12-2021

Bundled earnings guidance and analysts' forecast revisions

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Citation

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ABSTRACT

Bundling managerial earnings guidance with quarterly earnings announcements (EAs) has become an increasingly common practice. This study investigates the impact of bundled guidance on analysts' forecast revisions. Our findings indicate that analysts respond more to bundled guidance than non-bundled guidance. This effect increases with analysts' time pressure and cognitive constraints around the EA. Analysts' revisions also incorporate more of the bundled management guidance when accompanied by additional information, such as conference calls. We further find that analysts revise their forecasts more quickly following bundled guidance than non-bundled guidance. Together, these findings are consistent with the notion that analysts place more weight on bundled guidance than on non-bundled guidance in their forecast revisions as bundled guidance facilities analysts' timely forecast revisions following EAs. Finally, we find that analysts' forecast revisions following bundled guidance generate significant market reactions. Our findings enhance our understanding of analysts' information processing and shed light on why bundling can be an effective guidance strategy.

Keywords: bundled guidance, management forecast, analyst forecast, earnings announcement, timely forecast, information processing

Jumelage des indications concernant les bénéfices et révisions des prévisions des analystes

RÉSUMÉ

Le jumelage des indications des gestionnaires concernant les bénéfices aux annonces de bénéfices trimestriels est une pratique de plus en plus courante. La présente étude se penche sur l'impact de ce jumelage sur les révisions des prévisions des analystes. Nos résultats indiquent que les analystes réagissent davantage aux indications jumelées qu'à celles non jumelées. Cet effet augmente parallèlement aux contraintes temporelles et cognitives que subissent les analystes en lien avec les annonces de bénéfices trimestriels. De plus, les révisions des analystes intègrent davantage d'indications jumelées lorsqu'elles s'accompagnent de sources d'information additionnelles, comme

des conférences téléphoniques. Nous montrons aussi que les analystes révisent leurs prévisions plus rapidement lorsque les indications sont jumelées que lorsqu'elles ne le sont pas. Collectivement, ces résultats sont conformes à la notion selon laquelle les analystes accordent plus de poids aux indications jumelées qu'aux indications non jumelées lorsqu'ils révisent leurs prévisions, car les indications jumelées facilitent la présentation en temps opportun de ces révisions à la suite des annonces de bénéfices trimestriels. Enfin, nous établissons que les révisions de leurs propres prévisions par les analystes sur la base d'indications jumelées suscitent d'importantes réactions sur le marché. Nos résultats améliorent notre compréhension du traitement de l'information par les analystes et des raisons pour lesquelles le jumelage peut se révéler une stratégie efficace pour la présentation des indications.

1. Introduction

Financial analysts are important information intermediaries in capital markets. The market makes wide use of their consensus earnings estimates to assess a firm's performance. Given the market influence of financial analysts, managers have an incentive to issue earnings guidance that helps a firm's analysts update their earnings expectations (e.g., Ajinkya and Gift 1984; McNichols 1989). Firms have commonly issued earnings guidance *at the time of an earnings announcement* (EA), in a practice that has been termed "bundled guidance" (e.g., Anilowski et al. 2007). Although this disclosure practice has generated considerable interest in the accounting literature (see Rogers and Van Buskirk 2013), its economic consequences for financial analysts are still not well understood. To shed light on this issue, we investigate whether bundling (i.e., issuing a firm's guidance at the time of its EA) affects the weight financial analysts place on managerial guidance in revising their own earnings forecasts.[1] We also explore the mechanisms of how bundling influences analysts' forecast revisions, and examine how investors value the analysts' forecast revisions following bundled guidance as opposed to non-bundled guidance.

We posit that analysts respond more to the news in bundled guidance than in non-bundled guidance when revising their earnings forecasts for three reasons: (i) time pressure, (ii) cognitive constraints, and (iii) disclosure credibility. First, prior studies suggest that it is important for analysts to quickly issue forecast revisions around EAs (e.g., Guttman 2010; Keskek et al. 2014). Given the importance of issuing a timely forecast after an EA, analysts may face greater time pressure to process managerial information around EAs than at other times. Bundled guidance, which contains the information most directly related to future earnings, is of great use, and is released during a time when their clients demand timely forecasts ("time pressure" explanation). Second, even if the time pressure is the same for analysts to respond to bundled and non-bundled guidance, many firms tend to issue their EAs within the same short time period, known as the "earnings season" (e.g., Hirshleifer et al. 2009). This suggests that a substantial portion of information reaching analysts arrives in a relatively small window of time. Therefore, analysts may face cognitive constraints in processing information beyond managerial guidance around the time of an EA (e.g., Driskill et al. 2020). Analysts may thus rely heavily on bundled guidance in order to revise their forecasts quickly after an EA ("cognitive constraints" explanation).[2] Third, firms tend to disclose additional information during

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1. We follow prior studies and use the magnitude of analysts' forecast revisions in response to guidance news to measure how closely analysts follow the guidance. See, for example, Rogers and Stocken (2005), Cotter et al. (2006), and Hilary et al. (2014). In this study, we use "guidance" ("forecasts") to represent the estimates on future earnings made by managers (analysts).

2. The "time pressure" and "cognitive constraint" explanations do not necessarily imply that relying more on bundled guidance would lower the usefulness of analysts' forecasts. Extant literature suggests that analysts have incentives to issue timely forecasts around EAs (Guttman 2010; Keskek et al. 2014). All else being equal, a timelier forecast around EAs will enhance an analyst's welfare (Guttman 2010) and create greater stock price reactions (Keskek et al. 2014). In section 5, we examine how investors value analysts' revisions following a bundled guidance as opposed to a non-bundled guidance.

EAs (e.g., Chapman and Green 2018). Such additional disclosure (e.g., information provided in conference calls) may increase the credibility of bundled guidance, leading to a greater response of analysts to bundled guidance ("disclosure credibility" explanation).

Our empirical results are consistent with the predictions. Using managerial quarterly EPS guidance over the 1998–2017 period, we find that bundled guidance, as opposed to non-bundled guidance, is associated with greater analysts' forecast revisions (per unit of guidance news). We obtain our results after adjusting for analysts' reactions to EAs as in Rogers and Van Buskirk (2013). Our results hold when we explicitly control for a number of guidance attributes and firm characteristics including guidance horizon, past guidance accuracy, guidance precision, guidance bias, nature (good vs. bad) of the news, and earnings management. Our results also hold when we adopt an entropy-balancing approach to address the concern that bundled and non-bundled guidance are inherently different in their guidance and firm characteristics.

It is possible that an omitted correlated variable that potentially relates to both analysts' forecast revisions and managers' decisions to issue bundled guidance is driving our results. For example, managers may choose to issue bundled guidance when it is more informative because of the increased attention it will receive at an EA. To address this issue, we follow the Frank (2000) method and find that the possibility of an unobserved confounding variable to significantly affect our results is likely very small. Nevertheless, we find that our inferences do not change if we (i) remove non-bundled guidance around concurrent corporate events, (ii) control for time trend effects that coincide with the increase in popularity of bundled guidance, and (iii) control for prior disclosure policy or firm fixed effects to mitigate potential concerns that our observed effects of bundled guidance could be driven by certain omitted time-invariant firm characteristics. Overall, these results reinforce our inference that analysts place greater weight on bundled guidance than on non-bundled guidance.

To better understand our baseline analyst revision results, we also investigate each of the potential explanations (mechanisms) discussed earlier. First, we expect analysts to rely more on bundled guidance to issue timely forecasts for more salient firms (e.g., larger firms, firms with greater institutional ownership, or firms that attract greater analyst following) since analysts might have more pressure to issue a quick response for these firms. Second, analysts may rely more on bundled guidance when it is costly for them to produce information on their own due to their cognitive constraints (e.g., more EAs clustered on the same day). Third, analysts may place a greater weight on bundled guidance while producing their own forecasts when analysts receive additional concurrent information at an EA (e.g., conference calls and 10-K/10-Q filings) that might verify the information in the earnings guidance. Our empirical results are consistent with the above expectations. Note that the three mechanisms mentioned above are not mutually exclusive. Collectively, they help explain why analysts place a greater weight on bundled guidance than on non-bundled guidance. However, we also note that the economic significance of each mechanism is small.

The limited economic magnitude observed for each mechanism could be due to the difficulty in measuring the underlying constructs (e.g., difficulty in finding exogenous variation in those constructs, or potentially noisy proxies), or the difficulty in fully disentangling the effect of managerial guidance from that of the EA. To mitigate this concern, we examine the bundling effect before versus after the implementation of Regulation Fair Disclosure (Reg FD). Analysts likely face greater time pressure and cognitive constraints during EAs after Reg FD because Reg FD prohibits selective disclosure and analysts might rely more on EAs to obtain and process public information. In addition, analysts might find bundled guidance more credible after Reg FD with more concurrent disclosures (e.g., conference call, 10-K/10-Q) available to help verify the guidance news. Our results show that the bundling effect significantly increases after Reg FD, which is consistent with the idea that the bundling effect is stronger when its underlying mechanisms

are more likely to be present. In addition, the economic significance of Reg FD is much larger than that documented using proxies of each mechanism.[3]

Furthermore, we examine the effects of bundling on the speed of an individual analyst's forecast revision. Our results show that analysts revise their forecasts more quickly after bundled guidance than after non-bundled guidance, which is consistent with the notion that bundling helps analysts issue forecast revisions quickly when they are facing greater time pressure and cognitive constraints, and when they find managerial guidance more credible. Taken together, these additional results enhance our understanding of how bundling facilitates analysts' forecast revisions.

Finally, we address whether investors value analysts' forecast revisions following bundled guidance. Investors may value these timely forecast revisions because they help resolve information uncertainty shortly after an EA. However, investors may discount these forecast revisions if they perceive them as more likely to be piggybacking on managerial guidance. We find that the intraday market return is more sensitive to each unit of analysts' forecast revisions immediately following bundled guidance than to non-bundled guidance. Our results thus suggest that investors do not simply dismiss analysts' revisions as piggybacking. That is, the market benefits of issuing timely revisions following managerial guidance for analysts appear to outweigh the potential costs of possible piggybacking, which is consistent with prior studies that indicate the importance of analysts issuing timely forecasts immediately after EAs (e.g., Guttman 2010; Keskek et al. 2014).

Our study contributes to the literature in several ways. First, we extend the literature on managerial earnings guidance and analysts' forecast revisions. Prior studies examine analysts' revisions as a function of various guidance attributes (e.g., accuracy, precision, horizon, and bias).[4] We add to this literature by investigating the impact of issuing guidance at the time of an EA versus at a different time on analysts' forecast revisions. Our findings indicate that bundling is associated with greater analysts' responses to guidance news and quicker analysts' forecast revisions. We further explore the mechanisms (time pressure, cognitive constraints, and disclosure credibility) that influence the effect of bundling on analysts' revisions. The results of the mechanism analysis enhance our understanding of the role of bundled guidance in facilitating analysts' timely forecast revisions and shed light on factors that influence analysts' information processing around EAs (e.g., Blankespoor et al. 2020; Driskill et al. 2020).

Second, we add to the literature that examines the usefulness of analyst output subsequent to managerial disclosure (e.g., Altınkılıç et al. 2013; Li et al. 2015). Altınkılıç et al. (2013) show that investors, on average, do not react to analysts' forecast revisions following corporate disclosure. Li et al. (2015), on the other hand, find that analysts' recommendation revisions following corporate disclosure continue to generate significant market reaction.[5] Our study extends these prior studies by showing that investors value analysts' timely forecast revisions following bundled guidance.

Importantly, although we document the benefits of bundling to financial analysts, it should be noted that because bundling is determined by various factors (e.g., Skinner 1994; Cheng and Lo 2006; Kothari et al. 2009; Billings and Cedergren 2015), not all firms may find it optimal to issue bundled guidance. The main purpose of this study is to document the incremental positive

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3. It is worth noting that the setting of Reg FD also has its own limitations, such as the disadvantages of not being able to isolate one mechanism from another, the low number of bundled observations before Reg FD (i.e., October 2000), and the potential confounding events such as the Global Analyst Research Settlement (Global Settlement). Global Settlement was an enforcement agreement reached in April 2003 between the SEC and the 10 largest US investment firms to address conflicts of interest between investment banking and analyst research within these firms.

4. See, for example, Baginski et al. (1993), Rogers and Stocken (2005), Hutton and Stocken (2021), Gong et al. (2011), among others.

5. Lobo et al. (2017) find a larger (smaller) earnings response coefficient for EAs accompanied by reinforcing (contradicting) analysts' forecast revisions, and that this effect holds for EAs with or without bundled managerial guidance.

effects of bundling for firms that adopt this disclosure practice. We further note that although we adopt various methods to empirically control for firm characteristics and managerial incentives related to the bundling decision, we cannot fully rule out the possibility that there remains a correlated omitted variable.

2. Bundled guidance and analysts' revisions

Empirical design

We begin our analysis by investigating the impact of bundled guidance on analysts' forecast revisions. We define our key variable of interest, *Bundled*, as being equal to one if the managerial earnings guidance is in the form of bundled guidance and zero otherwise. We define bundled guidance as the earnings guidance issued on the EA date. Conversely, we define non-bundled guidance as managerial earnings guidance that is not issued on the EA date.[6] Note that we exclude the managerial earnings guidance issued after the corresponding fiscal quarter-end but before the EA (so-called "pre-announcements").

To test the effect of bundling on analysts' forecast revisions following managerial guidance, we estimate the following regression:

$$
\begin{aligned}
AFRev = {} & a_0 + a_1 MFNews + a_2 MFNews \times Bundled + a_3 Bundled + \sum a_k Controls \\
& + \sum b_k MFNews \times Controls + \gamma + w + \varepsilon,
\end{aligned} \tag{1}
$$

where *AFRev* represents analysts' forecast revisions following managerial guidance, both of which are for the same future period of earnings. *MFNews* represents managerial guidance news. We define *AFRev* as the difference between the consensus (i.e., mean) analyst forecast issued within five days after the managerial guidance date and the last consensus analyst forecast issued before the managerial guidance date, scaled by the firm's stock price one trading day before the guidance date (Kross et al. 2011; Rogers and Van Buskirk 2013).[7] We use a period of five days to measure *AFRev* and other analyst revision variables because previous studies (e.g., Zhang 2008) find that most analysts revise their forecasts within five days. We define *MFNews* as the difference between managerial guidance and the most recent consensus analyst forecast prior to the guidance date, scaled by the firm's stock price one trading day before the guidance date. Following Rogers and Van Buskirk (2013), we adjust our bundled guidance news (*MFNews*) to mitigate potential measurement error that may be positively correlated with earnings surprise (note that we do not make a similar adjustment for non-bundled guidance news). Essentially, this adjustment helps us obtain a refined consensus analyst forecast that represents analysts' expectations of future earnings immediately after the EA in the absence of bundled guidance. Therefore, by construction, this adjustment filters out the information contained in the actual earnings surprise as well as other supplementary information that is associated with the actual earnings surprise (but not bundled guidance), and hence enables us to obtain a more accurate measure of the *guidance* news contained in the bundled guidance.

Similarly, since our hypothesis focuses on the analyst reaction to *guidance*, rather than the reaction to the EA, we also adjust *AFRev* for any measurement error associated with the actual earnings news on the guidance date. Empirically, we follow Rogers and Van Buskirk (2013) and calculate *AFRev* as the difference between the unadjusted and fitted value of *AFRev*, estimated

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6.   Our main results are similar if we use the measurement window of one or two days around the EA date to define bundled guidance (we provide the details in section 6).

7.   We manually calculate the consensus of revised forecasts based on the analysts' forecasts available. In our main analysis, we set *AFRev* to zero if no analysts issue a revision for a specific firm within five days following the guidance. As a robustness check (reported in section 6), we drop observations where no analysts revise their forecasts within five days after the guidance date and find similar estimation results.

from an overall sample of EAs with no bundled guidance.[8] By doing so, we are able to mitigate the concern that the effect of bundled guidance using unadjusted analyst activities is mechanically driven by analysts' reactions to EAs rather than managerial guidance (Rogers and Van Buskirk 2013). In a similar vein, one of the benefits of testing *AFRev* is that it allows us to more precisely measure analysts' reactions to *each unit of managerial guidance news* (instead of measuring analysts' responses to non-guidance financial information contained in the EA).[9] In equation (1), if bundled guidance is associated with a stronger analyst response than non-bundled guidance, we expect the coefficient a_2 to be positive.

To help isolate the bundling effect from the potential effects of other guidance characteristics, we also control for the importance of guidance news (*AbsMFNews*) (Lipe et al. 1998; Rogers and Stocken 2005), the extent of guidance bias (*MFBias*) (Gong et al. 2011; Hilary et al. 2014), the historical guidance accuracy (*HMFAccu*) (Hutton and Stocken 2021), the sign of the guidance news (*MFBad*) (Rogers et al. 2009), the predicted loss (*MFLoss*) (Hayn 1995; Rogers and Stocken 2005), guidance horizon (*MFHorizon*) (Kasznik 1999; Rogers and Stocken 2005), and guidance precision (*MFWidth*) (Baginski et al. 1993). We further control for several firm characteristics, including discretionary accruals (*DAccrual*) (Rogers and Stocken 2005), the firm's growth opportunities (*Mrk-To-Bk*) (Bamber and Cheon 1998; Rogers and Stocken 2005), and the firm's consistency in meeting analysts' expectations (*MBEStreak*) (Kross et al. 2011). We also estimate an extended model that includes interactions between the current earnings news (*EANews*) and the magnitude of this news (*AbsEANews*), discretionary accruals (*DAccrual*), and firm growth opportunity (*Mrk-To-Bk*) (Rogers and Stocken 2005). Finally, we include the respective interaction terms for *MFNews* and the control variables described in equation (1). All continuous variables are winsorized at the 1st and 99th percentiles. We define all of these control variables in greater detail in Appendix 1.

In all of our analyses, we include both year-quarter (γ) and industry (w) fixed effects based on the 48 industry classifications of Fama and French (1997) to account for any intertemporal or cross-industry differences in managerial guidance and firm characteristics beyond the controls we discussed above.[10] Finally, we correct our standard errors for heteroskedasticity as well as the clustering of observations by firm and year-quarter.

Sample selection and summary statistics

To obtain our sample, we use managerial quarterly EPS estimates reported in the I/B/E/S Guidance database over the 1998–2017 period. Starting the sample period in 1998 mitigates the potential missing data issue before 1998 (e.g., Chuk et al. 2013). Next, we retain the point and close-ended range guidance observations and the confirming qualitative guidance observations, as guidance errors are less clearly defined for other forms of guidance such as open-ended or non-confirming qualitative guidance. To determine the numeric value for managerial guidance, we use the value of the point guidance and the midpoint of the range guidance. In cases where the

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8. This method of adjustment is based on the observation that even in the absence of explicit managerial guidance, analysts update their earnings estimates of a firm's future earnings after observing its current period actual earnings. To mitigate the impact of heterogeneity in the consensus analyst response to current earnings news with or without bundled guidance on our *AFRev* estimates, we control for the propensity to issue bundled guidance, thus accounting for potential self-selection (Rogers and Van Buskirk 2013). To make our study more comparable with prior literature, we focus on the consensus analyst forecast instead of individual analysts' forecasts in our main analyses. Adjusting for bundling errors at the individual analyst level would require considering the potential endogeneity issue at both the firm and analyst level and is beyond the scope of our study.

9. In addition, as a robustness check, we run our tests using unadjusted guidance news and unadjusted magnitude of analysts' forecast revisions. The effect of bundling continues to be significant (*p*-value <0.01, untabulated).

10. Our results are robust to further controlling for the interaction terms between industry fixed effects and guidance news and the interaction terms between year-quarter fixed effects and guidance news (*p*-value <0.01, untabulated). Although this approach essentially controls for potential differences in analysts' responses to guidance news across time and industry, it significantly reduces our sample size to 5,183.

TABLE 1
Sampling procedure

Managerial earnings guidance for fiscal quarter-end from January 1998 to December 2017	171,074
Less: Open-ended quantitative guidance or non-confirming qualitative guidance	16,575
Missing actual earnings or the actual earnings date being later than 90 days after the corresponding quarter-end	8,599
Guidance issued after the corresponding fiscal period end but before the EA	11,596
Missing consensus analyst forecast prior to managerial guidance date	22,476
Missing other data in I/B/E/S, Compustat, or CRSP	26,730
Number of guidance observations	85,098

I/B/E/S Guidance code indicates that the guidance value would be at the low (high) end of the range, we use the low (high) end of the range as the guidance value (Hutton et al. 2012). We next match our guidance data with the corresponding earnings and analysts' forecasts reported in I/B/E/S. We also remove firm-quarters with missing actual earnings or actual earnings releases that are issued later than 90 days after the corresponding quarter-end. In addition, we eliminate any guidance observations issued after the corresponding fiscal quarter-end (so-called "pre-announcements"). Finally, we match our guidance data to the other data used in our analyses. We obtain our financial accounting data from Compustat and stock returns data from CRSP.

The above procedures yield a final sample of 85,098 managerial guidance observations, of which 63,852 are classified as bundled guidance and 21,246 as non-bundled guidance. This distribution is consistent with the prevalence of bundled guidance observed in other studies (Anilowski et al. 2007; Rogers and Van Buskirk 2013). Table 1 summarizes our sampling procedure.

After obtaining our sample, we report the yearly distribution of bundled and non-bundled guidance in panel A of Table 2. Consistent with prior studies (e.g., Rogers and Van Buskirk 2013), the percentage of bundled guidance increased over time to roughly 85% in 2017. The lower percentage in 1998–2000 could be attributed to the fact that firms preferred issuing private guidance before Reg FD (Wang 2007).

Next, we calculate the summary statistics for the variables used in our main analyses and provide the univariate comparative statistics for various guidance characteristics across our bundled and non-bundled subsamples in panel B of Table 2. These statistics show that managers who bundle their guidance were, on average, more accurate in the past (*HMFAccu*), but are less precise (*MFWidth*) than their non-bundling counterparts.[11] We also find that the bundled guidance in our sample has a greater percentage of loss forecasts (*MFLoss*) and has a longer horizon (*MFHorizon*). These findings suggest that it is necessary to control for these guidance characteristics in our regression analysis in order to estimate the incremental effect of bundling. Panel C of Table 2 reports the summary statistics of conditioning variables used for the cross-sectional analyses in section 3. We discuss these variables in more detail in section 3.

Main results

Table 3 reports the results from equation (1). Specifically, in column (1), we only control for industry and year-quarter fixed effects. In column (2), we include guidance characteristics in the model. We include firm characteristics in column (3). We find that the coefficient on *MFNews×Bundled* is significant at the less than 1% level and the magnitude remains stable

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11. The term *HMFAccu* represents the historical guidance accuracy, defined as −1 multiplied by the average absolute management forecast error (scaled by stock price of one trading day before the guidance date) over the last two years (prior to the current quarter). Untabulated results further show that, ex post, bundled guidance is more accurate than non-bundled guidance (*p*-value <0.01).

TABLE 2
Sample descriptions

Panel A: Yearly distribution

Year	Bundled = 1		Bundled = 0	
	# of obs.	%	# of obs.	%
1998	38	8.74	397	91.26
1999	100	17.04	487	82.96
2000	194	22.66	662	77.34
2001	1,348	51.33	1,278	48.67
2002	2,560	62.21	1,555	37.79
2003	3,871	70.20	1,643	29.80
2004	4,783	74.12	1,670	25.88
2005	4,625	76.27	1,439	23.73
2006	4,140	76.99	1,237	23.01
2007	4,259	78.70	1,153	21.30
2008	4,492	75.89	1,427	24.11
2009	3,648	77.45	1,062	22.55
2010	3,831	76.73	1,162	23.27
2011	3,749	77.41	1,094	22.59
2012	3,798	79.03	1,008	20.97
2013	3,959	80.65	950	19.35
2014	4,051	80.96	953	19.04
2015	3,726	81.19	863	18.81
2016	3,491	83.76	677	16.24
2017	3,189	85.77	529	14.23
Total	63,852	75.03	21,246	24.97

(The table is continued on the next page.)

TABLE 2 (continued)

Panel B: Summary statistics of key variables

	(1) Overall sample N = 85,098			(2) Bundled = 1 N = 63,852			(3) Bundled = 0 N = 21,246			Differences in means and medians between (1) and (2)	
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median
AFRev	0.006	0.000	0.067	0.013	0.007	0.074	−0.013	0.000	0.027	**0.026**	**0.007**
Bundled	0.750	1.000	0.433								
MFNews	0.027	0.006	0.062	0.036	0.025	0.069	0.001	0.000	0.019	**0.035**	**0.025**
AbsMFNews	0.046	0.027	0.052	0.058	0.042	0.053	0.007	0.001	0.021	**0.051**	**0.041**
MFBad	0.346	0.000	0.476	0.290	0.000	0.454	0.512	1.000	0.500	−0.222	−1.000
HMFBias	0.026	0.023	0.027	0.026	0.022	0.026	0.029	0.025	0.029	−0.003	−0.003
HMFAccu	−0.030	−0.025	0.027	−0.029	−0.024	0.026	−0.031	−0.026	0.030	0.002	0.002
MFLoss	0.059	0.000	0.236	0.062	0.000	0.242	0.050	0.000	0.218	**0.013**	**0.000**
MFHorizon	5.016	4.836	0.673	5.062	4.787	0.589	4.880	4.949	0.863	**0.182**	−0.161
MFWidth	0.131	0.057	0.263	0.141	0.061	0.278	0.098	0.048	0.204	**0.043**	**0.013**
DAccrual	0.003	0.000	0.045	0.004	0.000	0.046	0.002	0.000	0.042	**0.001**	0.000
Mrk-To-Bk	3.607	2.498	3.996	3.628	2.502	3.995	3.543	2.488	3.996	**0.085**	**0.014**
MBEStreak	0.287	0.000	0.452	0.289	0.000	0.453	0.280	0.000	0.449	**0.009**	**0.000**
AFSpeed	−0.187	0.000	0.335	−0.061	0.000	0.179	−0.563	−0.467	0.403	**0.637**	**0.605**

Panel C: Summary statistics of conditioning variables for bundled guidance in the cross-sectional analyses

	Mean	Median	SD	N
Firm size	7.566	7.464	1.637	63,852
Institutional ownership	0.515	0.670	0.392	63,852
Analyst coverage	7.556	6	5.824	63,852
Analyst experience	52.618	47	28.991	63,852
Analyst portfolio size	10.484	10.667	4.994	63,852
Analyst busyness	0.062	0	0.143	63,852

(The table is continued on the next page.)

TABLE 2 (continued)

Panel C: Summary statistics of conditioning variables for bundled guidance in the cross-sectional analyses

	Mean	Median	SD	N
Conference call	0.789	1	0.408	63,852
10-K/Q filing	0.143	0	0.350	63,852
Length of 8-K filing	9,303.518	3,876	32,146.590	48,646

Notes: This table presents descriptive statistics for the bundled and non-bundled guidance used in our study. Panel A reports the yearly distribution of our sample. Panel B reports the summary statistics of variables used in our main analyses. We indicate results in bold if significant at the 5% level. Panel C reports the summary statistics of variables used for partitioning bundled guidance in the cross-sectional analyses. *Firm size* is measured as the natural logarithm of market capitalization at the end of the last quarter. *Institutional ownership* is measured by percentage of shares owned by institutional investors at the end of the last quarter. *Analyst coverage* is measured by the number of analysts following a firm. *Analyst experience* is measured by the average experience of analysts following a firm, where an analyst's experience is calculated as the number of quarters for which the analyst has issued forecasts up to the current quarter. *Analyst portfolio size* is the size of the analyst coverage portfolio, measured by the average number of firms covered by analysts who follow a firm in a given quarter. *Analyst busyness* during EA, measured as the number of busy analysts, that is, analysts who have more than three EAs issued by firms (including the focal firm) in their portfolios on the same day, divided by the total number of analysts following the focal firm. *Conference call* is an indicator variable equal to one if a bundled guidance is issued on the same day of a conference call, and zero otherwise. *10-K/Q filing* is an indicator variable equal to one if a bundled guidance is issued on the same day of a 10-K or 10-Q filing, and zero otherwise. *Length of 8-K filing* is measured as the number of words in the 8-K filing issued on the same day of bundled guidance. We exclude 15,206 bundled guidance that do not have a concurrent 8-K filing on the same day from our cross-sectional analysis conditional on the length of 8-K filings. All other variables are defined in Appendix 1.

across the first three columns. Economically, for example, column (3) shows that the effect of bundled guidance is approximately twice as large as that of non-bundled guidance.[12] Note that we use the column (3) specification as the baseline model in all of our subsequent analyses of analysts' reactions to managerial guidance news.

These results are robust when we include concurrent actual earnings news in column (4) to mitigate concerns that actual earnings surprise may not be fully adjusted. Together, these results support our prediction that bundling has a significant influence on analysts' reactions to managerial guidance. In other words, on average, analysts create more forecast revisions in response to each unit of bundled guidance news compared to their revision activity prompted by non-bundled guidance news.

Entropy balancing results

Next, we adopt an entropy balancing approach to address concerns that bundled and non-bundled guidance are inherently different in their guidance and firm characteristics. This approach allows us to use more homogenous subsamples to test the treatment (i.e., bundling) effect. Entropy balancing is a reweighting procedure that assigns a scalar weight to each sample unit such that the moments of the control variables are equal between the reweighted control group and the treatment group, creating a balanced sample for the subsequent estimation of the treatment effect (Hainmueller 2012). The entropy balancing approach reduces the effect of potential mis-specification (e.g., omitted variables) in the estimation of the treatment effect (Ho et al. 2007; Abadie and Imbens 2011). We first use the entropy balancing method to balance the mean, variance, and skewness of our baseline control variables (i.e., firm and guidance characteristics).[13] The results reported in panels A and B of Table 4 show that the differences in mean, variance, and skewness values of control variables between bundled and non-bundled guidance samples become negligible after the entropy balancing procedure is implemented. This suggests that the level of homogeneity between bundled and non-bundled guidance samples is high. Next, we re-estimate equation (1). Panel C of Table 4 shows that *MFNews×Bundled* remains significant across different specifications.

3. Mechanism analyses

In this section, we explore three explanations for why analysts respond more to bundled guidance than to non-bundled guidance. We have previously labeled these explanations as "time pressure," "cognitive constraints," and "disclosure credibility."

Time pressure

Prior studies suggest that it is important for analysts to issue quick forecast revisions around EAs (e.g., Guttman 2010; Keskek et al. 2014). Thus, they might face greater time pressure to process managerial information around EAs than at other times. Recent studies further suggest that analysts prioritize firms that are more visible and firms that are more important to their brokerage houses (Harford et al. 2019; Driskill et al. 2020). More specifically, these studies suggest that analysts have greater incentives to issue timely forecasts for larger firms and firms with higher institutional ownership. These firms are more visible in the capital market and generate greater trading activities. Covering large firms can have a greater impact on analysts' compensation and reputation (e.g., Hong and Kubik 2003), while covering firms with higher institutional ownership

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12. Note that *MFNews×Bundled* only captures the incremental effect of bundling on *MFNews* controlling for other interaction terms with *MFNews*. We calculate the incremental effect of bundling using the ratio of the coefficient on *MFNews×Bundled* and the coefficient on *MFNews* (0.577/0.623 + 1 = 1.926).

13. In an additional analysis, we also include implied volatility from Billings et al. (2015) as an additional covariate in the entropy matching. Although our sample is reduced by 28% due to the smaller data coverage of implied volatility, our results based on the reduced sample are unaffected (*p*-values <0.01, untabulated).

TABLE 3
The effect of bundled guidance versus non-bundled guidance on analyst forecast revision sensitivities

	AFRev							
	(1)		(2)		(3)		(4)	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
MFNews	0.295***	(9.91)	0.621***	(6.18)	0.623***	(6.24)	0.629***	(6.18)
MFNews×Bundled	0.686***	(23.92)	0.577***	(20.09)	0.577***	(20.20)	0.575***	(20.09)
Bundled	−0.010***	(−10.33)	−0.009***	(−6.77)	−0.009***	(−6.76)	−0.009***	(−6.75)
MFNews×AbsMFNews			0.339***	(3.58)	0.337***	(3.59)	0.338***	(3.57)
AbsMFNews			−0.060	(−0.95)	−0.059	(−0.93)	−0.066	(−1.02)
MFNews×HMFBias			1.405***	(3.45)	1.410***	(3.42)	1.405***	(3.40)
HMFBias			−0.650***	(−8.71)	−0.646***	(−8.66)	−0.650***	(−8.95)
MFNews×HMFAccu			2.656***	(7.31)	2.664***	(7.32)	2.669***	(7.31)
HMFAccu			−0.288***	(−3.88)	−0.287***	(−3.86)	−0.290***	(−4.05)
MFNews×MFBad			−0.007	(−0.05)	−0.003	(−0.02)	−0.017	(−0.11)
MFBad			−0.001	(−1.44)	−0.001	(−1.42)	−0.001	(−1.32)
MFNews×MFLoss			0.004	(0.18)	0.001	(0.08)	0.001	(0.05)
MFLoss			0.012***	(5.50)	0.012***	(5.50)	0.012***	(5.35)
MFNews×MFHorizon			−0.038***	(−3.84)	−0.039***	(−3.92)	−0.038***	(−3.89)
MFHorizon			−0.005***	(−4.44)	−0.005***	(−4.47)	−0.005***	(−4.49)
MFNews×MFWidth			0.004	(0.32)	0.004	(0.34)	0.003	(0.25)
MFWidth			0.007***	(7.43)	0.007***	(7.60)	0.007***	(7.58)
MFNews×DAccrual					−0.004	(−0.09)	0.003	(0.06)
DAccrual					0.007	(1.56)	0.006	(1.15)
MFNews×Mrk-To-Bk					0.001*	(1.66)	0.001**	(2.05)
Mrk-To-Bk					0.000***	(4.32)	0.000***	(3.38)
MFNews×MBEStreak					−0.009*	(−1.71)	−0.010*	(−1.89)
MBEStreak					−0.001***	(−2.60)	0.001	(1.43)
EANews							0.205*	(1.90)
EANews×AbsEANews							−4.986	(−1.04)
AbsEANews							0.072	(0.97)

(The table is continued on the next page.)

TABLE 3 (continued)

| | AFRev | | | | | | | | | | |
| | (1) | | (2) | | (3) | | (4) | |
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
EANews×DAccrual							−1.029	(−0.90)
EANews×Mrk-To-Bk							−0.044**	(−2.19)
EANews×MBEStreak							0.793***	(5.58)
Industry fixed effects	Yes		Yes		Yes		Yes	
Year-Quarter fixed effects	Yes		Yes		Yes		Yes	
No. of obs.	85,098		85,098		85,098		85,098	
Adjusted R^2	0.814		0.824		0.824		0.825	

Notes: This table reports the estimation results of the regression in equation (1). In column (1), we do not include control variables. In column (2), we control for mange-rial guidance characteristics and their interaction terms with *MFNews*. In column (3), we further control for firm characteristics and their interaction terms with *MFNews*. In column (4), we control for confounding actual earnings news (*EANews*) and its interaction terms with firm characteristics. All variables are defined in Appendix 1. Constant terms and industry and year-quarter fixed effects are included but not tabulated for brevity. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 10%, 5%, and 1% levels are indicated by *, **, and ***, respectively.

TABLE 4

Robustness check on entropy balancing method

Panel A: Before entropy balancing

	Bundled = 1			Bundled = 0		
	Mean	Variance	Skewness	Mean	Variance	Skewness
MFNews	0.04	0.00	0.46	0.00	0.00	3.45
AbsMFNews	0.06	0.00	1.23	0.01	0.00	6.73
HMFBias	0.03	0.00	1.08	0.03	0.00	1.15
HMFAccu	−0.03	0.00	−1.72	−0.03	0.00	−1.62
MFBad	0.29	0.21	0.92	0.51	0.25	−0.05
MFLoss	0.06	0.06	3.62	0.05	0.05	4.14
Horizon	5.06	0.35	0.31	4.88	0.74	−0.20
Width	0.14	0.08	4.63	0.10	0.04	6.04
DAccrual	0.00	0.00	0.84	0.00	0.00	0.59
Mrk-To-Bk	3.63	15.96	4.14	3.54	15.97	4.34
MBEStreak	0.29	0.21	0.93	0.28	0.20	0.98

Panel B: After entropy balancing

	Bundled = 1			Bundled = 0		
	Mean	Variance	Skewness	Mean	Variance	Skewness
MFNews	0.04	0.00	0.46	0.04	0.00	0.46
AbsMFNews	0.06	0.00	1.23	0.06	0.00	1.23
HMFBias	0.03	0.00	1.08	0.03	0.00	1.08
HMFAccu	−0.03	0.00	−1.72	−0.03	0.00	−1.72
MFBad	0.29	0.21	0.92	0.29	0.21	0.92
MFLoss	0.06	0.06	3.62	0.06	0.06	3.61
Horizon	5.06	0.35	0.31	5.06	0.35	0.31
Width	0.14	0.08	4.63	0.14	0.08	4.63
DAccrual	0.00	0.00	0.84	0.00	0.00	0.84
Mrk-To-Bk	3.63	15.96	4.14	3.63	15.96	4.14
MBEStreak	0.29	0.21	0.93	0.29	0.21	0.93

Panel C: Regression results

	Tests	Coeff. on $MFNews \times Bundled$	t-stat.	Obs.	Adj. R^2
(1)	No control variables	0.833***	(14.62)	85,098	0.756
(2)	Add controls of guidance characteristics variables concurrent with	0.771***	(21.96)	85,098	0.803
(3)	Add controls of firm characteristics	0.775***	(24.11)	85,098	0.804
(4)	Add controls of EANews	0.773***	(23.90)	85,098	0.805
	Industry fixed effects	Yes			
	Year-quarter fixed effects	Yes			

Notes: This table presents the robustness analysis on entropy balancing of mean, variance, and skewness of control variables between bundled guidance and non-bundled guidance. Panels A and B show descriptive statistics for control variables for bundled versus non-bundled guidance derived before and after the application of the entropy balancing approach, respectively. Panel C reports the estimation results based on the specifications in Table 3 (columns (1)–(4)). Variables are defined in Appendix 1. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 1% level are indicated by ***.

TABLE 5
Analyst constraints

Panel A: Time pressure

	AFRev		
Conditioning variables	(1) *Firm size*	(2) *Institutional ownership*	(3) *Analyst coverage*
MFNews×Bundled_HighPressure	0.588***	0.583***	0.585***
	(20.39)	(20.13)	(20.61)
MFNews×Bundled_LowPressure	0.570***	0.572***	0.573***
	(20.11)	(20.14)	(19.94)
Bundled_HighPressure	−0.009***	−0.009***	−0.011***
	(−6.12)	(−6.25)	(−6.96)
Bundled_LowPressure	−0.009***	−0.009***	−0.008***
	(−7.08)	(−7.00)	(−6.35)
p-value of the tests on $a_2 - a_3$	[0.001]	[0.012]	[0.023]
Other variables	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year-quarter fixed effects	Yes	Yes	Yes
No. of obs.	85,098	85,098	85,098
Adjusted R^2	0.857	0.857	0.857

Panel B: Cognitive constraints

	AFRev		
Conditioning variables	(1) *Analyst experience*	(2) *Analyst portfolio size*	(3) *Analyst busyness*
MFNews×Bundled_HighConstraint	0.580***	0.586***	0.585***
	(20.10)	(19.88)	(20.07)
MFNews×Bundled_LowConstraint	0.572***	0.567***	0.574***
	(20.20)	(20.76)	(20.17)
Bundled_HighConstraint	−0.009***	−0.011***	−0.010***
	(−6.78)	(−7.89)	(−6.82)
Bundled_LowConstraint	−0.009***	−0.008***	−0.009***
	(−6.59)	(−6.33)	(−6.70)
p-value of the tests on $a_2 - a_3$	[0.047]	[0.003]	[0.029]
Other variables	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year-quarter fixed effects	Yes	Yes	Yes
No. of obs.	85,098	85,098	85,098
Adjusted R^2	0.857	0.857	0.857

Notes: Panel A reports the estimation results of the following regression:

$$AFRev = a_0 + a_1 MFNews + a_2 MFNews \times Bundled\_HighPressure + a_3 MFNews \times Bundled\_LowPressure$$
$$+ a_4 Bundled\_HighPressure + a_5 Bundled\_LowPressure + \sum a_k Controls$$
$$+ \sum b_k MFNews \times Controls + \gamma + w + \varepsilon. \qquad (1a)$$

Bundled_HighPressure (*Bundled_LowPressure*) is equal to one for the bundled guidance if the conditioning variable (i.e., *Firm size*, *Institutional ownership*, and *Analyst coverage*) is higher than (lower than or equal to) the sample median of bundled guidance by each industry-year-quarter group, and zero otherwise.

(The table is continued on the next page.)

TABLE 5 (continued)

Panel B reports the estimation results of the following regression:

$$
\begin{aligned}
AFRev = a_0 &+ a_1 MFNews + a_2 MFNews \times Bundled\_HighConstraint \\
&+ a_3 MFNews \times Bundled\_LowConstraint + a_4 Bundled\_HighConstraint \\
&+ a_5 Bundled\_LowConstraint + \sum a_k Controls + \sum b_k MFNews \times Controls + \gamma + w + \varepsilon.
\end{aligned}
$$

$$(1b)$$

In column (1), *Bundled_HighConstraint* (*Bundled_LowConstraint*) is equal to one if *Analyst experience* is lower than or equal to (higher than) the sample median of bundled guidance, and zero otherwise. In columns (2) and (3), *Bundled_HighConstraint* (*Bundled_LowConstraint*) is equal to one for the bundled guidance if the conditioning variable (i.e., *Analyst portfolio size* and *Analyst busyness*) is higher than (lower than or equal to) the sample median of bundled guidance sample, and zero otherwise. All conditioning variables are defined in panel C of Table 2. Other variables are defined in Appendix 1. Constant terms, control variables, and industry and year-quarter fixed effects are included but not tabulated for brevity. Control variables are the same as those shown in column (3) of Table 3. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 1% level are indicated by ***.

can help create more revenue for analysts' brokerage houses (Frankel et al. 2006). Driskill et al. (2020) further indicate that the level of analyst coverage for a firm represents the popularity of the firm with analysts, and suggest that analysts have strong incentives to issue timely forecasts for these firms. Following this literature, we expect analysts to have more time pressure to issue a quick revision after EAs for larger firms, firms with higher institutional ownership, and firms with greater analyst coverage. We define these firm characteristics in more detail in panel C of Table 2.

Empirically, we replace *Bundled* in equation (1) with two indicator variables, *Bundled_HighPressure* and *Bundled_LowPressure*. *Bundled_HighPressure* (*Bundled_LowPressure*) is equal to one for the bundled guidance if the conditioning variable (i.e., firm size, institutional ownership, and analyst coverage) is higher than (lower than or equal to) the sample median of bundled guidance by each industry-year-quarter group, and zero otherwise. Panel A of Table 5 reports the results. We find statistically significant evidence consistent with our "time pressure" explanation. That is, the effect of bundling is larger (smaller) for firms with high (low) time pressure for analysts to issue timely forecasts. However, our results also suggest that the economic magnitude of the "time pressure" mechanism is small.

Cognitive constraints

In line with our argument that analysts rely more heavily on bundled guidance when they face greater cognitive constraints during EAs (i.e., the "cognitive constraint" explanation), we predict that the bundling effect increases with analysts' cognitive constraints. We use three proxies for cognitive constraints. We first consider cognitive constraints with respect to analyst ability. Following Clement (1999), we construct our first proxy for cognitive constraints using analysts' forecasting experience, that is, the average number of quarters in which analysts issue forecasts for the firms they follow. As Clement (1999) points out, only capable analysts can survive competition with peers as reflected in longer tenure, and analysts' skills and knowledge about a firm improve over time as they follow the firm. We, therefore, expect the effect of bundling to be greater for bundling firms followed by less experienced analysts than for other bundling firms.

Next, we consider cognitive constraints with respect to analyst busyness. Our second proxy for cognitive constraints is based on the size of the analyst coverage portfolio, measured by the average number of firms covered across all analysts following a firm (Clement 1999; Harford et al. 2019). As Harford et al. (2019) indicate, analysts with larger portfolios are more likely to

face constraints on time, energy, and resources. We thus expect the effect of bundling to be greater for bundling firms followed by analysts with larger portfolios than for other bundling firms. Our third measure of cognitive constraints incorporates the notion of analyst busyness due to the clustering of EAs. Driskill et al. (2020) show that analysts' constraints due to EA clustering limit their ability to process information from EAs and slow down their response. For example, Driskill et al. show that analysts with three or more concurrent announcements delay their forecasts by three times as much as those with one concurrent announcement. In our setting, when multiple firms from a given analyst's portfolio announce their respective earnings on the same day, the analyst might be busy processing multiple firms' information within a short period of time, and may thus find it difficult to produce his or her own information beyond public guidance. Thus, we expect the effect of bundling on analysts' revisions to be greater for bundling firms followed by a higher percentage of busy analysts (over the total number of analysts following the firm). We follow Driskill et al. and define busy analysts as those who have three or more concurrent EAs issued by firms in their portfolios on the same day. We define analyst experience, analyst portfolio size, and analyst busyness in more detail in panel C of Table 2.

To test our "cognitive constraints" explanation, we replace *Bundled* in equation (1) with two indicator variables, *Bundled_HighConstraint* and *Bundled_LowConstraint*. When we use analyst experience as the constraint proxy, *Bundled_HighConstraint* (*Bundled_LowConstraint*) is equal to one for the bundled guidance if analyst experience is lower than or equal to (higher than) the sample median of bundled guidance, and zero otherwise. When we use portfolio size as the constraint proxy, *Bundled_HighConstraint* (*Bundled_LowConstraint*) is equal to one for the bundled guidance if the size of the analyst coverage portfolio is higher than (lower than or equal to) the sample median of bundled guidance, and zero otherwise. Finally, when we use the percentage of busy analysts as the constraint proxy, *Bundled_HighConstraint* (*Bundled_LowConstraint*) is equal to one for the bundled guidance if the proportion of busy analysts of a firm described above is higher than (lower than or equal to) the sample median of bundled guidance, and zero otherwise. Panel B of Table 5 reports the results. Consistent with the notion that lower ability and busier analysts are more likely to rely on managerial guidance rather than on their own analysis, we find statistically significant evidence that the effect of bundling increases with analysts' constraints. However, we note that the economic significance of this mechanism is small.

Disclosure credibility

Next, we examine whether additional information concurrent with bundled guidance could increase disclosure credibility and explain why analysts react more to bundled guidance than to non-bundled guidance ("disclosure credibility" explanation). Although we adjust the bundling error to remove the potential impact of the actual earnings news on the EA date, other concurrent information may still exist at the EA. Additional concurrent disclosure may increase the credibility of bundled guidance, leading analysts to place greater weight on the guidance in revising their forecasts. We first consider conference calls as a source of additional disclosure. Chapman and Green (2018) show that bundled guidance is often disclosed in the accompanying conference call. Analysts ask managers about and receive forward-looking information during conference calls. Conference calls therefore allow analysts to obtain additional information to verify bundled guidance. We next consider 10-K or 10-Q filings as another source of concurrent disclosures (Arif et al. 2019). Similarly, analysts may find the bundled guidance more credible because of the additional disclosure they can obtain from a 10-K or 10-Q filing on the same day. Furthermore, analysts may obtain more additional information if a firm issues a longer EA than other firms (e.g., Bird and Karolyi 2016). Panel C of Table 2 provides the summary statistics of concurrent conference calls, concurrent 10-K/Q filings, and the length of concurrent 8-K filings.

To examine the "disclosure credibility" explanation, we replace *Bundled* in equation (1) with two indicator variables, *Bundled_MoreDisc* and *Bundled_LessDisc*, capturing whether more concurrent information is along with the bundled guidance. More specifically, *Bundled_MoreDisc*

TABLE 6
Disclosure credibility

Conditioning variables	AFRev		
	(1) Conference call	(2) 10-K/Q filing	(3) Length of 8-K filing
$MFNews \times Bundled\_MoreDisc$	0.581***	0.590***	0.610***
	(19.84)	(19.77)	(18.84)
$MFNews \times Bundled\_LessDisc$	0.559***	0.574***	0.593***
	(19.87)	(20.28)	(18.55)
$Bundled\_MoreDisc$	−0.009***	−0.011***	−0.012***
	(−7.01)	(−7.94)	(−9.32)
$Bundled\_LessDisc$	−0.008***	−0.009***	−0.009***
	(−5.43)	(−6.60)	(−7.75)
p-value of the tests on $a_2 - a_3$	[0.049]	[0.011]	[<0.001]
Other variables	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year-quarter fixed effects	Yes	Yes	Yes
No. of obs.	85,098	85,098	69,892
Adjusted R^2	0.857	0.857	0.867

Notes: This table reports the estimation results of the following regression:

$$AFRev = a_0 + a_1 MFNews + a_2 MFNews \times Bundled\_MoreDisc$$
$$+ a_3 MFNews \times Bundled\_LessDisc + a_4 Bundled\_MoreDisc + a_5 Bundled\_LessDisc$$
$$+ \sum a_k Controls + \sum b_k MFNews \times Controls + \gamma + w + \varepsilon. \qquad (1c)$$

In column (1), *Bundled_MoreDisc* (*Bundled_LessDisc*) is equal to one if the value of *Conference call* is one (zero), and zero if the value of *Conference call* is zero (one). In column (2), *Bundled_MoreDisc* (*Bundled_LessDisc*) is equal to one if the value of *10-K/Q filing* is one (zero), and zero if the value of *10-K/Q filing* is zero (one). In column (3), *Bundled_MoreDisc* (*Bundled_LessDisc*) is equal to one if the value of *Length of 8-K filing* is greater (equal to or smaller) than the median value of bundled guidance sample and zero otherwise. We exclude bundled guidance that does not have an 8-K filing on the same day from the analysis in column (3). The conditioning variables (*Conference call*, *10-K/Q filing*, and *Length of 8-K filing*) are defined in panel C of Table 2. Other variables are defined in Appendix 1. Constant terms, control variables, and industry and year-quarter fixed effects are included but not tabulated for brevity. Control variables are the same as those shown in column (3) of Table 3. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 1% level are indicated by ***.

(*Bundled_LessDisc*) is equal to one for the bundled guidance with (without) a concurrent conference call, with (without) a concurrent 10-K/10-Q filing, or with a longer (shorter) concurrent 8-K filing, and zero otherwise. We report the results of our comparative statics in Table 6.[14] We find that the effect of "disclosure credibility" is statistically significant. However, we note that the economic significance of this mechanism is also small.

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14.   In our analysis reported in column (3) of Table 6, we drop 15,206 bundled guidance observations with no concurrent 8-K filings on the EA date. Our results, untabulated, are unaffected if we keep these observations in our analysis and set the length of 8-K filings to zero for these observations.

TABLE 7

Regulation Fair Disclosure (Reg FD)

Panel A: The bundling effect before versus after Reg FD

	AFRev		
	(1)	(2)	(3)
			Entropy balancing on
	OLS	OLS	bundling and Reg FD
Sample period	Jan. 1998–Dec. 2017	Jan. 1998–Aug. 2003	Jan. 1998–Dec. 2017
MFNews×Bundled_PostRegFD	0.579***	0.481***	0.778***
	(20.12)	(7.15)	(37.40)
MFNews×Bundled_PreRegFD	0.012	0.174***	0.110*
	(0.20)	(3.76)	(1.68)
Bundled_PostRegFD	−0.009***	−0.002	−0.008***
	(−6.83)	(−0.58)	(−4.16)
Bundled_PreRegFD	0.016***	0.008***	0.021***
	(8.71)	(4.34)	(4.26)
p-value of the tests on $a_2 - a_3$	[<0.001]	[0.001]	[<0.001]
Other variables	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year-quarter fixed effects	Yes	Yes	Yes
No. of obs.	85,098	13,108	85,098
Adjusted R^2	0.857	0.515	0.803

Panel B: DiD analysis of analysts' reactions to bundled guidance around Reg FD

	AFRev	
	(1)	(2)
Sample period	Without entropy	Entropy balancing on
(Jan. 1998–Aug. 2003)	balancing	*BundledFirms*
BundledFirms×PostRegFD×MFNews	0.546***	0.562***
	(4.52)	(2.85)
PostRegFD×MFNews	−0.194*	−0.110
	(−1.69)	(−0.62)
BundledFirms×MFNews	0.116	0.127
	(1.64)	(1.17)
MFNews	1.401***	1.043***
	(4.17)	(2.86)
BundledFirms×PostRegFD	−0.004	−0.007*
	(−0.92)	(−1.95)
Other variables	Yes	Yes
Firm fixed effects	Yes	Yes
Year-quarter fixed effects	Yes	Yes
No. of obs.	3,728	3,728
Adjusted R^2	0.649	0.643

Notes: Panel A reports the estimation results of the following regression:

$$AFRev = a_0 + a_1 MFNews + a_2 MFNews \times Bundled\_PostRegFD + a_3 MFNews \times Bundled\_PreRegFD$$
$$+ a_4 Bundled\_PostRegFD + a_5 Bundled\_PreRegFD + \sum a_k Controls$$
$$+ \sum b_k MFNews \times Controls + \gamma + w + \varepsilon. \tag{1d}$$

TABLE 7 (continued)

Column (1) is conditional on whether bundled guidance is issued after Reg FD using the full sample. Column (2) is conditional on whether bundled guidance is issued after Reg FD using the sample period of January 1998 to August 2003. Column (3) reports the results of entropy balancing on whether a guidance is bundled with EA and issued after Reg FD. *Bundled_PostRegFD* is equal to one for the bundled guidance issued after Reg FD, and zero otherwise. *Bundled_PreRegFD* is equal to one for the bundled guidance issued before Reg FD, and zero otherwise. Panel B reports the estimation results of the regression in equation (2), based on a reduced sample from January 1998 to August 2003. Column (1) reports the estimation results of equation (2). Column (2) reports the estimation results of equation (2) with entropy balancing between treatment and control firms. Appendix 2 reports the effectiveness of entropy balancing. Bundled (non-bundled) firms consistently issued bundled guidance (non-bundled guidance) and did not issue any non-bundled guidance (bundled guidance) from January 1998 to August 2003. Other variables are defined in Appendix 1. In panel A (panel B), constant terms, control variables, and industry (firm) and year-quarter fixed effects are included but not tabulated for brevity. Control variables are the same as those shown in column (3) of Table 3. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 10% and 1% levels are indicated by * and ***, respectively.

Regulation Fair Disclosure

We note that the three explanations (mechanisms) discussed above are not mutually exclusive. Collectively, they help explain why analysts place a greater weight on bundled guidance than on non-bundled guidance. We also note that the economic significance of each mechanism is small. The limited economic magnitude of each individual mechanism could be due to the difficulty in measuring the underlying constructs (e.g., it is difficult to find exogenous variation in these constructs and their empirical proxies can be noisy), or the difficulty in fully disentangling the effect of managerial guidance from that of the EA. To mitigate this concern, we examine whether Reg FD affects how analysts react to managerial bundled guidance. After Reg FD, the above mechanisms underlying the bundling effect are likely to be more present. Analysts likely face greater time pressure and cognitive constraints during EAs because Reg FD prohibits selective disclosure and analysts might rely more on EAs to obtain and process public information (e.g., Bailey et al. 2003; Anilowski et al. 2007; Rogers and Van Buskirk 2013; Heflin et al. 2016). Moreover, analysts might find bundled guidance more credible because EAs are accompanied by more concurrent disclosures (e.g., conference calls) after Reg FD (e.g., Rogers and Van Buskirk 2013). The above reasoning leads us to posit that analysts' responses to the news in bundled guidance will significantly increase after Reg FD if the underlying mechanisms of "time pressure," "cognitive constraints," and "disclosure credibility" explain the bundling effect.

To examine whether the bundling effect increases after Reg FD, we conduct two tests. In the first test, we replace *Bundled* in equation (1) with two indicator variables, *Bundled_PostRegFD* and *Bundled_PreRegFD*, capturing whether analysts respond to the news in bundled guidance after versus before Reg FD. *Bundled_PostRegFD* (*Bundled_PreRegFD*) is equal to one if bundled guidance is issued after (before) the implementation date of Reg FD (October 23, 2000) and zero otherwise. Panel A of Table 7 reports the results of this test. Our results show that the bundling effect is indeed significantly greater after Reg FD (*p*-value <0.01). The results remain the same even if we consider the potential imbalanced distribution of guidance frequency around Reg FD either by (i) restricting our sample to end in August 2003 to obtain the same length of window before and after Reg FD or (ii) implementing an entropy balancing procedure to reweight the bundled guidance issued after Reg FD as opposed to the remaining guidance. In contrast to the findings in Tables 5 and 6 that show the small economic significance of each individual mechanism (e.g., the differences between the coefficients on *MFNews×Bundled_HighPressure* and *MFNews×Bundled_LowPressure* in Table 5 are small), the results in panel A of Table 7 show that the coefficients on *MFNews×Bundled_PostRegFD* are much larger than the

coefficients on *MFNews×Bundled_PreRegFD* across the three columns. Taken together, these results indicate that the magnitude of the bundling effect related to Reg FD is greater than the ones related to the three mechanisms when tested individually. This is consistent with the notion that the joint effect of the three mechanisms is likely more present after Reg FD.

To mitigate the concern that omitted variables could correlate with both firm decisions to switch to issuing bundled guidance after Reg FD and firm fundamentals (e.g., Wang 2007), we conduct a second test, in which we adopt a difference-in-differences (DiD) research design with an entropy balanced sample centered on the implementation date of Reg FD (October 23, 2000). We focus on the analysis covering January 1998 to August 2003, which comprises the same number of months before and after the implementation of Reg FD (October 23, 2000) with available guidance data. We define the bundled (non-bundled) firms as those that consistently issued bundled (non-bundled) guidance and did not issue any non-bundled (bundled) guidance in the above-mentioned sample period. Next, we follow a similar entropy balancing approach as in the previous section to ensure that our non-bundled firms are comparable to our bundled firms, although their decisions on the timing of guidance differ.[15] Appendix 2 illustrates the effectiveness of the entropy balancing process. It shows that the differences between the two groups are significant for all variables *before* reweighting, but no difference is significant afterward, suggesting that our balancing process is effective. In this design, bundled (non-bundled) firms' decisions to issue bundled (non-bundled) guidance do not change around Reg FD; therefore, it is less likely that these firms have significant changes in their disclosure practices around Reg FD compared to other firms. As such, our DiD design helps mitigate the omitted variable issues regarding both a firm's decision to switch to issuing bundled guidance after Reg FD, and firm fundamentals, especially after entropy balancing. We expect that the impact of Reg FD on analysts' reactions to guidance news is greater for bundled firms than for non-bundled firms because the regulation likely increases analysts' time pressure, cognitive constraints, and disclosure credibility around EAs, which coincide with the guidance issued by bundled firms but not the guidance issued by non-bundled firms.

We then estimate the following DiD model to examine whether bundled firms generate larger analysts' forecast revisions in response to guidance news after Reg FD than before, as compared with non-bundled firms:

$$
\begin{aligned}
AFRev = {} & b_0 + b_1 BundledFirms \times PostRegFD \times MFNews + b_2 PostRegFD \times MFNews \\
& + b_3 BundledFirms \times MFNews + b_4 MFNews + b_5 BundledFirms \times PostRegFD \\
& + \sum b_k Controls + \sum c_k Controls \times MFNews + \gamma + f + \varepsilon,
\end{aligned}
\tag{2}
$$

where *PostRegFD* is equal to one for observations after the implementation of Reg FD, and zero otherwise. *BundledFirms* is an indicator variable equal to one for bundled firms, and zero otherwise. Control variables (*Controls*) are the same as in column (3) of Table 3. We include both year-quarter (γ) and firm (f) fixed effects to account for any intertemporal or cross-firm differences in managerial guidance and firm characteristics beyond the control variables. We present the results of estimating equation (2) in panel B of Table 7. We first find that the coefficient on *BundledFirms×MFNews* is insignificant, suggesting that analysts react to the guidance of bundled firms and non-bundled firms

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15. We adopt the entropy balancing approach but not propensity score matching (PSM) for two main reasons. First, the sample size of treatment and control groups is small by nature in our setting, leading to low matching quality and hence potential biased inferences if we used PSM (e.g., Shipman et al. 2017). By reweighting the covariates under the entropy balancing approach, we do not further reduce the size of our testing sample. Second, the entropy balancing approach reduces the effect of potential misspecification under PSM (e.g., Abadie and Imbens 2011).

TABLE 8
Speed of analysts' revisions

	(1) OLS *AFSpeed*	(2) Tobit *AFSpeed*
Bundled	0.496***	1.250***
	(39.98)	(59.46)
MFNews	−0.125***	−0.357***
	(−2.88)	(−3.42)
AbsMFNews	0.571***	2.031***
	(11.46)	(12.63)
HMFBias	0.127	0.331
	(0.82)	(0.69)
HMFAccu	0.671***	2.142***
	(4.17)	(4.46)
MFBad	0.008	0.019*
	(1.16)	(1.96)
MFLoss	−0.000	0.005
	(−0.07)	(0.25)
MFHorizon	−0.099***	−0.255***
	(−18.79)	(−31.89)
MFWidth	−0.025***	−0.085***
	(−4.92)	(−4.69)
DAccrual	−0.034	−0.110
	(−1.32)	(−1.32)
Mrk-To-Bk	0.001**	0.006***
	(2.06)	(3.84)
MBEStreak	0.008**	0.060***
	(2.57)	(6.25)
Industry fixed effects	Yes	Yes
Year-quarter fixed effects	Yes	Yes
No. of obs.	85,098	85,098
Adjusted R^2	0.485	0.534

Notes: this table reports the estimation results of the regression in equation (3). *AFSpeed* is −1 multiplied by the average number of days taken by an analyst following a firm to issue an earnings forecast within five days after a managerial guidance, scaled by five. We adjust *AFSpeed* for the bundling error as in Rogers and Van Buskirk (2013). Column (1) reports the estimation results of OLS regression for equation (3). Column (2) reports the estimation results of Tobit regression for equation (3). All variables are defined in Appendix 1. We also adjust *MFNews*, *AbsMFNews*, *MFBad* for the bundling error as in Rogers and Van Buskirk (2013). Constant terms and industry and year-quarter fixed effects are included but not tabulated for brevity. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 10%, 5%, and 1% levels are indicated by *, **, and ***, respectively.

similarly prior to Reg FD. More importantly, we find that the coefficient on *BundledFirms*×*PostRegFD*×*MFNews* is significantly positive, which is consistent with analysts reacting more strongly to bundled guidance after Reg FD. We also conduct, in untabulated analyses, a trend analysis by creating an indicator variable, *PostRegFD*$^{-1}$, equal to one for guidance issued within the six-month window immediately before Reg FD (i.e., from May 1, 2000 to October 22, 2000), and zero otherwise. We find that the coefficient continues to be significantly positive on *BundledFirms*×*PostRegFD*×*MFNews*, but not on *BundledFirms*×*PostRegFD*$^{-1}$×*MFNews*, which is

consistent with the assertion that Reg FD has an impact on bundled firms only after Reg FD, but not before. These results corroborate the parallel trend assumption of our DiD design and mitigate concerns that an endogenous relation is responsible for the results.

In sum, the evidence from our mechanism analyses lends support to the notion that bundled guidance facilitates analysts' forecast revisions more when analysts have greater time pressure and cognitive constraints to produce information on their own at an EA, and when they receive additional information that increases the credibility of bundled guidance. Our results in this section should be interpreted with caution because it is inherently difficult to fully address the underlying causes of our results, although we have provided a series of tests to investigate the underlying mechanisms.

4. Speed of analysts' forecast revisions

Up to this point, our empirical results are consistent with the idea that analysts place more weight on bundled guidance than on non-bundled guidance when issuing their own forecasts. Our primary analysis in section 2 examines the sensitivity of analysts' responses to news in managerial earnings guidance. An alternative way to test whether analysts respond more to bundled guidance than to non-bundled guidance is to examine whether analysts revise their forecasts sooner after bundled guidance than after non-bundled guidance.

To explore this, we create *AFSpeed*, which accounts for the speed with which analysts issue their forecasts subsequent to guidance. To calculate *AFSpeed*, we first determine the average number of days between managerial guidance and the subsequent individual analysts' forecast revisions within the five-day post-guidance period, scaled by five. We code the number of days to be five for cases where no analysts issue forecasts within five days after the guidance, but, as discussed in footnote 16, our results are robust to removing these cases. Next, for analysts' revisions following a bundled guidance, we adjust the value of revision speed for the bundling error similar to the adjustment for *AFRev* following Rogers and Van Buskirk (2013). As mentioned earlier, we make this bundling adjustment to mitigate the concern that the effect of bundled guidance using unadjusted values could be driven by analysts' reactions to EAs rather than managerial guidance. More specifically, we use the Rogers and Van Buskirk (2013) approach to obtain a fitted value for the speed of analysts' revisions following EAs with no guidance. We then subtract the fitted value from the raw speed of analysts' revisions following bundled guidance to obtain the adjusted speed of revisions. We further winsorize this adjusted value of speed to be between zero and one to ensure that each value of speed in our analysis has practical meaning such that our results are not sensitive to this winsorization. Here, the value of zero (one) represents the fastest (slowest) speed, that is, it takes zero (five) days, on average, scaled by five, for analysts to issue their forecasts following guidance within our five-day measurement window. Finally, we multiply the speed of analysts' revisions by −1 to indicate the higher value of *AFSpeed*, the quicker their responses.

To estimate the effect of bundling on analyst revision speed, we estimate the following OLS regression:

$$AFSpeed = c_0 + c_1 Bundled + \sum c_k Controls + \gamma + w + \varepsilon, \tag{3}$$

where the dependent variable (*AFSpeed*) has been defined above. The indicator variable (*Bundled*) and control variables (*Controls*) are the same as in column (3) of Table 3. If analysts revise their forecasts more quickly after bundled guidance than after non-bundled guidance, we expect c_1 to be positively significant.

Column (1) of Table 8 reports the results from the OLS estimation of equation (3). Our results show that analysts revise their forecasts more rapidly after bundled guidance than after

non-bundled guidance (with a coefficient of 0.496 and *p*-value <0.01). In terms of the economic magnitude, it suggests that analysts are approximately 2.5 days (i.e., 0.496 × 5 days) faster in issuing their forecasts after bundled guidance than after non-bundled guidance.[16] Since *AFSpeed* is censored between negative one and zero, the OLS estimators in equation (3) could be biased and inconsistent. To address this concern, we also use a Tobit regression to estimate the effect of bundling on analyst revision speed. We find similar results from the estimation of this Tobit regression in column (2) of Table 8.

In summary, our results regarding the speed of analysts' forecast revisions are consistent with our framework discussed in the previous section. Because bundled guidance is issued at a time when analysts likely have greater time pressure and cognitive constraints and when firms often provide additional disclosures, analysts not only place a greater weight on the guidance news in revising their own forecasts, but also issue forecasts more quickly following the guidance.[17]

5. Bundled guidance and the informativeness of analysts' revisions

In this section, we investigate whether bundled guidance affects the usefulness of analysts' revisions to the market. Our results in section 2 suggest that analysts respond more to managerial earnings guidance issued at the time of an EA (i.e., bundled guidance) than to non-bundled guidance. Prior literature suggests that analysts help shape the market's assessment of corporate disclosures (e.g., Li et al. 2015). Investors may value the timeliness of analysts' forecasts following the EA (Guttman 2010; Keskek et al. 2014). Some studies also suggest that investors may value the interpretation role of analysts around an EA (Chen et al. 2010; Blankespoor et al. 2020). Thus, investors could be expected to react more to analysts' forecasts following bundled guidance than to forecasts following non-bundled guidance. On the other hand, bundled guidance might subsume the usefulness of subsequent revised forecasts if analysts tend to piggyback on managerial guidance (e.g., Altınkılıç et al. 2013; Kim and Song 2015). In this section, we examine whether investors react more or less strongly to individual analysts' forecasts following bundled guidance than non-bundled guidance.[18]

More specifically, we investigate whether the market incorporates the news contained in analysts' forecast revisions into stock prices. If the market finds analysts' revised forecasts to be useful, then we expect a significant market reaction to analysts' forecast revisions (Ivković and Jegadeesh 2004). We follow Ivković and Jegadeesh (2004) and examine the stock price response to individual analysts' forecast revisions (per unit of revision news) following bundled guidance

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16. As a robustness check, we rerun equation (3) by removing guidance observations where no analysts issue forecasts within five days after the guidance. Our results show that the coefficient on *Bundled* remains statistically significant (with the coefficient of 0.224 and *p*-value <0.01). Overall, we interpret our results as suggesting that analysts are at least one day (i.e., 0.224 × 5 days) faster in revising their forecasts after bundled guidance than after non-bundled guidance.

17. According to our framework, analysts likely have less time pressure and fewer cognitive constraints outside the EA window, and they may find non-bundled guidance less credible. As a result, analysts may spend more time and effort gathering and producing information on their own and put less weight on managerial guidance in the non-bundling case. Thus, our framework does not predict whether analysts' forecasts are more or less accurate after bundled guidance than after non-bundled guidance. We find no evidence that analyst forecast accuracy is higher for the forecasts issued after bundled guidance (not tabulated). We also explore whether "time pressure" and "cognitive constraints" would lead analysts to "overrely" on bundled guidance. To address this issue, we follow the research design in Feng and McVay (2010) and test whether the estimated analyst forecast revision in response to bundled guidance is associated with absolute analyst forecast errors. Our untabulated results suggest that relying on bundled guidance does not lower the accuracy of analysts' forecasts. We interpret this result as suggesting that analysts do not overweight bundled guidance.

18. Altınkılıç et al. (2013) suggest that analysts piggyback on managerial disclosure. However, there is an ongoing debate as to whether the results in Altınkılıç et al. (2013) can be interpreted as analyst piggybacking (e.g., Li et al. 2015). In fact, Altınkılıç et al. (2013) do find significant market reactions to analysts' revisions following public information events.

TABLE 9

Intraday market reaction sensitivity to analysts' revisions following managerial guidance

	MktReaction			
	(1)		(2)	
	Coeff.	t-stat.	Coeff.	t-stat.
AFRev	3.793***	(5.93)	3.072***	(4.97)
AFRev×Bundled	0.712***	(4.58)	0.682***	(4.42)
Bundled	0.005***	(7.61)	0.005***	(7.32)
AFRev×AbsAFRev	−36.615***	(−6.32)	−36.195***	(−6.24)
AbsAFRev	−0.357**	(−2.07)	−0.298*	(−1.68)
AFRev×HAFBias	−10.716	(−1.46)	−10.329	(−1.45)
HAFBias	−0.058	(−0.86)	0.072	(1.04)
AFRev×HAFAccu	8.345	(1.00)	10.057	(1.22)
HAFAccu	−0.162**	(−2.34)	0.007	(0.09)
AFRev×AFBad	−0.756	(−1.52)	−0.351	(−0.70)
AFBad	−0.007***	(−8.84)	−0.007***	(−8.83)
AFRev×AFLoss	−0.229**	(−2.02)	−0.214*	(−1.85)
AFLoss	−0.001	(−0.48)	−0.001	(−0.60)
AFRev×AFHorizon	−0.422***	(−3.80)	−0.339***	(−3.11)
AFHorizon	−0.002***	(−3.43)	−0.002***	(−3.17)
AFRev×DAccrual	0.944	(1.28)	1.223*	(1.75)
DAccrual	−0.005	(−0.71)	−0.002	(−0.22)
AFRev×Mrk-To-Bk	0.050**	(2.13)	0.044*	(1.90)
Mrk-To-Bk	0.000	(1.39)	0.000	(1.39)
AFRev×MBEStreak	−0.074	(−0.49)	−0.002	(−0.01)
MBEStreak	0.003***	(5.87)	0.002***	(3.11)
EANews			−1.144***	(−6.25)
EANews×AbsEANews			40.747***	(4.42)
AbsEANews			0.251***	(3.52)
EANews×DAccrual			2.378**	(2.11)
EANews×Mrk-To-Bk			−0.041	(−1.60)
EANews×MBEStreak			0.026	(0.14)
Industry fixed effects	Yes		Yes	
Year-quarter fixed effects	Yes		Yes	
No. of obs.	203,980		203,980	
Adjusted R^2	0.060		0.064	

Notes: This table reports the estimation results of the regression in equation (4). All variables are defined in Appendix 1. All analyst forecast-related variables are calculated for each individual analyst. The constant term and industry and year-quarter fixed effects are included but not tabulated for brevity. Robust t-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 10%, 5%, and 1% levels are indicated by *, **, and ***, respectively.

versus their revisions following the issuance of non-bundled guidance. More specifically, we regress the intraday market reaction around the analyst forecast announcement (MktReaction) on the AFRev, the interaction between AFRev and Bundled, and a set of control variables related to firm and analyst forecast characteristics as follows:

$$MktReaction = d_0 + d_1AFRev + d_2AFRev \times Bundled + d_3Bundled + \sum d_k Controls$$
$$+ \sum e_k AFRev \times Controls + \gamma + w + \varepsilon. \tag{4}$$

We follow Altınkılıç et al. (2013) and measure the intraday market reaction (*MktReaction*) over a window of four 10-minute intervals around the analyst forecast announcement within five days after the managerial guidance, where non-trading nighttime (or weekend or holiday) periods are folded into one interval. This relatively narrow 40-minute window helps isolate the market reaction to individual analysts' forecast revisions from reactions to the preceding guidance news. We use a similar specification as that in equation (1), except for focusing on analyst forecast variables instead of managerial guidance variables. We also follow Altınkılıç et al. (2013) and measure all analyst forecast-related variables of each individual analyst.[19]

Table 9 reports the results of this analysis. Column (1) shows that the interaction term, *AFRev×Bundled*, is positive and significant at the 1% level. This result does not change if we further control for actual earnings surprise (column (2)). Thus, our results here suggest that market reaction sensitivity to analysts' forecast revisions is greater for revisions issued after bundled guidance than for those issued after non-bundled guidance. Economically, for example, column (1) shows that bundled guidance is associated with an increase of approximately 19% in market reaction to analysts' forecast revisions.[20]

Our evidence in this section suggests that investors do not simply dismiss analysts' revisions after bundled guidance as piggybacking, but view analysts as still playing a role as an information intermediary in the presence of bundled guidance. This evidence is consistent with prior studies that indicate the importance of analysts in issuing timely forecasts immediately after EA (e.g., Guttman 2010; Keskek et al. 2014).

6. Robustness checks

Unobserved correlated variables

It is possible that the effects of bundling that we observe are due to some unobservable firm or CEO characteristics, confounding year trend effects, or incentives omitted from our baseline regression models. For example, the decision to issue bundled versus non-bundled guidance has been shown to be affected by a number of factors, including the disclosure venue, a firm's pre-committed disclosure policy, the type and magnitude of news provided within the guidance, firm characteristics, and the firm's information environment (e.g., Rogers and Van Buskirk 2013). Although we control for a number of guidance properties and conduct an entropy balancing analysis, in this section we perform additional checks to address these concerns.

A traditional way to address unobserved correlated variables is to implement a Heckman (1979) two-stage procedure. We note that the most critical step using the Heckman (1979) two-stage procedure is to find an instrumental variable (IV) that is correlated with the independent variable of interest but is exogenous relative to the dependent variable. However, finding such an exogenous variable in the setting of disclosure policy is generally difficult (e.g., Lennox et al. 2012). Previous studies suggest that the Heckman (1979) approach should not be used to bolster confidence in the OLS estimate if the IV is weak or semi-endogenous (Larcker and Rusticus 2010). Therefore, we follow Larcker and Rusticus (2010) and assess the sensitivity of

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19. We also consider the potential late time stamps of I/B/E/S data, but we do not think it is a major issue in our setting. First, late time stamps, if any, would lead us to misclassify some early guidance as late guidance, which in turn would weaken the association between delayed market reactions and guidance news. Second, such errors, if they exist, would affect both forecasts issued after bundled guidance and those issued after non-bundled guidance. This means that the potential errors would not systematically bias toward finding results for a particular group of analysts' forecasts. Third, Bradley et al. (2014) and Hoechle et al. (2015) document that time stamp errors are relatively rare after 2002. As an additional robustness check, we rerun equation (3) using post-2002 data and find similar results (the *p*-value associated with *AFRev×Bundled* is less than 0.01, untabulated).

20. The incremental effect of bundling is equal to the ratio of the coefficient on *AFRev×Bundled* and the coefficient on *AFRev* (0.712/3.793 = 0.188).

baseline results to unobserved correlated variables using the method developed by Frank (2000). This alternative approach is used to assess the likelihood of an unobserved confounding variable to significantly affect the results estimated from our baseline model. Our results from this analysis, reported in Appendix 3, suggest that the possibility of an unobserved confounding variable to significantly affect our results is very small.

Additional robustness checks

Next, we conduct a set of additional robustness checks based on alternative samples, estimation methods, and model specifications to further address the omitted variable issues, such as sticky firm disclosure policy and time trend effects.

Non-bundled guidance around concurrent corporate events

Prior studies show that non-bundled guidance can be "contaminated" by other concurrent events (e.g., conference calls, executive changes, product announcements) (Billings et al. 2015). Indeed, based on multiple data sources (e.g., Capital IQ's Key Developments, Thomson Reuters' Street Event, and Ravepack's Press Releases), we verify that 66% of the non-bundled guidance in our sample has a contaminating event. To address this concern, we reestimate our baseline model by removing non-bundled guidance with contaminating events and report the robust results in row (1) of Table 10.

No analyst forecast revisions

In our main analysis, we set *AFRev* to zero if the consensus analyst forecast after the managerial guidance is missing (i.e., there is no analyst revision). This implicitly assumes that the analyst issued a revision of zero when they did not change their expectations. As a robustness check, we drop any guidance with no analysts issuing their forecasts within five days after the guidance date. We find similar estimation results on *MFNews×Bundled* (row (2) of Table 10).

Managerial guidance issuance policy

We also consider that the decision to issue bundled versus non-bundled guidance could be a firm's pre-committed disclosure policy. For example, Billings et al. (2015) suggest that managers with a history of providing guidance are more likely to commit to providing bundled guidance to mitigate investor uncertainty. Our effect of bundling could be driven by a firm's committed disclosure policy. To address this alternative explanation, we create two indicator variables on whether a firm issued (i) managerial guidance in the past (*MFIssued*) and (ii) bundled guidance in the last quarter (*LagBundled*). Our results are robust to further controlling for the interactions of guidance news and these two indicator variables (row (3) of Table 10).

Time trend

As shown in Table 2, the frequency of bundling increases over time. To mitigate the concern that the bundling effect is due to a time trend, we examine whether our *AFRev* results are robust to controlling for a year-quarter trend variable (*Year-Quarter*) and its interaction with guidance news. This approach essentially controls for potential differences in the quality of guidance news and analysts' responses to guidance news over time. It also controls for other time-variant potentially confounding effects. The results in row (4) of Table 10 show that the effect of bundling remains unaffected.

Time-invariant effects

To control for potential omitted variables related to fixed firm characteristics, we reestimate equation (1) while including the interaction terms between firm fixed effects and *MFNews*. Note that the presence of firm fixed effects also allows us to interpret the coefficients as indicating the effects of changes in variables of interest (e.g., Balakrishnan et al. 2014). Thus, if we find a significantly positive coefficient on *MFNews×Bundled*, we can interpret it as a change in guidance

TABLE 10

Additional robustness checks

	Tests	Coeff. on $MFNews \times Bundled$	t-stat.	Obs.	Adj. R^2
(1)	Exclude non-bundled guidance concurrent with other events	0.576***	(15.95)	71,080	0.881
(2)	Exclude observations with no analysts issuing forecasts within five days after the guidance	0.540***	(13.69)	72,923	0.850
(3)	Control for prior disclosure policy: *MFIssued, MFNews×MFIssued, LagBundled,* and *MFNews× LagBundled*	0.580***	(20.14)	85,098	0.865
(4)	Control for time trend effects: *Year-Quarter, MFNews×Year-Quarter*	0.551***	(16.71)	85,098	0.853
(5)	Control for firm fixed effects: Firm fixed effects, and *MFNews×* firm fixed effects	0.430***	(3.32)	5,078	0.896
(6)	Adjust for bias in *AFRev* and *MFNews* as in Hilary et al. (2014)	0.401***	(15.27)	84,880	0.903
(7)	Define bundled guidance using the window of 3 days centered on the EA	0.584***	(18.07)	84,595	0.870
(8)	Define bundled guidance using the window of five days centered on the EA	0.582***	(18.09)	84,519	0.870
Other variables		Yes			
Industry fixed effects		Yes			
Year-quarter fixed effects		Yes			

Notes: This table reports the estimation results of of the regression in equation (1). In row (1), we exclude the non-bundled guidance issued concurrent with other events. In row (2), we exclude observations with no analysts issuing forecasts within five days after the guidance. In row (3), we control for firms' tendency to issue prior guidance and prior bundled guidance. In row (4), we control for the effect of time trend, *Year-Quarter*. In row (5), we control for firm fixed effects and their interaction terms with *MFNews*. In row (6), we adjust for bias in *AFRev* and *MFNews* as in Hilary et al. (2014). In row (7), we redefine bundled guidance as being issued within three days centered on the EA. In row (8), we redefine bundled guidance as being issued within five days centered on the EA. All variables are defined in Appendix 1. Constant terms, control variables, and industry and year-quarter fixed effects are included but not tabulated for brevity, except that year-quarter fixed effects (industry fixed effects) are excluded in row 4 (5), respectively. Baseline control variables are the same as those shown in column (3) of Table 3. Robust *t*-statistics are reported in parentheses. Standard errors are clustered at the firm and year-quarter level. Coefficients that are significant at the 1% level are indicated by ***.

bundling associated with a change in analysts' revision activities. The results in row (5) of Table 10 show that our main findings continue to hold.

Other robustness checks

Prior studies suggest that both analysts and managers have incentives to include a certain level of bias in their forecasts (Hilary and Hsu 2013; Hilary et al. 2014). As a result, the face value of management guidance news (*MFNews*) and analysts' forecast revisions (*AFRev*) may not necessarily reflect what analysts and managers "truthfully" believe. This could lead to some good (bad) guidance news being classified as bad (good) news if we do not consider the effect of those biases in calculating *MFNews*, or some upward (downward) revision being classified as downward (upward) revision if we do not consider the biases in calculating *AFRev*. To ensure that our results are not sensitive to the potential biases in management guidance and analysts' forecasts,

we estimate these potential biases and exclude them from management guidance and analysts' forecasts following Hilary et al. (2014) and rerun our baseline model. As shown in row (6) of Table 10, our main findings are not affected.

In our main analysis, we define bundled guidance as guidance issued on the EA date. Some prior studies define bundled guidance as being issued within three days (e.g., Rogers and Van Buskirk 2013) or five days (e.g., Billings et al. 2015) centered on the EA. The percentage of bundled guidance slightly increases from 75.03% to 77.21% (77.38%) of our sample if we use the measurement window of three days (five days) centered on the EA. This confirms that the majority of bundled guidance is issued on the EA date. Our results in rows (7) and (8) of Table 10 show that our main findings are robust to using these alternative windows to define bundled guidance.

Finally, we estimate our baseline regression conditional on the sign of forecast news (Rogers and Stocken 2005; Kothari et al. 2009) and the sign of guidance bias (Baik and Jiang 2006; Hilary et al. 2014). Our untabulated results indicate that the effects of bundled guidance on *AFRev* hold for both good and bad news guidance (relative to analyst consensus) or optimistic and pessimistic guidance (relative to actual earnings). These results suggest that it is unlikely that our findings are driven by the sign of the news or the sign of the bias in managerial guidance (e.g., the downward bias in managerial guidance).[21]

In summary, the results of various analyses in this section continue to show that bundled guidance is positively associated with the magnitude of analysts' revisions in response to guidance news. Although we cannot fully rule out the possibility that a correlated omitted variable remains, these results provide greater confidence in the conclusion that it is unlikely that our main findings are due to endogeneity issues.

7. Summary and conclusions

In this study, we find that bundled guidance influences analysts' expectations more than non-bundled guidance. This result is robust to a series of robustness tests. We further examine three possible explanations ("time pressure," "cognitive constraints," and "disclosure credibility") for the bundling effect. Collectively, these mechanisms help explain the usefulness of bundled guidance for analysts, but the economic significance of each mechanism is small.

Next, we find that analysts revise their forecasts more quickly following bundled guidance than non-bundled guidance. This evidence corroborates our main hypothesis that bundled guidance helps address analysts' time pressure and cognitive constraints and is more credible due to additional disclosures around EAs, which in turn facilitates analysts' forecast revisions. Finally, we show that investors respond more strongly to analysts' forecasts that follow bundled guidance than to those forecasts that follow non-bundled guidance. Our results thus suggest that the market values analysts' timely forecast revisions following bundled guidance.

Overall, our study contributes to the literature by investigating the effects of the increasingly common practice of bundled guidance on analysts' forecast revisions. Importantly, our results show that by aligning managerial guidance with analysts' routine revision activity, bundling facilitates analysts' forecast revisions. This finding provides insight into the growing body of literature that examines the impact of management guidance attributes on capital markets. Our study on the consequences of bundling on financial analysts also enhances our understanding of how analysts process information at the time of an EA versus at other times. Lastly, our study extends prior studies on the interpretation role of analysts around corporate public information events by showing that investors value analysts' forecast revisions issued after bundled guidance more than those revisions issued after non-bundled guidance. This finding confirms the importance of analysts in issuing timely forecasts immediately after EAs, which helps explain why bundling can be an effective guidance strategy.

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21.   Our results continue to hold if we use management guidance on *annual* earnings to estimate the bundling effect (*p*-value <0.01, untabulated).

Appendix 1: Variable definitions

Variable	Definition
Bundled	Indicator variable equal to one if a manager issues earnings guidance for future earnings together with actual EA of current quarter, and zero otherwise. Bundled guidance is issued on the same day of an EA date
AbsAFRev	Absolute value of *AFRev*
AbsEANews	Absolute earnings surprise of current quarter, measured as the absolute value of the difference between the current quarter's actual earnings and its most recent consensus analyst forecast, scaled by the stock price one trading day before the EA date
AbsMFNews	Absolute value of *MFNews*
AFBad	Indicator variable equal to one if individual analyst forecast revision is negative, and zero otherwise
AFHorizon	Analyst forecast horizon, measured as the natural logarithm of the number of days between the actual EA of forecasted earnings and the issuance of an analyst forecast
AFLoss	Indicator variable equal to one if the value of analyst forecast is negative, and zero otherwise
AFRev	Adjusted analysts' forecast revisions scaled by the stock price one trading day before the guidance date. Unadjusted analysts' forecast revisions are the difference between the consensus (i.e., mean) analyst forecast issued within five days after the managerial guidance date and the last consensus analyst forecast issued within 30 days before the managerial guidance date. We adjust analysts' forecast revisions for the bundling error as in Rogers and Van Buskirk (2013)
AFSpeed	Analyst revision speed. We first obtain the average number of days taken by analysts following a firm to issue a forecast for the future earnings within five days after a managerial guidance, scaled by five. We next adjust this value for the bundling error similar to the adjustment for *AFRev* following Rogers and Van Buskirk (2013), and then multiply the adjusted value by −1
DAccrual	Discretionary accruals of current quarter, measured as in Kothari et al. (2005)
EANews	EA news of current quarter, measured as the difference between actual earnings of the current quarter and its most recent consensus analyst forecast, scaled by the stock price one trading day before the EA date
HAFAccu	Historical analyst forecast bias, measured as −1 multiplied by the averaged absolute difference between individual analyst forecast and actual earnings over the past eight quarters, scaled by the stock price one trading day before the guidance date
HAFBias	Historical analyst forecast bias, measured as the averaged value of the difference between individual analyst forecast and actual earnings over the past eight quarters, scaled by the stock price one day before guidance date
HMFAccu	Historical guidance accuracy, defined as −1 multiplied by the averaged absolute value of the difference between guidance and actual earnings over the past eight quarters (prior to the current quarter), scaled by stock price of one trading day before the guidance date
HMFBias	Historical managerial guidance bias, measured as the averaged value of the difference between guidance and actual earnings over the past eight quarters (prior to the current quarter), scaled by the stock price one trading day before the guidance date
LagBundled	Indicator variable equal to one if a manager issues earnings guidance for future earnings together with actual EA of last quarter, and zero otherwise. A bundled guidance is issued on the same day as an EA date
MBEStreak	Indicator variable equal to one if a firm consistently met or beat analyst expectations in the past four EAs, and zero otherwise
MFBad	Indicator variable equal to one if *MFNews* is negative, and zero otherwise

(The table is continued on the next page.)

(continued)

Variable	Definition
MFHorizon	Managerial guidance horizon, measured as the natural logarithm of the number of days between the issuance of a managerial guidance for future earnings and the EA of forecasted earnings
MFIssued	Indicator variable equal to one if a firm previously issued a guidance targeting the same period's earnings as the current guidance, and zero otherwise
MFLoss	Indicator variable equal to one if the value of a managerial guidance on earnings is negative, and zero otherwise
MFNews	Managerial guidance news, measured as the difference between the value of guidance on future earnings and the most recent consensus analyst forecast for the same period before the guidance date, scaled by the stock price of one trading day before the guidance date. We adjusted *MFNews* for the bundling error as in Rogers and Van Buskirk (2013)
MFWidth	Managerial guidance width, measured as the difference between the upper- and lower-end estimates of managerial guidance, scaled by the absolute value of the midpoint of managerial guidance (point estimates have a range of zero)
MktReaction	Percentage change of the stock price over a window of four 10-minute intervals around the analyst forecast announcement, where non-trading nighttime (or weekend or holiday) periods are folded into one interval (Altınkılıç et al. 2013)
Mrk-To-Bk	Market-to-book ratio of the current quarter, measured as the market value of equity divided by the book value of equity at the end of quarter
PostRegFD	Indicator variable equal to one if the guidance is issued after Reg FD, and zero otherwise
BundledFirms	Indicator variable equal to one (zero) for firms that consistently issued bundled guidance (non-bundled guidance) and did not issue any non-bundled guidance (bundled guidance) during January 1998 and August 2003, respectively
Year-Quarter	Numerical value of fiscal year multiplied by 10, plus the numerical value of fiscal quarter (e.g., *Year-Quarter* = 19,981 for fiscal year 1998 and fiscal quarter one)

Appendix 2: Effectiveness of entropy balancing on bundled and non-bundled firms in the DiD analysis

Panel A: Before entropy balancing

	BundledFirms = 1			*BundledFirms* = 0		
	Mean	Variance	Skewness	Mean	Variance	Skewness
MFNews	0.02	0.00	1.72	0.00	0.00	1.50
AbsMFNews	0.03	0.00	3.50	0.02	0.00	3.70
HMFBias	0.02	0.00	1.72	0.01	0.00	2.40
HMFAccu	−0.02	0.00	−2.37	−0.02	0.00	−2.97
MFBad	0.27	0.20	1.02	0.51	0.25	−0.04
MFLoss	0.13	0.11	2.21	0.17	0.14	1.79
Horizon	4.99	0.33	0.51	4.35	0.75	0.49
Width	0.19	0.11	3.59	0.14	0.07	4.23
DAccrual	0.00	0.00	−0.02	0.00	0.00	0.45
Mrk-To-Bk	3.59	19.82	3.99	3.10	12.24	4.55
MBEStreak	0.23	0.18	1.28	0.17	0.14	1.77

(The table is continued on the next page.)

(continued)

Panel B: After entropy balancing

	BundledFirms = 1			BundledFirms = 0		
	Mean	Variance	Skewness	Mean	Variance	Skewness
MFNews	0.02	0.00	1.72	0.02	0.00	1.72
AbsMFNews	0.03	0.00	3.50	0.03	0.00	3.50
HMFBias	0.02	0.00	1.72	0.02	0.00	1.72
HMFAccu	−0.02	0.00	−2.37	−0.02	0.00	−2.37
MFBad	0.27	0.20	1.02	0.27	0.20	1.02
MFLoss	0.13	0.11	2.21	0.13	0.11	2.21
Horizon	4.99	0.33	0.51	4.99	0.33	0.51
Width	0.19	0.11	3.59	0.19	0.11	3.59
DAccrual	0.00	0.00	−0.02	0.00	0.00	−0.02
Mrk-To-Bk	3.59	19.82	3.99	3.59	19.82	3.99
MBEStreak	0.23	0.18	1.28	0.23	0.18	1.28

Notes: This table presents the effectiveness of entropy balancing for our DiD analysis in panel B of Table 7 based on mean, variance, and skewness of control variables for bundled firms (*BundledFirms* = 1) versus non-bundled firms (*BundledFirms* = 0) derived before and after the application of the entropy balancing approach, respectively. The sample of bundled firms consists of bundled guidance issued by firms consistently issuing bundled guidance during January 1998 and August 2003, while the sample of non-bundled firms consists of non-bundled guidance issued by firms consistently issuing non-bundled guidance during January 1998 and August 2003. All variables are defined in Appendix 1.

Appendix 3: Frank (2000) method

The Frank (2000) method is based on the notion that for an unobserved variable (e.g., the variable that is not controlled by the model) to affect the results, it needs to be correlated with both *MFNews×Bundled* and *AFRev* (controlling for the other variables). Specifically, we derive the minimum correlation necessary to turn a statistically significant effect of *MFNews×Bundled* into a borderline insignificant result. To identify such a borderline, we derive the impact threshold for a confounding variable (ITCV). Empirically, we simulate an omitted variable with different correlations with *AFRev* and *MFNews×Bundled*. ITCV is defined as the lowest product of (i) the partial correlation between the *x* variable (e.g., *MFNews×Bundled*) and a simulated omitted variable that makes the coefficient on the *x* variable insignificant, and (ii) the partial correlation between the *y* variable (i.e., *AFRev*) and the same simulated omitted variable. If the ITCV of the *x* variable, *MFNews×Bundled*, is high (low), our baseline results are less (more) likely to be affected by the omitted variable. The results, reported in the table below, show that the ITCV of *MFNews×Bundled*, based on the baseline specification in column (3) of Table 3, is 0.193. To determine whether this ITCV is high or low, we compute the impact scores of other observed covariates in our baseline specification for comparison. We find that *MFNews*, *MFNews×HMFAccu*, and *MFLoss* are most highly correlated with *AFRev* and *MFNews×Bundled* and, thus, have the highest impact scores. As shown in column (2) of the following table, the impact scores of *MFNews*, *MFNews×HMFAccu*, and *MFLoss* are, however, only 0.061, 0.011, and 0.011, respectively, which are much lower than the ITCV of *MFNews×Bundled*. This implies that we would need a confounding variable with a much stronger correlation with *AFRev* (*MFNews×Bundled*) than *MFNews*, *MFNews×HMFAccu*, and *MFLoss* in order to render the results on *MFNews×Bundled* insignificant. Thus, our results from this analysis, reported in the table below, suggest that the possibility of an unobserved confounding variable to significantly affect our results is very small.

	(1) ITCV	(2) Impact _Partial_
MFNews×Bundled	0.1926	
MFNews		0.0609
MFNews×HMFAccu		0.0111
MFLoss		0.0111
MFHorizon		0.0099
MFNews×HMFBias		0.0018
MFNews×MFBad		0.0016
MFNews×AbsMFNews		0.0012
MFBad		0.0008
MFNews×MFLoss		0.0006
MBEStreak		0.0005
MFNews×Mrk-To-Bk		0.0004
AbsMFNews		0.0002
MFNews×MFWidth		0.0001
MFNews×DAccrual		0.0001
DAccrual		−0.0001
MFNews×MBEStreak		−0.0001
Mrk-To-Bk		−0.0003
MFWidth		−0.0004
HMFAccu		−0.0008
MFNews×MFHorizon		−0.0028
HMFBias		−0.0052
Bundled		−0.009

Notes: This table reports the impact of unobservable confounding variables based on Frank (2000). In column (1), the impact statistic (ITCV) indicates the minimum impact of a confounding variable that would be needed to render the coefficient on _MFNews×Bundled_ statistically insignificant. The ITCV is defined as the product of the correlation between _MFNews×Bundled_ (independent variable of interest) and the confounding variable (a simulated omitted variable) and the correlation between _AFRev_ (dependent variable) and the confounding variable. To assess the likelihood that such a variable exists, column (2) shows the impact of the inclusion of each control variable in our baseline model on the coefficient on _MFNews×Bundled_. The impact score is calculated as the product of (i) the partial correlation between _MFNews×Bundled_ and the control variable and (ii) the correlation between _AFRev_ and the control variable (teasing out the effect of the other control variables). All variables are defined in Appendix 1.

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