

(Dis)aggregated earnings forecasts and acquisition financing

(Dis)aggregated
earnings
forecasts

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255

Abstract

Purpose – The purpose of this paper is to examine how a firm's mergers and acquisitions (M&A) goals influence its voluntary disclosure policy. Specifically, this paper examines how a firm's M&A financing intentions influence the degree of aggregation in management guidance prior to and after the M&A transaction.

Design/methodology/approach – Using a logistic model, this study tests the relation between M&A financing and the decision to issue disaggregate earnings guidance for 3,929 acquiring firms from 2007 to 2011.

Findings – The logistic regression results show that firms are more likely to provide disaggregate earnings guidance when using mostly stock to finance M&A and that the incentives to disaggregate guidance vary throughout the M&A transactional window. Alternatively, because the value of cash is independent of the true value of the acquirer, the results show that firms offering mostly cash to finance M&A are less likely to issue disaggregate earnings forecasts. Additional analysis reveals that the decision to issue disaggregate earnings guidance also influences post-merger outcomes such as CEO turnover.

Research limitations/implications – The choice to disaggregate earnings guidance and the choice to use stock as a means to finance an acquisition is made by management, thus are endogenous which could introduce bias.

Originality/value – This study provides insights into management's incentives and attitudes toward the use of management forecasts to effect a potential merger and acquisition. Given the flexibility management has in issuing voluntary forecasts, management can tailor a financial message toward investors and potential targets in attempt to facilitate a merger and acquisition and to further the firm's goals.

Keywords M&A, Voluntary disclosure, Earnings forecasts, Pro-forma earnings forecasts

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1. Introduction

In this study I examine management forecast activity around mergers and acquisitions (M&A). M&A involve a complex process. Much of the complexity relates to the acquiring firm's information flow. Not only does an acquirer have to obtain enough information to accurately value the target, it also has to convey enough credible information so that the target will agree to the offered price. Formulating a disclosure policy that increases credibility can be difficult for many managers, particularly in situations where managerial incentives conflict with those of shareholders, investors and other market participants (Merkley *et al.*, 2013). For example, managers planning a stock acquisition may attempt to temporarily increase their stock price by choosing to (refraining from) disclosing good (bad) news in forecasts thus acting opportunistically (Brockman and Martin, 2009; Ge and Lennox, 2011). Conversely, managers may choose to fashion a disclosure policy aimed at conveying credible private information to reduce information asymmetry. Disentangling and measuring the effect these incentives have on voluntary disclosure behavior is an important goal of M&A and disclosure research. The purpose of this study is to examine how a firm's M&A goals influence its voluntary disclosure policy. Specifically, I examine how a firm's M&A financing intentions influence the degree of aggregation in management guidance prior to and after the M&A transaction.

In M&A transactions financed with stock, significant asymmetries exist between the acquirer's management and its shareholders, the target's shareholders and other market participants (Amel-Zadeh and Meeks, 2019). Because managers tend to manipulate earnings upward prior to mergers (Erickson and Wang, 1999), disclose significantly more good news before acquisitions (Brockman and Martin, 2009) and a general presumption exists that



stock-based acquisitions are misvalued (Shleifer and Vishny, 2003) market participants tend to question the motives of management. In addition, Rogers and Stocken (2005) argue that when a firm's earnings vary as its circumstances change, the difficulty in accurately forecast earnings increases, thus making it more difficult for investors to evaluate the truthfulness of the manager's projections. M&A can make future earnings hard to predict and may cause market participants to interpret inaccuracies in earnings forecasts either as a manager's intention to mislead or an honest mistake arising from the difficulty of forecasting a firm's earnings. Merkley *et al.* (2013) posit that disaggregation detail in earnings forecasts serve to increase the credibility of earnings guidance in situations where earnings are more difficult to forecast or are noisy. They argue that disaggregated forecasts derived from income statement line items, which are based on well-defined accounting data, are more reliable than other supplementary disclosures such as "soft talk" which are based on non-accounting data. When stock is offered in an acquisition, the financial statements (or accounting data) of the acquirer will affect the equity price of the shares the target receives. Supplemental information provided through disaggregated earnings guidance can assist in the valuation of the acquirer's shares and serve to enhance the credibility of management especially when that information is based off of well-defined accounting data.

As such, I posit that management's acquisition financing plans influence the aggregation level and information content of the earnings guidance that it offers to the market. I hypothesize that firms financing an acquisition with stock have a higher propensity to issue disaggregated earnings forecasts relative to those using cash financing. I find that acquirers that use stock as the principal means to finance a merger and acquisition are more likely to issue disaggregate earnings guidance.

I also find that the incentives to disaggregate guidance vary throughout the M&A transactional window. Kimbrough and Louis (2011) argue that managers have incentives to effectively communicate the rationale for a proposed merger due to cost of capital benefits. These incentives are the strongest when the intensity for investor demand for supplemental information is pronounced. They expect that the period where managers have the strongest incentives to favorably affect the market's reaction to their stock price is during the merger announcement period before the effective date of the merger. Furthermore, Lang and Lundholm (2000) argue that managers have the incentive to increase disclose frequency prior to the announcement of seasoned equity offerings (SEOs) in an attempt to increase the proceeds from the security issuance. They find that beginning six months before the offering managers make more frequent disclosures about performance, provide more detail and interpretation of their results and make more optimistic disclosures. Consistent with the rationale explained in Kimbrough and Louis (2011) and Lang and Lundholm (2000) I expect that acquiring firms are more likely to issue disaggregated earnings guidance prior to and during the merger announcement periods before the effective date of the merger. I find the incentives to disaggregate are strongest during the transactional window period between the merger announcement and effective date of the merger. The incentives are slightly weaker during pre-acquisition period and become insignificant in the post-acquisition period.

I further investigate the decision to issue disaggregate earnings guidance by testing whether the decision to issue disaggregate earnings guidance influences post-merger outcomes. Specifically, I test whether issuing disaggregate earnings guidance influences the likelihood of subsequent CEO turnover. I find that the acquirer's CEO is less likely to turnover when management issues disaggregate earnings guidance during the acquisition period.

My research contributes to the literature in a number of ways. First, this study furthers the literature by examining management's ability to use voluntary disclosure as a means of conveying private information in order to obtain M&A goals. Second, my results provide insights into management's incentives and attitudes toward the use of management forecasts to effect a potential merger and acquisition. Given the flexibility management has

in issuing voluntary forecasts, it can tailor a financial message toward investors and potential targets in attempt to facilitate a merger and acquisition. Third, this study identifies a particular circumstance and firm characteristic where disaggregated forecasts are provided to further firm goals. As such, I address Hirst *et al.*'s (2008) concern that prior empirical research has done little to identify circumstances and characteristics that result in the disaggregation of management forecasts. Finally, this study evaluates whether management conveys its intention about the type of acquisition financing through the use of voluntary disclosure. Examining these actions can assist researchers and investors in understanding the purpose and meaning of management forecasts in the context of M&A.

Section 2 highlights previous research and develops hypotheses. Section 3 describes sample selection and construction including the creation of acquisition-related time windows. Section 4 explains the research design including variable direction prediction and descriptive statistics. Section 5 describes the results of the model on the full sample and three subsamples derived from forecast timing relating to the acquisition announcement and effective dates. Section 6 details further analysis regarding disaggregated earnings forecasts and acquisition outcomes. Finally, Section 7 concludes.

2. Literature review and hypothesis development

Much of the previous literature relating to management forecast aggregation focuses on establishing whether or not disaggregated forecasts present credible and genuine private information to market participants. According to Dye (1986), managers can improve the credibility of their reports by disclosing additional details. Obviously, the extent to which managers can increase credibility depends not only on the quantitative but also the qualitative aspects of the disclosure. In recent years, many managers have chosen to issue disaggregated earnings guidance, which usually includes an earnings forecast supplemented with other forecast measures such as sales or cash flows from operations. Arguably, disaggregation improves the information environment by providing additional detail not typically present in traditional earnings forecasts. By forecasting sales, cash flow or other income statement items, managers can supply market participants with details on how they arrive at their earnings estimates. Still, most reasonable investors understand that managerial incentives can differ from their own in certain circumstances. Chen *et al.* (2008) argue that these incentives may make disaggregated forecasts more biased and less accurate than aggregated forecasts. They highlight the possibility that over-confident management may provide more information to simply obfuscate bad news or to support optimistic bias in their earnings forecasts. Conversely, Lansford *et al.* (2013) argue that disaggregated forecasting is associated with an improved information environment. By analyzing the different determinants of disaggregated forecasting they provide evidence to suggest that the additional information provides credibility, rather than confuse analysts in predicting future revenues and earnings. They argue that *ex ante* factors such as supply and demand, which are unrelated to manager's private information, drive forecast disaggregation. Generally, whether disaggregation augments credibility depends on the incentives both managers and market participants face in the particular context. In this study, I explore basic incentives that managers and market participants face with respect to financing in a M&A.

Previous research in SEOs, where managers and market participants arguably face similar incentives to those in M&As, may provide a direction to understand incentives to disaggregate earnings forecast in this context. Lang and Lundholm (2000) suggest that management may wish to reduce information asymmetry in an SEO by increasing disclosure. They find that voluntary disclosure can decrease information asymmetry but warn that the market does penalize firms that substantially increase disclosure if incentives to "hype" the firm's stock exist. Unlike other studies that analyze management guidance,

Lang and Lundholm (2000) rely mostly on disclosure data originating from press releases that relate to the SEO. They evaluate the tone of each of these voluntary disclosures and note a change in disclosure frequency between offering and non-offering firms during the six months prior to the first announcement of the offering compared to the previous six months. Specifically, issuing firms dramatically increase their disclosure activity by providing more detail and more interpretation of their results in those categories where managers have the most control[1]. This research appears to indicate that when a firm faces a major change, the incentives are heightened to a point that changes disclosure behavior.

Similar to SEOs, M&A activity can have such widespread effects on the firm. Therefore, management may be incentivized to alter disclosure behavior relating to management guidance. Lipin and Sirower (2003) argue that long before M&A transactions are brought before the board, management must develop a plan to communicate the deal. These communications involve disclosing specific details to investors including financial projections, merger assumptions, integration plans and the basis for the purchase price which will likely force a change in the firm's disclosure policy. Understandably, management will incorporate and communicate these details through mechanisms where they have the most control. For example, Kimbrough and Louis (2011) suggest that bidding firms are more likely to hold conference calls around merger announcements to communicate favorable private information to the market. Kimbrough and Louis draw attention to the way bidders respond to managerial incentives to maximize share prices around mergers. They demonstrate that merger announcement conference calls are a useful means to provide genuine information to positively influence stock prices.

Like conference calls, management earnings forecasts have been shown communicate information to influence stock prices (Pownall *et al.*, 1993). They also afford management a great deal of flexibility and control concerning the details of the disclosure. Brockman and Martin (2009) highlight the use of managerial control over earnings forecasts prior to and after an acquisition. They examine how opportunism in forecasts during the acquisition process influences a firm's stock price and thus the method of payment. They find that stock-financed acquirers change the content of their earnings forecasts by releasing significantly more good news in attempt to boost the stock price. Stock-financed acquirers issue management forecasts with higher abnormal returns during the pre-acquisition event window compared to matched non-acquirers. These results are consistent with the findings in Martin's (1996) study that examines characteristics that tend to motivate a particular payment method in corporate acquisitions. He finds that investment opportunities are an important determinant of the method of payment. Specifically, higher investment opportunities lead to an increased use of stock-financing. In addition, Amel-Zadeh and Meeks (2019) examine an acquirer's information and corporate control motives for disclosing earnings forecasts before an acquisition. They find that voluntarily disclosing pro-forma earnings forecasts provides benefits to acquirers in stock-financed acquisitions, particularly by increasing the likelihood of deal completion, expediting the deal closing and lowering the acquisition premium. Nevertheless, they document that not all acquirers forecast because of the potential costs (CEO turnover and subsequent litigation) associated with a weak forecasting reputation and underperformance after the merger.

Other studies focusing on pre-merger earnings management as a form of opportunism (Erickson and Wang, 1999; Louis, 2004) also support these findings. Erickson and Wang (1999) acknowledge, however, that reasonable investors likely understand that management incentives will be optimistic in this setting. Therefore, investors are likely to reverse temporary returns attributable to the pre-announcement strategies of earnings management and earnings guidance. Nevertheless, according to Graham *et al.* (2005) managers feel that earnings are an important metric to outsiders. That is, they believe that hitting earnings benchmarks is important because meeting earnings benchmarks builds credibility with the

market and helps maintain or increase the firm's stock price. DeAngelo (1986, 1990) argues for this rationale in the M&A context by discussing the role of accounting earnings in stock valuation during buyouts.

In a stock-financed transaction, the acquirer shares the risk of overvaluation with the target owners. More precisely, when an acquirer offers stock to finance an acquisition the value of stock is dependent on the true value of acquirer. At the time of acquisition, the target will want to estimate the true value of the acquirer's shares. Therefore, it's likely that the target and other market participants will demand supplemental disclosures to reduce uncertainty relating to the true value of the acquirer. This rationale is consistent with Lansford *et al.*'s (2013) *ex ante* factors. Alternatively, as suggested by Merkley *et al.* (2013), management may provide disaggregated earnings forecast if management believes the disclosure will strengthen the perceived forecast credibility to the target and investors, especially if the guidance is based on well-defined accounting data detailed in the income statement.

On the other hand, the incentives for financing with cash differ greatly from financing with stock. In a cash-financed transaction the acquirer bears all the risk of overvaluation (Officer *et al.*, 2009). Generally, when an acquirer offers cash the value of cash is independent of the value of firm. The true value of cash is solely the amount of cash offered at the time of acquisition. Therefore, from the standpoint of both the acquirer and the bidder, the true value of the transaction is easily ascertainable because cash is almost effortless to value. The incentives to provide supplemental earnings forecast information appear to be not as strong. Therefore I also hypothesize that:

- H1. M&A firms issuing (dis)aggregate earnings forecasts are (a) more ((b) less) likely to enter into a stock-based acquisition than a cash-based acquisition over a similar time period.

3. Sample selection

The sample selection process is described in detail in Tables I–III. As Table I indicates, I gather my initial sample of management forecasts from Thomson Reuters I/B/E/S Guidance. I begin by extracting all guidance available from 2000 to 2012. I then limit my sample to include all annual and quarterly forecasts for the years 2007 through 2011[2]. I drop observations that are missing an I/B/E/S ticker as this is the primary identifier that I use to match with I/B/E/S analyst data and other data. Specifically, I retain all management forecasts that have the required I/B/E/S, Compustat, Center for Research in Security Prices (CRSP), Thomson Reuters 13-f and SDC data. This results in a sample of 32,748 management forecasts.

	Annual	Quarterly	<i>N</i>
All observations on the I/B/E/S guidance database, 2000–2012	136,557	87,153	223,710
Drop observations made before 2007 and after 2011	(50,313)	(42,113)	(92,426)
Drop observations missing I/B/E/S ticker	(5)	(9)	(14)
Total sample of management forecasts on I/B/E/S guidance database	86,239	45,031	131,270
Drop observations not match with I/B/E/S analyst guidance database	(4,895)	(2,115)	(7,010)
Drop observations that do not match with Compustat and CRSP	(39,960)	(18,118)	(58,078)
Drop observations that have no Thomson Reuters 13-f database info	(586)	(406)	(992)
Drop observations that do not match with SDC	(20,450)	(11,992)	(32,442)
Preliminary sample of management forecasts	20,348	12,400	32,748
Drop observations for fiscal periods for which multiple forecasts are issued	(3,741)	(1,576)	(5,317)
Drop managerial forecasts that do not fall with one of the M&A windows	(14,261)	(9,241)	(23,502)
Number of management forecasts that qualify as either aggregate or disaggregate forecasts	2,346	1,583	3,929

Table I.
Details of forecast
sample construction

As Table II shows, I initially extract the M&A data from Thompson Financial SDC M&A database for the years 2007–2011. I then exclude observations that fail to provide sufficient detail on the type of financing used in the deal. I define a stock-based transaction as one where 50 percent or more of the transaction was purchased with stock and a cash-based transaction as one where greater than 50 percent of the deal used cash. Because the timing of the forecast relative to the M&A announcement and effective dates are important in my tests, I require both dates to be available. In addition, I limit my criteria to include only public targets so as to match with financial data provided through Compustat, CRSP, I/B/E/S and Thomson Reuters 13-f databases. The SDC final sample includes 7,530 observations.

As previously mentioned, SDC includes two important acquisition dates. The first is the announcement date of the prospective acquisition, which is the date where negotiations have become so material to create an affirmative duty to disclose the transaction to market participants. The second is the effective date, the date when the entire transaction is completed and effective. A third date, the agreement date, is not listed in SDC. According to Erickson and Wang (1999) the agreement date is the date that a formal agreement concerning the terms of the merger is reached. The agreement date is important in a stock-based acquisition because that is when the negotiated exchange ratio is fixed. The exchange ratio indicates the number of shares of acquiring firm stock will be issued for a share of target stock, which may influence disclosure incentives. The actual value target shareholders will receive depends on the price of the acquirer's stock on the effective date and the exchange ratio. The agreement date is unknown until it is announced but for purposes of this analysis I assume the agreement date occurs between the announcement date and effective date.

Table II.
Details of M&A
sample construction

	<i>N</i>
All observations on the Thomson Reuters SDC M&A database, 2007–2011	51,847
Drop observations missing SDC identifier	(1)
Drop observations made before 2007 and after 2011	(718)
Drop observations that do not have financing information	(30,564)
Drop observations where the effective date is not measurable	(6,721)
Drop observations that do not satisfy cash trans. or stock trans. criteria	(6,313)
Final sample of M&A activity	7,530

Table III.
Forecast detail by
forecast description

	<i>N</i>	Frequency (%)
Earnings per share	1,479	37.6
Sales	1,066	27.1
Capital expenditure	344	8.8
Fully reported earnings	304	7.7
Gross margin	230	5.9
EBITDA	183	4.7
Net income	146	3.7
Operating profit	115	2.9
Pretax income	37	0.9
Funds from operations	9	0.2
EBITDA per share	6	0.2
Dividends per share	6	0.2
Return on assets (%)	2	0.1
Return on equity (%)	2	0.1
Total	3,929	100

Note: This table details the final sample size by forecast description

Considering these three dates is important in obtaining an understanding as to how certain managerial incentives impact earnings guidance. Throughout this process, both parties will conduct due diligence work to obtain sufficient information to make a prudent decision about whether or not to proceed with the acquisition. Arguably, this work can incentivize the acquirer to supplement financial information, thus providing the target with a refined idea of the true value of the acquirer. Hypothetically, supplemental financial information can be provided through a disaggregated earnings forecast without triggering the materiality threshold that would create a duty to disclose. The question that remains, however, is whether these incentives continue through the M&A process? Obviously, the time from the start of negotiations to the completion date varies from transaction to transaction. Fortunately, SDC provides information relating to the end of the timeline (i.e. the effective or completion dates). The negotiation period, however, is difficult to measure. Fortunately, Heitzman and Klasa (2012) investigate the negotiation period and find that M&A negotiations last an average of 177 days.

Using this measure, I form a general forecast event window surrounding the acquisition that will act as the basis of my tests. Considering the average negotiation period in Heitzman and Klasa (2012), I begin my event window 210 days before acquisition announcement date and end the event window 30 days after completion date. For a forecast observation to qualify for the final SDC/Guidance sample, the observation has to fall within this window. I also treat multiple forecasts of the same type for the same forecast period as one forecast event and select the most recent forecast to include in the final SDC/guidance sample.

Finally, an appropriate final sample rests on the measure of disaggregated and aggregated forecasts. For purposes of this study, I define disaggregated earnings guidance as earnings forecast with at least one other measure forecasted 15 prior to or after the original earnings forecast. I define an aggregated forecast to be a forecast based on a derivation of earnings with no other measure forecasted 15 days prior to or after the earnings forecast. I code earnings per share (EPS), fully reported earnings per share (GPS), EBITA (EBT) and EBITA per share (EBS) as earnings forecasts. I exclude forecasts that do not qualify as earnings forecasts or were not forecasted within the specified windows above to qualify as disaggregated forecasts from the final SDC/Guidance sample. This resulted in a final SDC/Guidance sample of 3,929 forecasts. Table III shows that the category “Earnings per Share” comprises 37.6 percent of the final SDC/Guidance sample, with “Sales” forecasts as the next largest category, making up 27.1 percent of the sample.

Because my objective is to analyze these categories relative to the different managerial incentives in the acquisition period, I create smaller windows to obtain an understanding of how disclosure behavior may vary through time and perhaps identify a specific time when incentives change. To do this, I divide my general acquisition window into nine separate windows to compare frequencies and look for indications of abnormal disclosure behavior. Each window is measured relative to the announcement and effective dates. Seven windows occur before the acquisition announcement date (Days (-210, -181), Days (-180, -151), Days (-150, -121), Days (-120, -91), Days (-90, -61), Days (-60, -31), Days (-30, announce)). There is one window for the time between the announcement date and effective date. Finally, there is one window that occurs after the effective date (Days (effective, 30)). The timeline is detailed in Figure 1.

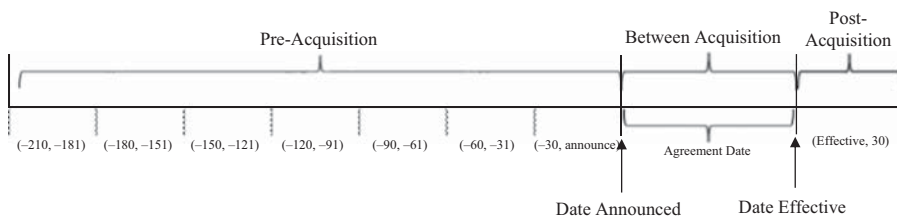


Figure 1. Timeline of acquisition windows

Table IV details the breakdown of the sample by window.

Noticeably, cash-financed transactions make up the 90.3 percent of total acquisitions. A casual observation reveals that the frequency of forecasts is consistent through the acquisition timeline. For the time period occurring between announcement date and effective date, however, 27.56 percent of the forecasts occurred during this time for stock-financed transactions compared to 18.80 percent for cash-financed transactions.

4. Research design

I model the relation between disaggregate management forecasts and the stock-based financing used in an acquisition as follows:

$$\begin{aligned}
 DISAGEARN = & \beta_0 + \beta_1 STOCK_t + \beta_2 LOGMARKET_{t-1} + \beta_3 LOSS_t + \beta_4 NEGRET_{t-1} \\
 & + \beta_5 RD_{t-1} + \beta_6 LOGNUMEST_t + \beta_7 DEVIATION_{t-1} \\
 & + \beta_8 LITIGATION_t + \beta_9 IO_t + \beta_{10} VARSAL_{t-1} + \beta_{11} CONTROL_t \\
 & + \beta_{12} TAX_{t-2} + \beta_{13} VOLATILITY_t + \varepsilon.
 \end{aligned}
 \tag{1}$$

The dependent variable in the logistic regression above, *DISAGEARN*, equals 1 if the observation qualifies as a disaggregated forecast and 0 if the forecast is an aggregated forecast. The independent variable of interest, *STOCK*, is equal to 1 if the observation qualifies as a stock-financed acquisition and 0 if the observation is a cash-financed acquisition.

Aside from these two variables, other factors are included in the model as controls. First, I calculate *LOGMARKET* which is the natural log of the market value of equity which controls for the size of the firm. All else equal, larger firms tend to have more publically available information than small firms. Because of this, I expect that the need to disaggregate forecasts decreases with firm size; that is, I expect a negative coefficient for *LOGMARKET*. I include the control variable *LOSS* because, as Skinner (1994) argues, bad news firms may disclose bad news earlier in attempt to reduce litigation risk. They may also supplement bad news earlier with additional financial detail to satisfy legal obligations. Thus, I expect a positive coefficient for *LOSS*. Conversely, I use an indicator variable *NEGRET* for firms who have experienced a negative cumulative abnormal return around the earnings forecast date. Hutton *et al.* (2003) find that verifiable forward looking statements increase investor’s reliance on good news. Being verifiable suggests that good news requires supplemental information to be credible (Mercer, 2004). Lansford *et al.* (2013) suggest that R&D expenses (*RD*) can reveal the extent to which the firm plans new products. This may serve as a deterrent to supplemental disclosure as additional information may help competitors. However, I expect a positive coefficient for *RD*

Window	Stock (N = 381)		Cash (N = 3,548)	
	N	Frequency (%)	N	Frequency (%)
Days(-210,-181)	17	4.46	382	10.77
Days(-180, -151)	40	10.50	326	9.19
Days(-150,-121)	35	9.19	284	8.00
Days(-120,-91)	31	8.14	427	12.03
Days(-90,-61)	33	8.66	329	9.27
Days(-60, -31)	50	13.12	314	8.85
Days(-30, announce)	16	4.20	345	9.72
Days(announce, effective)	105	27.56	667	18.80
Days(effective, 30)	54	14.17	474	13.36
	381	100	3,548	100

Table IV.
Forecast detail by transaction and timing window

Note: This table lists the number of forecasts by transaction type broken out in timing windows relative to M&A announcement and effective dates

because the expensing of R&D, where the benefits are delayed, increases the noise in earnings for firms investing heavily in R&D (Aboody and Lev, 1998). Next, I include Francis *et al.*'s (1994) measure of litigation risk (*LITIGATION*). They find that additional prior and concurrent disclosures may sometimes reduce the severity of litigation. I also add a control variable for analyst following (*LOGNUMEST*). Lansford *et al.* (2013) argue that investors and analysts may demand disaggregated information for valuation when aggregation is uninformative. I expect a positive coefficient for *LOGNUMEST* because as analyst following increases so does the demand for disaggregated forecasts. I include the control variable *DEVIATION*, because when a greater uncertainty of forecasts earnings exists, investors and analysts demand supplemental information to more accurately predict earnings. I proxy for this variable with the standard deviation of analyst annual EPS forecasts over the preceding fiscal year. Next, I follow Lansford *et al.* (2013) by including two additional *ex ante* disaggregation determinants of institutional ownership (*IO*) and change in sales (*VARSALE*). They argue that institutional investors need to actively monitor manager's performance thus requiring supplemental disclosure. I expect a positive coefficient for *IO*. Also, volatile sales changes impede investor's ability to accurately predict sales, thus creating a demand for more sales guidance. I expect a positive coefficient for *VARSALE* if the volatility in sales deters management supplying sales guidance, thus increasing investors demanded revenue guidance and a negative coefficient if the volatility of sales hinders investor's ability to predict revenue. Finally, I include three more control variables, *CONTROL*, *TAX* and *VOLATILITY*. *CONTROL* represents managerial control and is measured as the common shares ownership percentage of the CEO as of the earnings forecast date (Lafond and Roychowhury, 2008). *TAX* attempts to capture the impact of tax avoidance on disclosure (Dyreng *et al.*, 2008). *VOLATILITY* controls for the possibility that more volatile firms disclose differently. Firms with high return volatility are "riskier" than firms with low return volatility which may influence disclosure (Cain and McKeon, 2016). Full variable definitions can be found in Table A1.

In the next model I change the variable of interest *STOCK* from an indicator variable to a continuous variable *PERSTOCK*. *PERSTOCK* is the percent stock that was used in the total payment of the acquisition. My intention is to see whether the 50 percent threshold for the indicator variable *STOCK* is mis-specified and whether the results hold at different levels of stock:

$$\begin{aligned}
 DISAGEARN = & \beta_0 + \beta_1 PERSTOCK_t + \beta_2 LOGMARKET_{t-1} + \beta_3 LOSS_t \\
 & + \beta_4 NEGRET_{t-1} + \beta_5 RD_{t-1} + \beta_6 LOGNUMEST_t + \beta_7 DEVIATION_{t-1} \\
 & + \beta_8 LITIGATION_t + \beta_9 IO_t + \beta_{10} VARSALE_{t-1} + \beta_{11} CONTROL_t \\
 & + \beta_{12} TAX_{t-2} + \beta_{13} VOLATILITY_t + \varepsilon.
 \end{aligned} \tag{2}$$

Table V presents descriptive statistics and tests for difference of means for each control variable. Noticeably, firms using cash financing are significantly larger than firms that utilize stock as a means to finance acquisitions. Interestingly, firms that use stock to finance acquisitions have a higher percentage of R&D compared to those that use cash. This result, considered with the difference in firm size, suggests that firms that use stock to finance acquisitions invest more in R&D perhaps take more risks to grow. Also, firms using cash financing have a lower sales volatility compared to those that use stock-financing. This may indicate that firms using cash financing can better estimate sales and cash flows allowing them to feel more comfortable using cash as a means of financing.

Table VI presents the Pearson correlation of the variables in the main logistic regression. Many of the correlations are as expected. Those correlations that are significant at the 5 percent level are in italic.

Variable	STOCK (<i>N</i> = 431)			CASH (<i>N</i> = 3,697)			Pr > <i>t</i>
	Mean	SD	Median	Mean	SD	Median	
<i>LOGMARKET</i>	7.008	1.560	6.637	7.547	1.612	7.318	< 0.0001***
<i>LOSS</i>	0.333	0.472	0.000	0.158	0.365	0.000	< 0.0001***
<i>NEGRET</i>	0.370	0.483	0.000	0.481	0.500	0.000	< 0.0001***
<i>RD</i>	0.087	0.059	0.088	0.065	0.059	0.057	< 0.0001***
<i>LOGNUMEST</i>	1.873	0.493	1.946	1.963	0.649	2.004	0.0120**
<i>DEVIATION</i>	0.052	0.072	0.020	0.052	0.067	0.030	0.948
<i>LITIGATION</i>	0.465	0.499	0.000	0.369	0.483	0.000	0.000***
<i>IO</i>	0.747	0.200	0.813	0.796	0.204	0.856	< 0.0001***
<i>VARSAI</i>	0.157	0.163	0.164	0.097	0.126	0.098	< 0.0001***
<i>CONTROL</i>	0.018	0.026	0.007	0.021	0.054	0.005	0.266
<i>TAX</i>	0.170	0.261	0.081	0.236	0.597	0.207	0.033**
<i>VOLATILITY</i>	0.133	0.053	0.121	0.105	0.044	0.097	< 0.0001***

Notes: This table presents summary statistics for firm characteristics at the end of (over) fiscal year prior to acquisition announcement for acquirers. I also partition them into stock and cash acquisitions and test the differences of the means. The sample period is from 2007 to 2011. *, **, ***Significant at 0.10, 0.05 and 0.01, respectively

Table V.
Descriptive statistics

5. Empirical results

Model 1 in Table VII presents the results of the logistic regression in which I use the event window of 210 days before acquisition announcement to 30 days after effective date to test whether the likelihood of issuing a disaggregated forecast depends on acquisition financing method (cash or stock).

Because of missing data for some of the control variables, the sample size shrinks to 2,545. The results reported are for a full set of control variables. The coefficient for *STOCK*, the main variable of interest, is positive and significant at the 0.01 level, supporting *H1a* and *H1b*. The coefficients for *LOGMARKET* and *RD* are also significant at the 0.01 level. *DEVIATION*, *LITIGATION* and *VARSAI* are also significant. The coefficients in logistic regression are in terms of the log odds. For example, the coefficient for *STOCK* is 1.315 which implies that a one unit change in *STOCK* results in a 1.315 unit change in the log of the odds. Therefore those managers that use stock to finance their acquisitions are 3.726 times ($e^{1.315} = 3.726$) more likely to disaggregate their forecasts. This result is consistent with managers and investors realizing that the value of acquirer's stock is dependent on the true value of acquirer. This also suggests that either market participants are demanding disaggregated information to better value the firm, or that managers perceive that by disaggregating forecasts they provide creditability to their earnings forecasts.

LOGMARKET is negatively associated with disaggregation suggesting that larger firms disaggregate less compared to smaller firms. *RD* is positively correlated with disaggregated forecasts which support the premise that disaggregated earnings are in higher demand to compensate for the noise in earnings for firms that invest heavily in R&D. *VARSAI* is positively related to *DISAG EARN* which suggests that the volatility of sales hinders investor's ability to predict revenue thus increasing investor's demand for revenue guidance. More importantly, the likelihood ratio is 338.987 with a *p*-value of < 0.0001, indicating a good fit.

Model 2 in Table VII presents the results of the same logistic regression in Model 1 but for the substitution of the indicator variable for *STOCK* with the continuous predictor variable *PERSTOCK*. The results indicate that MODEL 2 is fairly robust as all the signs, coefficients and significance are similar to Model 1. More importantly, the continuous variable *PERSTOCK* is also significant indicating that the indicator predictor variable *STOCK* in Model 1 is not mis-specified.

Variable	LOG STOCK MARKET	LOSS	NEGRET	RD	LOG NUMEST	DEVIATION	LITIGATION	IO	VARSAL CONTROL	TAX	VOLATILITY	
DISAG_EARN	0.015	0.088	(0.010)	0.204	(0.009)	(0.025)	0.121	0.005	0.050	0.013	(0.009)	0.140
STOCK	(0.120)	0.127	(0.061)	0.112	(0.042)	0.005	0.052	(0.052)	0.123	(0.011)	(0.047)	0.147
LOGMARKET	(0.080)	(0.230)	0.068	(0.233)	0.585	0.065	(0.023)	0.192	(0.120)	(0.080)	0.022	(0.432)
LOSS			0.015	0.271	(0.125)	(0.074)	0.100	(0.128)	0.071	(0.071)	0.037	0.219
NEGRET				(0.036)	0.006	(0.021)	(0.032)	0.001	0.002	(0.055)	(0.051)	(0.065)
RD					(0.051)	(0.015)	0.311	(0.148)	0.131	(0.047)	(0.076)	0.288
LOGNUMEST						0.061	0.204	0.183	0.099	(0.041)	(0.008)	(0.147)
DEVIATION							(0.106)	(0.102)	(0.023)	(0.071)	(0.043)	0.118
LITIGATION								0.015	0.049	(0.001)	0.015	0.100
IO									(0.111)	(0.014)	(0.020)	(0.239)
VARSAL CONTROL										(0.002)	(0.064)	0.216
TAX											0.164	(0.042)
												0.015

(Dis)aggregated earnings forecasts

Table VI. Correlation coefficients

Variable	Model 1			Model 2		
	Parameter estimate	SE	Pr > χ^2	Parameter estimate	SE	Pr > χ^2
Intercept	3.6633	0.8293	< 0.0001***	3.5935	0.8310	< 0.0001***
Variables of Interest						
<i>STOCK</i>	1.3154	0.4372	0.0026***			
<i>PERSTOCK</i>				0.0121	0.0054	0.0257***
Controls						
<i>LOGMARKET</i>	-0.3040	0.0722	< 0.0001***	-0.2943	0.0721	< 0.0001***
<i>LOSS</i>	0.0983	0.2800	0.7257	0.1140	0.2796	0.6836
<i>NEGRET</i>	0.0143	0.1546	0.9264	0.0148	0.1544	0.9235
<i>RD</i>	12.6710	2.4091	< 0.0001***	12.6846	2.4055	< 0.0001***
<i>LOGNUMEST</i>	0.1911	0.1920	0.3195	0.1760	0.1907	0.3562
<i>DEVIATION</i>	2.8909	1.4770	0.0503*	2.8280	1.4676	0.0540*
<i>LITIGATION</i>	0.4405	0.2160	0.0414**	0.4734	0.2152	0.0278**
<i>IO</i>	0.3935	0.4909	0.4228	0.4093	0.4934	0.4068
<i>VARSAL</i>	1.5916	0.8405	0.0583*	1.5848	0.8477	0.0616*
<i>CONTROL</i>	1.4229	1.7708	0.4217	1.4441	1.7740	0.4156
<i>TAX</i>	0.0647	0.1632	0.6916	0.0567	0.1630	0.7281
<i>VOLATILITY</i>	-1.1259	2.8936	0.6972	-1.2233	2.9056	0.6738
Industry fixed effects	Yes			Yes		
Year fixed effects	Yes			Yes		
Likelihood ratio	338.987		< 0.0001***	333.299		< 0.0001***
Observations	2,545			2,545		

Table VII.
Main results of the
logistic regression

Notes: This table reports results of testing the relation between the probability of management issuing a disaggregated/aggregated forecast and a cash/stock transaction for the entire sample. *, **, ***Significant at 0.10, 0.05 and 0.01, respectively

The question remains as to whether incentives change throughout the acquisition process. A general review of the timeline an acquirer faces reveals some significant events where disclosure incentives may change for management. Obviously, the announcement date and effective dates are the two significant events where managerial incentives may change. Based on these two dates I break the final SDC/Guidance sample into three subsamples representing three periods: the pre-acquisition, the between-acquisition period and the post-acquisition period. The pre-acquisition period encompasses the seven pre-announcement windows detailed in prior analysis. The between-acquisition period includes the one window for the time between the announcement date and effective date. Finally, the post-acquisition period encompasses the one window that occurs after the effective date (Days (effective, 30)). The subsample for the pre-acquisition period includes 2,629 observations. The subsamples for the between-acquisition and post-acquisition have 772 and 528 observations, respectively.

To examine the possible effect of these windows, I use the same logistic regression but estimated it three separate times, once for each event period representing the three subsamples. Once again, I lose observations because of missing data for the control variables. The sample size drops to 1,666 for the pre-acquisition period, 536 for the between-acquisition period and 343 for the post-acquisition period. The results reported in Table VIII are for a full set of control variables.

Once again, the coefficient for the variable of interest, *STOCK*, is significant for the pre-acquisition and between-acquisition periods, but not for the post-acquisition period. The coefficient is larger in the between-acquisition period than in the pre-acquisition period suggesting that the incentive to disaggregate is stronger after the announcement date than before the announcement date. This also suggests that the acquirer is still providing detailed information to target and other market participants so as to effectuate the merger

Variable	Pre-acquisition		Between acquisition		Post-acquisition	
	Coeff. Est.	SE	Coeff. Est.	SE	Coeff. Est.	SE
Intercept	3.419	1.024	0.313	2.160	4.662	6.086
STOCK	1.033	0.615	2.169	0.721	-1.942	2.160
LOGMARKET	-0.265	0.095	-0.005	0.163	-1.011	0.560
LOSS	0.323	0.387	0.316	0.590	-1.757	1.745
NEGRET	0.232	0.202	-0.346	0.324	-0.636	1.280
RD	8.676	2.870	18.659	5.733	82.523	28.310
LOGNUMEST	0.009	0.251	0.479	0.438	2.084	1.235
DEVIATION	3.514	2.168	3.419	2.668	19.537	13.361
LITIGATION	0.419	0.263	1.232	0.525	0.151	1.268
IO	0.772	0.617	0.582	1.112	-0.233	3.772
VARSAI	0.788	1.106	2.816	1.957	5.824	5.421
CONTROL	1.114	2.127	5.150	5.395	23.189	37.694
TAX	-0.138	0.229	0.196	0.265	0.978	0.860
VOLATILITY	1.158	3.740	-11.164	7.269	0.416	19.983
N	1,666		536		343	
Likelihood ratio	197.246		119.987		75.500	
			< 0.0001***		< 0.0001***	
						< 0.0001***

Notes: This table reports results of testing the relation between the probability of management issuing a disaggregated forecast and a stock transaction. The regression is estimated for three subsamples at the firm-window level: pre-acquisition, between-acquisition and post-acquisition, respectively. The pre-acquisition subsample represents one of the seven windows (-210, -181) (-180, -151), (-150, -121), (-120, -91), (-90, -61), (-60, -31) and (-30, announce). The between-acquisition subsample corresponds to one window of (announce, effective). Finally, the post-acquisition subsample corresponds to the (effective, 30) window. *, **, ***Significant at 0.10, 0.05 and 0.01, respectively

Table VIII.
Logistic regression results for different acquisition windows

after the announcement date. More importantly, however, is that the coefficient in the post-acquisition period becomes negative and is no longer significant. This result suggests that management no longer has the incentive to disaggregate because the demand for supplemental disclosures to reduce uncertainty is no longer present after the acquisition. Nevertheless, it appears that after the announcement date the incentives to learn the true value of the acquiring firm are the strongest, suggesting a greater frequency of disaggregation. The coefficient for *RD* continues to be significant at the 1 percent level throughout the three different periods.

Analyzing the model as a whole, the likelihood ratio for the pre-acquisition and between-acquisition periods is 197.246 and 119.987, respectively. The likelihood ratio for the post-acquisition period is 75.50. The model for all three periods is significant with a probability of being greater than a χ^2 being less than 1 percent.

6. Additional analysis

A natural extension from this analysis includes investigating whether the decision to issue disaggregate earnings guidance influences post-merger outcomes. Like Amel-Zadeh and Meeks (2019), I test whether the decision to issue disaggregate earnings guidance influences CEO turnover[3]. Specifically, I regress *DISAG EARN*, *STOCK* and an interaction of *DISAG EARN* and *STOCK* on CEO turnover (*TURNOVER*). *TURNOVER* is measured as an indicator variable equal to 1 if the CEO of the acquiring firm leaves the firm within three years after the effective date of the acquisition, 0 otherwise. I find that acquirers decision to issue disaggregate earnings guidance is negatively related to subsequent CEO turnover (Table IX). This suggests a potential benefit to issuing disaggregated earnings guidance during acquisitions. Further research looking into the relation between-acquisition-related disaggregated earnings guidance will inform us more about the cost and benefits of this type of disclosure.

7. Conclusion

In recent years many firms have decided to disclose disaggregated earnings guidance. Disaggregated earnings guidance usually consists of an earnings-per-share forecast plus some other supplemental forecast(s) usually related to income statement items. Arguably, providing such disclosures improves the credibility of management’s estimates to market participants. Considering the wealth of information exchanged between firms involved in acquisition, it is reasonable to expect that in M&A activity, particularly the financing of the deal, may have some influence on the decision to disaggregate any forecasts offered to the market. I reason

Variable	Parameter estimate	SE	Pr > χ^2
Intercept	3.6633	0.8293	< 0.0001***
Variables of interest			
<i>DISAG EARN</i>	-0.7716	0.1800	< 0.0001***
<i>STOCK</i>	-0.6752	0.8625	0.4337
<i>DISAG EARN X STOCK</i>	0.9749	0.8805	0.2682
Controls	Yes		
Industry fixed effects	Yes		
Year fixed effects	Yes		
Likelihood ratio	449.492		< 0.0001***
Observations	2,545		

Table IX.
Additional analysis

Note: This table reports results of testing the relation between the probability of subsequent CEO turnover of the acquiring firm and management issuing a disaggregated forecast

that the value of acquirer's stock is dependent on the true value of the acquirer. Therefore, I hypothesize that in a stock-based acquisition either market participants will demand forecast disaggregation to obtain a better understanding of the acquirer's true value, or managers will disaggregate forecasts prior to M&A activity because they believe it will increase creditability in promoting the acquisition. Alternatively, I hypothesize that firms offer cash as a means of financing M&A have no incentive to disaggregate guidance because the value of cash is independent of the true value of acquirer.

To test these hypotheses, I examine 3,929 forecast observations that fall within a window surrounding the acquisition announcement and effective dates. I test for differences of the means of related variables and regress the decision to use stock-financing and other control variables on the decision to disaggregate forecast. I find that the decision to use stock is statistically significant and correlated with the decision to disaggregate with significance at the 1 percent level. I subsequently provide further analysis by dividing the overall sample into three subsamples and conduct similar tests. I find that the decision to use stock-financing is significantly correlated with the decision to disaggregate throughout the window periods. The correlation appears to be the strongest in the between-acquisition period, suggesting that the incentives to disaggregate are highest during this period.

This study has some potential limitations. One concern relating to M&A research involves the impact that multiple and habitual acquirers have on the empirical results. It is possible that an acquiring firm enters into my sample more than once during the general event window (210 days pre-announcement, 30 days post-effective). Also, a firm's guidance policy is likely sticky. Therefore, if firms provide guidance from period to period, the likelihood the guidance is related to M&A is small. Finally, both the choice to disaggregate earnings guidance and the choice to use stock as a means to finance an acquisition are made by management, thus are endogenous.

In spite of these limitations, this study contributes to the literature by providing evidence that management uses voluntary disclosure as a means of conveying private information in order to obtain M&A goals. This study also provides insights into managerial incentives and attitudes toward the use of management forecasts to affect a potential merger and acquisition.

Notes

1. Lang and Lundholm (2000) refer to two categories where management has the most discretion in disclosure. The "performance statements" include quarterly earnings, other earnings and nonfinancial statements. The second, "management spin statements" include statements of additional detail and managerial quotes.
2. Thomson Reuters previously allowed access to an FTP site for guidance data download. The data were obtained through this site. Users download text files that contain every observation on record. Users then have to use statistical software to limit data to specific time periods. In this case, I limit the time period from 2007 to 2011 to match with the SDC sample data.
3. Amel-Zadeh and Meeks (2019) also test the whether pro-forma earnings forecasts are associated with likelihood of deal completion, time of deal closing, acquisition premium and subsequent litigation. I found no relation between disaggregate earnings guidance and subsequent litigation. I was unable to test the relation between disaggregate earnings guidance and deal completion, time of deal closing and acquisition premium because of data constraints.

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Appendix

Variable	Description
<i>DISAG EARN</i>	Indicator variable equal to 1 if the observation qualifies as a disaggregated forecast and 0 otherwise
<i>STOCK</i>	Indicator variable equal to 1 if the acquisition was financed with stock, and 0 otherwise
<i>PERSTOCK</i>	The percentage of stock payment involved in the total payment of the transaction
<i>LOGMARKET</i>	The natural logarithm of the market value of equity (Compustat annual #199 × #25)
<i>LOSS</i>	Indicator variable equal to 1 if the firm reported losses in the current period, and 0 otherwise
<i>NEGRET</i>	1 if the cumulative abnormal returns calculated as the excess firm returns over the CRSP value weighted index over the three-day window [-1, 1] around issuance of management forecasts is negative, 0 otherwise
<i>RD</i>	Research and development expense scaled by total assets (Compustat annual #46/#6)
<i>LOGNUMEST</i>	Natural logarithm of average number of analyst's reports for the firm over the course of a fiscal year
<i>DEVIATION</i>	The average of standard deviation of analyst annual EPS forecast over the course of a fiscal year measured during the fiscal year prior to an EPS forecast
<i>LITIGATION</i>	1 for all firms in the biotechnology (2,833–2,836 and 8,731–8,734), computers (3,570–3,577 and 7,370–7,374), electronics (3,600–3,674) and retail (5,200–5,961) industries, and 0 otherwise
<i>IO</i>	The percentage of shares owned by institutional investors reported for the most recent fiscal quarter before the management forecast event
<i>VARSAL</i>	The average annual absolute change in sales in the past three years, scaled by average sales in the three-year period
<i>CONTROL</i>	The number of shares held by the CEO divided by the total number of shares outstanding
<i>TAX</i>	The average cash taxes paid per dollar of pretax book income minus special items from year $t-2$ to year t
<i>VOLATILITY</i>	The annualized standard deviation of monthly stock returns from $t-1$ to t
<i>TURNOVER</i>	Indicator variable equal to 1 if the CEO of the acquiring firm leaves the firm within three years after the effective date of the acquisition, 0 otherwise

Table A1.
Variable definitions

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