view that managers can and do positively shape their firms' information environments with earnings guidance.

Keywords: disclosure; earnings guidance; volatility

JEL Classification: M41; K22; G14

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1. Introduction

No managerial communication arouses such negative reaction, even fury, as earnings guidance does. In 2006, the prestigious Conference Board urged managers to stop issuing quarterly guidance because it encourages a short-term focus, detrimental to a firm's ability to manage for the long-term ("Revising Stock Market Short-Termism," 2006). Also in 2006, the CFA Institute in conjunction with the Business Roundtable, in a dramatic "Call for Action," implored managers to "End the practice of providing quarterly guidance," because it's an "unproductive and wasted effort by corporations . . . and causes . . . neglect of long-term business growth…." In 2007, a bipartisan commission established by the U.S. Chamber of Commerce also called for the end of the earnings guidance practice, to be substituted by an explanation of the firm's long-term goals and strategies (The Commission on the regulation of U.S. Capital Markets in the 21st Century, 2007). In addition, the leading consulting company McKinsey made its view about guidance clear in a report to clients: "The Misguided Practice of Earnings Guidance" (2006), claiming that guidance doesn't provide any economic benefit, including the tampering of share volatility.

Although the frequency of quarterly guidance decreased by about 30% in 2007-2008, mainly due to difficulties to predict firm performance during the financial crisis and the ensuing recession, about 800 public companies still regularly provide quarterly guidance and about 1,800 companies provide annual and/or quarterly guidance. From a universe of roughly 5,500 U.S. public companies, this represents a substantial number of guiders. Obviously, guiders believe that they benefit from the practice. But what exactly are those benefits? We focus in this study on a major and contested potential benefit—reducing share price volatility.

Managers often express concern with excessive share price volatility and survey evidence indicates that they voluntarily disclose information aimed at dampening that volatility (Graham, Harvey, and Rajgopal 2005; McKinsey survey 2006). Indeed, executives frequently claim that they provide earnings forecasts in order to reduce the volatility of their stock price (Johnson 2009; National Investor Relations Institute 2009). In contrast to managers' claims, some academic work links guidance with increased volatility and heightened crash risk (Rogers, Skinner and Van Buskirk 2009; Hamm, Li and Ng 2012), while other research suggests that opportunistic managers provide guidance in an intentional effort to foster uncertainty in order to enhance stock option gains (So 2012). Consequently, recent research argues that guidance not only fails to promote tranquility but may actually prompt turbulence. The stage is thus set for an examination of the relation between quarterly earnings guidance and share price volatility.

In this paper, we consider the interplay between guidance and volatility, providing evidence of a link between increased volatility in the days prior to a scheduled earnings release and the likelihood that managers "bundle" a forecast with the firm's earnings announcement. Overall, we observe a negative relation between the level of share volatility and the incidence of guidance: volatile firms guide less frequently, presumably because they find it harder to predict future performance. However, the relation between volatility and guidance turns positive when there is a pre-earnings announcement run-up in volatility: a spike in volatility influences the choice to bundle a forecast with the scheduled earnings release, presumably reflecting managers' efforts to quiet the turmoil in the stock. Shifting attention to the market's receipt of managers' curative disclosure efforts, we find no evidence to indicate that guidance fuels volatility. Indeed, we document the opposite: earnings releases bundled with guidance are associated with larger

post-announcement reductions in volatility than non-bundled earnings releases (after controlling for any pre-announcement movements in volatility).

Our analyses examine a sample of 107,307 quarterly earnings announcements made in the decade since Regulation Fair Disclosure ("Reg FD") took effect in October of 2000. Evidence indicates that increasingly guidance is provided with earnings announcements (Anilowski, Feng and Skinner, 2007; Rogers and Van Buskirk, 2012). Our focus on bundled guidance in this study thus covers the large majority of guidance cases released today. We find that over 30% (32,910) of our sample's quarterly earnings announcements coincide with the issuance of forward-looking guidance. In our empirical tests, we compare the volatility dynamics surrounding the quarterly earnings announcements bundled with guidance to earnings announcements without guidance (i.e., bundled versus non-bundled earnings announcements). Our finding that a volatility run-up prior to the earnings announcements is associated with the choice to supply quarterly guidance holds after controlling for known determinants of management's decision to guide—most notably, the current quarter's earnings news and the firm's guidance choices in the past.

The evidence of a link between run-ups in volatility and guidance is consistent with two explanations: (1) the market anticipating the act of bundling (and its associated impact on prices), and/or (2) managers reacting to the rising volatility by providing guidance. We attempt to distinguish between these two explanations for our findings by focusing on investors' ability to predict guidance. Examining firms that guided within the past 12 quarters, we find that the majority of firms do not guide every quarter. Of the 47,168 firm-quarter observations where managers have recently (last 12 quarters) guided, only 50% guided in the same quarter of the prior year and 25% either remained silent or offered a single forecast in the past 4 quarters. This

guiding irregularity indicates that investors cannot perfectly anticipate the quarters in which guidance occurs. Importantly, when we relate the likelihood of a firm providing guidance (as measured by the issuance of guidance in the prior quarter, the same quarter last year, or the proportion of guidance supplied in the prior four quarters) to the volatility run-up prior to the earnings announcement, we find a very low correlation. This casts doubt on the notion that the volatility run-up exclusively reflects the market's anticipation of the guidance. Furthermore, when we limit our analysis to recent guiders (i.e., focusing on variation in guidance behavior while attempting to limit variation in the extent to which the market anticipates the presence of a forecast), we again detect a link between recent run-ups in volatility and managers' propensity to bundle in the current quarter. Thus, consistent with managers' claim that they guide to suppress volatility, we conclude that the choice to bundle in a particular quarter is indeed related to a recent spike in volatility for firms committed to using earnings guidance to communicate with investors.

If a volatility run-up induces managers to issue guidance, the question is: is the guidance effective in arresting volatility? Examining movement in volatility on the day of the earnings announcement and in the days immediately thereafter, we find a significantly larger decrease in volatility for the guiders than for the non-guiders. Regardless of the nature of the forecast news, positive or negative, and controlling for both the earnings news released and the pre-announcement run-up in volatility (as well as other factors), we detect no difference in volatility movement on the day of the earnings announcement when we comparing bundled quarters to non-bundled quarters. Hence, we find no evidence that guidance increases volatility. Further, in the subsequent trading days, our evidence indicates that the bundling of guidance with the regular announcement of earnings is associated with a greater post-announcement reduction in

volatility than that for non-bundled earnings. Our findings thus contradict the guidance naysayers.

The remainder of this paper progresses as follows. Section 2 reviews the relevant literature and presents our predictions. Section 3 discusses our approach to sample selection and our empirical methods. Section 4 presents the descriptive statistics and empirical results of the study. Finally, Section 5 concludes with a summary and discussion.

2. Related Literature and Hypotheses

Investor uncertainty and, by extension, stock price volatility fluctuate considerably around earnings-relevant information releases. Patell and Wolfson (1979, 1981) document that option implied volatility increases in the days leading up to quarterly earnings announcements and decreases thereafter. Focusing on "unbundled" management forecasts (i.e., earnings guidance issued apart from the regular announcement of earnings), Rogers, Skinner and Van Buskirk (2009) also observe a rise in volatility prior to guidance, but, in contrast to Patell and Wolfson, report that volatility remains elevated in the post-guidance days, concluding that these forecasts increase short-term volatility. Unbundled guidance, however, is now rare. More than 80% of all guidance cases are now bundled with earnings (Anilowski, Feng and Skinner, 2007; Rogers and Van Buskirk 2012). In our sample, nearly one third of all earnings announcements bundle the release of current quarter results with a forward-looking guidance, leading us to focus on bundled guidance.

Prior work indicates that managers tend to disclose more when earnings are less volatile (Waymire 1985) and easier to predict (Chen, Matsumoto, and Rajgopal 2011). Consistent with this, Cotter, Tuna, and Wysocki (2006) find that "management guidance is more likely when ...

analysts' forecast dispersion is low." Similarly, Houston, Lev, and Tucker (2010) argue that forecast dispersion reflects greater difficulty in predicting earnings and document a positive relation between increased dispersion and the likelihood that a manager stops guiding. Collectively, these studies indicate that managers are less likely to bundle a forecast with the firm's earnings announcement when the levels of volatility are high, which leads us to our first hypothesis:

H1: High preannouncement levels of share price volatility are associated with a decreased likelihood of bundling guidance with earnings.

At the same time, survey evidence suggests that managers guide with an aim toward dampening share price volatility (Graham, Harvey, and Rajgopal, 2005; McKinsey survey 2006). Indeed, executives frequently indicate that they commit to guidance in an attempt to constrain the volatility in their stock (Johnson 2009; National Investor Relations Institute 2009). This suggests that a pre-earnings-announcement rise in volatility induces managers to provide guidance in an effort to dampen the rising volatility.

H2: Pre-announcement increases in share price volatility are associated with an increased likelihood of bundling guidance with earnings.

Shifting attention to the consequences of guidance, we note that prior evidence suggests that guidance might not achieve managers' intentions. While early work connects earnings guidance (and/or improvements in disclosure ratings) to decreased stock price volatility and other information environment benefits (Welker, 1995; Coller and Yohn, 1997; Bushee and Noe 2000), more recent work links guidance directly with increased volatility and heightened crash risk (Rogers, Skinner and Van Buskirk 2009; Hamm, Li and Ng, 2012). Indeed, So (2012) builds on Rogers, Skinner and Van Buskirk (2009), arguing that managers know that guidance fosters volatility and, consequently, opportunistically provide guidance in order to profit from the

option value of equity. Collectively, these studies suggest that guidance not only fails to decrease volatility, but might actually increase it. These recent findings (derived largely from unbundled guidance) lead to us to make the following prediction with respect to post-earnings announcement movements in volatility:

H3: The post-earnings-announcement decrease in volatility is reduced by the presence of guidance in the earnings release.

3. Data

We begin our data collection by obtaining the report date of quarterly earnings (*RDQ*) for all firm quarters in Compustat for the period of 2001 through the end of 2010. To these firm-quarter observations, we add guidance data from First Call's Company Issued Guidelines files. We code a variable (*GUIDE*) to indicate when a management forecast occurs during the 5 trading days centered on the earnings announcement. We also code a number of indicator variables that reflect the firm's guidance history prior to the current quarter's earnings announcement: *GUIDE_CQTR* reflects whether the firm previously provided guidance for the current quarter's earnings, while *GUIDE_PRIOR* reflects whether the firm bundled earnings guidance with the prior quarter's earnings announcement. Expanding the focus from just the prior quarter, we code two additional indicator variables that aim to capture managers' tendency to use guidance to communicate with the market in the past. *GUIDE_HISTORY* equals one for firms with at least one earnings guidance captured in First Call's database prior to the current quarter's earnings announcement. *SILENT_12Q* equals one for firms with no earnings guidance in their history for at least the past 12 quarters.

Next, we collect analyst forecast data from I/B/E/S using the unadjusted detail file three days prior to each earnings announcement. From this file, we derive the number of analyst

forecasts conditional on the forecast being no more than 90 days old (i.e., non-stale), the consensus (median) non-stale analyst forecast, and the standard deviation of non-stale analyst forecasts. The median analyst forecast, combined with the actual earnings for a given quarter, provides a history of earnings surprises. Specifically, we measure each quarter's surprise (*SURPRISE*) as the reported actual earnings (obtained from Compustat quarterly files) minus the most recent median analyst estimates, deflated by stock price 3 trading days prior to the earnings release date. That is, we produce the typical Standard Unexpected Earnings (*SUE*) number.

In addition to actual and forecasted earnings information, we collect share price, return, number of shares and volume data from the Center for Research in Security Prices (CRSP) database. We use these data to compute the market value of a firm's equity each quarter, the 90-day return ending three days prior to the earnings release date, and the standard deviation of actual returns over that 90-day period.

Finally, we gather close-of-day implied volatility data from Option Metrics. Specifically, we collect implied volatilities on 30-day standardized at-the-money options during the 15 days before and after each earnings date. This allows us to determine an average level of implied volatility in the days before a quarterly earnings release and the changes in implied volatility over various time periods before and after quarterly earnings releases. We also collect closing levels of the Chicago Board Option's Exchange volatility index (VIX) from their website during the three-day window centered on an earnings announcement date to consider market-wide volatility effects. We define all the variables used in our analyses in the Appendix.

4. Our Findings

This section reports the results of our two-pronged investigation into the association between (1) pre-announcement volatility changes and the decision to bundle guidance with earnings release in the current quarter and (2) the association between the existence of guidance in the earnings release and post-announcement changes in volatility. First, we provide a statistical description of the data.

Descriptive Statistics

Table 1 provides descriptive statistics of the relevant variables for the 107,307 sample observations. Panel A provides unconditional statistics and Panel B conditions the data on whether the earnings announcement is or is not associated with management guidance.

[Insert Table 1.]

Notably, 31% of quarterly earnings announcements are bundled with guidance. There is a certain consistency in guidance behavior, as 31% of the earning announcements also had guidance bundled with the prior quarter's earnings announcements (*GUIDE_PRIOR*), and 27% of this quarter's earnings releases were the subject of prior managerial forecasts (*GUIDE_CQTR*). Conversely, 56% of earnings announcements have no management guidance in the previous twelve quarters (*SILENT_12Q*). Of the 56% of earnings reports released without prior guidance, only 3% (not tabulated in Table 1) bundle guidance with earnings. Of the firm-quarter observations where managers have recently guided (i.e., *SILENT_12Q* = 0.), only 50% guided in the same quarter of the prior year and 25% either remained silent or offered a single forecast in the past 4 quarters (not tabulated in Table 1). Thus, while there is some consistency in the practice of guidance, investors generally cannot perfectly predict current quarter's guidance from the firm's guidance history.

The mean (median) *SUE* for the sample firms is -0.006 (0.000), and 20% of the earnings announcements are losses. About 58% of earnings announcements exceed the median analyst forecast by an *SUE* of at least +0.0001 (*P_SURPRISE,* we classify these as "beats"), whereas 31% of the actuals fall below the median analyst forecast of -0.0001, leaving about 11% of earnings meeting the analysts' consensus forecast. This bias toward beats is consistent with prior research.

Examining Panel B, we find statistically significant differences between the means and medians of the bundled and non-bundled earnings announcements for all the variables tabulated. Specifically, managements issuing positive current and past earnings news (*P_SURPRISE* and *PROBMB*) are more likely to bundle guidance with the earnings releases than managements of firms with less favorable earnings news. Guiders tend to have greater market capitalizations and be more widely followed by analysts than non-guiders. There also tends to be less disagreement among analysts following firms that guide than those that do not guide. Interestingly, firms that do not guide are associated with larger pre-announcement stock price increases than firms that do guide. Combined with the fact that non-guiders are more likely to disappoint with the earnings announcement, the larger stock price run-up prior to the earnings release might exaggerate the disappointment. Table 2 provides the correlations among the examined variables.

Table 3 provides descriptive statistics for the volatility measures we use in our analyses. Because listed options exist only for a sub-sample of firms, we have only 72,123 observations (out of a total of 107,307) after requiring OptionMetrics data.

[Insert Table 3.]

On average, the realized stock price volatility (standard deviation of daily returns), *SVOL_LEVEL*, in the 90 days prior to the earnings announcement, is 3% per day, or about 47.6%

annualized (assuming identically and independently distributed returns) to a 252 trading-day year. Implied volatility from OptionMetrics, *IVOL_LEVEL*, on average, is 49%. As noted in prior literature, implied volatility rises in the days prior to an earnings announcement (by 1.8% over three days, as evidenced by *ΔIVOL_PRE3D*, and 3% over 15 days, as evidenced by *ΔIVOL_PRE15D*, on average) and falls substantially on the earnings announcement day (2.5%, on average, as evidenced by *ΔIVOL_RDQ*) and the immediately following days (by over 6%).

From Panel B of Table 3, we find that firms choosing to bundle guidance with earnings announcements tend to have lower *levels* of volatility (measured by either realized or implied volatility), but larger *increases* in volatility immediately prior to the earnings release. The first result is consistent with prior work (see, Waymire, 1985; Bozanic, Roulstone, and Van Buskirk, 2012). The larger volatility increase in the 15 days prior to earnings announcements of guiders (4.2%) vs. non-guiders (2.3%), *ΔIVOL_PRE15D***,** suggests that the decision to guide might be related to the pre-earnings volatility increase—a finding not reported in existing literature to our knowledge.

We also document significantly larger decreases in post-earnings-announcement volatility for guiding firms (around 11%, consisting of 2.8% on the earnings announcement day and over 8% in the days thereafter) than for earnings announcements not accompanied by guidance (less than 8%)—as evidenced by contrasting *ΔIVOL_PRE3D* and *ΔIVOL_PRE15D* across the guidance parition. We define the net change in volatility as the pre-earnings change in implied volatility (typically positive) plus the post-earnings change in volatility (typically negative). On average, firm-quarters with bundled earnings-guidance, are associated with a more negative net change (i.e. decrease) in implied volatility (measured either from 3 or 15 days before the earnings release dates to three or 15 days afterwards) than for firms without earnings

guidance. For example, the mean seven-day net volatility change from three days before the announcement through three days afterwards is -5.8% for non-guiders and -7.2 for guiders (the difference is statistically significant).

It might be argued that the higher pre-announcement increase in volatility for guiders reflects investors' expectation of the release of guidance. Yet, in Panel C of Table 3, we note that the volatility differences between guiders and non-guiders hold even when we focus our attention on firms for which investors might anticipate guidance. For this analysis, we use the 48,168 observations where the firm provided guidance at least once in the prior twelve quarters (i.e., *SILENT_12Q* = 0.). We find that such firms, all with a recent history of guiding, are less likely to guide in a given quarter if the level of realized or implied volatility is high (*SVOL_LEVEL* and *IVOL_LEVEL*), and more likely to guide if there is a larger increase in implied volatility in the days immediately prior to the earnings announcement (*ΔIVOL_PRE3D* and *ΔIVOL_PRE15D*). Likewise, the post-announcement volatility decrease is greater and the 7- or 31-day net change in implied volatility is more negative for guiders than for non-guiders. It, thus, appears that guidance is mainly a response to a volatility spike rather than merely reflective of a volatility increase in expectation of guidance.

Finally, in Panel D of Table 3, we condition the statistics on the sign of the earnings news (negative announcements are those with a $SUE < -0.0001$, and positive with a $SUE > +0.0001$). We note that regardless of the earnings news our earlier results hold: firm-quarters with higher levels of volatility are less likely to have guidance, firm-quarters with a greater increase in pre-announcement volatility are more likely to have guidance, and firm-quarters with guidance are associated with a larger decrease in post-earnings volatility (and more negative net volatility

changes) than firm-quarters without guidance. Thus, the specific earnings message does not alter our main findings.

As seen in Table 4, the news associated with the guidance also does not affect our main findings. For each state of earnings news (negative, neutral, and positive), we disaggregate the guidance to negative, neutral, and positive, relative to the consensus forecast for the guided quarter. Notably, the majority of guidance cases for each earnings message are negative (warnings). Regardless of the guidance news, the likelihood of guidance is positively associated with a volatility spike before the earnings announcement. Specifically, for each of the three guidance messages (positive, neutral, negative), the pre-announcement volatility increases (*ΔIVOL_PRE3D* and *ΔIVOL_PRE15D*) are larger for guiders than the volatility increases of non-guiders (the only exception: positive earnings and positive guidance, 15 days prior). Also, without exception, the post-earnings announcement volatility decreases, both over 3 and 15 days, are larger for guiding quarters than for non-guiding-quarters. Thus, we find consistent regularities between management's decision to guide and pre- and post-earnings-announcement changes in volatility across the information contained in both the earnings and the guidance message. We now turn to a multivariate analysis.

What Affects the Decision to Guide? Multivariate Analysis

We begin by investigating managers' decision to bundle guidance with an earnings announcement. Rogers and Van Buskirk (2012) supplies the basic model for predicting the incidence of bundled guidance in a given quarter. In particular, our multivariate analysis begins by replicating their prediction model:

$$GUIDE_{i,t} = \beta_0 + \beta_1 GUIDE\_CQTR_{i,t} + \beta_2 GUIDE\_PRIOR_{i,t} + \beta_3 P\_SURPRISE_{i,t} + \beta_4 N\_SURPRISE_{i,t} + \beta_5 |SURPRISE_{i,t}| + \beta_6 LOSS_{i,t} + \beta_7 DISPERSION_{i,t} + \beta_8 PRIOR\_RET_{i,t} + \beta_9 LOG\_MVE_{i,t} + \beta_{10} LOG\_NUMEST_{i,t} + \beta_{11} PROBMB_{i,t} + \varepsilon_{i,t,} \quad (1)$$

Consistent with prior research, we anticipate that the guidance decision is affected by past guidance practice, the current quarter's earnings news, and the information environment of the firm.[2] To control for past guidance practice, we create a binary variable that takes a value of one if management issued guidance concerning the prior quarter's earnings (*GUIDE_PRIOR*) and another binary variable taking a value of one if management issued guidance during the current quarter (*GUIDE_CQTR*). We expect that both of these variables are positively correlated with the decision to bundle guidance with the current quarter's earnings announcement. That is, we expect that guiding firms tend to continue to guide and that non-guiders tend to not guide.

Management's guidance decision might also be related to the message of the current quarter's earnings. To increase the credibility of a positive earnings surprise, a manager might bundle the earnings news with guidance, whereas negative earnings surprises often lead managers to curtail guidance (Houson, Lev, and Tucker, 2010). As noted earlier, we denote SUE values less than -0.0001 as negative surprises, values between -0.0001 and 0.0001 as no surprise, and values exceeding 0.0001 as positive surprises. We create two binary variables, one that identifies negative surprises and one that identifies positive surprises. In addition, prior literature finds that losses are treated differently by the market than positive earnings, so we create a binary variable to identify instances where the firm-quarter's actual earnings number is a loss.

[2] For example, Houston, Lev, and Tucker (2010), Tang (2011), and Chen, Matsumato, and Rajgopal (2011) study the decision by managers to cease giving earnings guidance and find roles for guidance history, current and past earnings, the firm's information environment measured by firm characteristics and financial analyst coverage variables, and own realized volatility levels. Kim, Pandit and Wasley (2012) demonstrate the importance to control for market-wide volatility.

We also look back four quarters to create a history of the firm's earnings performance relative to expectations by computing the proportion of the last four quarters in which the firm's SUE exceeded -0.0001, i.e., the fraction of the four quarters where the firm met or beat analyst expectations. Finally, we control for the size of the earnings surprise by taking the absolute value of the SUE.

We characterize the information environment of the firm by several variables. The log of the market capitalization is included, as large firms likely have a richer information environment than small firms. The log of the number of analyst estimates and the standard deviation of those estimates are also included as information variables, representing the amount of private information generation about a firm and the apparent agreement (forecast dispersion) with regard to that private information. To address possible information leakage prior to the earnings announcements, we include the return on the firm's stock during the 90 days prior to announcement (roughly since the last earnings announcement).

After first replicating the results of Rogers and Van Buskirk (2012), we then build on their model in order to consider the association between share price volatility and the decision to guide. Postulating both a levels effect and an effect of changes in volatility, we formulate two variables. For the levels variables, we compute the standard deviation of daily returns during the 90 days prior to the earnings announcement (ending three days prior), and use the implied daily volatility from a standardized 30-day at-the-money option from 15 days before the earnings announcement through 15 days after the announcement. We focus on standardized 30-day implied volatilities from Option Metrics as they provide the best high frequency measure of the market's assessment of stock price volatility. As we believe that firms will respond to pre-announcement volatility run-ups only if they have an established policy of guiding, we interact

the pre-announcement change in volatility with our SILENT_12Q variable. To isolate firm-specific volatility effects, we also control for the level of market-wide volatility, using the volatility index (VIX).

Specifically, we estimate the following regression with year and industry fixed effects:

$$GUIDE_{i,t} = \begin{array}{l} \beta_0 + \beta_1 GUIDE\_CQTR_{i,t} + \beta_2 GUIDE\_PRIOR_{i,t} + \\ \beta_3 P\_SURPRISE_{i,t} + \beta_4 N\_SURPRISE_{i,t} + \beta_5 |SURPRISE_{i,t}| + \\ \beta_6 LOSS_{i,t} + \beta_7 DISPERSION_{i,t} + \beta_8 PRIOR\_RET_{i,t} + \beta_9 LOG\_MVE_{i,t} \\ + \beta_{10} LOG\_NUMEST_{i,t} + \beta_{11} PROBMB_{i,t} + \beta \\ {}_{12} VOLATILITY\_LEVEL_{i,t} + \beta_{13} VOLATILITY\_CHANGE_{i,t} + \beta \\ {}_{14} VOLATILITY\_CHANGE_{i,t} * SILENT\_12Q_{i,t} + \varepsilon_{i,t,} \end{array} \quad (2)$$

Estimates of regressions (1) and (2) are reported in Table 5. We report six specifications of the regression.

[Insert Table 5.]

Initial regression estimations (columns 1 and 2) use all the 107,307 sample firm-quarters. When we add the implied volatility levels from Option Metrics, our sample size decreases to 72,123 firm-quarters, as not all firms have traded options. Of these, 27,046 firm quarters (37.5%) include earnings guidance.

In column (1) of Table 5, we find that the majority of our predicted associations are confirmed. Guidance history is positively correlated with the decision to include guidance with the current quarter's earnings; the coefficient estimates on the variables guide_cqtr and guide_prior are reliably positive. The direction and magnitude of the current quarter's earnings news also matters. Managers are more likely to guide if the current and past quarters' earnings news beats analysts' forecasts and are (weakly) less likely to bundle if the earnings miss the consensus. The negative earnings news result is reliably negative only if the firm reports a loss. For large earnings surprises in either direction (|surprise|), managers are less likely to guide. Managers are more likely to include guidance with earnings if the firm has a larger market

capitalization, when it is followed by more analysts, or when the analysts are in more agreement. The general picture emerging is that guidance is associated with a more informed and transparent information environment.

In columns (2) and (3) of Table 5, we control for market volatility (measured with VIX) and add the level of individual stock price volatility, measured as the realized volatility in column (2) and the implied volatility in column (3), to the previously included variables.

We confirm that, regardless of whether we measure volatility by historical share price volatility (*SVOL_LEVEL*) or implied volatility (*IVOL_LEVEL*), firms are less likely to provide guidance as the level of volatility increases. This is consistent with the notion that managers decline to guide in situations that are particularly difficult to forecast. Using realized volatility, the previously documented results are maintained. With implied volatility as our measure of stock price volatility, the number-of-analysts variable loses statistical significance in explaining the decision to guide. Overall, adding the level of volatility to the regression specification adds only marginally to the explanatory power of the model.

In columns (4) and (5) of Table 5, we investigate the effect of the pre-earnings-announcement *change* in implied volatility on the decision to guide. We anticipate that guidance is more highly associated with rising levels of pre-earnings volatility, particularly for firms with a history of guiding (i.e., where *SILENT_12Q* = 0.), than for firms that do not guide (i.e., where *SILENT_12Q* = 1.). This might reflect management's reaction to the rising volatility or it might be a market anticipation of receiving both actual earnings and guidance.

The estimates in columns 4 and 5 of Table 5 show that the pre-announcement increase in volatility, measured as $\Delta IVOL\_PRE3D$ or $\Delta IVOL\_PRE15D$, is positively associated with the likelihood of guidance. Moreover, this association is confined to firms with a recent history of

guidance, since when the pre-announcement volatility change is interacted with *SILENT_12Q*, we find a negative coefficient estimate of sufficient magnitude to swamp the positive coefficient estimate on the volatility run-up. That is, rising pre-announcement volatility is associated with an increased likelihood of guidance for firms with a recent history of guidance but not for firms without the practice of guiding. The addition of the pre-announcement implied volatility change modestly improves the explanatory power of the model, with the pseudo-R^2 rising from less than 0.64 to over 0.67. Most of the explanatory power is provided by past guiding behavior.

It may be argued that the decision to guide is endogenous and that guiding and non-guiding firms are inherently different and should not be combined in a single regression. Accordingly, in column 6 of Table 5, we analyze only firms that have provided guidance at least once in the 3 years prior to the quarter of interest (i.e., *SILENT_12Q* = 0.) This reduces our sample size to 47,168 firm-quarters. Given that we are focusing here on firms with a recent guidance history, we no longer use the "silent" variable to distinguish between firms with a guiding history and those without such a history. Notably, our results are maintained: the likelihood of bundling is negatively associated with the level of volatility and positively associated with pre-announcement changes in volatility.

In summary, after controlling for variables found in prior research to influence the decision by management to bundle earnings guidance with quarterly earnings releases, we find that increases in volatility prior to the earnings announcement are positively associated with the decision to guide. This might be due either to managers trying to mitigate the volatility spike by guidance or to the market anticipating additional volatility associated with a management forecast in the upcoming earnings release. However, the fact that this association is also observed when narrowing the sample to only those firms with a recent history of guidance

(column 6), and, therefore, firms that the market anticipates guiding, is more consistent with the first explanation above, namely, that guidance is a response to a volatility run-up.

Management Reaction or Investor Anticipation?

To further distinguish between the competing hypotheses for the volatility run-up (i.e., management reaction and market anticipation), we partition our sample using an alternative metric for whether the market might reasonably expect the firm to guide this quarter. Specifically, we determine whether the firm guided in the same quarter of the prior fiscal year, arguing that this is another type of "regular" guider. Firms that guided in the same quarter of last year are flagged with a binary variable, *GUIDE_SQLY* = 1.

Using the binary variables *GUIDE* and *GUIDE_SQLY* to create four subsamples, we examine the pre-earnings run-ups in implied volatility. Results are present in Table 6. As in column 6 of Table 5, we find that even when the market can reasonably anticipate that a firm will guide (i.e., *GUIDE_SQLY* = 1.), the change in implied volatility is greater for firm-quarters in which guidance is actually given (0.043 pre 15 days run-up for guiders, vs. 0.023 run-up for no-guidance), suggesting that it is not just the market's anticipation of guidance influencing the implied volatility changes. We also find that current-quarter guiders experience a larger run-up in pre-earnings volatility than non-guiders regardless of whether they might be expected to guide and that the differences in run-up for the firms that might be expected to guide and those firms that might not be expected to guide generally do not differ. We interpret this as additional evidence against the hypothesis that the volatility run-up is mainly the market anticipating the guidance in an upcoming earning release.

[Insert Table 6.]

In Panel B of Table 6, we examine the correlation among various measures of the likelihood of guidance and the pre-earnings volatility change. In addition to whether the firm guided in the prior quarter or the same quarter last fiscal year, we include the proportion of the prior four quarters that the firm guided as a proxy for the market's expectation of current-quarter guidance (*PROP_GUIDE_PRIOR*). As expected, our various proxies for the likelihood of current-quarter guidance based on past guiding behavior are (reasonably) highly correlated. The correlation between the pre-earnings-announcement increase in implied volatility and the various measures of the market's ability to anticipate guidance are quite small, however. We interpret these results to suggest that the hypothesis that the market increases the implied volatility it builds into option prices in anticipation of the additional information associated with guidance bundled in an earnings release explains only a very small portion of the association we find between volatility run-ups and the decision to guide in the current quarter. We now move from the pre-earnings release period to the post-release period.

The Change in Implied Volatility following the Earnings Announcement

First, we examine the change in implied volatility on the day the earnings are announced. Of primary interest to our investigation is whether firm-quarters with bundled earnings-guidance differ systematically in the volatility change from firm-quarters without guidance.

To do so, we estimate the following regression model:

$$\begin{aligned}\Delta IVOL\_RDQ_{i,t} = {} & \beta_0 + \beta_1|SURPRISE_{i,t}| + \beta_2 GUIDE_{i,t} + \beta_3 LOG\_MVE_{i,t} + \beta_4 LOG\_NUMEST_{i,t} + \beta_5 DISPERSION_{i,t} + \beta_6 LOG\,\Delta \mathrm{VIX}_{i,t} + \beta_7 \mathrm{VIX}_{i,t} + \beta_8 IVOL\_LEVEL_{i,t} + \beta_9 \Delta IVOL\_PRE3D_{i,t} + \varepsilon_{i,t,}\end{aligned} \quad (3)$$

Results are summarized in Table 7. Of particular interest is the sign of the estimated *GUIDE* regression coefficient, β_2. If earnings guidance triggers a volatility increase, as

suggested by recent findings, we expect a positive and significant β_2 coefficient. However, as made clear by the estimates reported in Table 7, the β_2 coefficient is statistically insignificant for negative, neutral, and positive earnings news. We, thus, find no evidence indicating that guidance increases anticipated share price volatility on the earnings announcement day relative to earnings announcements not containing guidance.

[Insert Table 7.]

We also find in Table 7 that higher levels of pre-announcement volatility and higher pre-announcement run-ups in volatility are associated with larger decreases in announcement-day volatility, most likely indicating that earnings announcements relieve more volatility when the market is most uncertain about earnings. With the exception of the number of analysts providing estimates, the coefficient estimates on the control variables in Table 7 have signs consistent with our expectations.

To further explore the impact of guidance on the announcement day volatility we examine whether differences can be detected between the guidance conveying positive, neutral, or negative news. We find that none of the estimated guidance coefficients are significant at traditional levels, except that associated with neutral forecast news associated with positive earnings news. The positive coefficient in that case suggests that this specific combination of news (out of nine combinations; 4.6% of our sample) is correlated with higher announcement-day volatility. Other than that particular combination, guidance seems to be unrelated to the volatility change on the earnings release day.

Lastly, we extend the post-announcement time of study to investigate whether the change in volatility in the days following bundled earnings announcements earnings releases are associated with larger declines in volatility than earnings releases without guidance. We

estimate an equation similar to equation (3). Here, however, the dependent variable is the percent change in the implied volatility over the three days after the earnings announcement from the day of the earnings announcement (our conclusions are not altered using the 15-day post-announcement volatility change). We include in the regression the earnings day change in implied volatility as a control variable. Results are reported in Table 8.

[Insert Table 8.]

It is evident from Table 8 that the firm-quarters identified with guidance (regardless of the news contained in the forecast) have larger post-earnings announcement *decreases* in volatility than firm-quarters without guidance. Stated differently, guidance is associated with subsequent lower implied volatility than non-guidance. This result holds after controlling for positive, negative and neutral earnings news, and the change in volatility levels leading up to the earnings release. The clear message is that bundling guidance with earnings announcement is associated with larger decreases in post-earnings announcement volatility than unbundled earnings releases.

5. Conclusion

In this study, we consider the interplay between guidance and volatility. Motivation for this investigation comes from the tension between managers' claims that a major reason for earnings guidance is to arrest share price volatility and recent academic evidence suggesting that guidance increases volatility (at least for those guidance events not associated with earnings announcements). As the large majority of guidance cases currently are released with the quarterly earnings announcements, we focus our study on cases of bundled earnings guidance.

Consistent with the notion that volatility does indeed factor into managers' decisions to provide earnings guidance, we first show that the likelihood of bundling a forecast with the firm's earnings announcement in a given quarter increases following a spike in volatility. This association does not seem to be well-explained by an alternative hypothesis that the volatility spike is due to the market anticipating the additional news in a bundled earnings announcement. Thus, an increase in volatility prior to the earnings announcement appears to induce managers to provide guidance along with the earnings announcement.

And what happens to share volatility after the guidance release? First, we find no evidence that the decision to guide in a given quarter increases volatility. In fact, our evidence indicates that the drop in volatility on the day of the earnings release for bundled earnings releases is no different than that of unbundled announcements and, in the post-announcement days, the volatility decrease associated with earnings-guidance bundled releases is greater than that of unbundled ones. Consistent with managers' perceptions, guidance appears to arrest share volatility.

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Appendix A ■ Variable definitions

We assemble a sample of 107,307 firm-quarter observations for the period of 2001 through 2010 with available Compustat, CRSP, I/B/E/S and First Call data. In tests that require the use of implied volatility data (obtained from the standardized options dataset in OptionMetrics), the sample includes 72,123 firm-quarter observations. We winsorize all continuous firm-quarter observations at the 1% and 99% levels. All regressions include industry fixed effects, which we code based on 2-digit SIC codes.

guide	An indicator variable set to 1 if the firm provided an earnings forecast during the 5-day window surrounding the report date of quarterly earnings.
negative_fnews	An indicator variable set to 1 if **bundled=1** and the bundled forecast estimate is less than the pre-forecast prevailing median analyst estimates.
positive_fnews	An indicator variable set to 1 if **bundled=1** and the bundled forecast estimate is greater than the pre-forecast prevailing median analyst estimates.
neutral_fnews	An indicator variable set to 1 if **bundled=1** and the bundled forecast estimate is equal to the pre-forecast prevailing median analyst estimates.
cond_fnews	We also code indicator variables based on Rogers and Van Buskirk (2012)'s approach to calculating conditional forecast news. Specifically, **negative_cond_fnews** (**positive_cond_fnews**) is an indicator variable set to 1 if the forecast news, conditional on expected analyst forecast revisions, is negative (positive).
guide_cqtr	An indicator variable set to 1 if the firm previously provided earnings guidance for the current quarter's earnings.
guide_history	An indicator variable set to 1 if the firm had supplied at least one piece of earnings guidance in the First Call data prior to the 5-day window surrounding the current quarter's earnings announcement.
silent_12q	An indicator variable set to 1 if the firm provided no earnings guidance in the prior 12 quarters. (We also consider 4 and 8 quarters in our analyses.)
guide_prior	An indicator variable set to 1 if the firm issued an earnings forecast during the 5-day window surrounding the report date of quarterly earnings last quarter.
guide_sqly	An indicator variable set to 1 if the firm issued an earnings forecast during the 5-day window surrounding the report date of quarterly earnings same quarter of last year.
prop_guide_prior	The proportion of the previous 4 quarters that included an earnings forecast during the 5-day window surrounding the report date of quarterly earnings.
surprise	Actual earnings minus the prevailing median analyst estimates, deflated by stock price 3 trading days prior to the report date of quarterly earnings.
p_surprise	An indicator variable set to 1 if this quarter's earnings surprise exceeds +0.0001.
n_surprise	An indicator variable set to 1 if this quarter's earnings surprise falls below -0.0001.
loss	An indicator variable set to 1 if actual earnings is less than 0.
dispersion	The standard deviation of prevailing analyst estimates for the current period's earnings.
prior_ret	The cumulative stock return over the 90-day period ending 3 trading days prior to the report date of quarterly earnings.
mve	The market value of equity (i.e., price multiplied by shares outstanding) measured 3 trading days prior to the report date of quarterly earnings.
numest	The number of analysts with outstanding estimates 3 trading days prior to the report date of quarterly earnings.
propmb	The proportion of the previous 4 quarters that the firm's reported earnings met or

	exceeded analysts' prevailing median consensus estimates.
svol_level	The standard deviation of daily stock returns over the 90-day period ending 3 trading days prior to the report date of quarterly earnings.
ivol_level	The average level of implied volatility (**ivol**) for a 30-day duration, at-the-money option in the 5 trading days prior to the report date of quarterly earnings.
Δivol_pre15d	The natural logarithm of the ratio of **ivol** measured at the close of the day prior to the report date of quarterly earnings to **ivol** measured 15 days prior to the report date of quarterly earnings (i.e., the change in ivol in the 15 days prior to the earnings release).
Δivol_pre3d	The natural logarithm of the ratio of **ivol** measured at the close of the day prior to the report date of quarterly earnings to **ivol** measured 3 days prior to the report date of quarterly earnings (i.e., the change in ivol in the 3 days prior to the earnings release).
Δivol_rdq	The natural logarithm of the ratio of **ivol** measured at the close of the report date of quarterly earnings to **ivol** measured at the close of the day prior to the report date of quarterly earnings (i.e., the change in ivol on the day of the earnings release).
Δivol_post3d	The natural logarithm of the ratio of **ivol** measured 3 days after the report date of quarterly earnings to **ivol** measured as of the close of the report date of quarterly earnings (i.e., the change in ivol in the 3 days following the earnings release).
Δivol_post15d	The natural logarithm of the ratio of **ivol** measured 15 days after the report date of quarterly earnings to **ivol** measured as of the close of the report date of quarterly earnings (i.e., the change in ivol in the 15 days following the earnings release).
vix_level	The level of the Chicago Board Options Exchange Volatility Index on the report date of quarterly earnings.
Δvix	The natural logarithm of the ratio of **vix_level** measured 1 day after the earnings announcement to the **vix_level** measured 1 day prior to the earnings announcement.

Table 1 ■ Descriptive statistics

The sample consists of 107,307 firm-quarter observations from 2001 through 2010. Panel A provides descriptive statistics for the full sample, while Panel B provides descriptive statistics for the full sample partitioned based on the presence of an earnings forecast during the 5-day window surrounding the announcement of earnings. In Panel B, •••,••,• denote instances where the two subsamples differ significantly at the 1%, 5%, and 10% level, respectively, for two-tailed tests. Please refer to the Appendix for variable definitions.

Panel A: Full sample (*n*=107,307)

	Mean	Median	Min	Q1	Q3	Max
guide	0.307	0	0	0	1	1
silent_12q	0.560	1	0	0	1	1
guide_cqtr	0.269	0	0	0	1	1
guide_prior	0.310	0	0	0	1	1
surprise	-0.006	0.000	-68.724	-0.001	0.002	7.146
p_surprise	0.581	1	0	0	1	1
n_surprise	0.305	0	0	0	1	1
loss	0.201	0	0	0	0	1
dispersion	0.032	0.014	0.000	0.003	0.034	0.382
prior_ret	0.033	0.040	-0.796	-0.079	0.152	0.851
mve ($mil)	4.701	0.778	0.001	0.262	2.614	522.711
numest	5.482	4.000	1.000	2.000	7.000	43.000
propmb	0.702	0.750	0.000	0.500	1.000	1.000

Panel B: Full sample, partitioned based on bundled earnings guidance (guide)

	guide=0 (*n*=74,397)			guide=1 (*n*=32,910)			Differences	
	Mean	Median	Std. Dev.	Mean	Median	St. Dev.	Mean	Median
silent_12q	0.782	1	0.413	0.061	0	0.239	•••	•••
guide_cqtr	0.114	0	0.317	0.620	1	0.485	•••	•••
guide_prior	0.086	0	0.281	0.816	1	0.388	•••	•••
surprise	-0.010	0.000	0.379	0.001	0.001	0.034	•••	•••
p_surprise	0.542	1	0.498	0.671	1	0.470	•••	•••
n_surprise	0.354	0	0.478	0.194	0	0.395	•••	•••
loss	0.253	0	0.435	0.083	0	0.277	•••	•••
dispersion	0.036	0.014	0.064	0.022	0.013	0.036	•••	•••
prior_ret	0.035	0.040	0.252	0.029	0.039	0.209	•••	•••
mve	3.775	0.594	15.519	6.796	1.355	21.981	•••	•••
numest	5.034	3.000	4.989	6.495	5.000	5.314	•••	•••
propmb	0.655	0.750	0.287	0.808	0.750	0.230	•••	•••

Table 2 ■ Correlations

The sample consists of 107,307 firm-quarter observations from 2001 through 2010. We present Pearson (Spearman) correlations below (above) the diagonal. Please refer to the Appendix for variable definitions.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
[1] silent_12q	1	-0.55	-0.76	0.19	0.03	0.01	-0.21	-0.19	-0.25	0.12	0.13	-0.05	-0.03	0.01	0.09	0.09
[2] guide_cqtr	-0.55	1	0.61	-0.21	-0.08	-0.03	0.14	0.15	0.25	-0.03	-0.03	0.03	0.02	0.02	-0.08	-0.09
[3] guide_prior	-0.76	0.61	1	-0.20	-0.02	-0.01	0.23	0.18	0.26	-0.15	-0.15	0.05	0.03	-0.02	-0.09	-0.08
[4] |surprise|	0.12	-0.11	-0.14	1	0.12	0.01	-0.36	-0.21	-0.27	0.32	0.28	-0.06	-0.02	0.00	0.03	0.06
[5] dispersion	0.11	-0.11	-0.11	0.19	1	-0.02	0.31	0.57	-0.05	-0.02	-0.02	-0.03	-0.02	-0.07	0.04	0.05
[6] prior_ret	0.01	-0.04	-0.01	-0.03	-0.03	1	0.06	-0.03	0.00	-0.04	-0.12	-0.07	-0.01	0.02	0.01	0.04
[7] mve	-0.07	0.05	0.08	-0.07	0.04	0.00	1	0.56	0.24	-0.46	-0.55	0.03	0.01	-0.13	-0.02	0.00
[8] numest	-0.15	0.13	0.15	-0.12	0.18	-0.04	0.33	1	0.19	-0.10	-0.12	0.02	0.00	-0.04	-0.07	-0.05
[9] propmb	-0.25	0.25	0.25	-0.22	-0.12	0.00	0.09	0.17	1	-0.10	-0.09	0.04	0.02	0.00	-0.08	-0.08
[10] svol_level	0.12	-0.04	-0.14	0.42	0.09	-0.03	-0.13	-0.08	-0.13	1	0.87	-0.10	-0.06	0.07	-0.01	-0.04
[11] ivol_level	0.13	-0.03	-0.15	0.25	0.06	-0.16	-0.20	-0.09	-0.11	0.76	1	-0.01	-0.06	0.03	-0.06	-0.11
[12] Δivol_pre15d	-0.04	0.02	0.04	-0.03	-0.03	-0.08	0.01	0.01	0.03	-0.09	0.02	1	0.48	-0.25	-0.11	-0.11
[13] Δivol_pre3d	-0.03	0.01	0.03	-0.02	-0.02	-0.01	0.00	0.00	0.01	-0.05	-0.05	0.50	1	-0.26	-0.06	-0.07
[14] Δivol_rdq	0.01	0.01	-0.02	0.02	-0.03	0.01	-0.04	-0.03	0.00	0.04	0.01	-0.32	-0.31	1	-0.38	-0.37
[15] Δivol_post3d	0.08	-0.07	-0.08	0.03	0.04	0.01	0.00	-0.06	-0.06	0.02	-0.04	-0.11	-0.07	-0.44	1	0.65
[16] Δivol_post15d	0.08	-0.09	-0.08	0.03	0.05	0.02	0.01	-0.04	-0.07	-0.01	-0.08	-0.11	-0.07	-0.42	0.67	1

Table 3 ■ Volatility and earnings news

The sample consists of 107,307 firm-quarter observations from 2001 through 2010. Panel A provides descriptive statistics for the full sample, while Panel B provides descriptive statistics for the full sample partitioned based on the presence of an earnings forecast during the 5-day window surrounding the announcement of earnings. Panel C provides descriptive statistics for the subsample of observations where firms have supplied bundled guidance at some time during the past 12 quarters, partitioned based on bundled guidance versus non-bundled guidance quarters. Panel D displays the median value for further partitions of the sample based on the sign of earnings news supplied in the earnings release. ◆ denotes instances where availability of OptionMetrics data reduces sample size to 72,123. In Panels B, C and D, •••,••,• denote instances where the two subsamples differ significantly at the 1%, 5%, and 10% level, respectively, for two-tailed tests. Please refer to the Appendix for variable definitions.

Panel A: Full sample (*n*=107,307)

	Mean	Median	Q1	Q3
svol_level	0.030	0.025	0.017	0.036
ivol_level◆	0.490	0.442	0.326	0.606
Δivol_pre15d◆	0.030	0.021	-0.061	0.114
Δivol_pre3d◆	0.018	0.012	-0.040	0.072
Δivol_rdq◆	-0.025	-0.018	-0.096	0.047
Δivol_post3d◆	-0.061	-0.044	-0.139	0.027
Δivol_post15d◆	-0.066	-0.059	-0.167	0.038
vix_level	0.223	0.205	0.150	0.254

Panel B: Full sample, partitioned based on bundled earnings guidance (guide)

	guide=0 (*n*=74,397)			guide=1 (*n*=32,910)			Differences	
	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median
svol_level	0.032	0.026	0.022	0.026	0.022	0.015	•••	•••
ivol_level◆	0.514	0.468	0.235	0.448	0.408	0.199	•••	•••
Δivol_pre15d◆	0.023	0.015	0.190	0.042	0.032	0.162	•••	•••
Δivol_pre3d◆	0.016	0.010	0.115	0.022	0.017	0.108	•••	•••
Δivol_rdq◆	-0.023	-0.017	0.167	-0.028	-0.019	0.161	•••	•••
Δivol_post3d◆	-0.051	-0.037	0.179	-0.080	-0.058	0.174	•••	•••
Δivol_post15d◆	-0.054	-0.050	0.208	-0.086	-0.073	0.193	•••	•••
vix_level	0.225	0.207	0.105	0.217	0.198	0.106	•••	•••

Panel C: Recent guidance subsample, partitioned based on bundled guidance (guide)

	guide=0 (*n*=16,251)			guide=1 (*n*=30,917)			Differences	
	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median
svol_level	0.031	0.026	0.020	0.025	0.022	0.014	•••	•••
ivol_level◆	0.503	0.458	0.232	0.442	0.403	0.195	•••	•••
Δivol_pre15d◆	0.027	0.018	0.187	0.043	0.033	0.161	•••	•••
Δivol_pre3d◆	0.019	0.012	0.113	0.023	0.017	0.108	•••	•••
Δivol_rdq◆	-0.021	-0.013	0.166	-0.029	-0.020	0.161	•••	•••
Δivol_post3d◆	-0.062	-0.043	0.178	-0.081	-0.059	0.173	•••	•••
Δivol_post15d◆	-0.071	-0.062	0.208	-0.087	-0.075	0.198	•••	•••
vix_level	0.221	0.203	0.098	0.217	0.195	0.108	•••	•••

Table 3 ■ Volatility and earnings news (continued)

Panel D: Full sample, partitioned based on nature of earnings news

	***Earnings news* =**								
	Negative (*n*=32,701)			Neutral (*n*=12,223)			Positive (*n*=62,383)		
	guide=1 (*n*=6,387)	guide=0 (*n*=26,314)		guide=1 (*n*=4,456)	guide=0 (*n*=7,767)		guide=1 (*n*=22,067)	guide=0 (*n*=40,316)	
svol_level	0.022	0.028	•••	0.022	0.026	•••	0.022	0.025	•••
ivol_level	0.410	0.490	•••	0.408	0.459	•••	0.407	0.458	•••
Δivol_pre15d◆	0.029	0.013	•••	0.035	0.019	•••	0.033	0.016	•••
Δivol_pre3d◆	0.015	0.009	•••	0.017	0.011	•••	0.017	0.010	•••
Δivol_rdq◆	-0.014	-0.013		-0.012	-0.009	•	-0.022	-0.020	••
Δivol_post3d◆	-0.047	-0.028	•••	-0.051	-0.036	•••	-0.063	-0.041	•••
Δivol_post15d◆	-0.064	-0.040	•••	-0.073	-0.059	•••	-0.076	-0.054	
vix_level	0.196	0.208	•••	0.195	0.205	•••	0.199	0.207	•••

Table 4 ■ Volatility and forecast news

The sample consists of 107,307 firm-quarter observations from 2001 through 2010. This table supplies median values of volatility level and changes surrounding the report date of quarterly earnings for the full sample partitioned based on the presence of a bundled forecast and the nature of both the earnings and forecast news. ◆ denotes instances where availability of OptionMetrics data reduces sample size to 72,123. Please refer to the Appendix for variable definitions.

	Earnings news =											
	Negative (*n*=32,701)				Neutral (*n*=12,223)				Positive (*n*=62,383)			
	guide =1			guide =0	guide =1			guide =0	guide =1			guide =0
Forecast news =	Neg.	Neut.	Pos.	None	Neg.	Neut.	Pos.	None	Neg.	Neut.	Pos.	None
***n*=**	*3,940*	*1,383*	*1,064*	*26,314*	*2,550*	*1,131*	*775*	*7,767*	*10,724*	*4,940*	*6,403*	*40,316*
	12%	*4%*	*3%*	*81%*	*21%*	*9%*	*6%*	*64%*	*17%*	*8%*	*10%*	*65%*
svol_level	0.022	0.023	0.020	0.028	0.023	0.024	0.021	0.026	0.022	0.023	0.021	0.025
ivol_level◆	0.417	0.423	0.369	0.490	0.417	0.416	0.374	0.459	0.411	0.417	0.390	0.458
Δivol_pre15d◆	0.028	0.029	0.033	0.013	0.035	0.033	0.037	0.019	0.030	0.029	-0.039	0.016
Δivol_pre3d◆	0.014	0.017	0.013	0.009	0.018	0.017	0.013	0.011	0.016	0.017	0.019	0.010
Δivol_rdq◆	-0.014	-0.005	-0.022	-0.013	-0.014	-0.008	-0.011	-0.009	-0.023	-0.014	-0.027	-0.020
Δivol_post3d◆	-0.048	-0.050	-0.044	-0.028	-0.051	-0.053	-0.051	-0.036	-0.065	-0.062	-0.063	-0.041
Δivol_post15d◆	-0.067	-0.061	-0.054	-0.040	-0.074	-0.074	-0.062	-0.059	-0.077	-0.080	-0.074	-0.054
vix_level	0.201	0.182	0.186	0.208	0.202	0.187	0.190	0.205	0.203	0.193	0.195	0.207

Table 5 ■ Does volatility affect the likelihood of supplying a forecast?

The sample consists of 107,307 firm-quarter observations from 2001 through 2010; the availability of OptionMetrics data reduces sample size to 72,123 in some specifications. In specification [4], Δivol_pre = Δivol_pre3d. In specifications [5] and [6], Δivol_pre = Δivol_pre15d. In specification [6], the sample is limited to observations where firms have supplied bundled guidance at some time during the past 12 quarters. •••,••,• denote significance at the 1%, 5%, and 10% level, respectively, for two-tailed tests. Please refer to the Appendix for variable definitions

		Dependent variable = guide. Marginal effect (*p*-value below)											
		[1]		[2]		[3]		[4]		[5]		[6]	
guide_cqtr	+	0.083	•••	0.084	•••	0.085	•••	0.055	•••	0.055	•••	0.071	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001	
guide_prior	+	0.313	•••	0.312	•••	0.343	•••	0.213	•••	0.213	•••	0.328	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001	
p_surprise	+	0.012	•••	0.012	•••	0.016	•••	0.016	•••	0.015	•••	0.026	•••
		<.0001		<.0001		0.001		<.0001		<.0001		<.0001	
n_surprise	–	-0.005		-0.006	•	0.002		0.003		0.002		-0.003	
		0.169		0.079		0.693		0.404		0.674		0.702	
|surprise|	–	-0.470	•••	-0.292	•••	-0.404	•••	-0.634	•••	-0.582	•••	-0.861	•••
		<.0001		0.0003		0.005		<.0001		<.0001		0.0003	
loss	–	-0.051	•••	-0.046	•••	-0.057	•••	-0.051	•••	-0.050	•••	-0.082	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001	
dispersion	–	-0.200	•••	-0.190	•••	-0.210	•••	-0.158	•••	-0.155	•••	-0.190	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		0.0004	
prior_ret	?	-0.009	••	-0.009	••	-0.027	•••	-0.029	•••	-0.027	•••	-0.061	•••
		0.034		0.046		<.0001		<.0001		<.0001		<.0001	
log(mve)	+	0.012	•••	0.010	•••	0.008	•••	0.008	•••	0.008	•••	0.015	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001	
log(numest)	+	0.005	•••	0.007	•••	0.003		-0.003	•	-0.002		-0.006	••
		0.001		<.0001		0.299		0.067		0.138		0.036	
propmb	+	0.055	•••	0.056	•••	0.059	•••	0.051	•••	0.049	•••	0.061	•••
		<.0001		<.0001		<.0001		<.0001		<.0001		<.0001	
year	?	-0.004	•••	-0.004	•••	-0.005	•••	-0.003	•••	0.003	•••	-0.005	•••
		<.0001		<.0001		<.0001		<.0001		0.001		<.0001	
svol_level	–			-0.643	•••								
				<.0001									
ivol_level	–					-0.049	•••	-0.028	•••	-0.032	•••	-0.106	•••
						<.0001		0.0003		<.0001		<.0001	
Δivol_pre	+							0.027	••	0.052	•••	0.085	•••
								0.022		<.0001		<.0001	
silent_12q	–							-0.198	•••	-0.197	•••		
								<.0001		<.0001			
Δivol_pre ∗silent_12q	–							-0.059	••	-0.059	•••		
								0.013		<.0001			
Industry controls		Yes		Yes		Yes		Yes		Yes		Yes	
VIX controls		No		Yes		Yes		Yes		Yes		Yes	
n		107,307		107,307		72,123		72,123		72,123		47,168	
Pseudo R^2		63.3%		63.4%		63.9%		67.7%		67.6%		33.8%	
ROC area		0.920		0.920		0.916		0.928		0.929		0.795	

Table 6 ■ Is the run-up in volatility related to the market's expectation of guidance?

The sample consists of 107,307 firm-quarter observations from 2001 through 2010; the availability of OptionMetrics data reduces sample size to 72,123 in some specifications.

Panel A: Recent guidance subsample, partitioned based on whether they bundled guidance in the same quarter of last year (guide_sqly)

	guide=0 (n=16,251)			guide=1 (n=30,917)		
	Mean	Median	St. Dev.	Mean	Median	St. Dev.
No expectation of guidance this quarter (guide_sqly=0)						
Δivol_pre15d	0.029	0.019	0.183	0.043	0.031	0.169
Δivol_pre3d	0.019	0.012	0.112	0.024	0.015	0.112
Expectation of guidance this quarter (guide_sqly=1)						
Δivol_pre15d	0.023	0.015	0.195	0.043	0.035	0.157
Δivol_pre3d	0.018	0.012	0.116	0.022	0.018	0.105
Differences						
Δivol_pre15d	0.006	0.004		0.000	-0.004•	
Δivol_pre3d	0.001	0.000		0.002	-0.003	

Panel B: Pearson correlation among run-up in volatility and the market's expectation of guidance

	prop_guide_prior	guide_prior	guide_sqly	Δivol_pre15d	Δivol_pre3d
prop_guide_prior	1				
guide_prior	0.676	1			
guide_sqly	0.565	0.222	1		
Δivol_pre15d	0.019	0.019	0.005	1	
Δivol_pre3d	0.014	0.013	-0.001	0.504	1

Table 7 ■ What explains changes in volatility on the date of earnings announcements?

The sample consists of 107,307 firm-quarter observations from 2001 through 2010; the availability of OptionMetrics data reduces sample size to 72,123 in some specifications. ◆ Results are robust to categorizing forecast news based on conditional analyst forecast revisions, as described in Rogers and Van Buskirk (2012). •••,••,• denote significance at the 1%, 5%, and 10% level, respectively, for two-tailed tests. Please refer to the Appendix for variable definitions.

		Dependent variable = Δivol_rdq. Coefficient (*p*-value below)											
Earnings news =		**Negative** (*n*=32,701)				**Neutral** (*n*=12,223)				**Positive** (*n*=62,383)			
		[1]		[2]		[3]		[4]		[5]		[6]	
|surprise|	+	0.142 0.010	•••	0.143 0.010	••					0.087 0.244		0.092 0.221	
guide	?	0.0013 0.385				-0.002 0.539				0.001 0.799			
negative_fnews◆	?			0.003 0.331				-0.003 0.436				-0.002 0.299	
positive_fnews◆	?			-0.006 0.279				-0.007 0.261				-0.003 0.277	
neutral_fnews◆	?			0.008 0.171				0.004 0.452				0.011 0.001	•••
log(mve)	–	-0.014 <.0001	•••	-0.014 <.0001	•••	-0.015 <.0001	•••	-0.015 <.0001	•••	-0.017 <.0001	•••	-0.017 <.0001	•••
log(numest)	–	0.001 0.488		0.001 0.492		0.007 0.002	•••	0.007 0.002	•••	0.009 <.0001	•••	0.009 <.0001	•••
dispersion	–	-0.075 <.0001	•••	-0.074 <.0001	•••	-0.178 0.001	•••	-0.176 0.001	•••	-0.088 <.0001	•••	-0.088 <.0001	•••
log(Δvix)	+	0.166 <.0001	•••	0.166 <.0001	•••	0.130 <.0001	•••	0.130 <.0001	•••	0.149 <.0001	•••	0.149 <.0001	•••
vix	+	0.111 <.0001	•••	0.111 <.0001	•••	0.099 <.0001	•••	0.099 <.0001	•••	0.078 <.0001	•••	0.076 <.0001	•••
ivol_level	?	-0.091 <.0001	•••	-0.091 <.0001	•••	-0.071 <.0001	•••	-0.072 <.0001	•••	-0.083 <.0001	•••	-0.084 <.0001	•••
Δivol_pre3d	–	-0.471 <.0001	•••	-0.471 <.0001	•••	-0.420 <.0001	•••	-0.420 <.0001	•••	-0.452 <.0001	•••	-0.452 <.0001	•••
Industry controls		Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted R^2		13.4%		13.4%		12.2%		12.2%		12.8%		12.8%	

Table 8 ■ What explains changes in volatility following earnings announcements?

The sample consists of 107,307 firm-quarter observations from 2001 through 2010; the availability of OptionMetrics data reduces sample size to 72,123 in some specifications. ◆ Results are robust to categorizing forecast news based on conditional analyst forecast revisions, as described in Rogers and Van Buskirk (2012). •••,••,• denote significance at the 1%, 5%, and 10% level, respectively, for two-tailed tests. Please refer to the Appendix for variable definitions.

		Dependent variable = Δivol_post. Coefficient (*p*-value below)											
Earnings news =		**Negative** (*n*=32,701)				**Neutral** (*n*=12,223)				**Positive** (*n*=62,383)			
		[1]		[2]		[3]		[4]		[5]		[6]	
|surprise|	+	0.189 <.0001	•••	0.190 <.0001	•••					0.187 0.009	•••	0.044 0.541	
guide	?	-0.016 <.0001	•••			-0.016 <.0001	•••			-0.020 <.0001	•••		
negative_fnews◆	?			-0.013 <.0001	•••			-0.014 0.001	•••			-0.019 <.0001	•••
positive_fnews◆	?			-0.024 <.0001	•••			-0.029 <.0001	•••			-0.019 <.0001	•••
neutral_fnews◆	?			-0.017 0.002	•••			-0.011 0.039	••			-0.012 <.0001	•••
log(mve)	–	-0.011 <.0001	•••	-0.011 <.0001	•••	-0.014 <.0001	•••	-0.014 <.0001	•••	-0.013 <.0001	•••	-0.011 <.0001	•••
log(numest)	–	-0.005 0.004	•••	-0.005 0.003	•••	-0.004 0.039	•••	-0.005 0.035	•••	-0.009 <.0001	•••	-0.009 <.0001	•••
dispersion	–	-0.029 0.100	•	-0.028 0.099	•	-0.113 0.026	•••	-0.111 0.030	•••	-0.001 0.954		0.014 0.325	
log(Δvix)	+	0.188 <.0001	•••	0.188 <.0001	•••	0.186 <.0001	•••	0.186 <.0001	•••	0.182 <.0001	•••	0.197 <.0001	•••
vix	+	0.114 <.0001	•••	0.114 <.0001	•••	0.185 <.0001	•••	0.186 <.0001	•••	0.169 <.0001	•••	0.157 <.0001	•••
ivol_level	?	-0.090 <.0001	•••	-0.090 <.0001	•••	-0.107 <.0001	•••	-0.108 <.0001	•••	-0.111 <.0001	•••	-0.085 <.0001	•••
Δivol_pre3d	–	-0.374 <.0001	•••	-0.374 <.0001	•••	-0.357 <.0001	•••	-0.357 <.0001	•••	-0.360 <.0001	•••	-0.264 <.0001	•••
Δivol_rdq	–	-0.557 <.0001	•••	-0.557 <.0001	•••	-0.557 <.0001	•••	-0.558 <.0001	•••	-0.592 <.0001	•••	-0.607 <.0001	•••
Industry controls		Yes		Yes		Yes		Yes		Yes		Yes	
Adjusted R^2		25.7%		25.7%		26.9%		27.0%		31.5%		33.5%	