Management Forecast Quality and Capital Investment Decisions

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ABSTRACT: Corporate investment decisions require managers to forecast expected future cash flows from potential investments. Although these forecasts are a critical component of successful investing, they are not directly observable by external stakeholders. In this study, we investigate whether the quality of managers' externally reported earnings forecasts can be used to infer the quality of their corporate investment decisions. Relying on the intuition that managers draw on similar skills when generating external earnings forecasts and internal payoff forecasts for their investment decisions, we predict that managers with higher quality external earnings forecasts make better investment decisions. Consistent with our prediction, we find that forecasting quality is positively associated with the quality of both acquisition and capital expenditure decisions. Our evidence suggests that externally observed forecasting quality can be used to infer the quality of capital budgeting decisions within firms.

Keywords: management earnings forecasts; voluntary disclosure; capital expenditure; investment; capital budgeting; managerial ability; forecasting ability.
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I. INTRODUCTION

Capital budgeting is one of the most fundamental and important responsibilities of firm management. A key determinant of successful investment is management's ability to forecast project payoffs, because forecasting plays a central role in investment valuation methods (e.g., net present value [NPV] calculations, forward-looking price/earnings multiple or other discounted cash flow analyses). Although these forecasts are a critical component of firm health, most forecasts are internal and thus not directly observable by external stakeholders. However, we expect that management's forecasting ability used to generate internal project payoff forecasts may transfer to other managerial tasks that involve forecasting, such as providing external management earnings forecasts. For this specific type of managerial forecast, the properties are readily observable. Thus, these voluntarily disclosed earnings forecasts may be valuable to external stakeholders not only because they provide management's expectations of next period earnings, but also because they reveal information about managers' knowledge of the firm's economic environment and their ability to forecast future business prospects, a major component in the investment decision process (Trueman 1986).

This paper investigates whether the quality of voluntarily disclosed management forecasts can be used to predict the quality of managerial investment decisions. Although prior research views earnings guidance and capital budgeting as distinct tasks, we argue that both tasks depend on a common trait—forecasting ability.[1] For example, when conducting a corporate acquisition, managers often begin by making earnings forecasts to assess the intrinsic value of the potential target (Eccles, Lanes, and Wilson 1999; Cullinan, Le Roux, and Weddigen 2004). Similarly, managers must predict future project payoffs when selecting among potential capital expenditure projects (Graham and Harvey 2001). These forecasts require managers to understand

[1] In this study, forecasting ability is comprised of management's ability to: (1) collect high quality information regarding both internal operations (e.g., cost reports, margins, personnel) and the external environment (e.g., competition, industry trends, product demand); and (2) process and synthesize this information, which is a function of experience and innate talent, to develop accurate forecasts. We provide more detail in Section II.

the economic environment as well as their competitive position within the environment. This same understanding is needed when providing earnings guidance as well, because earnings are essentially the aggregate payoff from past investments. Thus, the quality of managers' earnings forecasts is potentially an observable signal of their broader forecasting ability.

Although forecasting future project payoffs is an important part of investment decision-making, a priori, it is unclear whether we can empirically find a relation between external management forecasts and managerial investment decisions. First, the quality of a manager's *external* forecasts may not be a good measure of *internal* forecasting ability, since providing guidance could encourage managers to engage in earnings management, possibly through suboptimal investment decisions, so their forecasts appear more accurate (Kasznik 1999; Roychowdhury 2006). Second, the quality of external forecasts may measure only short-term earnings forecasting ability. Thus, it may not be associated with the long-term forecasting skills required for successful capital budgeting.

To test our hypothesis, we examine the relation between management forecasting quality and the quality of subsequent investments using both investments in other companies (corporate acquisitions) and investments in fixed assets (capital expenditures).[2] We begin by examining the relation between management forecasting quality and the quality of subsequent acquisition decisions. We proxy for the quality of acquisition decisions using (i) the stock price reaction to acquisition announcements (Jensen and Ruback 1983; Masulis, Wang, and Xie 2007; Francis and Martin 2010), (ii) post-acquisition changes in operating performance (Healy, Palepu, and Ruback 1992), (iii) the probability and magnitude of post-acquisition goodwill write-downs (Gu and Lev

[2] We examine both types of investments because they offer unique advantages that complement each other. We examine acquisitions because they are large, high profile corporate events, with publicly available information, such as the exact investment date and specific investment characteristics that we can use in our analyses to provide more robust evidence. In contrast, much less information is publicly available about capital expenditure projects. However, as compared to acquisitions, capital expenditures are less complex investment transactions that do not involve external parties such as investment bankers. As such, forecasting ability and investment valuation may be more directly attributable to managers in a capital expenditure setting. We discuss the role of forecasting ability in both types of investment in Section II.

2011), and (iv) the probability of a post-acquisition divestiture (Francis and Martin 2010). Acquisition announcement returns serve as an ex ante measure of the quality of the acquisition decision and the remaining three measures serve as ex post measures of acquisition performance. We use the pre-acquisition three-year average accuracy of managers' external earnings forecasts as our measure of forecasting quality.

We find that forecasting accuracy is positively associated with acquisition announcement returns and post-acquisition operating performance, and negatively associated with the probability and magnitude of post-acquisition goodwill impairments and the probability of post-acquisition divestitures. These results suggest that firms providing high quality management forecasts make better acquisition decisions. Our inferences are robust to controlling for a number of alternative explanations related to (i) uncertainty in the overall economic environment driving both forecasting accuracy and investment quality, (ii) agency problems that lead to opaque disclosures and inefficient investment, (iii) higher financial statement quality and disclosure quality reducing financing constraints, and thus increasing investment efficiency, and (iv) self-selection associated with managers voluntarily providing earnings forecasts.

Next, we examine whether the relation between management forecasting accuracy and acquisition quality is weaker in settings where managerial forecasting ability may not fully extend to the valuation of other firms. Specifically, we argue that managers' forecasting ability extends more easily to firms operating in the same industry and firms with similar earnings generating processes. Since investment appraisal involves management's ability to acquire and process information about industry- and economy-wide prospects, managers can use, or transfer, this knowledge to more effectively aid the valuation of (i) firms in the acquirer's industry, and (ii) firms that have similar earnings generating processes. Consistent with this argument, we find that management forecast quality is more strongly associated with acquisition announcement

returns when the target operates in the same industry and when the target has a similar earnings generating process, as measured by comovement is prior stock returns.

To provide further support for our prediction and corroborate the evidence documented using acquisitions, we examine the association between forecasting accuracy and investment efficiency using capital expenditures as a measure of investment. Investment *in*efficiency is defined as investment that differs from the amount that would be predicted given the firm's investment opportunities (Brennan 2003). Following a long list of prior studies, we measure investment efficiency as the magnitude of the deviation of actual investment from the expected level of investment given the firm's investment opportunities.[3] Consistent with our prediction, we find that firms providing more accurate forecasts invest more efficiently in capital expenditures.

Our findings contribute to prior research along several dimensions. First, our study extends the capital investment and the management forecast literatures by considering the critical role played by managerial forecasting ability in *both* short-term earnings forecasting and long-term capital investment decisions. Typically, the management forecast and investment literatures operate as distinct strands of research. Most of the prior capital investment literature focuses on the value created or destroyed by corporate capital investment and on whether firms' level of capital investment falls in line with their investment opportunity set (Hubbard 1998; Stein 2003), whereas much of the prior management forecast research examines the determinants of management forecasting behavior and its consequences for capital markets (Hirst, Koonce, and Venkataraman 2008). These two research streams offer little discussion on whether the abilities related to capital budgeting or generating earnings forecasts extend to other managerial tasks. By highlighting the relation between managerial tasks that draw on common forecasting ability, our

[3] See e.g., Fazzari et al. (1988), Wurgler (2000), Biddle and Hilary (2006), Richardson (2006), Whited (2006), Acharya, Almeida, and Campello (2007), McNichols and Stubben (2008), and Biddle, Hilary, and Verdi (2009).

research identifies an observable proxy for the quality of internal project payoff forecasting. Our findings also suggest that, when studying the determinants and consequences of managers' earnings guidance, researchers should regard the quality of earnings forecasts as a broader measure of forecasting ability and not simply as a means for providing information about managers' expectations of next period earnings.

Second, our findings may be relevant to market participants and regulators, as they inform the recent debate regarding the cessation of management earnings forecasts. Corporate professionals (Business Roundtable Institute for Corporate Ethics and CFA Institute Centre for Financial Market Integrity 2006) and some academics (Fuller and Jensen 2002) argue that managers should end the practice of providing quarterly earnings guidance because it induces myopic behavior by managers. However, proponents contend that guidance can better align external stakeholder expectations with those of management, thereby reducing information asymmetry. We provide empirical evidence suggesting that the quality of these forecasts can be used as a valuable measure of broader managerial forecasting ability related to investment. Thus, our findings point to an additional benefit of voluntarily disclosed forecasts that should be considered in the guidance cessation debate.[4]

Third, our research provides greater insight into the nature of managerial ability. Trueman (1986) analytically shows that managers may be motivated to release earnings forecasts because it gives investors a more favorable assessment of the manager's ability to anticipate changes in the economic environment and to adjust investment decisions accordingly. However, there is little empirical evidence in the prior literature about whether managerial ability can be inferred from their earnings forecasts. We add to this literature by providing evidence consistent

[4] Note that our findings do not imply that issuing guidance is optimal, or even encouraged, for all firms. Our findings only suggest that external stakeholders of firms that provide guidance may be able to draw inferences about management's investing ability relative to that of managers of other firms that also provide earnings guidance.

with the notion that the quality of external management forecasts can serve as a measure of a broader forecasting ability related to investment decision inputs.[5]

Finally, our paper contributes to the nascent literature that explores the relation between external disclosures and internal decision-making. For example, Hemmer and Labro (2008) provide analytical evidence that the properties of the financial reporting system affect the quality of the managerial accounting system, and thus the quality of corporate investment decisions. Similarly, Durnev and Mangen (2009), McNichols and Stubben (2008), Biddle et al. (2009), Bens, Goodman, and Neamtiu (2012), Badertscher, Shroff, and White (2013), Shroff, Verdi, and Yu (2013) and Shroff (2013) provide arguments and evidence linking external reporting to internal investment decisions. However, none of these studies examine the relation between managers' *voluntary* disclosure quality and the quality of their internal investment decisions.

Section II next discusses the motivation for the study. Section III describes the research design, descriptives, and results. Section IV discusses robustness tests, and Section V concludes.

II. MOTIVATION

In this section, we discuss the central role forecasting plays in the assessment of potential corporate investment projects. We also discuss why the quality of external managerial earnings forecasts may serve as a useful signal of managers' internal forecasting ability.

Forecasting and Corporate Acquisitions

Corporate acquisitions typically require a large expenditure by the acquiring firm and a rigorous and thorough due diligence process. This process requires a deep understanding of: (i) the target value as a stand-alone business when operated by its current management; (ii) the

[5] Note that there are many drivers of managerial ability related to leadership, communication, delegation, business acumen, etc. We focus on one particular aspect of managerial ability, i.e., forecasting ability, because it is directly related to both investment decisions and earnings forecasts.

value of potential synergies; and (iii) the maximum bid price the acquirer should pay. We expect each of these steps to be dependent on the manager's earnings forecasting ability.[6]

First, earnings forecasting ability plays a central role in valuing the target company. Practitioner resources (Eccles, Lanes, and Wilson 1999; Cullinan, Le Roux, and Weddigen 2004) and M&A textbooks (Copeland, Koller, and Murrin 2000) suggest that managers begin the acquisition valuation process by calculating the target's stand-alone value. Copeland et al. (2000) indicate that the independent valuation of the target on a stand-alone basis should be the essential underpinning of any deal. Common valuation approaches include using a forward-looking price/earnings (P/E) multiple or a discounted cash flow (DCF) analysis, both of which rely heavily on earnings forecasts as inputs for the valuation (Chaplinsky, Schill, and Doherty 2006).[7]

Second, once acquirers determine the stand-alone value of a target, they must determine the value of any synergies. Here again, managers must rely on their forecasting ability to estimate the synergies involved in an acquisition, which requires knowledge of the acquiring and target firms' cost structures and revenue drivers. For example, a common type of synergy is cost savings from eliminating facilities and expenses that are no longer necessary when the two businesses are consolidated. Revenue enhancement synergies are also possible if the acquirer and the target achieve higher sales growth together than the firms could do operating on their own. Successfully forecasting these synergies requires a clear understanding of the firms' economic environments and cost and revenue structures. Such an understanding is also central to successfully forecasting earnings.

[6] For ease of exposition, we discuss the role of forecasting in three distinct steps. However, separating these steps, conceptually or empirically, is very difficult because they are unlikely to be independent.

[7] Successful capital budgeting decisions are those that generate cash receipts in excess of disbursements. Thus, it is reasonable to expect that managers forecast future cash flows to evaluate potential projects. However, over finite intervals, cash flows are not necessarily as informative as earnings because cash flows have timing and matching problems that cause them to be a 'noisy' measure of project performance. The purpose of earnings is to smooth transitory fluctuations in cash flows to better measure firm/project performance over finite intervals (Dechow 1994). Over the life of a project/firm, aggregate cash flows by definition equal aggregate earnings. For the purpose of our paper, we use both cash flows and earnings interchangeably to mean project payoffs.

Lastly, acquirers need to determine their maximum bid price. This price is a direct function of the target's stand-alone value and the value of the potential synergies, making it dependent on forecasting ability as well. The extent to which the final offer price is close to the acquirer's maximum bid price depends on how the allocation of gains from the business combination is negotiated between the acquirer and target (Grossman and Hart 1980).[8] This negotiation process also depends on forecasting ability, making negotiating ability and forecasting ability complements, as effective negotiations are not possible unless the acquirer has clear insight into the value of the target.

We note, however, that the acquisition process typically involves parties other than the acquirer and target. In particular, investment bankers frequently aid the acquirer in valuing the target firm and provide assistance in negotiating the deal price and other terms. Servaes and Zenner (1996) find that acquirers retain investment bank advisors when the deals are more complex and when the acquirer lacks prior acquisition experience. Although investment banks often play an advisory role in important phases of the acquisition, the ultimate responsibility for the acquisition valuation process and the final investment decision rests with the acquirer's management. This view is supported by prior research (Lehn and Zhao 2006), which shows that the acquirer's manager experiences elevated turnover probabilities following poor acquisitions.

Forecasting and Capital Expenditures

Capital expenditures, which typically require fewer resources than business acquisitions, are another common type of investment in real assets. We again expect forecasting ability to play a central role in capital expenditure decisions because the ability to better forecast each potential project's future payoffs provides management with a more precise estimate of the project's net present value. In fact, the same forecasting factors, such as a series of projected future payoffs, a

[8] Exactly how much of the total estimated transaction value is transferred to the target depends in part on the relative bargaining power of the target and acquirer. If there is intense competition among multiple bidders for a target, the acquirer is likely to have less negotiating power (Jensen and Ruback 1983).

terminal value, etc., and valuation methods, such as DCF, are again applicable when valuing capital expenditures (Brennan 2003; Chaplinsky et al. 2006).

There are, however, some differences with respect to forecasting between the acquisition and capital expenditure settings. For example, because capital expenditures typically reflect purchases of long-term assets that are related to existing operations, a manager's ability to forecast her own firm's earnings is likely to extend to forecasting the payoffs of the new assets. In contrast, acquisitions may involve targets in other industries or with different earnings generating processes, where a manager's forecasting ability might not extend as readily. Capital expenditure decisions are also less likely to involve third parties, such as investment bankers, making the forecasting and valuation process more directly attributable to managers.[9] Because of these differences, it is important to examine both acquisitions and capital expenditures to glean a more complete understanding of the role of managerial forecasting ability with respect to the quality of investment decision making.

External Earnings Forecasts as a Proxy for Managerial Forecasting Quality

Earnings represent a summary measure of the payoffs from past investments and are precisely what managers are interested in estimating when choosing among alternative investment projects (Graham, Harvey, and Rajgopal 2005). Thus, managers likely draw on similar information and skills when generating external earnings forecasts and internal project payoff forecasts. If external earnings forecasts serve as a useful signal of managers' forecasting ability with respect to the future returns from investments, we expect the quality of external forecasts to be associated with subsequent investment quality. Consistent with our argument, Trueman (1986) analytically demonstrates conditions under which management forecasts allow

[9] Unfortunately, because individual capital expenditures are often of smaller magnitude than corporate acquisitions, there is less detail on the nature of the capital expenditure relative to acquisitions. This lack of detail makes it difficult to explore cross-sectional variation based on the types of the expenditures or to link expenditure decisions to subsequent outcomes, such as divestitures and impairments.

investors to better assess a manager's ability to anticipate changes in the economic environment and adjust production plans accordingly.

Managers' forecasting ability is driven by two important factors: (i) the availability of high quality information regarding internal operations and the external environment, and (ii) their ability to process this information in developing forecasts. Supporting the argument that the ability to process information is important, Simon (1973, 270) argues that "…the scarce resource is not information; it is processing capacity to attend to information. Attention is the chief bottleneck…and the bottleneck becomes narrower…as we move to the tops of organizations…" Supporting the role of information systems in generating high quality forecasts, Feng, Li, and McVay (2009) find that managers of firms with material weaknesses in their internal control over financial reporting provide less accurate earnings forecasts.

While we cannot disentangle the individual effects of information system quality and managerial forecasting ability, we note that information systems are designed and implemented by managers to aid them in making better operating decisions. Therefore, the quality of internal systems can be at least partly attributed to managerial ability. For example, Bamber, Jiang, and Wang (2010) suggest that managers who have earned an MBA degree, and thus have formally learned how to *collect* and *process* relevant information for forecasting, provide higher quality forecasts. Accordingly, we assume that the accuracy of management forecasts arises from both managers' ability to obtain high quality information, by putting in place appropriate information systems, and their skill in processing and incorporating this information into their forecasts.

Ex-ante, it is an open question whether external earnings forecasts can serve as a signal of managers' internal forecasting ability with respect to investment for two reasons. First, the public dissemination of earnings forecasts may provide incentives for managers to engage in financial reporting manipulations or suboptimal investments to meet their own earnings targets (Fuller and Jensen 2002; Roychowdhury 2006; Cohen, Mashruwala, and Zach 2010), which would confound

the forecasting ability signal.[10] For example, a manager may appear to have high quality external forecasts, but in reality the manager may have engaged in earnings management and actually has lower forecasting ability (Kasznik 1999). Alternatively, managers may have strong internal forecasting abilities, but strategically bias external forecasts to meet an objective other than forecasting accuracy, such as walking down analysts' earnings expectations, misleading competitors, and manipulating their stock price for insider trading and/or compensation reasons (Cotter et al. 2006; Matsumoto 2002; Aboody and Kasznik 2000). Thus, the quality of the external forecasts may not capture the manager's actual forecasting ability. On the other hand, both the 'settling up' of external forecasts and their recurring nature impose disciplinary and potential legal constraints on managers' freedom to bias their expectations from their internal projections (Baginski, Hassell, and Kimbrough 2002). As such, it is unclear to what extent managers make substantive forecast adjustments from their actual expectations.

Second, there are differences in the forecasting horizon between forecasting earnings and forecasting investment payoffs. It is possible that the quality of external forecasts measures only short-term earnings forecasting ability, whereas the successful implementation of commonly used investment valuation methods, such as a DCF analysis, requires not only short-term, but also long-term earnings forecasting ability and terminal value estimates. Although these two forecasting tasks are distinct, we expect the quality of the two tasks to be positively related in that they rely on the manager's ability to assess the external economic environment, their firm's place in that environment, potential future changes in competition, demand, technology, production costs, etc., as well as the quality of the firm's internal information systems. We

[10] The above evidence also suggests that the act of providing management forecasts may lead to suboptimal investment decisions. For example, Cheng, Subramanyam and Zhang (2007) document that dedicated guiders engage in myopic R&D investment behavior relative to occasional guiders, which results in adverse effects on long-term growth. Moreover, Graham, Harvey and Rajgopal (2005) find that managers pass up positive NPV projects to meet their earnings targets. Therefore, ceteris paribus, it is plausible that firm that issue earnings forecasts invest less efficiently than firms that do not forecast earnings. However, our interest lies in documenting variation in investment efficiency conditional on managers issuing earnings forecasts.

expect that short-term forecasting ability is a necessary, but not sufficient, condition for long-term forecasting ability. In other words, *on average*, we expect that managers who are unable to accurately forecast earnings in the short-term will also forecast poorly over longer horizons.

III. RESEARCH DESIGN AND EMPIRICAL RESULTS

Managerial Forecast Quality Measure

We use the quality of *earnings* forecasts to proxy for managerial forecast quality because earnings represent the aggregate payoffs from past investment decisions and because most other managerial forecasts are internal and not observable by outsiders. To assess the *quality* of management earnings forecasts, we focus on forecast accuracy following prior literature (Baik et al. 2011; Bamber et al. 2010; Feng et al. 2009; Hirst et al. 2008). Our intuition is that a manager who has a better understanding of the overall economic environment and her firm's place in that environment should forecast more accurately and thus engage in better investment decisions. We use the absolute magnitude of forecast errors to measure forecast accuracy.[11]

We collect information about management earnings forecasts and actual earnings per share (EPS) from First Call's Company Issued Guidance (CIG) and the First Call's Actuals databases. For each forecast, accuracy is measured as the absolute value of the difference between the management EPS forecast and the actual EPS, divided by the stock price. For range forecasts, we use the mid-point of the range following prior literature (e.g., Rogers and Stocken 2005).[12] We also follow prior literature (Rogers and Stocken 2005) and use annual, rather than

[11] For example, suppose that both firm A and firm B have actual earnings of $1.00. If firm A's manager forecasts $1.01 and firm B's manager forecasts $0.85, we argue that manager A (who is able to forecast closer to the actual realization) has better forecasting ability than manager B, even though manager A was optimistically biased in her forecast. Similarly, if manager A (B) forecasted $0.99 ($1.15), we would argue that manager A has better forecasting ability, even though she was conservatively biased in her forecast. That is, the sign of the forecast error is less relevant with respect to the manager's ability to predict the actual earnings number. Further, we note that biases in forecasts may be correlated with agency problems that lead to inefficiency investment decisions. We address the role of agency problems in affecting investment efficiency in Section IV.

[12] Following prior research (e.g., Rogers and Stocken 2005), we remove open-ended forecasts because it is difficult to measure forecasting accuracy when we cannot unambiguously compare the forecast to the realized earnings.

quarterly, forecasts because they relate to earnings that are audited, and thus are less amenable to manipulation. To ensure that we do not include earnings pre-announcements and that we allow some time between the forecast announcements and earnings realizations, we require forecasts to be issued at least three weeks before the earnings announcement date.

We calculate our forecast accuracy measure, *Forecasting Accuracy*, as the average accuracy for all annual forecasts issued in the three-year period *before* the investment decision (see Figure 1). We then multiply this average by negative one to transform it into an increasing-in-quality measure. The long measurement window helps mitigate short-term effects that may bias forecast quality, including earnings management or short periods of forecasting 'luck,' both of which are unlikely to be sustainable (Hilary and Hsu 2011).

The Relation between Forecasting Accuracy and Corporate Acquisition Quality

In this section, we examine the relation between management forecasting quality and acquisition quality. We measure acquisition quality using an ex ante estimate of acquisition quality (i.e., acquisition announcement returns) as well as three ex post estimates of acquisition quality (i.e., post-acquisition change in operating performance, post-acquisition probability and magnitude of goodwill impairments, and post-acquisition probability of divestitures).

Corporate Acquisition Announcement Return Analysis

Following a large body of prior research (e.g., Asquith, Bruner, and Mullins 1983; Jensen and Ruback 1983; Lehn and Zhao 2006; Masulis et al. 2007; Francis and Martin 2010), we use the stock return around the acquisition announcement to proxy for the quality of the investment decision. This approach assumes that the market incorporates information in stock prices efficiently, so that the announcement return is an unbiased estimate of the impact of an acquisition on the wealth of acquiring-firm shareholders (Moeller, Schlingemann, and Stulz 2004). Since almost all acquisitions of public companies are publicly announced in a salient

manner, the short window return is likely to capture the market's assessment of the acquisition decision and is relatively less subject to misspecification than other measures of acquisition quality, such as long-window return measures (Shleifer and Vishny 1997).

We collect our acquisition sample from the Securities Data Corporation's (SDC) US Mergers and Acquisitions database. We identify acquisitions announced between January 1, 1996 and December 31, 2008 that meet several criteria: (i) the acquirer is a US public company; (ii) the acquirer has annual financial statement information available from Compustat and stock return data from the CRSP Daily Stock Price and Returns file; (iii) the acquisition is completed. We retain only acquisitions that are at least five years apart for each firm. For firms engaging in multiple acquisitions within a five-year period, we retain only the first acquisition in this period. We impose this condition because prior literature finds strong evidence that (i) repeat acquirers have lower acquisition announcement returns for their later acquisitions than they do for their earlier acquisitions (Fuller, Netter, and Stegemoller 2002; Conn, Cosh, Guest, and Hugues 2004; Ahern 2008; Ismail 2008) and (ii) management forecast accuracy is fairly stable overtime (Hutton and Stocken 2009).[13] Therefore, when collectively viewed, these results suggest that we should not necessarily expect a relation between management forecast accuracy and the announcement returns for subsequent acquisitions undertaken in a series.[14]

[13] Importantly, we also note that the reasons why repeat acquirers have lower announcement returns for later acquisitions are unlikely to be related to forecasting accuracy. Specifically, prior research identifies three potential reasons why repeat acquirers have declining announcement returns: (1) the opportunity set hypothesis, which predicts that the best targets are acquired first and worse targets later (Klasa and Stegemoller 2007); (2) the hubris hypothesis, which predicts that early success leads to managerial overconfidence and thus overbidding in later deals (Aktas, de Bodt, and Roll 2009); and (3) the agency hypothesis, which predicts that management interests become less aligned with shareholder interests as a firm matures. Thus, later deals may be made to generate private managerial benefits, not shareholder wealth gains (Moeller, Schlingemann, and Stulz 2004). Since it is a significant empirical challenge to fully control for all the reasons why we might observe lower announcement returns for later acquisitions by serial acquirers, the declining pattern observed in acquisition announcement returns contaminates the interpretation of forecast accuracy when we include all acquisition in our sample.

[14] In untabulated analyses, we find that our acquisition announcement test results are not robust to using the sample of all acquisitions. While we believe this result is to be expected given the patterns described above, we caution readers that our inferences do not hold for the sample of all acquisition announcements.

To test our prediction regarding the association between forecast quality and the quality of subsequent acquisitions, we use the following regression model:

$$CAR_t = \gamma_0 + \gamma_1 Forecasting\ Accuracy_{[t-3,\ t-1]} + \gamma_i \Sigma\, CONTROLS + e_t, \qquad (1)$$

where *CAR* is the three-day cumulative abnormal return around the acquisition announcement and abnormal returns are measured using (i) the market model or (ii) the market-adjusted return, where Table 1 provides a detailed description of the variable construction approach.[15] *Forecasting Accuracy* is defined above, and we predict $\gamma_1 > 0$. We cluster standard errors by four-digit SIC industry and fiscal period end to allow for residual correlation within an industry and fiscal period. Our regression model also includes industry and time fixed effects.

CONTROLS is a vector of control variables measuring acquirer and acquisition characteristics as well as the overall uncertainty in the firm's environment. With respect to acquirer characteristics that are likely to affect acquisition announcement returns, following prior research we control for *Firm Size* using the natural log of total assets, *Tobin's Q*, the return on assets (*ROA*), sales growth (*Growth*), *Leverage*, and *Stock Return*. We measure all firm characteristics as of the last fiscal year end preceding the acquisition announcement. *Tobin's Q*, *ROA*, *Growth* and *Firm Size* are associated with a firm's growth opportunities and the availability of financing (Moeller et al. 2004; Dong et al. 2006). *Leverage* captures monitoring by creditors that may limit a firm's ability to overinvest (e.g., Maloney et al. 1993; Masulis et al. 2007). Finally, we control for the acquirer's pre-acquisition *Stock Returns* because prior work (e.g., Rosen 2006) documents that an acquirer's twelve-month stock return trailing the announcement date is a determinant of the acquisition announcement return. In addition, the management forecast literature finds that earnings forecast properties are a function of firm size (e.g., Ajinkya, Bhojraj, and Sengupta 2005), growth opportunities (e.g., Feng et al. 2009),

[15] In untabulated analyses, we re-estimate our acquisition announcement test using the average daily abnormal return between the announcement date and the completion date, and *Forecasting Accuracy* is still positive and significant at the 1% level.

leverage (e.g., Hutton, Lee, and Shu 2012) and past stock returns (e.g., Gong, Li, and Wang 2011). We include these controls to mitigate the concern of correlated omitted variables. The definitions of all our control variables are detailed in Table 1.

In addition, we control for overall economic uncertainty to mitigate concerns that firms operating in environments with less uncertainty find it easier to forecast future earnings and expected future payoffs from their investment opportunities. That is, in a more certain environment, it is easier to both (i) forecast earnings and (ii) filter out poor investment decisions. In contrast, where there is more uncertainty, forecast errors will naturally be larger and firms will tend to make poorer investment decisions. Thus, instead of managers' forecasting ability affecting both external forecast quality and the quality of their investment decisions, it could be general uncertainty that affects both.

To mitigate the uncertainty concern, we control for *Analyst Forecast Accuracy* and *Analyst Forecast Dispersion* over the same period that we measure management forecast accuracy (Zhang 2006; Hutton and Stocken 2009).[16] We also control for earnings and stock return volatility (*Stdev. ROA*; *Stdev. Stock Returns*) as well as *Earnings Persistence* (Hutton and Stocken 2009) to mitigate any potential residual effect of uncertainty on management forecast accuracy and investment quality. Finally, to the extent managers who operate in a more uncertain business environment are likely to issue a less precise forecast (i.e., issue wider range forecasts), we include a measure of *Forecast Precision,* calculated as the average precision of all forecasts issued in the three-year period prior to the investment decision.

Next, we control for *Forecast Horizon*, measured as the natural log of the number days between the forecast announcement date and fiscal period end date. We use the average horizon

[16] Hutton and Stocken (2009) use a relative accuracy measure computed as the manager's forecast accuracy less the consensus analyst forecast accuracy. We decompose this measure and include each accuracy measure separately in the regression to allow the coefficients to vary. However, in untabulated analyses we find that our inferences are robust to using the relative accuracy measure.

of all forecasts issued in the three-year period before the investment decision. *Forecast Horizon* can play an important role in shaping accuracy, potentially influencing our inferences about managers' forecasting ability drawn from observed accuracy. For example, an accurate forecast issued a year before the fiscal period end date signals a greater level of forecasting ability than an equally accurate forecast issued a month before the period end date. Consistent with this intuition, prior studies, such as Ajinkya et al. (2005) and Hutton et al. (2012), document that timelines is an important determinant of forecasting accuracy.

Consistent with prior research, we also control for the target's public status – *Public Target* (Chang 1998; Fuller, Netter, and Stegemoller 2002). Private targets have concentrated ownership, and thus the owners of private targets become large shareholders of the acquirer so that they have incentives to monitor the management of the acquiring firm (e.g., Chang 1998). This is especially the case when the acquisition is entirely paid for using the acquirer's stock. We control for whether the target is located in the same country as the acquirer, *Domestic Target*, following Moeller et al. (2004), and the method of payment, *Cash M&A* and *Stock M&A*, following Travlos (1987) and Moeller et al. (2004). We include *Cash M&A* in our regression because it is more likely that cash acquisitions are the result of free cash flow problems, as proposed by Jensen (1986) (see Shleifer and Vishny 1997). We control for *Stock M&A* because arbitrageurs put pressure on the stock price of the acquiring firm for 100% equity offers for public firms (Mitchell et al. 2004). We also control for *Diversifying Acquisitions* because prior research finds that diversifying acquisitions are a sign that managers are trying to build larger and more stable empires, and thus have lower announcement period returns (Morck, Shleifer, and Vishny 1990).

We control for the size of the target relative to the acquirer, *Relative Target Size*, to adjust for the impact of an acquisition on the equity market capitalization of the acquiring firm. If a dollar spent on acquisitions has the same positive payoff, irrespective of the size of the

acquisition, the abnormal return should increase in the size of the target relative to the size of the acquirer (Asquith, Bruner, and Mullins 1983). Finally, we control for whether the acquisition was hostile, *Hostile Takeover* (Schwert 2000), and the number of bidders competing to acquire the target, *No. of Bidders* (Mitchell et al. 2004). We control for *No. of Bidders*, as competition among bidders increases the price paid by the acquirer, thereby lowering returns to acquiring-firm shareholders (Moeller et al. 2004), and we control for *Hostile Takeover*, as Schwert (2000) finds that hostile acquisitions have lower abnormal returns than friendly acquisitions.

Table 2 Panel A presents descriptive statistics for the variables in equation (1). The average acquisition announcement return is close to zero, which is consistent with prior research (Malmendier and Tate 2008; Bens et al. 2012). The interquartile range for both the *Market Model CAR* and the *Market Adjusted CAR* reveals that there is considerable variation in market responses (Q1 = -0.022, Q3 = 0.034), which is important, because our analysis examines whether variation in manager forecasting ability can explain cross-sectional variation in these announcement returns.[17] Panel A also presents descriptive statistics of our main independent variable, *Forecasting Accuracy*, and the other management forecast characteristics.

Table 2 Panel B reports the results from estimating equation (1). We find that the coefficient for *Forecasting Accuracy* is positive and significant with a *t*-statistic of 2.03 when announcement returns are measured using a *Market Model CAR*, and 1.90 using a *Market Adjust CAR*. This suggests that managers who generate more accurate forecasts make better acquisition decisions than managers who provide less accurate forecasts, which is consistent with our prediction.[18] The coefficients for the control variables are signed consistently with those

[17] Untabulated descriptive statistics indicate that no individual year contains more than 10% of our acquisition sample. In addition, there does not appear to be a time trend where the sample size is dramatically increasing or decreasing over time.

[18] An alternative explanation for our results is that some managers only provide external forecasts when fairly certain of outcomes and select only new investment projects with a high probability of success. This may lead to a positive association between forecast accuracy and investment quality in the cross-section that is unrelated to forecasting ability. To address this concern, we control for forecast frequency. Specifically, we add forecast

documented in prior research. For example, the coefficients for *Firm Size* and *Tobin's Q* are negative and significant (Moeller et al. 2004), the coefficient for *Diversifying Acquisition* is also negative and significant (Morck et al. 1990), and the coefficient for *Relative Target Size* is positive and significant (Asquith et al. 1983). Finally, we also find that announcement returns are more negative for acquisitions of public targets (Chang 1998) and acquisitions completed by firms operating in uncertain environments, those firms with high *Analyst Forecast Dispersion*.

Post-Acquisition Change in Operating Performance Analysis

Next, we examine post acquisition accounting data to test for changes in operating performance following acquisitions. Specifically, we examine post-acquisition changes in the acquirer's return on assets and cash flow from operations (Healy et al. 1992). Conceptually, we focus on both income before extraordinary items and cash flows because they represent the actual economic benefits generated by the assets. Since the level of economic benefits is affected by the assets employed, we scale both measures by the assets employed to form a return measure that can be compared across time and across firms. We examine the average post-acquisition performance in the three years following the acquisition completion. We employ the regression model described in equation (1), but change the dependent variable to the average change in the accounting based measures of performance from three years before the acquisition announcement to three years after the acquisition completion (see Figure 1, Panel B). Since we require three years of accounting data both pre- and post-acquisition, our sample size is reduced by roughly 30% from that used in the acquisition announcement analyses. Table 3, Panel A presents the descriptive statistics of the variables used in these regressions. We note that our sample characteristics are very similar to those documented in Table 2, Panel A.

Table 3, Panel B presents the results from these tests. We find that the coefficient for *Forecasting Accuracy* is positive and statistically significant when we use the *Change in ROA*

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frequency as a control variable in the regressions presented in Table 2. *Forecasting Accuracy* remains statistically significant at the 1% in these untabulated tests.

and the *Change in CFO* as the operating performance measure. However, we note that when *Change in ROA* is the dependent variable, the coefficient for *Forecasting Accuracy* is at best marginally significant using a one-tailed test (one-tailed p-value = 0.058). These results suggest that firms with higher forecasting accuracy engage in more profitable acquisitions.

Post-Acquisition Goodwill Impairment Analysis

We next examine goodwill impairments as a measure of acquisition quality. Specifically, following recent studies, such as Doellman and Ryngaert (2010) and Gu and Lev (2011), we interpret goodwill impairment losses recorded in the post-acquisition period as an indication of a lower quality investment decision. Since goodwill represents the difference between what the acquirer pays for the target and the fair value of the target's separable assets, impairment charges related to prior acquisitions' goodwill represent cases where the premium paid above the value of the separable assets is no longer justified. While monitors, such as auditors, play a role in requiring firms to record goodwill impairments, managers also have significant discretion in the application of impairment rules (Ramanna and Watts 2011). However, we expect that a manager's discretion would play a larger role in determining the amount of an impairment than in determining whether an impairment occurs. Accordingly, we examine both the probability and the magnitude of impairments in the three years following an acquisition.

We expect that acquirers with higher pre-acquisition forecasting accuracy are less likely to record goodwill impairments in the post-acquisition period. We use the following logistic (OLS) regression model when the dependent variable is the existence (magnitude) of an impairment to test our prediction:

$$Goodwill\ Impairment_{\ t} = \gamma_0 + \gamma_1 Forecasting\ Accuracy_{\ [t-3,\ t-1]} + \gamma_i \Sigma\, CONTROLS + e_t, \qquad (2)$$

where *Goodwill Impairment* is either (i) an indicator variable that takes a value of one (zero) if a firm records (does not record) an impairment following the acquisition, or (ii) the magnitude of the impairment. *Forecasting Accuracy* and *CONTROLS* are as defined as earlier. Figure 1, Panel

C provides a timeline of our variable measurement windows. Our regressions include year and industry fixed effects, and we cluster standard errors by industry and year. We estimate equation (2) using a sample of acquisitions that generate significant goodwill amounts, which we define as an increase in goodwill greater than or equal to 5% of total assets.[19] To increase our sample size, and thus the test's power, we retain all acquisitions that generate large goodwill increases, as opposed to retaining only the first deal in a series, as for the CAR analysis.[20, 21]

Since our sample differs from that used in the previous analyses, Table 4, Panel A re-tabulates the descriptive statistics for the goodwill sample. The descriptive statistics indicate that the characteristics of the firms included in the goodwill impairment test are similar to the characteristics of firms used in our acquisition announcement analysis. *Firm Size*, *Return on Assets*, *Leverage*, *Growth*, etc. have similar values in both tables. More importantly, the forecast characteristics are also very similar with a median *Forecasting Accuracy* of -0.013 in Table 2, Panel A, and -0.010 in Table 4, Panel A.

Table 4, Panel B presents the results from estimating equation (2). We find that the coefficient for *Forecasting Accuracy* is negative and statistically significant across both specifications, consistent with our hypothesis that managers with high forecasting ability make better investment decisions.[22]

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[19] In sensitivity tests, our conclusions do not change when we rerun our analysis using 1% of total assets as a cut-off point for the magnitude of goodwill increases as well as when we use the full sample without any cut-off point.

[20] We use Compustat to identify our large goodwill generating acquisitions because this information is not available on SDC. However, a limitation of this approach is that we do not have transaction-specific characteristics for all the deals in this sample.

[21] Requiring both that the acquisition be first in the series and that there be at least a 5% increase in goodwill is not feasible. Using both criteria would reduce our sample size substantially because the first acquisitions are not necessarily those that create large goodwill increases.

[22] The accounting rules for goodwill impairments changed during our sample period with the implementation of SFAS 142 in 2001. Prior to SFAS 142, firms were required to amortize goodwill, and sufficiently high amortization could have reduced or eliminated goodwill impairments in the pre SFAS 142 period. In addition, SFAS 142 increased the regularity of impairment testing. Taken together, these changes may increase the probability that, in the post SFAS 142 period, a firm whose goodwill is overvalued will record an impairment loss. Accordingly, we re-estimate our goodwill impairment model using only observations after 2002, and our results do not change. Specifically, we continue to find that the coefficient for *Forecasting Accuracy* is negative and statistically significant at the 5% level.

Post-Acquisition Divestitures Analysis

Prior studies, including Mitchell and Lehn (1990) and Francis and Martin (2010), suggest that post-acquisition divestitures indicate poorer acquisition decisions. The authors interpret the divestiture decision as evidence that acquisition strategies failed to increase and perhaps, decreased value. Therefore, we also measure the ex-post success of an acquisition by observing the likelihood of a subsequent divestiture. Our analysis of divestitures complements the goodwill impairment tests, because some firms will divest a poor acquisition rather than continue the operations of the acquired unit and incur an impairment charge. Assuming that post-acquisition divestitures are indicative of poor acquisition decisions, we expect that firms with greater pre-acquisition forecasting quality are less likely to have a subsequent divestiture. We test this prediction using the following logistic regression model:

$$Divestiture_{\,t} = \gamma_0 + \gamma_1 Forecasting\ Accuracy_{\,[t-3,\,t-1]} + \gamma_i \Sigma\, CONTROLS + e_t, \qquad (3)$$

where *Divestiture* is an indicator variable that takes a value of one (zero) if an acquisition results in (does not result in) a subsequent divestiture.[23] An acquisition is defined as having a subsequent divestiture if the target acquired at the acquisition date has the same four-digit SIC code as the unit divested in the three-year post-acquisition period. *Forecasting Accuracy* and *CONTROLS* are as defined as before. Figure 1, Panel C presents a timeline of our variable measurement windows. As with our earlier tests, our regressions include time and industry fixed effects, and we cluster standard errors by industry and year.

Our sampling criteria for this analysis differs from that used in our prior analyses since we do not restrict the acquisitions to those that (i) generate large goodwill values, or (ii) are the first acquisition in a series. As a result, we re-tabulate the descriptive statistics for the divestiture sample in Table 5, Panel A. The removal of these restrictions results in a significantly larger

[23] Using a continuous variable for our divestiture analysis is not feasible, as our SDC data source does not provide a dollar value for most of the divestitures.

sample with larger firms for our divestiture analysis. However, the properties of the managers' forecasts and other firm characteristics are comparable across tables.

Results in Table 5, Panel B for equation (3) show that the coefficient for *Forecasting Accuracy* is negative and statistically significant (*z*-statistic = -1.77), consistent with our prediction that firms with high forecast quality are less likely to engage in acquisitions that result in subsequent divestitures. Our results from examining both announcement returns as an ex ante measure of acquisition quality and three ex post measures of acquisition quality, changes in operating performance, goodwill impairments, and divestitures, provide consistent evidence that forecasting accuracy is associated with the quality of acquisition decisions.[24]

Cross-sectional Tests: Forecasting Accuracy and Acquisition Quality

We conduct two cross-sectional tests related to acquisition type based on the intuition that the transferability of an acquirer's ability to forecast her own firm's earnings to forecasting a target's earnings is increasing in the similarities between the two firms. As managers acquire and process information about their industry's prospects and other drivers of their investment payoffs, they can transfer this knowledge to aid in the valuation of (i) other firms in the same industry, and (ii) firms that have similar earnings generating processes.

Following this intuition, we examine whether the relation between forecast quality and investment quality is weaker when the firm acquires a target in a different industry and stronger when it acquires a target with a similar earnings generating process. We identify similarities in firms' earnings generating processes by examining the extent to which the acquirers' stock

[24] In untabulated analyses, we triangulate our evidence based on the ex ante and ex post measures of acquisition quality by examining the relation between acquisition announcement returns and post-acquisition changes in performance, goodwill impairments, and divestitures. Consistent with our expectations, we find that acquisition announcement returns are positively correlated with post-acquisition changes in performance, and negatively correlated with goodwill impairments and divestitures. However, the association between announcement returns and divestitures is statistically insignificant at conventional levels.

returns co-move with the targets' industry returns.[25] A measure based on changes in stock price is a natural choice for capturing similarities in the earnings generating process, since a firm's stock price reflects the present value of its future earnings (Parrino 1997). If the acquiring firm and the firms in the target's industry employ similar production technologies and operate in similar product markets, news concerning changes in factors such as economic conditions or technological innovations will tend to affect their cash flows, and therefore their stock prices, in a similar manner. Therefore, we estimate regressions of the acquiring firm's stock returns on the market return index and the target's industry return index. The partial correlation coefficient for the industry return index is used to proxy for similarities in the earnings generating processes of the target and acquirer; we call this measure *Comovement*.

We predict that when the target and the acquirer are in different industries, the association between forecast quality and the acquisition announcement return will be weaker; when the acquirer and target have similar earnings generating processes, the association will be stronger. We test our predictions by including interaction terms between (i) *Forecasting Accuracy* and *Diversifying Acquisition*, an indicator variable for whether the acquirer operates in a different industry than the target, and (ii) *Forecasting Accuracy* and *Comovement*.

The results in Table 6 show that the coefficient for *Forecasting Accuracy* x *Diversifying Acquisition* is negative and statistically significant (*t*-statistic = -2.09). As predicted, forecasting accuracy has a smaller effect on acquisition quality when firms acquire targets in different industries.[26] Further, we find that the coefficient for *Forecasting Accuracy* x *Comovement* is

[25] We use the target's industry returns, as opposed to the target firm's returns, because the majority of the targets in our sample are private, and publicly available returns are not available.

[26] Diversifying acquisitions and the associated announcement returns are interpreted as a type of merger for which there is an agency motivation, with managers seeking to build not only larger, but more stable empires (see e.g., Morck et al. 1990, Stein 2003). Accordingly, we control for the main effect of diversifying acquisitions on announcement returns. However, to the extent the interaction between *Forecasting Accuracy* and *Diversifying Acquisitions* captures any residual effect of such empire building motives, the interpretation of our results is problematic. To reduce concerns that such agency problems affect our inferences, we follow Hoechle, Schmid, Walter and Yermack (2012), who find that the negative announcement returns associated with diversifying

positive and statistically significant (*t*-statistic = 2.39), which suggests that forecasting ability has a greater effect on acquisition quality when the acquirer and target have similar earnings generating processes. These results help strengthen our inference that managerial forecasting quality is positively associated with the quality of their investment decisions.

Capital Expenditure Analysis

We next focus on capital expenditures, R&D expenditures, and advertising expenditures. To remain consistent with prior research, we examine capital expenditures separately and in conjunction with R&D and advertising expenditures (McNichols and Stubben 2008; Biddle et al. 2009). To determine whether a firm's investment levels deviate from expected investment levels, we use a benchmark investment model based on prior research on investment efficiency (McNichols and Stubben 2008; Biddle et al. 2009; Shroff 2013). Specifically, we calculate unexpected investment as the absolute value of the residual from industry-year regressions of a firm's capital expenditures (or the sum of capital, R&D, and advertising expenditure) on lag Tobin's Q, cash flows from operations, lag asset growth and lag investment. We predict that higher forecasting accuracy is associated with more efficient investment decisions. Because better investment choices are reflected as smaller deviations from expected levels, we multiply the absolute value of the residual by negative one to make our variable increasing in efficiency.[27]

Although this model of investment is widely used in prior research, there is significant measurement error in this proxy for investment efficiency (Erickson and Whited 2000).

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acquisitions are significantly weaker for firms with strong governance mechanisms, and verify that our inferences are robust to controlling for additional governance proxies (untabulated).

[27] In untabulated analyses, we attempt to validate our measure of investment efficiency by examining whether firms identified as investing more efficiently also have better future performance. Specifically, we examine the relation between our measure of investment efficiency and ex post performance using four proxies: (i) average ROA in the three years following the year we measure investment efficiency, (ii) aggregate earnings in the three years following the year we measure investment efficiency, scaled by assets in the year we measure investment efficiency, (iii) average cash flows from operations, scaled by assets in the three years following the year we measure investment efficiency, and (iv) aggregate cash flows from operation in the three years following the year we measure investment efficiency, scaled by assets in the year we measure investment efficiency. We find that our measure of investment efficiency is (significantly) positively related to all measures of future performance.

Therefore, we use an indicator variable that takes a value of one if the absolute value of a firm's level of unexpected investment falls below the median absolute value of the unexpected investment distribution, and zero otherwise.[28] We estimate a logistic regression of investment efficiency on *Forecasting Accuracy* and *CONTROLS*, as defined before. In addition to our standard set of control variables, we also include the standard deviation of capital expenditures (*Stdev. Investment*), as greater historical volatility decreases the probability that the deviation in investment in a period is small. Finally, our regression includes industry and year fixed effects, and we cluster standard errors by industry and year. Figure 1 Panel D shows a timeline of our variable measurement windows.

Table 7, Panel A presents the descriptive statistics for the variables used in the investment efficiency analysis. Both measures of investment efficiency have a mean value of 0.50 because we classify firms above (below) the median as investing efficiently (inefficiently). The forecasting characteristics are very similar to those reported in our earlier tables. For example, the median *Forecasting Accuracy* is -0.010 in both our investment efficiency sample (Table 7, Panel A) and our goodwill impairment sample (Table 4, Panel A).

Table 7, Panel B presents our regression results. We find that the coefficient for *Forecasting Accuracy* is positive and statistically significant for both measures of investment efficiency. These results indicate that managers who have greater forecasting ability invest more efficiently in fixed assets, R&D, and advertising, as measured by the magnitude of unexpected investment amounts. Overall, our analyses of acquisitions and capital expenditure decisions provide consistent evidence that external management forecast quality acts as a measure of broader managerial forecasting ability regarding investment. Table 7, Panel B also shows that the coefficients for our control variables are consistent with expectations and prior research (e.g., Biddle et al. 2009). For example, larger firms and firms with higher leverage investment more

[28] However, we note that our inferences are unchanged if we use the continuous measure of investment efficiency.

efficiently and firms operating in more uncertain environments (i.e., those with a higher *Stdev. Investment* and *Stdev. ROA*) invest less efficiently.

IV. ROBUSTNESS TESTS

Financial Reporting Quality

Our evidence above suggests that earnings guidance can be used as a measure of a broader forecasting ability. However, managerial forecast quality could simply be one component of an overall disclosure policy of transparent, or 'high quality,' reporting, and thus serve as a proxy for better financial reporting quality. Several recent studies (Biddle and Hilary 2006; McNichols and Stubben 2008; Biddle et al. 2009) find that firms with higher financial statement reporting quality have more efficient investment. These studies contend that high quality financial reporting can lead to more efficient investment via two mechanisms. First, transparent financial statements can help financially constrained firms attract capital by reducing information asymmetry between the firm and outside suppliers of capital. Second, higher quality financial accounting can lead to better monitoring, which reduces moral hazard related to overinvestment. Thus, we control for the effect of reporting quality on managerial investment decisions, and examine whether management forecasts provide incremental information.

To capture financial reporting quality, we use a principal component analysis, where we extract a common factor from the following three reporting quality measures: (i) working capital accrual estimates in earnings, which is calculated as the sum of changes in accounts receivable, inventory, accounts payable, taxes payable and net changes in other accrued assets for the period, (ii) 'abnormal' accruals, which is calculated as the absolute value of the residuals from industry-

level regressions of the McNichols (2002) abnormal accrual model, where only industries with at least 20 observations are included, and (iii) the FOG index following Li (2008).[29]

In untabulated analyses, we find that our inferences are robust to including reporting quality as an additional variable in each of our regression models. The coefficient estimates for financial reporting quality are positive in all our analyses, and statistically significant in the goodwill and investment efficiency tests. This suggests that financial reporting quality is associated with better investment, consistent with findings in prior research. Overall, these results indicate that managerial forecast quality provides incremental information over and above the effects of financial reporting quality with respect to managerial investment decisions.

Governance Measures

As prior literature (Biddle et al. 2009) uses the quality of financial reporting as a measure related to agency costs, we supplement this analysis by including additional control variables that more directly measure incentive alignment and monitoring. In particular, we measure a firm's governance characteristics using: (i) board size , (ii) percentage of independent directors on the board, (iii) audit committee size, and (iv) whether the CEO is also the chairman of the board. Our empirical analyses of acquisition returns, changes in post-acquisition performance, post-acquisition divestitures and investment efficiency are robust to the inclusion of these controls. However, in our goodwill impairment test, we find that the coefficient for *Forecasting Accuracy*, although still negative, becomes weaker (one-tailed *p*-value = 0.11). We note, however, that this result seems primarily driven by the reduced sample size and not the inclusion of additional control variables. For these sensitivity tests, our sample size reduces by about 50% because we retain only observations that have sufficient information on RiskMetrics to compute the

[29] Abnormal accrual models have been used extensively in the earnings quality literature. However, despite their prevalence, many have argued that there are considerable measurement error issues with the models (Dechow, Ge, and Schrand 2010). Because of these measurement error concerns, we use non-accrual based measures such as the FOG index as well to verify the robustness of our inferences.

governance variables. Using this restricted sample, we obtain the same results both when the governance variables are included in the model and when they are not included.

We also measure managerial incentive alignment following Core and Guay (1999), where we calculate the change in a CEO's equity portfolio for a 1% change in the stock price for the period before the investment decision. When estimating our models with CEO equity incentives as an additional control variable, our untabulated results are qualitatively similar to the results of the governance characteristic analysis described above.

Selection Bias

One potential concern with our analyses is that the provision of management earnings forecasts is an endogenous choice, which may bias our coefficient estimates. To mitigate this concern, we implement the Heckman two-stage procedure to correct for a potential self-selection bias. In the first stage, we model managers' forecast issuance decision using a sample that includes both guiders and non-guiders. That is, we regress the indicator variable, *Guide*, on determinants of issuing guidance following prior literature (Lennox and Park 2006; Bamber at al. 2010). Specifically, we use the following variables: firm size, earnings performance, growth opportunities, leverage, earnings volatility, analyst following, percentage of shares held by institutional investors, the amount of debt and equity finance raised in the capital markets, R&D intensity and two indicator variables identifying firms reporting losses and restructuring charges. Based on this first stage regression, we calculate the inverse Mills ratio and include it as an additional control variable in our regressions. We find that our inferences are unchanged after including the inverse Mills ratio as an additional control variable.

Controlling for Forecasting Aggressiveness

It is possible that some managers make aggressive earnings forecasts, that is forecasts that are higher than the realized earnings, and also aggressive investment payoff forecasts. As a

result, these managers undertake projects that would not pass their firm's hurdle rate absent such high forecasted payoffs. To determine whether our results are driven by this potential relation between aggressive forecasts and poor investment outcomes, we conduct two tests. First, we redo our analyses controlling for whether the average *signed* forecast error for the three years prior to the investment date is positive, that is, forecasted earnings are higher than realized earnings. And second, we redo our analyses after controlling for the proportion of forecasts in the three years prior to the investment date that have positive forecast errors, i.e., the proportion of forecasts that are aggressive. We find that our inferences are unchanged in these analyses.

Role of Range Forecasts

One difficulty in measuring forecast accuracy for our sample is that some forecasts are range forecasts. Although we follow prior literature (Rogers and Stocken 2005) in using the midpoint of the range as the focal point, there is potential that this measurement adds noise, or perhaps even some bias. Accordingly, we run the following two tests. First, we recalculate average accuracy using *only* point forecasts, as opposed to point and range forecasts. Our results are qualitatively similar when we follow this approach. Second, following Ciconte, Kirk, and Tucker (2012), we recalculate average accuracy using the upper bound, as opposed to the mid-point, of the range forecasts. The intuition is that managers face an asymmetric loss function regarding earnings surprises, whereby they are asymmetrically 'punished' for earnings realizations that are below the forecast. Accordingly, managers tend to provide their actual expectation near the top of the range to allow 'more room for error.' Our results are robust to this alternate specification as well.

Prior Investment Quality

Finally, we examine whether managerial forecast quality provides information that is incremental to lagged investment quality. That is, investors may use prior investment quality to

predict future investment quality. As such, guidance may not provide any incremental information. To address this issue, we include lagged investment quality for our non-market based measures: *Goodwill Impairment*, *Divestitures* and *Investment Efficiency*. Lagged investment quality is the *average* investment quality in the prior three years, similar to our approach for calculating *Forecasting Accuracy* in our main analyses. Specifically, for the goodwill impairment test, lagged investment quality is the likelihood of recording goodwill impairments in the three years before the acquisition of interest. In the divestiture test, lagged investment quality is the likelihood of having divestitures in the three years before the acquisition of interest. Finally, for our investment efficiency tests, lagged investment quality is the average annual deviations from expected investment levels in the three years before the investment period of interest. Across these tests, we find that, although lagged investment quality is predictive of future investment quality, as expected, our findings continue to hold.

V. CONCLUSION

Capital budgeting relies heavily on the ability of managers to estimate payoffs related to potential projects. Even though these forecasts are critical to firm value, most forecasts are internal and thus not directly observable by external stakeholders. This paper investigates whether the quality of voluntarily disclosed management forecasts predicts the quality of managerial investment decisions. We contend that managers with higher quality external management forecasts have stronger internal forecasting skills, which result in better estimation of investment project payoffs, and thus better investment decisions.

Using the accuracy of managers' external forecasts as a measure of managerial forecasting quality, we predict that management forecast quality is positively associated with acquisition announcement returns, post-acquisition changes in operating performance, and negatively related to post-acquisition goodwill write-downs and divestitures. We find evidence

consistent with these predictions. We also explore settings with significant variation in the extent to which managerial forecasting expertise extends to the valuation of other firms. We find that the association between management forecast quality and subsequent acquisition announcement returns is weaker in those settings where the target either is in the different industry or has a dissimilar earnings generating process. Finally, we predict and find a positive association between forecasting quality and investment efficiency in capital expenditures.

Our study lies at the intersection of the investment and management forecast literatures. There is a dearth of evidence in the investment literature on whether managers' proficiency at non-investment related tasks can be used to infer the quality of their investment decisions. Similarly, there is little evidence in the guidance literature on whether the abilities related to generating manager forecasts extend to other managerial tasks. We contribute to these literatures by providing evidence that forecasting ability is positively associated with the quality of investment appraisal. These findings suggest that short-term earnings forecasting and long-term capital investment decisions rely on common forecasting expertise, despite being distinct managerial tasks with different objectives and horizons.

Our findings also inform the recent debate regarding the cessation of management earnings forecasts. Both corporate professionals and academics argue that managers should end the practice of providing quarterly earnings guidance. We provide empirical evidence suggesting that the quality of these forecasts can be used as a valuable measure of broader managerial forecasting ability regarding investment. Thus, our findings point to an additional benefit of voluntarily disclosed forecasts that should be weighted in the guidance cessation debate.

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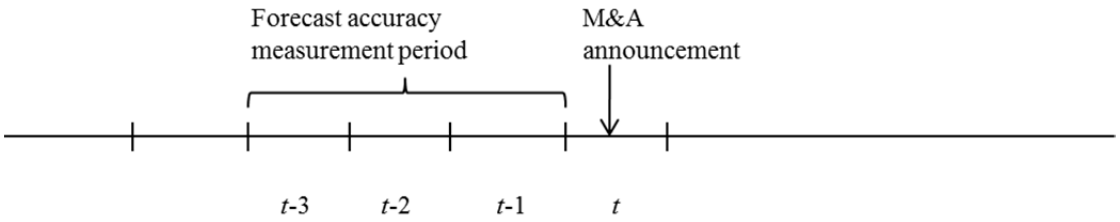
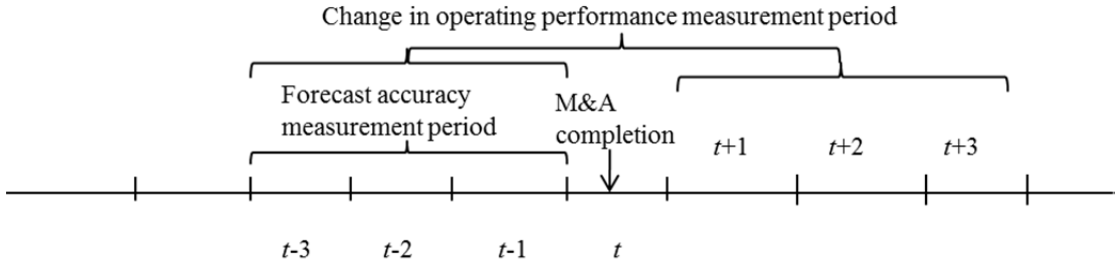
FIGURE 1

This figure presents the timeline for measuring management forecasting accuracy (our independent variable of interest) relative to acquisition announcement returns, goodwill impairments, divestitures, and investment efficiency (our dependent variables).

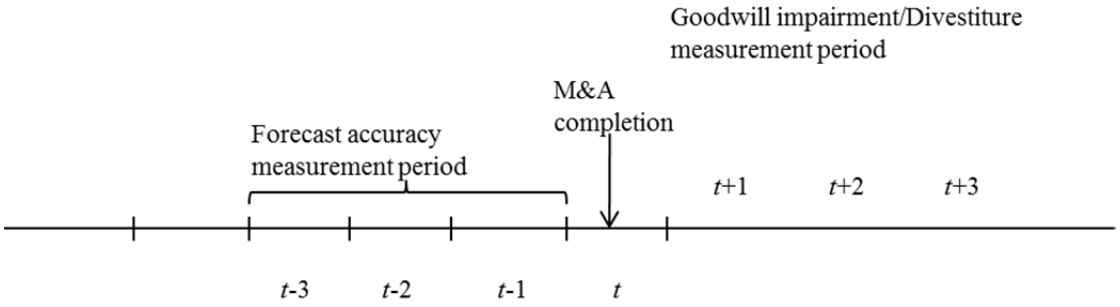
Panel A: Timeline for Measuring Forecast Accuracy relative to Acquisition Announcement Returns



Panel B: Timeline for Measuring Forecast Accuracy relative to Changes in Operating Performance Measurement



Panel C: Timeline for Measuring Forecast Accuracy relative to Goodwill and Divestiture Measurement



Panel D: Timeline for Measuring Forecast Accuracy relative to Investment Efficiency Measurement

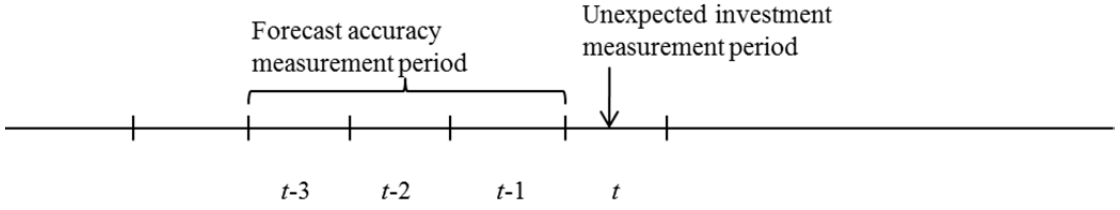


TABLE 1
Variable Definitions

This table provides a detailed description of the procedure used to compute each variable used in our analyses. The variables are listed in alphabetical order.

Variable	Definition
Analyst Forecast Accuracy	Analyst earnings forecasts accuracy is measured using the analyst earnings forecast issued immediately before the management earnings forecast date. For each analyst forecast, accuracy is measured as the absolute value of the difference between the forecasted EPS and the actual EPS divided by the stock price three days prior to the analyst forecast release date.
Analyst Forecast Dispersion	Analyst earnings forecast dispersion measured immediately prior to the management earnings forecast date. We scale dispersion by stock price three days prior to the management forecast date.
Capital Expenditure Efficiency	Indicator variable that takes a value of one if a firm has an unexpected investment level below the median of the distribution of unexpected investment and zero otherwise. unexpected investment is measured as the absolute value of the residual from a regression of a firm's capital expenditures on lag Tobin's Q, cash flows from operations, lag asset growth and lag capital expenditures. The regressions are estimated by industry and year for industries with at least 30 available observations.
Capital + R&D + Advertising Expenditure Efficiency	Indicator variable that takes a value of one if a firm has an unexpected investment level below the median of the distribution of unexpected investment and zero otherwise. unexpected investment is measured as the absolute value of the residual from a regression of a firm's aggregate investment on lag Tobin's Q, cash flows from operations, lag asset growth and lag aggregate investment. Aggregate investment is defined as capital expenditures plus R&D expenditures plus advertising expenditure. The regressions are estimated by industry and year for industries with at least 30 available observations.
Cash M&A	Indicator variable that takes a value of one if a hundred percent of the consideration paid for the target consist of cash, zero otherwise.
Change in CFO	The average CFO over the years t+1 to t+3 minus the average CFO over the years t-3 to t-1, where year t is the acquisition year. CFO is measured as cash flow from operations divided by total assets.
Change in ROA	The average ROA over the years t+1 to t+3 minus the average ROA over the years t-3 to t-1, where year t is the acquisition year. ROA is measured as income before extraordinary items divided by total assets.
Comovement	The partial correlation coefficient for the industry return index obtained from regressions of the acquiring firm's monthly stock returns on the monthly market return index and the target's monthly industry return index. The regressions are estimated over the three-year period prior to the acquisition announcement date. We standardize the variable to have a mean zero and standard deviation of one to ease the interpretation of the interaction term in our cross-section test.
Diversifying Acquisition	Indicator variable that takes a value of one if the target and acquirer have different two-digit SIC industry code, zero otherwise.
Divestiture Indicator	Indicator variable that takes a value of one (zero) if an acquisition has (does not have) a subsequent divestiture during the three years following the acquisition. An acquisition is defined as having a subsequent divestiture if the target acquired at the acquisition date has the same four-digit SIC code as the firm divested during the three-year post-acquisition period.
Domestic Target	Indicator variable that takes a value of one if the target is a domestic company, zero otherwise.
Earnings Persistence	First-order autocorrelation in quarterly earnings before extraordinary items in the three-year period prior to the investment date/period.
Firm Size	Natural log of total assets at the end of the fiscal year preceding the investment date/period.

Forecasting Accuracy	Average accuracy of all annual management forecasts issued in the three years prior to the investment date/period (for acquisitions and capital expenditures, respectively). For each forecast, accuracy is measured as the absolute value of the difference between the management forecasted EPS minus the actual EPS divided by the stock price three days prior to the management forecast release date. The management forecast is either a point estimate or the mid-point of a range estimate of a firm's annual earnings. Accuracy is multiplied by minus one to transform it in an increasing-in-quality measure.
Forecast Horizon	Average forecast horizon of all annual management forecasts issued in the three-year period prior to the investment announcement. For each forecast, forecast horizon is measured as the natural log of the number days between the forecast announcement date and the fiscal period end date.
Forecast Precision	Average precision of all annual management forecasts issued in the three-year period prior to the investment date/period. For each forecast, precision is measured as the absolute value of the difference between the upper bound of the management forecast minus the lower bound divided by the stock price three days prior to the management forecast release date. For a point forecast, the upper and lower bounds of the forecast range will be equal. Precision is multiplied by minus one to transform it in an increasing-in-precision measure.
Goodwill Impairment Indicator	Indicator variable that takes a value of one (zero) if a firm records (does not record) goodwill impairment losses in the three-year period following an acquisition that generates a large increase in goodwill. A large increase in goodwill is defined as an increase in goodwill greater or equal to 5% of total assets.
Goodwill Impairment Loss	The magnitude of goodwill impairment losses recorded in the three-year period following an acquisition that generates a large increase in goodwill. A large increase in goodwill is defined as an increase in goodwill greater or equal to 5% of total assets.
Growth	Percentage change in sales in the fiscal year preceding the investment date/period.
Hostile Takeover	Indicator variable that takes a value of one if the acquisition was classified as hostile in the SDC database, zero otherwise.
Leverage	Leverage computed as the ratio of total liabilities to total assets at the end of the fiscal year preceding the investment date/period.
Market Adjusted CAR	Three-day cumulative abnormal return around the acquisition announcement. The abnormal return is computed as the stock return minus the return to the CRSP value-weighted index over the three day announcement window.
Market Model CAR	Three-day cumulative abnormal return around the acquisition announcement. The abnormal return is computed using the market model, where the parameters of the model are estimated over the window (-271,-21) trading days preceding the acquisition announcement and the market return is measured as the return to the CRSP value-weighted index.
No. of Bidders	Indicator variable that takes a value of one if there is more than one bidder for the target firm, zero otherwise.
Public Target	Indicator variable that takes a value of one if the target is a public company, zero otherwise.
Relative Target Size	Ratio of the acquisition transaction value to the acquirer's market value.
Return on Assets (ROA)	Income before extraordinary items divided by lag total assets for the fiscal year preceding the investment date/period.
Stdev. ROA	Standard deviation of quarterly ROA over the three years prior to the investment date/period.
Stdev. Stock Returns	Standard deviation of the daily buy-and-hold stock returns measured over the one-year period prior to the investment date/period.
Stock M&A	Indicator variable that takes a value of one if a hundred percent of the consideration paid for the target consist of the acquirer's stock, zero otherwise.
Stock Returns	Buy and hold stock return in the fiscal year preceding the investment date/period. For the acquisition announcement analysis, the buy and hold return is measured over the period (-13,-1) month relative to the acquisition announcement.
Tobin's Q	Market value of equity plus the book value of short and long term debt scaled by total assets measured at the end of the fiscal year preceding the investment date/period.

TABLE 2
Acquisition Announcement Returns and Management Forecast Accuracy

Panel A: Descriptive Statistics of the Variables in our Regression Analyses of Acquisition Announcement Returns (N = 948)

	Mean	Std	Q1	Median	Q3
ACQUISITION QUALITY					
Market Model CAR	0.007	0.065	-0.022	0.005	0.034
Market Adjusted CAR	0.006	0.064	-0.024	0.003	0.033
FORECAST CHARACTERISTICS					
Forecasting Accuracy	-0.024	0.031	-0.031	-0.013	-0.004
Forecast Precision	-0.003	0.003	-0.004	-0.002	0.000
Forecast Horizon	5.329	0.552	5.149	5.455	5.676
ACQUIRER CHARACTERISTICS					
Firm Size	6.640	1.796	5.347	6.501	7.776
Return on Assets	0.048	0.087	0.017	0.051	0.092
Tobin's Q	2.274	1.645	1.236	1.677	2.691
Leverage	0.508	0.239	0.307	0.522	0.671
Growth	0.182	0.394	0.010	0.097	0.236
Stock Returns	0.244	0.567	-0.095	0.159	0.425
UNCERTAINTY					
Stdev. ROA	0.019	0.028	0.005	0.010	0.021
Stdev. Stock Returns	0.028	0.013	0.018	0.025	0.033
Earnings Persistence	0.117	0.304	-0.094	0.089	0.337
Analyst Forecast Accuracy	-0.009	0.015	-0.010	-0.004	-0.002
Analyst Forecast Dispersion	0.003	0.009	0.001	0.001	0.003
ACQUISITION CHARACTERISTICS					
Public Target	0.204	0.403	0.000	0.000	0.000
Domestic Target	0.816	0.387	1.000	1.000	1.000
Cash M&A	0.348	0.477	0.000	0.000	1.000
Stock M&A	0.072	0.258	0.000	0.000	0.000
Diversifying Acquisition	0.434	0.496	0.000	0.000	1.000
Relative Target Size	0.156	0.245	0.020	0.063	0.168
Hostile Takeover	0.021	0.144	0.000	0.000	0.000
No. of Bidders	0.008	0.092	0.000	0.000	0.000

TABLE 2 (continued)

Panel B: Analyses of Acquisition Announcement Returns and Management Forecast Accuracy

Dependent Variable = Acquisition Announcement Cumulative Abnormal Returns (CAR)					
	Predicted Sign	*Market Model CAR*		*Market Adjusted CAR*	
		Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
FORECAST CHARACTERISTICS					
Forecasting Accuracy	+	0.144 **	2.03	0.127 **	1.90
Forecast Precision		1.046	1.17	1.087	1.22
Forecast Horizon		0.003	0.70	0.003	0.63
ACQUIRER CHARACTERISTICS					
Firm Size		-0.004 **	-1.98	-0.004 **	-2.06
Return on Assets		0.023	0.82	0.021	0.83
Tobin's Q		-0.005 **	-2.55	-0.005 **	-2.64
Leverage		0.015	0.85	0.012	0.67
Growth		-0.004	-0.36	-0.003	-0.31
Stock Returns		0.005	1.35	-0.001	-0.17
UNCERTAINTY					
Stdev. ROA		0.058	0.31	0.065	0.35
Stdev. Stock Returns		0.029	0.20	-0.111	-0.95
Earnings Persistence		-0.006	-0.68	-0.004	-0.53
Analyst Forecast Accuracy		0.072	0.40	0.079	0.42
Analyst Forecast Dispersion		-0.450 **	-2.47	-0.429 **	-2.51
ACQUISITION CHARACTERISTICS					
Public Target		-0.019 ***	-3.57	-0.020 ***	-3.76
Domestic Target		0.009	1.08	0.008	1.03
Cash M&A		0.001	0.12	0.000	-0.01
Stock M&A		-0.005	-0.53	-0.005	-0.61
Diversifying Acquisition		-0.006 *	-1.70	-0.006 **	-2.24
Relative Target Size		0.029 **	2.53	0.032 **	2.62
Hostile Takeover		0.013	1.20	0.018	1.49
No. of Bidders		-0.020	-0.85	-0.020	-0.88
N		948		948	
R-Sq.		15.2%		14.8%	
Year & Industry Indicators		Yes		Yes	
S.E. Clustered by Industry & Year		Yes		Yes	

Panel A in this table presents descriptive characteristics of the variables used in the acquisition announcement return analyses. Panel B reports results from an OLS regression of the market reaction to the acquisition announcement on management forecast accuracy and control variables. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.

TABLE 3
Analyses of Post-Acquisition Change in Operating Performance and Management Forecast Accuracy

Panel A: Descriptive Statistics of the Variables in our Analyses of Post-Acquisition Operating Performance (N=668)

	Mean	Std	Q1	Median	Q3
ACQUISITION QUALITY					
Change in ROA	-0.025	0.122	-0.052	-0.007	0.018
Change in CFO	-0.004	0.085	-0.039	-0.005	0.034
FORECAST CHARACTERISTICS					
Forecasting Accuracy	-0.025	0.030	-0.033	-0.014	-0.004
Forecast Precision	-0.002	0.003	-0.003	-0.001	0.000
Forecast Horizon	5.308	0.576	5.066	5.440	5.684
ACQUIRER CHARACTERISTICS					
Firm Size	6.566	1.784	5.299	6.347	7.634
Return on Assets	0.048	0.091	0.018	0.053	0.092
Tobin's Q	2.348	1.728	1.249	1.712	2.814
Leverage	0.504	0.234	0.307	0.522	0.666
Growth	0.187	0.382	0.013	0.107	0.257
Stock Returns	0.253	0.604	-0.119	0.160	0.448
UNCERTAINTY					
Stdev. ROA	0.019	0.027	0.006	0.011	0.021
Stdev. Stock Returns	0.028	0.013	0.019	0.026	0.035
Earnings Persistence	0.119	0.307	-0.095	0.087	0.349
Analyst Forecast Accuracy	-0.010	0.018	-0.010	-0.004	-0.001
Analyst Forecast Dispersion	0.003	0.005	0.000	0.001	0.003
ACQUISITION CHARACTERISTICS					
Public Target	0.193	0.395	0.000	0.000	0.000
Domestic Target	0.820	0.384	1.000	1.000	1.000
Cash M&A	0.329	0.470	0.000	0.000	1.000
Stock M&A	0.075	0.263	0.000	0.000	0.000
Diversifying Acquisition	0.433	0.496	0.000	0.000	1.000
Relative Target Size	0.158	0.247	0.018	0.063	0.182
Hostile Takeover	0.021	0.143	0.000	0.000	0.000
No. of Bidders	0.010	0.102	0.000	0.000	0.000

TABLE 3 (continued)

Panel B: Analyses of Post-Acquisition Operating Performance and Management Forecast Accuracy

Dependent Variable = Post Acquisition Change in Performance					
	Pr. Sign	*Change in ROA*		*Change in CFO*	
		Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
FORECAST CHARACTERISTICS					
Forecasting Accuracy	+	0.247 *	1.57	0.271 **	1.71
Forecast Precision		-1.880	-0.96	0.250	0.16
Forecast Horizon		-0.002	-0.21	0.004	0.75
ACQUIRER CHARACTERISTICS					
Firm Size		0.001	0.17	0.002	0.78
Return on Assets		-0.422 ***	-4.84	-0.248 ***	-3.46
Tobin's Q		-0.006	-1.36	-0.006 **	-2.07
Leverage		0.013	0.43	-0.008	-0.32
Growth		-0.026	-1.57	0.009	0.69
Stock Returns		0.030 **	2.31	0.015 **	2.05
UNCERTAINTY					
Stdev. ROA		1.032 **	2.63	0.750 ***	2.68
Stdev. Stock Returns		-1.515 ***	-3.37	-0.233	-0.70
Earnings Persistence		0.002	0.10	0.007	0.55
Analyst Forecast Accuracy		0.383	0.60	0.350	0.58
Analyst Forecast Dispersion		-4.023	-1.36	-0.968	-0.35
ACQUISITION CHARACTERISTICS					
Public Target		0.001	0.07	0.004	0.38
Domestic Target		-0.010	-0.97	-0.007	-0.71
Cash M&A		-0.015	-1.34	-0.010	-1.37
Stock M&A		-0.028	-1.16	-0.013	-0.71
Diversifying Acquisition		-0.001	-0.07	0.004	0.57
Relative Target Size		-0.017	-1.02	0.002	0.18
Hostile Takeover		0.027	1.10	-0.002	-0.09
No. of Bidders		-0.009	-0.34	0.006	0.33
N		668		638	
R-Sq.		27.7%		24.5%	
Year & Industry Indicators		Yes		Yes	
S.E. Clustered by Industry & Year		Yes		Yes	

Panel A in this table presents descriptive characteristics of the variables used in the analyses of post-acquisition changes in operating performance. Panel B reports results from OLS regressions of changes in post-acquisition operating performance on management forecast accuracy and control variables. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.

TABLE 4
Post-Acquisition Goodwill Impairments and Management Forecast Accuracy

Panel A: Descriptive Statistics of Variables used in our Analyses of Post-Acquisition Goodwill Impairments (N=1,399)

	Mean	Std	Q1	Median	Q3
Goodwill Impairment Indicator	0.277	0.447	0.000	0.000	1.000
Goodwill Impairment Loss	0.030	0.079	0.000	0.000	0.002
Forecasting Accuracy	-0.019	0.032	-0.024	-0.010	-0.004
Forecast Precision	-0.003	0.003	-0.004	-0.002	-0.001
Forecast Horizon	5.438	0.411	5.342	5.505	5.652
Firm Size	6.610	1.515	5.563	6.512	7.582
Return on Assets	0.061	0.073	0.038	0.067	0.094
Book-to-Market	0.402	0.237	0.239	0.354	0.522
Leverage	0.450	0.199	0.281	0.458	0.590
Growth	0.219	0.320	0.057	0.152	0.285
Stock Returns	0.307	0.689	-0.062	0.176	0.475
Stdev. ROA	0.027	0.041	0.007	0.013	0.028
Stdev. Stock Returns	0.028	0.013	0.019	0.025	0.034
Earnings Persistence	0.146	0.293	-0.058	0.115	0.359
Analyst Forecast Accuracy	-0.005	0.008	-0.006	-0.003	-0.001
Analyst Forecast Dispersion	0.002	0.002	0.000	0.001	0.002

Panel B: Logistic and OLS Analyses of Post-Acquisition Goodwill Impairments and Management Forecast Accuracy

Dependent Variable = Indicator Variable for Goodwill Impairment or the Magnitude of the Impairment					
	Pr. Sign	*P(Goodwill Impairment)*		*Magnitude of Goodwill Impairment Loss*	
		Marginal Effect	*z*-Statistic	Coefficient	*t*-Statistic
Forecasting Accuracy	-	-0.668 **	-1.99	-0.329 **	-2.16
Forecast Precision		-3.433	-0.75	-0.202	-0.16
Forecast Horizon		-0.020	-0.70	-0.008	-1.54
Firm Size		0.013	0.78	0.000	-0.09
Return on Assets		-0.055	-0.32	0.041	1.30
Book-to-Market		0.143 **	2.37	0.018	1.16
Leverage		0.076	0.79	-0.030 *	-1.92
Growth		0.064	1.52	0.016 *	1.83
Stock Returns		-0.026	-1.38	-0.006	-1.41
Stdev. ROA		0.335 *	1.68	0.065	1.54
Stdev. Stock Returns		2.755 **	2.52	0.915 ***	2.83
Earnings Persistence		-0.042	-1.26	-0.006	-1.09
Analyst Forecast Accuracy		-0.517	-0.26	0.422	1.16
Analyst Forecast Dispersion		-5.780	-1.03	0.049	0.04
N		1,399		1,399	
Pseudo R-Sq. / R-Sq.		8.0%		14.2%	
Year & Industry Indicators		Yes		Yes	
S.E. Clustered by Industry & Year		Yes		Yes	

Panel A in this table presents descriptive characteristics of the variables used in our analyses. Panel B reports results from a Logistic regression and OLS regression analyses. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.

TABLE 5
Post-Acquisition Divestitures and Management Forecast Accuracy

Panel A: Descriptive Statistics of the Variables used in our Analyses of Post-Acquisition Divestitures (N=5,051)

	Mean	Std	Q1	Median	Q3
Divestiture Indicator	0.188	0.390	0.000	0.000	0.000
Forecasting Accuracy	-0.021	0.027	-0.028	-0.012	-0.004
Forecast Precision	-0.002	0.003	-0.003	-0.001	0.000
Forecast Horizon	5.408	0.479	5.283	5.495	5.680
Firm Size	7.370	1.874	6.046	7.236	8.557
Return on Assets	0.048	0.076	0.019	0.052	0.085
Book-to-Market	0.420	0.263	0.233	0.366	0.541
Leverage	0.524	0.221	0.358	0.529	0.671
Growth	0.217	0.365	0.040	0.129	0.284
Stock Returns	0.228	0.515	-0.068	0.151	0.393
Stdev. ROA	0.018	0.029	0.004	0.008	0.018
Stdev. Stock Returns	0.026	0.012	0.017	0.023	0.031
Earnings Persistence	1.572	0.655	1.069	1.614	2.054
Analyst Forecast Accuracy	-0.008	0.033	-0.008	-0.003	-0.001
Analyst Forecast Dispersion	0.002	0.009	0.000	0.001	0.002

Panel B: Analyses of Post-Acquisition Divestitures and Management Forecast Accuracy

Dependent Variable = Probability of Post-Acquisition Divestiture			
	Predicted Sign	Marginal Effect	*z*-Statistic
Forecasting Accuracy	-	-0.543 **	-1.77
Forecast Precision		6.701 **	2.32
Forecast Horizon		0.016	0.81
Firm Size		0.061 ***	10.98
Return on Assets		-0.106	-1.01
Book-to-Market		0.018	0.55
Leverage		-0.057	-1.08
Growth		0.018	1.05
Stock Returns		-0.005	-0.49
Stdev. ROA		0.092	0.72
Stdev. Stock Returns		0.665	0.80
Earnings Persistence		0.011	1.12
Analyst Forecast Accuracy		-0.863 **	-2.27
Analyst Forecast Dispersion		0.325	0.49
N		5,051	
Pseudo R-Sq.		14.8%	
Year & Industry Indicators		Yes	
S.E. Clustered by Industry & Year		Yes	

Panel A in this table presents descriptive characteristics of the variables used in the post-acquisition divestiture analyses. Panel B reports results from a Logistic regression of the probability of divestiture post acquisition on management forecast accuracy and control variables. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.

TABLE 6
Cross-Section Test for Acquisitions Announcement Returns and Management Forecasting Accuracy

Dependent Variable = Acquisition Announcement CAR					
	Pr. Sign	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
FORECAST CHARACTERISTICS					
Forecasting Accuracy	+	0.296 ***	2.81	0.135 **	2.16
Diversifying Acquisition		-0.012 **	-1.96	-0.007	-1.50
Forecasting Accuracy × Diversifying Acq.	-	-0.423 **	-2.09	---	---
Comovement		---	---	0.000	-0.15
Forecasting Accuracy × Comovement	+	---	---	0.123 ***	2.39
Forecast Precision		1.050	1.45	1.033	1.38
Forecast Horizon		0.002	0.62	0.002	0.53
ACQUIRER CHARACTERISTICS					
Firm Size		-0.004 **	-2.00	-0.004 *	-1.77
Return on Assets		0.017	0.69	0.021	0.85
Tobin's Q		-0.005 **	-2.50	-0.004 **	-2.33
Leverage		0.011	0.75	0.013	0.74
Growth		-0.004	-0.42	-0.003	-0.24
Stock Returns		0.006	1.28	0.007	1.37
UNCERTAINTY					
Stdev. ROA		0.083	0.49	0.055	0.33
Stdev. Stock Returns		-0.051	-0.19	-0.022	-0.08
Earnings Persistence		-0.005	-0.57	-0.006	-0.66
Analyst Forecast Accuracy		0.089	0.45	0.068	0.32
Analyst Forecast Dispersion		-0.545 ***	-3.71	-0.413 ***	-3.23
ACQUISITION CHARACTERISTICS					
Public Target		-0.018 **	-2.63	-0.018 **	-2.46
Domestic Target		0.010	1.49	0.010	1.20
Cash M&A		0.000	0.02	0.001	0.26
Stock M&A		-0.006	-0.54	-0.006	-0.53
Relative Target Size		0.030 ***	3.20	0.029 ***	3.01
Hostile Takeover		0.013	1.33	0.011	0.95
No. of Bidders		-0.015	-0.78	-0.022	-1.06
N		948		889	
R-Sq.		15.5%		15.7%	
Year & Industry Indicators		Yes		Yes	
S.E. Clustered by Industry & Year		Yes		Yes	

This table presents the results from an OLS regression of acquisition announcement returns on management forecast accuracy, an interaction between management forecast accuracy and (i) an indicator variable for acquisitions within the same industry and (ii) comovement between the acquirer's stock returns and target's industry stock returns and control variables. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.

TABLE 7

Investment Efficiency Analyses

Panel A: Descriptive Statistics of the Variables in our Regression Analyses of Investment Efficiency (N=9,999)

	Mean	Std	Q1	Median	Q3
Capital Expenditure Efficiency	0.503	0.500	0.000	1.000	1.000
Capital + R&D + Advertising Exp. Efficiency	0.500	0.500	0.000	1.000	1.000
Forecasting Accuracy	-0.023	0.039	-0.026	-0.010	-0.004
Forecast Precision	-0.006	0.231	-0.004	-0.002	-0.001
Forecast Horizon	5.315	0.433	5.191	5.375	5.543
Firm Size	6.991	1.796	5.698	6.884	8.189
Return on Assets	0.042	0.106	0.020	0.050	0.087
Book-to-Market	0.513	0.463	0.259	0.424	0.648
Leverage	0.524	0.229	0.358	0.532	0.673
Stock Returns	0.123	0.576	-0.212	0.055	0.323
Stdev. ROA	0.021	0.042	0.005	0.010	0.022
Stdev. Investment	0.022	0.023	0.009	0.016	0.027
Stdev. Stock Returns	0.029	0.015	0.019	0.026	0.036
Earnings Persistence	0.110	0.286	-0.084	0.078	0.312
Analyst Forecast Accuracy	-0.011	0.048	-0.009	-0.004	-0.001
Analyst Forecast Dispersion	0.002	0.006	0.000	0.001	0.002

Panel B: Analyses of Investment Efficiency and Management Forecast Accuracy

Dependent Variable = Investment Efficiency					
	Pr. Sign	*Capital Expenditure Efficiency*		*Capital + R&D + Advertising Expenditure Efficiency*	
		Marginal Effect	*z*-Statistic	Marginal Effect	*z*-Statistic
Forecasting Accuracy	+	0.317 **	2.44	0.346 **	1.84
Forecast Precision		-1.644	-1.38	0.703	0.56
Forecast Horizon		0.032 **	2.58	0.006	0.40
Firm Size		0.030 ***	4.85	0.017 ***	3.20
Return on Assets		-0.133 **	-2.33	0.046	0.61
Book-to-Market		0.044 ***	2.84	0.121 ***	6.41
Leverage		0.084 **	2.06	0.271 ***	6.60
Stock Returns		-0.005	-0.46	-0.003	-0.21
Stdev. ROA		-0.040	-0.27	-0.955 ***	-4.06
Stdev. Investment		-6.586 ***	-11.34	-3.244 ***	-9.10
Stdev. Stock Returns		-0.124	-0.16	-0.827	-1.15
Earnings Persistence		0.010	0.57	-0.074 ***	-4.22
Analyst Forecast Accuracy		0.104	1.41	-0.178	-1.20
Analyst Forecast Dispersion		-0.946	-1.04	-1.898	-1.54
N		9,999		9,993	
Pseudo R-Sq.		8.0%		6.3%	
S.E. Clustered by Industry & Year		Yes		Yes	

Panel A in this table presents descriptive characteristics of the variables used in the investment efficiency analyses. Panel B reports results from Logistic regressions of an indicator variable for firm-years classified as investing efficiently on management forecast accuracy and control variables. Table 1 provides our variable definitions. In Panel B, *, **, *** indicate significance at the 10%, 5%, and 1% level respectively, using a one-tailed test when a prediction is indicated and a two-tailed test otherwise.