Stock Price Informativeness, Managerial Attributes, and M&A Decisions

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Abstract

This study examines whether the interaction of corporate managerial attributes and the amount of private information in stock prices exerts significant effects on the sensitivity of merger and acquisitions (M&As) and the performance of acquiring firms. We find the heterogeneity in firms' M&A decisions and outcomes is greatly attributed to the interaction of heterogeneous managerial attributes and private information in stock prices. We also document that managerial attributes have distinct and greater explanatory power on acquirers' performance than firm fixed effects and deal characteristics. Our findings are also robust to other endogeneity concerns and different measures of stock price informativeness and managerial attributes.

Keywords: Stock price informativeness; managerial attributes; M&A decisions; M&A performance

JEL Classification: G14; G32; G34; M0; M12; M20

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1. Introduction

A large number of studies on mergers and acquisitions (M&As), over the last forty years, have revealed several determinants of acquirer performance, but the overall variation in the returns to acquisition decisions remains mostly unsettled. The theoretical literature (Dow and Gorton 1997; Subrahmanyam and Titman 1999; Dow and Rahi 2003; Goldstein and Guembel 2008) argues that, while managers have discretion over investment decisions, stock market traders may have important information that managers do not have about their own firms' fundamentals that can use to improve the efficiency of their investment decisions.[3] In effect, this suggests that managers learn from investors through stock price performance about their own firms' fundamentals, such as firms' product demand or business strategy, when they make investment decisions. As this view has been the focus of several empirical studies (e.g., Luo 2005; Chen, Goldstein, and Jiang 2007; Bakke and Whited 2010; Edmans, Goldstein, and Jiang 2012; Foucault and Frésard 2012), whether poor investment outcomes are associated with managers' inefficient use of private information in stock prices (i.e., the amount of information in the secondary markets not already possessed by managers) remains unknown. A different strand of the literature emphasizes the importance of personal manager idiosyncratic attributes (such as managerial ability) in affecting corporate decisions, operations, and performance.[4] Given the substantial growth of M&As in the United States over recent decades and empirical evidence that more than half fail to create value, it is important to understand whether the variation in acquirer M&A outcomes—an issue that remains puzzling despite the examination of a large number of factors—can be attributed to the interaction of

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[3] For a review on managers' use of private information in stock prices and the efficiency of their investment decisions, see Bond, Edmans, and Goldstein (2012).

[4] See, for example, Bertrand and Mullainathan (2003), Malmendier, Tate, and Yan (2011), Benmelech and Frydman (2015), Falato, Li, and Milbourn (2015), Dittmar and Duchin (2016), Bernile, Bhagwat, and Rau (2017), Huang, Chen, and Chen (2018), and Page (2018).

managerial attributes and the private information in stock prices. Specifically, whether the poor M&A decisions and outcomes are related to the inefficient (efficient) use of private information in stock prices, revealed in the secondary markets, by low-attribute (high-attribute) managers. While this is an important issue, surprisingly, no empirical investigation, to the best of our knowledge, has been conducted yet and merit exploration.

Although managerial attributes can influence all corporate decisions, it is more likely to be identified in the ones on which managers exert sizeable effects. Therefore, we focus on M&As, known to exceed the size and the market scrutiny of capital expenditures (CAPEX) and R&D expenses, because they are transformative corporate decisions and, thus, at the sharp end of recommendations regarding the qualifications or compensation arrangements of firms' top managers. In this paper, we conjecture and show that acquirers' value creation is allied with talented managers who engage in greater and more efficient use of the private information in stock prices when stock prices have greater information content managers do not have.

The rationale behind this conjecture is that managers with endowed managerial attributes are expected to make greater use of the private information in stock prices to improve the efficiency of their M&A decisions for two reasons. First, they have stronger incentives to ensure that their superior executive reputation capital (i.e., the market value of their superior managerial attributes) is constantly priced (reaffirmed) by the market and secondly, they have the competence to identify and use the most relevant component of the private information in stock prices.[5] These motives are related to two strands of the literature. First, previous empirical evidence shows that poor M&A decisions play a key role in forced CEO turnovers (Lehn and Zhao 2006; Alexandridis, Doukas,

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[5] This is not limited to M&A decisions, but also in other investment decisions, such as capital and R&D expenditures, as documented in this study.

and Mavis 2019), which, in turn, damage the market value of executives' reputation capital and future career prospects (Brickley, Linck, and Coles 1999; Dahiya and Yermack 2008; Chang, Dasgupta, and Hilary 2010). Compared to their low-skilled counterparts, managers with endowed managerial attributes are concerned more about the value loss of their reputation capital because the market value of their reputation capital is higher (i.e., more to lose), and thus have stronger incentives to use the germane portion of private information in stock prices to avoid engaging in poor M&A decisions. Second, given that numerous studies recognize that managers' varying ability contributes substantially to differences in firms' decisions, organizational structures, and investment decision outcomes (e.g., Demerjian, Lev, and McVay 2012; Kaplan, Klebanov, and Sorensen 2012; Doukas and Zhang 2020), the assessment and use of the private information in stock prices is unlikely to be uniform across managers with divergent attributes. Efficient use of the private information in stock prices requires that managers have superior managerial talents and sophistication to identify its most valuable component and use it efficiently in combination with their own available information (e.g., internal information they own) to make valuable investment decisions.[6] Consequently, given that managers with exceptional traits have a high capacity and strong incentives to use the private information in stock prices effectively in order to make value increasing M&A decisions, they are more likely to engage in M&A investments realizing superior firm outcomes when the level of private information content in their firms' stock prices (i.e., stock

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[6] Stock prices per se cannot be directly used to guide firms to make profitable investment decisions because they value the entire firm, rather than the prospects of a marginal investment (Dow and Gorton 1997). To use them in investment decisions, managers need to extract the most relevant part of private information from stock prices and use it with their own available information (e.g., internal information they own). This procedure is not an easy task, and it is not expected to be equally effective for all managers.

price informativeness) is high.[7] In contrast, low-skilled managers are less likely to use the private information in stock prices effectively in their M&A decisions than high-skilled managers because they lack the required talents. Operating under the burden to improve firm performance and maintain their current job raises the level of their risk tolerance, which is more likely to motivate them to engage in M&As with a low probability of success (i.e., overestimating the odds of success). Additionally, Dow and Gorton (1997) argue that traders will make an effort to generate private information about a firm's prospects only if managers heed the resulting price signal. The significance of this argument is that M&As carried out by skilled managers relying on the private information in stock prices—the decisions responding to the price signal—will boost the informativeness of future stock prices.

This paper studies three questions around the influence of managerial attributes and the role of stock price informativeness in identifying high-prospect M&A opportunities. Are high-prospect M&As more likely to be announced by managers with superior attributes when the stock price informativeness of acquirers is high? Does the interaction of managerial attributes and stock price informativeness matters for M&A outcomes? Finally, do M&As carried out by high-attribute managers, under conditions of high stock price informativeness, lead to improved future stock price information efficiency?

The results are consistent with our conjectures. Specifically, we find that, under high levels of stock price informativeness, high managerial attributes significantly raise the volume of M&A activity and the chances of M&A initiations. We obtain similar results for conventional CAPEX

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[7] One may claim that greater use of the private information in stock prices does not necessarily lead to more M&A investments because the private information could indicate both good and bad opportunities. We argue that there are always good and bad M&A opportunities in the markets and managers act conservatively (i.e., fewer or no investments) when they are unable to differentiate the good ones from the bad ones. Effective use of the private information in stock prices enable skilled managers to identify good M&A opportunities and, thus, boost the M&A activity.

and R&D investment decisions. Then, we find that the interaction of high managerial attributes and high levels of stock price informativeness leads to superior M&A announcement-period abnormal stock returns and three-year post-merger operating performance.[8] These findings are in support of the view that skilled managers who have the capacity and willingness to use the private information in stock prices are more likely to initiate value increasing M&As under conditions of high stock price informativeness, resulting in positive and significant announcement-period abnormal stock returns and improved post-merger operating performance. Our results also show that high-skilled managers make superior M&A investments by drawing inferences about the prospects of such decisions from the private information in stock prices prior to M&A decisions, and do not engage in deal cancellations as the low-skilled managers do. Our results hold when different measures of stock price informativeness and managerial attributes are used.[9]

Our findings remain consistent in both the overall M&A sample (i.e., M&A deals involving both private and public targets) and the public M&A subsample (i.e., M&A deals involving only public targets). Most importantly, our evidence remains robust to the endogeneity concerns that our results are likely to be driven by unobservable firm characteristics that might attract the managers with certain attributes and the attention of informed trading and, thus, lead to better M&A decisions. Specifically, as discussed and shown in Section 4.3, we document managerial attributes having much greater explanatory power of acquiring firms' M&A performance than firm

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[8] We also examine the mangers' use of the private information in stocks two and three years before the M&A announcement, as reported in Table A.1 of the Online Appendix and available upon request, we find that past private information is consistently relevant, but the private information near the M&A transactions has a greater bearing on managers' decision making.

[9] We use stock price nonsynchronicity (*NSY*), idiosyncratic volatility (*IVOL*), and the bid–ask spread (*BASPD*) as our alternative measures of stock price informativeness. Also, we use the first principal component of four managerial ability proxies (i.e., *MA_SCORE*; the fitted value of CEO fixed effects, *CEO_FIX*; the past five years of stock returns; and CEO tenure) as our alternative measure throughout this study. Additionally, we check the robustness of our results using *CEO_FIX*, investment efficiency (*INVEFF*), and CEO compensation (*CEO_COMP*) as alternative measures of managerial ability. Reported in Table A.2 in the Online Appendix and available upon request.

fixed effects and deal characteristics under conditions of high stock price informativeness, indicating that our main findings cannot be attributed to unobservable firm characteristics. Furthermore, we find that high managerial attributes improve M&A performance the most when the levels of both the acquirer's and target's stock price informativeness are high, indicating that skilled managers of acquiring firms can identify M&As with superior prospects by using the private information embedded in their own stock prices, as well as that in their target's stock prices. Finally, our results demonstrate that M&As initiated by skilled managers under conditions of high stock price informativeness improve acquirers' future stock price informativeness in the post-merger period, serving both shareholders' and managers' long-term interests. This finding is consistent with the view of Dow and Gorton (1997), that managers' use of the private information in stock prices facilitates a virtuous cycle between stock price efficiency and economic efficiency, suggesting that capital resources are efficiently directed to superior investments.

Our study differs from previous studies in this research stream in two ways. First, unlike previous studies which examine firms' investment sensitivity to the interaction between the private information in stock prices and firm's Tobin's q (e.g., Chen et al. 2007; Bond et al. 2012), we examine whether the interaction between the private information in stock prices and managerial attributes lead to better M&A decisions and firm performance by taking into consideration the role of managerial attributes in the use of the private information in stock prices.[10] Second, while existing studies examine if managers adjust their announced M&A decisions in response to the market's negative reaction (e.g., Luo 2005; Kau, Linck, and Rubin 2008), we investigate whether

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[10] Our approach of investigating the effects of managerial attributes interacted with the private information in stock prices on M&A investments is also consistent with the conceptual argument of Dow and Gorton (1997) that firms use marginal q of potential investment opportunities instead of firms' total q to make investment decisions. Our results remain robust even after controlling for the interaction between Tobin's q and stock price informativeness. The results are reported in Table A.3 of the Online Appendix and available upon request.

the private information in stock prices has been used to improve M&A decisions prior to M&A announcements and find evidence consistent with this view suggesting that skilled managers make efficient use of the private information in stock prices before they make an acquisition. The importance of this result is that the private information in stock prices is used by talented managers to shape M&A decisions before announcing them because initiating a poor M&A and canceling it later would signal a suboptimal investment choice as a deal cancellation is not costless in terms of managers' reputation capital.

The contribution of this study to the literature is fourfold. First, our evidence demonstrates that CEOs endowed with superior managerial attributes make greater and more effective use of the private information in stock prices to infer the market's valuation of prospective M&A decisions than their low-skilled counterparts, resulting in improved firm outcomes. Second, this study extends the body of knowledge about the variation in M&A outcomes between high- and low-ability managers (e.g., Chen and Lin 2018; Cui and Leung 2020), by showing that such variation can be, at least partly, attributed to managers' heterogeneous attributes and efficiency of using the private information in stock prices to assess the prospects of M&A decisions. Third, a broader implication of our empirical results is that managers with endowed managerial attributes facilitate a virtuous cycle between stock price efficiency and investment efficiency through their competent use of the private information in stock prices, which results in superior M&A returns and improved stock price informativeness in the future.[11] Finally, our study provides evidence against several stylized facts and sheds light on the puzzle that M&A activity persists despite repeated research findings that most M&As do not create shareholder value.

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[11] According to Dow and Gorton (1997), traders will make an effort to generate private information about a firm's prospects only if managers will heed the resulting price signal.

The remainder of the paper is organized as follows. Section 2 develops the hypothesis development. Section 3 discusses the methodology. Section 4 presents the results. Section 5 concludes the paper.

2. Hypothesis development

The idea that real decision makers learn new information from secondary market prices can be traced back to Hayek (1945), and Dow and Gorton (1997) have theoretically shown that this notion applies well to corporate decisions. According to Dow and Gorton (1997), managers can infer the prospects of investment opportunities from the private information in stock prices and use it to improve the efficiency of corporate investment decisions, which, in turn, connects stock market efficiency to economic efficiency. [12] Additionally, given that numerous studies show that heterogeneity in investment, financial, and organizational decisions across firms are attributed to managers with heterogeneous attributes (e.g., Bertrand and Schoar 2003; Demerjian et al. 2012; Kaplan et al. 2012; Demerjian, Lev, Lewis, and McVay 2013; Doukas and Zhang 2020), managers are not expected to be equally competent in using the private information in stock prices in their decision making. Therefore, unlike previous studies that assume managerial homogeneity with respect to the use of the private information in stock prices, we argue that this is unlikely that managers with diverse managerial attributes and incentives will equally exhibit the same interest and intensity to use the private information in stock prices. This variation, then, is expected to lead

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[12] One may wonder whether it is reasonable for managers (insiders) to obtain information from market traders (outsiders). Although managers can, individually, be the most informed agents about their own firms, traders could collectively be more informed (Grossman 1976; Hellwig 1980). Edmans, Jayaraman, and Schneemeier (2017) show that managers' use of the private information in stock prices is more pronounced when stock prices have greater information content managers do not have.

to different corporate decisions and outcomes across firms since they are run by managers with diverse managerial attributes and their stock prices are unlikely to be equally informative.

Although this prediction conceptually works for other investment decisions, we focus on M&As since the influence of managerial attributes on the investment decisions is more likely to be identified if managers exert sizeable effects on such decisions. M&As are generally viewed as the most critical and discretionary investment decisions of a firm's top management (Aghion and Tirole 1997; Harris and Raviv 2005; Furfine and Rosen 2011; Custódio and Metzger 2013; Graham, Harvey, and Puri 2015), that is most likely to affect firm outcomes (Williamson 1963; Singh 1975; Fee and Hadlock 2003), and thus they offer a unique ground to examine whether the interaction between managerial attributes and the private information in stock prices has important effects on acquirer firm value. In addition, M&As, known to exceed the size and the market scrutiny of CAPEX and R&D expenses, are transformative corporate decisions and, thus, at the sharp end of recommendations regarding the qualifications or compensation arrangements of firms' top managers.[13]

Previous empirical evidence shows that poor M&A decisions destroy significant firm value (Moeller, Schlingemann, and Stulz 2005) and lead to forced CEO turnovers (Lehn and Zhao 2006; Alexandridis et al. 2019). Also, only 12% of fired CEOs find analogous positions in other public firms after their dismissal, which are typically much smaller and offer considerably less pay (Brickley et al. 1999; Dahiya and Yermack 2008; Chang et al. 2010). Therefore, making poor M&A decisions is a serious concern to corporate managers since it has harmful implications for both the current value (job loss) and future value (career prospects) of their reputation capital in a

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[13] Managers need to be motivated to use the private information in stock prices, because of the agency problem.

competitive executive labor market. Managers with endowed managerial attributes are more concerned about the damage of their reputation capital than their low-skilled counterparts because the market value of their human capital is higher. Meanwhile, efficient use of the private information embedded in stock prices requires that managers possess superior attributes to identify the most valuable component of private information in stock prices and use it with their own available information (e.g., internal information they own) to make investment decisions. As a result of the difficulty in extracting and using private information from stock prices, high-skilled managers are expected to assign greater value on its importance and use it more efficiently than their low-skilled counterparts. Based on the heterogenous competence of managers and incentives of using the private information in stock prices, we conjecture that heterogeneity in managerial attributes plays a critical role in managers' use of the private information in stock prices, which, in turn, could lead to diverse investment decisions and outcomes across firms.

As a result, high-skilled managers are expected to have the expertise and incentive to effectively use the private information in the stock prices of the firms they manage in their M&A decisions. Due to the catastrophic effects of poor M&A decisions on managers' reputation capital, high-skilled managers are expected to engage in more conservative M&A investments when the uncertainty of the outcomes is high, compared to their low-skilled counterparts since they have greater reputation capital at stake. Effective use of the private information in stock prices helps high-skilled managers to identify good M&A opportunities and, thus, boost the economic prospects of acquirers to the benefit of shareholders. Hence, firms under the helm of high-skilled managers are expected to engage in more efficient M&A decisions, realizing superior short- and long-term performance, when their own stock prices have a greater amount of private information about their firms' fundamentals. To the extent that managers with superior attributes make greater

use of the private in formation in stock prices, in turn, they will incentivize traders to evaluate firms' prospects and generate more information through trading (i.e., trading based on the firms' prospects), because traders' efforts to obtain information about firms' prospects are rewarded only if the firms' managers heed and respond to this information (Dow and Gorton 1997). Thus, acquirers' future stock price informativeness is expected to be enhanced through such decisions. In contrast, low-skilled managers are more likely to act opportunistically and engage in M&A decisions based on their own beliefs than to recognize the value of the private information in stock prices, in the hopes of looking like their high-skilled counterparts. Hence, top executives with low managerial attributes are more likely to initiate M&As when acquirers' stock prices informativeness is low.

The above discussion leads to three empirically testable predictions. First, high-skilled managers are more likely to engage in M&As when acquirers' stock price informativeness is high because of the higher probability to identify high quality M&A opportunities. Namely, their M&A decisions are expected to be sensitive to acquirers' stock price informativeness. Second, the M&As carried out by high-skilled managers under high stock price informativeness is expected to outperform those made by their low-skilled counterparts because of greater and more efficient use of the private information in stock prices. That is, by undertaking M&A decisions under conditions of high stock price informativeness, high-skilled managers will succeed in improving firm performance by initiating M&As with high growth prospects and allow investors to reaffirm their beliefs about the current and future value of their strong managerial attributes. Hence, we also expect M&A cancellations to be associated with poor investment choices carried out by low-skilled than high-skilled managers. Third, consistent with Dow and Gorton (1997) who suggest that efficient use of the private information in stock prices facilitates future stock price

informativeness, M&A decisions made by skilled managers under conditions of high stock price informativeness are expected to lead to high levels of stock price informativeness in the future. A counter view holds that low-skilled managers, under the fear of job losses, may have greater incentives to use the private information in stock prices and, thus, mimic the M&A practices of high-skilled managers to avoid revealing their true ability and reduce the consequences of a job loss by engaging in M&A decisions in states of high stock price informativeness. Also, one may argue that low-skilled managers may be eager to use the private information in stock prices given their lower expertise and fewer resources to process public information on themselves. These contrasting views warrant investigation, and they are also addressed in this study.

In sum, whether high-skilled managers engage in efficient M&A investment decisions to realize superior shareholder value and improve firm future performance when stock prices contain more private information is key to our empirical investigation. We expect and find the interaction between high managerial attributes and high stock price informativeness to increase the probability of initiating high-quality M&As with superior economic firm outcomes. This pattern is also observed when we examine general investment decisions such as capital expenditures and R&D spending. In addition, we expect and find that high-skilled managers' M&A decisions are consummated while low-skilled managers' M&As are canceled, indicating that they fail to efficiently use the private information in their stock prices prior to the announcement of their M&A deals. Finally, we expect and demonstrate M&As initiated by skilled managers under conditions of high stock price informativeness to further improve the stock price informativeness of acquiring firms, because such investments, which are in response to the information conveyed by traders, incentivize traders to further evaluate firms' prospects and trade at prices near fundamental values.

3. Methodology and sample

In this section, we first describe our methods for measuring a firm's managerial attributes, private information in stock prices, and M&A performance. We then describe our sample and model specifications.

3.1 Measures of managerial attributes

In this section, we introduce our measures of managerial attributes, *MA*. Many previous studies document that the differences in firms' decisions, organizational structures, and investment decisions and outcomes are largely attributed to the heterogeneity of manager attributes (e.g., Rosen 1982; Trueman 1986; Bertrand and Schoar 2003; Chemmanur, Paeglis, and Simonyan 2009). Bertrand and Schoar (2003), for instance, report that a significant portion of the heterogeneity in firms' investment decisions is credited to unobserved manager fixed effects, supporting the upper echelons theory (Hambrick and Mason 1984). Therefore, the efficiency of managers' use of the private information in stock prices is unlikely to be uniform across managers with different attributes. In addition, because high-skilled managers' superior executive reputations gain greater lifelong rewards, they have strong incentives to be more informative to the market and thus avoid reputationally harmful behavior (Demerjian, Lewis-Western, and McVay 2020).

While a firm's managerial attributes to efficiently manage resources is not directly observable, it must be assessed using observable outcomes due to executives' management decisions. Hence, we use the managerial ability score, *MA_SCORE*, developed by Demerjian et al. (2012), used extensively as an appropriate measure of managerial attributes, as our first measure of managerial attributes. This measure is used to gauge how efficiently top managers use the

resources of the firms they manage (e.g., capital, labor, and innovative assets) to transform corporate resources into firm revenues, relative to their competitors in the same industry. The authors document that this is a valid measure of managerial attributes by showing that *MA_SCORE* is significantly explained by CEO fixed effects, positively associated with future stock returns after equity financing, and negatively associated with stock price reactions to CEO turnover, as well as subsequent firm performance. Subsequent studies find that *MA_SCORE* is positively associated with corporate earnings quality (Demerjian et al. 2013), innovative success (Chen, Podolski, and Veeraraghavan 2015), tax avoidance (Koester, Shevlin, and Wangerin 2017), risk-taking policies (Yung and Chen 2018), and investment opportunities (Lee, Wang, Chiu, and Tien 2018), and negatively associated with credit risks (Bonsall IV, Holzman, and Miller 2017).

We estimate *MA_SCORE*, following the procedure of Demerjian et al. (2012). Specifically, we first estimate each firm's efficiency score using data envelopment analysis (Charnes 1979; Banker, Charnes, and Cooper 1984).[14] Then, using Tobit regression, we estimate each firm's efficiency score on a group of control variables by industry.[15] The residuals from this estimation yield each firm's *MA_SCORE*.

Our alternative measure of managerial attributes is the first principal component (*MA_PC*) of *MA_SCORE*, the fitted value of CEO fixed effects (*CEO_FIX*), the historical stock return (*HIS_RET*), and CEO tenure (*CEO_TENURE*). Managerial attributes, as a latent variable, cannot be directly observed and measured. Therefore, there is always a concern about measurement error. Although previous studies have documented strong relations between superior managerial

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[14] The output is a firm's sales, and the inputs are the cost of goods sold; selling, general, and administrative expenses; net property, plant, and equipment; net operating leases; research and development expenses; goodwill; and other intangible assets. For details, see Demerjian et al. (2012).

[15] The controls are the logarithm of total assets, the market share, a free cash flow indicator, the logarithm of firm age, business segment concentration, a foreign currency indicator, and year dummies.

attributes and these measures (i.e., *MA_SCORE*, *CEO_FIX*, *HIS_RET*, and *CEO_TENURE*), they

may also carry other economic meanings, respectively.[16] For example, *MA_SCORE* and *CEO_FIX*

may reflect unobservable firm characteristics because they are estimated by using firm efficiency

scores. As a market performance-based measure, *HIS_RET* could also reflect market states and

investor sentiment. In addition to CEO talent, *CEO_TENURE* is linked with CEO entrenchment.

MA_PC is the most important underlying common factor (i.e., superior managerial attributes) that

is reflected in these variables and is orthogonal to other factors carried by them. Also, the relations

between *MA_PC* and these variables are consistent with the theoretical prediction of the relation

between managerial talent and each of these variables, confirming that *MA_PC* reflects superior

managerial attributes (with correlation coefficients of 0.5624, 0.5259, 0.2717, and 0.1064 for

MA_SCORE, *CEO_FIX, HIS_RET,* and *CEO_TENURE*, respectively). The variable *CEO_FIX* is

a fitted value of the CEO dummies on the firm efficiency score used in the *MA_SCORE* estimation;

HIS_RET is the five-year historical value-weighted industry-adjusted return (from year t - 5 to year

t - 1). We identify the firm's industry using Fama and French's 48 (FF48) industry classification.

The variable *CEO_TENURE* is the logarithm of the number of years that a top executive has held

the title of CEO at the current firm, according to Execucomp records.

   To further mitigate the concern of measurement error with respect to *MA_SCORE*, even

though it has been used widely in other studies, we employ other measures of managerial attributes

used in previous studies—including *CEO_FIX*, *CEO_COMP* (Demerjian et al. 2012), and

INVEFF (Richardson 2006; Biddle, Hilary, and Verdi 2009)—to test our main conjecture that

high-ability managers have both the capacity and willingness to effectively use the private

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[16] In previous studies, managerial attributes is measured by *CEO_FIX* (e.g., Bertrand and Schoar 2003; Leverty and Grace 2012), *CEO_TENURE* (e.g., Milbourn 2003; Demerjian et al. 2012), and *HIS_RET* (e.g., Fee and Hadlock 2003; Demerjian et al. 2013).

information embedded in the stock prices of the firms they manage and to make M&A investments with superior outcomes when stock prices are highly informative. The results show that our main findings based on *MA_SCORE* are robust to these alternative managerial attributes measures.[17]

3.2 Measures of private information in stock prices

3.2.1 Probability of informed trading

Private information in stock prices, also known as stock price informativeness, reflects the amount of private information managers can use in making value-enhancing corporate decisions. In this section, we introduce our measures of private information in stock prices, *INFO*. Our main *INFO* measure is the probability of informed trading (*PIN*), which is estimated using the information on the stock trading process. This measure was initially developed by Easley, Kiefer, and O'Hara (1996), used in many studies (e.g., Easley, O'Hara, and Paperman 1998; Easley, O'Hara, and Srinivas 1998), and subsequently updated (Easley, Hvidkjaer, and O'Hara 2002, 2010; Lin and Ke 2011). The theoretical foundations of *PIN* are based on a structural market microstructure model in which trades are initiated by noise traders or informed traders. The *PIN* variable measures the probability of informed trading in a stock and therefore reflects the stock's price informativeness (Vega 2006). Hence, the composition of the information in high-*PIN* stocks is more from private sources than public sources, and a high *PIN* value indicates more private than public information is embedded in stock prices. Easley et al. (2002) report that high-*PIN* stocks earn higher returns, rewarding investors for the high risk of private information. We estimate *PIN* following the procedure of Lin and Ke (2011). We identify buy and sell orders by using the approach of Ellis, Michaely, and O'Hara (2000). The intraday transaction data are from Trade and Quote (TAQ).

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[17] These results are reported in Table A.2 in the Online Appendix and available upon request.

3.2.2 Alternative measures of private information in stock prices

In addition, we use three alternative measures of *INFO*: stock price nonsynchronicity (*NSY*), idiosyncratic volatility (*IVOL*), and the bid–ask spread (*BASPD*). The *NSY* variable was originally proposed by Roll (1988) and developed by Morck, Yeung, and Yu (2000), Durnev, Morck, Yeung, and Zarowin (2003), and Durnev, Morck, and Yeung (2004). Roll (1988) has documented that *NSY* has very little correlation with public news and, therefore, captures private information. More recent studies document a negative link between R^2, which is calculated from regressing individual stock returns on market and industry returns, and stock price informativeness (e.g., Morck et al. 2000; Durnev et al. 2003; Durnev et al. 2004; Hutton, Marcus, and Tehranian 2009; An and Zhang 2013; Dong, Li, Lin, and Ni 2014). Following these studies, we estimate R^2 within a 12-month period by regressing daily stock returns on market returns and industry returns. Then, we calculate *NSY* using the following equation:

$$NSY = \ln(1 - R^2/R^2). \tag{1}$$

We also calculate the idiosyncratic volatility, *IVOL*, which is the standard deviation of the residuals from the regression used to estimate R^2. Both *NSY* and *IVOL* measure the proportion of stock returns that cannot be explained by systematic factors (i.e., market returns and industry returns), and thus reflect the firm-specific information embedded in stock prices. A high *NSY* or *IVOL* value indicates high firm stock price informativeness. However, unlike *NSY*, *IVOL* is not affected by stocks' factor loadings on market returns or industry returns, which are linked to firms' risk profiles rather than stock price informativeness.

Our last *INFO* measure is the bid–ask spread, *BASPD*. According to Bagehot (1971), *BASPD* is positively associated with stock price informativeness, because market makers protect

themselves by charging a spread when they trade against informed individuals. We estimate *BASPD* within 12 months using the approach of Corwin and Schultz (2012). To measure the degree of stock price informativeness managers are exposed to while undertaking an M&A decision, we estimate the *INFO* measures within the 12 months prior to the merger announcement month. In the M&A probability analysis, we estimate the *INFO* measures during the fiscal year for firms that did not initiate any M&As in a certain year.

3.3 Measures of M&A performance

To evaluate the M&A performance of firms run by managers with different skill levels, we calculate their announcement cumulative abnormal returns (*CAR*) and operating performance (*OPER_PERF*), measured by the average industry-adjusted return on assets during the three years after the deal completion date, to capture the short-term stock price reaction and long-term performance, respectively. The variable *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. We use a 120-day estimation window to estimate an acquirer's factor loading on the three Fama–French factors. We leave a 10-day gap between the *CAR* window and the estimation window. In untabulated results, which are available upon request, our findings are also robust to the one-factor market model and the market-adjusted model.

The variable *OPER_PERF* is the average industry-adjusted return on assets in the three years after the deal completion date. The return on assets is identified as the ratio of earnings before interest, tax, and depreciation and amortization, scaled by the book value of assets. The benchmark industry portfolio includes firms that have the same four-digit Standard Industrial Classification code but which have not been involved in any M&As over the past three years. We also require the benchmark firms to have a return on assets within the range of 60–115% that of the sample

firms. The industry-adjusted return on assets is a firm's return on assets minus the average return on assets of the benchmark firms.

3.4 Sample selection and specification

Our full sample consists of U.S. firms covered in the Compustat, Center for Research in Security Prices (CRSP), Execucomp, and TAQ databases from January 1, 1996, to December 31, 2019. We require the observations to have valid records to calculate all the necessary variables. These selection criteria create a sample consisting of 28,186 firm–year observations. On average, each year contains 1,281 firms. Our overall M&A sample includes completed M&A deals available in the Securities Data Company Thomson One database that meet the following criteria: 1) the acquirer is included in our full sample, with no missing information for the required variables; 2) the acquirer enjoys control of the target through the deal (i.e., owns no more than 50% of the target's equity before the deal announcement and owns at least 50% of it on the deal completion date), to ensure the deal is of strategic importance to the acquirer;[18] and 3) the deal has a value of at least $1 million.[19] These criteria yield a sample of 8,128 M&A deals. From our overall M&A sample, we also create a public M&A subsample consisting of M&A deals involving only public targets. In this subsample, we require that the targets have valid records in the CRSP and TAQ, to estimate their *INFO* measures. The public M&A subsample includes 1,049 M&A deals, with an average deal value of $2,413 billion.

Table 1 presents the descriptive statistics of the firms in the full sample (Panel A) and of the acquirers in the overall M&A sample (Panel B) and in the public M&A subsample (Panel C).

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[18] We also replicate our analysis with acquirers that own no more than 0%, 20%, and 30% of the target's equity before the deal announcement, respectively. These results, reported in Table A.4 of the Online Appendix and available upon request, are consistent with our main findings.

[19] Our main findings hold in a subsample that includes larger deals, with a value of at least $100 million. These results are reported in Table A.4 of the Online Appendix and available upon request.

In the full sample, the mean of *MA_SCORE* is -0.0048, with a standard deviation of 0.1527. Meanwhile, the mean of *MA_SCORE* in the overall M&A sample is 0.0081, with a standard deviation of 0.1672. The higher mean *MA_SCORE* value in the M&A samples (Panels B and C) than in the full sample (Panel A) indicates that acquiring firms, on average, appear to be associated with more skilled managers than firms that do not initiate M&As. Additionally, the statistics (i.e., means and standard deviations) of *MA_SCORE* and *PIN* in the full sample are at similar levels to those in previous studies.[20]

[Insert Table 1 about here]

If superior managerial attributes enhance managers' capacity and willingness to use the private information in stock prices and thus make superior investment decisions, high-ability managers are expected to engage in M&As with strong prospects under conditions of high stock price informativeness. To address this conjecture, we examine the effects of the interaction between managerial attributes and stock price informativeness, *MA×HI_INFO*, on M&A investments, M&A decisions, and M&A outcomes, measured by the acquirers' announcement cumulative abnormal returns, *CAR,* and three-year post-merger performance, *OPER_PERF*, respectively. The variable *HI_INFO* is a dummy that is equal to one if a firm's *INFO* value is above the median in its FF48 industry, and zero otherwise.[21] We use *HI_INFO* instead of its continuous version *INFO* because interpreting the effects of interactions between two continuous variables is complex.

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[20] For example, Demerjian et al. (2012) find the mean and standard deviation of *MA_SCORE* to be -0.004 and 0.149, respectively. Additionally, Lin and Ke (2011) find a mean *PIN* of 0.1396.
[21] In untabulated results, we use continuous *INFO* proxies. The results are similar.

In addition to managerial attributes and stock price informativeness, a firm's investment decision and performance could also be affected by CEO's risk incentives (Coles, Daniel, and Naveen 2006; Croci and Petmezas 2015). Therefore, we control for the CEO's vega and delta, which are widely used to measure CEO risk incentives, in all the regressions specifications.[22] Moreover, M&A decisions and outcomes can be influenced by corporate governance characteristics (Masulis, Wang, and Xie 2007; Cai, Kim, Park, and White 2016). For example, Masulis et al. (2007) find that acquirers with CEOs who are also the chair of the board are more likely to indulge in empire-building M&A decisions and, therefore, to experience low announcement abnormal returns. To control for the status of corporate governance, we use a binary CEO duality variable (*DUAL_CEO*) that takes the value of one if the CEO is also the chair of the board, and zero otherwise. Additionally, we account for the absolute value of discretionary accruals (*ABSDA*), since it has been shown to be negatively linked to strong corporate governance (Cornett, Marcus, and Tehranian 2008). We estimate *ABSDA* using the approach introduced by Kothari, Leone, and Wasley (2005).

We first examine the sensitivity of M&A investments to the interaction of managerial attributes and stock price informativeness (*MA×HI_INFO*). In addition, we explore whether managers' use of the private information in stock prices affects general corporate investments by testing the effects of *MA×HI_INFO* on acquirers' capital expenditures and R&D spending as well as the change in assets scaled by beginning-of-year assets. Specifically, we estimate the following regression:

$$INVESTMENT = \beta_0 + \beta_1 \times MA \times HI\_INFO + \gamma Controls + \varepsilon, \qquad (2)$$

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[22] The CEO vega and delta are estimated by using the Black–Scholes model (Black and Scholes 1973; Merton 1973). See Core and Guay (2002) and Caliskan and Doukas (2015) for the calculations of the CEO's vega and delta.

where *INVESTMENT* measures are *M&A_DEAL_VALUE*, the sum of acquirer's M&A deal value in a given year scaled by assets value, and the capital expenditure plus R&D spending scaled by assets (*CAPXRND)*, the capital expenditure scaled by assets (*CAPX*), and the change in the total assets scaled by the beginning-of-year total assets (*ASSET_G*), respectively. *MA×HI_INFO* is the interaction of *MA* and *HI_INFO,* as defined above. In our analysis we use the following control variables (*Controls*) are *MA*, *HI_INFO*, the CEO vega (*CEO_VEGA*), the CEO delta (*CEO_DELTA*), *DUAL_CEO, ABSDA,* 1/Book value of assets, Tobin's Q (*Tobin's Q*), the firm's financial leverage (*LEV*), dividend yield (*DIVIDEND*), firm age (*FAGE*), sales growth (*SALE_GROWTH*), and surplus cash (*SPLUS_CASH*). The detailed definitions of all the variables used in this study are listed in Appendix A. We also include industry and year dummies to control for industry and year fixed effects, respectively. It is also worth noting that, following the previous literature (e.g., Chen et al. 2007; Phan 2014), the control variables used in Equations (2) and the following empirical specifications (i.e., Equations 3 to 6) are not the same when the dependent variables change.

Then, we investigate the effect of the interaction between the managerial attributes and the stock price informativeness of the acquiring firm (*MA×HI_INFO*) on the probability of initiating M&A decisions by estimating the following equation:

$$M\&A\_INVST = \beta_0 + \beta_1 \times MA \times HI\_INFO + \gamma Controls + \varepsilon, \qquad (3)$$

where *M&A_INVST* is the M&A deal dummy, which takes the value of one if the firm announces an M&A in a given year, and zero otherwise. Based on previous studies on M&A decisions, our basic regressions include the following set of *Controls*: *MA*, *HI_INFO*, *CEO_VEGA*, *CEO_DELTA*, *DUAL_CEO, ABSDA, LEV*, *SPLUS_CASH*, *Tobin's Q*, the net working capital ratio (*NWCR*), the past 12-month stock return (*STOCK_RET*), *SALE_GROWTH*, firm size (*SIZE*),

FAGE, and industry and year dummies. The detailed definitions of all these variables are listed in Appendix A. Equation (3) is estimated using logit and probit models, alternately.

Next, we study the effect of *MA×HI_INFO* on the market's reaction around the M&A announcement, *CAR*, by estimating the following model using ordinary least squares (OLS) regression:

$$CAR = \beta_0 + \beta_1 \times MA \times HI\_INFO + \gamma Controls + \varepsilon, \qquad (4)$$

where *CAR* is the cumulative abnormal return in the five-day window [-2, +2] around the announcement date, and *Controls* stands for the following set of control variables: *MA*, *HI_INFO*, *CEO_VEGA*, *CEO_DELTA*, *DUAL_CEO, ABSDA, Tobin's Q*, the logarithm of firm market capitalization (*MRKT_CAP*), *LEV*, a cash dummy (*CASH_D*), a stock dummy (*STOCK_D*), *SPLUS_CASH*, a public dummy (*PUBLIC_D*), a tender dummy (*TENDER_D*), a high-tech dummy (*TECH_D*), a hostile dummy (*HOSTILE_D*), a diversifying dummy (*DIV_D*), and the logarithm of the M&A deal value scaled by the acquirer's market capitalization (*DEAL_RATIO*). The definitions of these variables are also listed in Appendix A. We also include industry and year dummies in the model to control for industry and year fixed effects, respectively. To mitigate concern about selection bias, we estimate the same specification using the Heckman (1979) two-stage selection model. The specification used in the first stage of the Heckman model is the same as Equation (3).

We next replace *CAR* in Equation (4) with *OPER_PERF* to test the effect of *MA×HI_INFO* on acquirers' long-term operating performance. Specifically, we estimate the following equation using the OLS model, as well as the Heckman two-stage selection model:

$$OPER\_PERF = \beta_0 + \beta_1 \times MA \times HI\_INFO + \gamma Controls + \varepsilon, \qquad (5)$$

where *OPER_PERF* is the average three-year post-merger operating performance. All the other variables are the same as in Equation (4). Additionally, the specification used in the first stage of the Heckman model is the same as Equation (3).

Finally, to examine whether M&A decisions made by skilled managers under high levels of stock price informativeness improve future stock price informativeness, we estimate the following equation:

$$INFO\_F = \alpha + \beta \times MA \times HI\_INFO \times M\&A\_INVST + \gamma Controls + \varepsilon, \tag{6}$$

where *INFO_F* is an acquirer's future stock price informativeness, which is one of the *INFO* measures estimated at the end of year $t + 1$, and *Controls* represents *MA×M&A_INVST, HI_INFO× M&A_INVST, MA×HI_INFO, M&A_INVST*, and the same control variables as in Equation (3).

In all the regressions, we consecutively use the two measures of acquirer managerial attributes (i.e., *MA_SCORE* and *MA_PC*) and the four measures of acquirer stock price informativeness (i.e., *PIN, NSY, IVOL,* and *BASPD*).

4. Empirical results

In this section, we first investigate the effect of *MA×HI_INFO* on M&A investment amounts and decisions. Next, we discuss the effect of *MA×HI_INFO* on acquirers' *CAR* and *OPER_PERF*, respectively. Then, we examine whether the skilled managers of acquiring firms use not only the private information embedded in their own firms' stock prices, but also the private information in the stock prices of their targets, to improve their M&A outcomes. Finally, we investigate if the

acquirers' future stock price informativeness is greater when their M&A decisions are initiated by skilled managers under conditions of high acquirer stock price informativeness.

4.1 Managerial attributes, stock price informativeness, and M&A investments

If private information in stock prices helps high-skilled managers to attain a better grasp of their own firms' fundamentals and efficiently identify the investment opportunities, they should leverage this advantage and hence initiate M&As when the acquirer's stock price is more informative. To test this prediction, we examine the effect of *MA×HI_INFO* on M&A investment amounts and decisions, respectively.

4.1.1 Managerial attributes, stock price informativeness, and M&A investment sensitivity

We first investigate whether high-skilled managers invest more in M&As under high levels of stock price informativeness. Explicitly, we estimate Equation (2) using *MA_SCORE* and *HI_INFO*s (i.e., *HI_PIN*, *HI_NSY*, *HI_IVOL*, and *HI_BASPD*). The results are reported in Table 2. Panel A presents the results of M&A sensitivity, and Panels B to D show the results of general investment sensitivity (i.e., *CAPXRND*, *CAPX*, and *ASSET_G*).

Panel A of Table 2 reveals that managers with superior attributes engage in greater MA deals when traders generate high levels of private information content in stocks prices. Specifically, the results of regression (1) show that the coefficient of *MA_SCORE* × *HI_PIN* is 1.4712 and statistically significant at 1%, suggesting that, when the level of private information in the acquirer's stock price, *PIN*, is high, a one standard deviation increase (decrease) in managerial ability, *MA_SCORE*, increases (decreases) the M&A investment to total assets by 25.63%

(19.30%).[23] In addition, the coefficient of *MA_SCORE* is 0.2072 and statistically insignificant, indicating that the *MA_SCORE* has no significant effect on the M&A investments when the level of *PIN* is low. These results are consistent with our conjecture that skilled managers effectively use the private information produced by traders to identify profitable M&A opportunities and therefore boost the firms' M&A investment activity. The results are robust when different *INFO* measures are used. Also, the results based on the M&A sample, reported in regressions (5) to (8), illustrate the same pattern.

In addition to the M&A investments, we also find a similar relation between the interactive effect of managerial attributes and stock price informativeness and other general investments (i.e., capital expenditures, R&D expenditures, and the change in assets scaled by beginning-of-year assets). As shown in Panels B to D, the interaction variable *MA_SCORE* × *HI_PIN* explains the variation in *CAPXRND*, *CAPX*, and *ASSET_G*, indicating that skilled managers make use of the private information in stock prices generated by traders to identify the investment opportunities and lead to high levels of corporate general investments.

In sum, the results in Table 2 demonstrate that high-skilled managers invest more in M&As as well as general corporate investments when the acquirer's stock price informativeness is high, supporting our conjecture that skilled managers effectively make greater use of the private information produced by traders to identify profitable M&A opportunities that facilitates acquirers' M&A investments. It is also worth noting that these results do not seem to support the view that

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[23] To estimate the economic significance of the effect of *MA_SCORE* on M&A investments under *HI_PIN*, since *MA_SCORE* has a standard deviation of 0.1527 and the coefficient of *MA_SCORE* under *HI_PIN* is 1.4712 and the coefficient of *MA_SCORE* under *HI_PIN* is 0.7879 - 0.0713, a one standard deviation increase in *MA_SCORE* increases the M&A investment to total assets by $(1.4712 + 0.2072) \times 0.1527 \times 100 = 25.63\%$, and a one standard deviation decrease in *MA_SCORE* changes the M&A investment to total assets by $(-1.4712 + 0.2072) \times 0.1527 \times 100$ $=19.30\%$.

low-skilled managers mimic high-skilled managers to initiate M&As when the stock price informativeness is high to avoid revealing their true ability and reduce the consequences of a job loss by improving their M&A decisions. It appears that their M&A decisions are driven by their own private information and opportunistic incentives of low probability of success.

[Insert Table 2 about here]

4.1.2 Managerial attributes, stock price informativeness, and the M&A decisions

Next, we examine whether high-skilled managers are more likely to initiate M&As when firms' stock prices are more informative. First, in Panel A of Table 3, we report the average value of *MA_SCORE* conditional on the level of *PIN* in the full sample and M&A sample, respectively. In the full sample including all firms, there is no significant difference in the average value of *MA_SCORE* between high-*PIN* and low-*PIN* firms, indicating that, in general, high- and low-skilled managers are evenly distributed in firms with high- and low-value of *PIN*. In the M&A sample, however, high-*PIN* acquirers exhibit significantly higher *MA_SCORE* value than their low-*PIN* counterparts, suggesting that high-skilled managers are more likely to initiate M&A deals in high states of private information. These findings suggest that high-skilled managers take into consideration the private information in stock prices in their M&A decisions.

Then, we further investigate this pattern through propensity analysis of M&A decisions. Specifically, we estimate Equation (3) using *MA* (i.e., *MA_SCORE* and *MA_PC*) and *HI_INFO*s (i.e., *HI_PIN*, *HI_NSY*, *HI_IVOL*, and *HI_BASPD*), sequentially and report the results in Panels B and C of Table 3. Panel B of Table 3 reports the regression results of the probability of initiating M&A decisions in response to our main measure of high stock price informativeness, *HI_PIN*, which captures the amount of private information in the stock price of the acquiring firm.

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regressions (1) to (4) are estimated using logit regressions, and regressions (5) and (6) are estimated using probit regressions. regressions (1) to (3) represent the benchmark models, showing the effects of *MA_SCORE* and *HI_PIN* on the probability of M&A initiation, *M&A_INVST*, without our interaction variable, *MA_SCORE×HI_PIN*. The results of regression (1) indicate that *HI_PIN* alone has a nonsignificant impact on the probability of M&A initiation. The results of regression (2) show that the coefficient of *MA_SCORE* is 0.3565 and statistically significant at the 5% level, suggesting that a one standard deviation increase in *MA_SCORE* increases the chances of M&A initiation by 5.59%.[24] In regression (3), the *MA_SCORE* effect remains significant after controlling for the level of *PIN*. In regression (4), the coefficient of our main focus interaction variable, *MA_SCORE×HI_PIN*, is 0.7879 and statistically significant at 1%, suggesting that, when the level of private information in the acquirer's stock price, *PIN*, is high, a one standard deviation increase (decrease) in managerial attributes, *MA_SCORE*, increases (decreases) the probability of initiating an M&A by 11.56% (10.37%).[25]

As expected, the results suggest that, when the acquirer's stock price informativeness is high, skilled managers are more likely to initiate M&As, but their low-skilled counterparts are less likely to engage in M&As. This result is consistent with the view that skilled managers make greater use of the private information embedded in the acquirer's stock prices through traders' activities and take advantage of the valuable component of the extrinsic information in stock prices that facilitates their M&A decisions. In contrast, low-skilled managers, unable to use the private

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[24] To estimate the economic significance of the effect of managerial ability on M&A decisions, since *MA_SCORE* has a standard deviation of 0.1527, a one standard deviation increase in *MA_SCORE* increases the chances of M&A initiation by $(\exp(0.3565 \times 0.1527) - 1) \times 100 = 5.59\%$.

[25] To estimate the economic significance of the effect of *MA_SCORE* on M&A decisions under *HI_PIN*, since *MA_SCORE* has a standard deviation of 0.1527 and the coefficient of *MA_SCORE* under *HI_PIN* is 0.7879 - 0.0713, a one standard deviation increase in *MA_SCORE* increases the chances of M&A initiation by $(\exp((0.7879 - 0.0713) \times 0.1527) - 1) \times 100 = 11.56\%$, and a one standard deviation decrease in *MA_SCORE* changes the chances of M&A initiation by $(\exp((0.7879 - 0.0713) \times -0.1527) - 1) \times 100 = -10.37\%$

information in stock prices effectively, are less likely to initiate M&As under conditions of high stock price informativeness. In addition, the coefficient of *MA_SCORE* is -0.0713 and statistically insignificant, indicating that, for low *PIN* values, managers' ability has no significant impact on their M&A decisions. The results of regression (5) estimated using probit regression are similar to those of regression (4). Finally, the results of regression (6) demonstrate that our conclusion is robust to the use of alternative managerial skill metrics, such as *MA_PC*. According to the results in Panel C of Table 3, our main findings hold for different *MA* and *INFO* measures.

Several interesting implications can be drawn from these results. First, the results suggest that the private information in acquirers' stock prices plays a critical role in M&A decisions carried out by high-ability managers. In particular, the results demonstrate that managerial attributes work more effectively on M&A decisions when more private information is generated by the market participants (i.e., high-*PIN* conditions), but has little effect on investments when there is little private information on stock prices (i.e., low-*PIN* conditions). This finding highlights the important role financial markets play in producing information through the trading process that facilitates the prediction of economic outcomes of corporate decisions such as M&A investments. According to this logic, whether the interaction between managerial attributes and private information on the stock prices of acquiring firms leads to superior M&A investments is a very important issue that we will examine later. Second, the results indicate that low-skilled managers are less likely to engage in M&As when *PIN* values are high, conditions that aid the investment decisions of skilled managers using traders' private information. Hence, the evidence does not support the view that low-skilled managers mimic the M&A practices of high-skilled managers and that they might be eager to use the private information in stock prices.

Generally, the results presented in Table 3 indicate that skilled managers are more likely to initiate M&As when the firms' stock price informativeness is high, supporting our conjecture that superior managerial attributes aid managers of acquiring firms to make their investment decisions by exploiting the private information in acquirers' stock prices, and thus effectively pursue their investment decisions. The more interesting question is whether skilled managers' use of the private information in acquirers' stock prices leads them to engage in M&As that improve firm performance. Next, we direct our investigation to determine whether such M&A decisions infused by private information have added value for shareholders and whether they lead to improved firm performance after the announcement date.

[Insert Table 3 about here]

4.2 Managerial attributes, stock price informativeness, and CAR(-2, +2)

To examine the hypothesis that managers with endowed managerial attributes effectively use the private information in stock prices to make efficient M&A decisions with superior outcomes, we test whether their M&A investments under conditions of high stock price informativeness yield returns superior to those undertaken by others.

First, we address this issue by focusing on the univariate results of investors' reactions to M&A announcements by estimating *CAR* values. Specifically, to the extent that skilled managers efficiently use the private information incorporated in acquirers' stock price, acquirers with both skilled managers and informative stock prices should experience higher *CAR* values than their counterparts. To examine this prediction, we calculate the average acquirer *CAR* conditional on acquirers' *PIN* (*A_PIN*) and *MA_SCORE* values. Specifically, we assign all acquirers to two *A_PIN* quantiles within their FF48, and we then also sort those into two *MA_SCORE* quantiles.

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The top and bottom quantiles are identified as the high and low quantiles. This procedure yields four portfolios (i.e., high *A_PIN*–high *MA*, high *A_PIN*–low *MA*, low *A_PIN*–high *MA*, and low *A_PIN*–low *MA*). Then, when we focus on the public M&A subsample (i.e., M&A deals involving only public targets), we further classify acquirers based on their targets' *PIN* (*T_PIN*). We are thus interested in testing whether high-ability managers also improve the outcomes of M&A decisions from the private information in their targets' stock prices. The average *CAR* values of the portfolios are reported in Table 4.

In Panel A of Table 4, we report acquirers' average *CAR* values conditional on high and low levels of acquiring firms' private information in stock prices, *A_PIN*, and managerial ability *MA_SCORE*, respectively. According to the results, without conditioning on *MA_SCORE*, we find the *CAR* value of firms with high-*A_PIN* stocks is 0.34% higher (significant at the 10% level) than that of firms with low-*A_PIN* stocks. In Panel B of Table 4, we further classify high-*A_PIN* stocks and low-*A_PIN* stocks into two groups (i.e., high_*MA* and low_*MA*) based on their *MA_SCORE* value. When classified as high-*A_PIN* acquirers, acquirers with high-ability managers realize, on average, a *CAR* value of 1.38% around the M&A announcement, with a *t*-statistic of 5.21. In contrast, acquirers with low-skilled managers experience lower (*CAR* = 0.29%) and statistically insignificant (*t*-statistic = 1.48) announcement abnormal returns. The difference between the two groups of acquirers is economically and statistically significant (*CAR* = 1.09%, *t*-statistic = 3.34). On the other hand, when we look at acquirers with a low *A_PIN* level, the difference between acquirers with high-skilled and low-skilled managers is statistically insignificant (*CAR* = 0.11%, *t*-statistic = 0.64). This nonsignificant difference suggests that investors do not anticipate different M&A outcomes between high- and low-skilled managers when the acquirer's stock price

informativeness, *A_PIN,* is low, implying that investors are unable to differentiate the quality of the M&A decisions of high- and low-skilled managers.

In sum, the results in Panel A of Table 4 show that investors react favorably to M&A decisions initiated by skilled managers when the acquirer's stock prices contain high levels of private information, suggesting that skilled managers efficiently use the private information in the stock prices of the firms they manage. Interestingly, when stock price informativeness is low, acquisitions carried out by high-ability managers realize lower cumulative abnormal returns (*CAR* = 0.56%, *t*-statistic = 4.15) than under conditions of high stock price informativeness (*CAR* = 1.38%, *t*-statistic = 5.21), suggesting that stock price informativeness has a crucial effect on the efficiency of M&A investment decisions. The difference between investor reactions to M&As under conditions of high and low stock price informativeness suggests that investors' predictions about the M&A outcomes differ even when acquirers are led by managers of similar managerial abilities. Hence, conditions of high stock price informativeness reinforce investors' beliefs about the expected added value of M&A decisions made by skilled managers.

Panel B of Table 4 presents the differences in the average acquirer's announcement cumulative abnormal returns (*CAR*) between high- and low-skilled managers engaged in M&As of public targets, conditional on the levels of acquirer (*A_PIN*) and target (*T_PIN*) stock price informativeness. The results reveal that acquiring firms led by high-skilled managers significantly outperform their counterparts led by low-skilled managers, but only when the level of stock price informativeness of both the acquirer and target is high. This finding suggests that skilled managers use not only the private information in acquirers' stock prices, but also the private information in targets' stock prices.

[Insert Table 4 about here]

Luo (2005) has shown that the withdrawn (completed) M&A deals are associated with negative (positive) market reactions. This raises the question whether M&A withdrawals are associated with high-skilled managers that are actively learning from stock prices even after the announcement of M&As or low-skilled managers that avoid completing bad deals based on markets' reaction to avoid the implications of poor investment decisions in terms of being fired as it has been shown that poor M&A decisions lead to forced turnovers (Lehn and Zhao 2006). To shed light on this issue, we compare the characteristics of completed and withdrawn M&A deals and report the results in Table 5. Specifically, we present the means of *CAR*, *MA_SCORE*, *PIN*, *MA_SCORE×HI_PIN*, and *MA_SCORE×PIN*. Consistent with Luo (2005), our results point out that withdrawn (completed) M&As are associated with negative (positive) market reactions. Most importantly, the withdrawn deals are associated with low-skilled managers and low values of the interaction term of *MA_SCORE* and *PIN* value (i.e., *MA_SCORE×HI_PIN* and *MA_SCORE×PIN*), respectively. These differences are statistically significant, indicating that deals carried out by high-skilled managers generate higher abnormal returns in high *PIN* states and they are not associated with M&A withdrawals as a result of these managers' superior managerial skill and better use of the private information in stock prices prior to M&A announcements. These results imply that high-skilled managers value the private information in stock prices prior to their M&A announcements and do not withdraw their M&A deals because investors trading reaffirms their managerial talents with positive market reactions. The opposite is true for low-skilled managers. In sum, these results show that high-skilled managers make superior M&A decisions using efficiently the private information in stock prices prior to M&A announcements and they do not engage in deal cancellations as the low-skilled managers do.

[Insert Table 5 about here]

Overall, the results in Sections 4.2 are consistent with our conjecture that M&A decisions yield superior abnormal returns when high levels of private information are contained in stock prices, but only when acquirers are under the helm of high-ability managers. Put differently, M&A investment efficiency is best facilitated when acquiring firms are run by high-attribute managers and under high levels of stock price informativeness.

4.3 CEO attributes fixed effects and CAR (-2, +2)

One may argue that companies with some unobservable characteristics are more likely to hire high-skilled managers and attract informed traders. According to this view, firm attributes might be the reason for attracting both high-attribute managers and informed traders' attention that result in better M&A decisions. To examine if our results are driven by unobservable firm attributes, we investigate and compare the explanatory power of CEO *attributes* fixed effects relative to the firm fixed effects on *CAR (-2, +2)* under high and low states of the acquirer's stock price informativeness, *PIN*. Also, these tests do not rely on any estimated managerial attributes measures and, thus, mitigate the measurement error concern of managerial attributes.[26] Although these tests are unable to provide conclusive evidence since CEO fixed effects capture not only CEO attributes but all CEO-level characteristics, it sheds some light on the effect of managerial attributes on *CAR* because if CEO attributes matter, CEO attributes fixed effects are expected to affect *CAR*.[27] Specifically, we estimate the following model for the overall M&A sample, the subsample of high-*PIN* acquirers, and the subsample of low-*PIN* acquirers, respectively:

$$CAR = \gamma_0 + \gamma_1 Controls + \gamma_2 Dummies + \varepsilon, \tag{7}$$

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[26] Bertrand and Schoar (2003) and Golubov, Yawson, and Zhang (2015) use this test to examine the CEO- and firm-fixed effects on corporate policies and acquire returns.

[27] It is worth noting that many CEO characteristics, such as experience and education, are linked to CEO ability. Also, it is worth pointing out that we account for CEO's risk incentives in the regression model.

where *CAR (-2, +2)* is the cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, *Controls* is the same as in Equation (4), and *Dummies* refers to CEO fixed effects. We control for fixed effects using the corresponding dummies. In the "None" specification, no dummies are included. In the "CEO FE" and "Acquirer FE" specifications, CEO and acquirer dummies are included, respectively. In the "CEO FE and Year FE" specification, both CEO and year dummies are included. Then, we report the *F*-values for the joint significance of CEO fixed effects, as well as the R^2 values of the corresponding regressions. If CEO attributes do matter in using the private information in stock prices, we expect CEO fixed dummies in high-*PIN* acquirers can jointly explain *CAR* (i.e., a high *F*-value) and improve the explanatory power of the model (i.e., a high R^2), in comparison to benchmark models (i.e., the "None" and "Acquirer FE" specifications). The results are reported in Table 6.

Panel A of Table 6 reports the explanatory power of the CEO fixed effects for the *CAR* values of the overall M&A sample. The results show that the CEO fixed effects significantly explain *CAR*s, with an *F*-value of 2.5811, increasing the adjusted R^2 from 0.0176 (i.e., the R^2 of the regression with no fixed effects) to 0.3430. We find a similar effect after controlling for both CEO and year fixed effects. In addition, the CEO fixed effects explain *CAR* more than the acquirer fixed effects (adj. R^2, 0.3430 vs. 0.1195; *F*-value, 2.5811 vs. 1.5806), suggesting that managerial attributes are distinct from and far more important than acquirer fixed effects.

Panel B of Table 6 reports the results of the same test for the subsample of acquirers with a high *PIN*. The pattern of these results is like that in Panel A for the overall M&A sample. It is worth noting that the CEO fixed effects have much higher explanatory power for *CAR* than the acquirer fixed effects, when the *PIN* level of acquirers is high (adj. R^2, 0.3776 vs. 0.0465; *F*-value, 2.2958 vs. 1.0849). Panel C reports the results for the subsample of acquirers with a low *PIN*.

These results show that the CEO fixed effects have much lower explanatory power for *CAR* for acquiring firms with a low *PIN* than for those with a high *PIN* (adj. R^2, 0.2230 vs. 0.3776; *F*-value, 1.6872 vs. 2.2958), indicating that managerial attributes matter the most when acquirer stock prices contain more private information (i.e., high-*PIN* conditions). Another interesting result in Panels B and C of Table 6 is that the acquirer fixed effects have much higher explanatory power under low than high-*PIN* conditions (adj. R^2, 0.1835 vs. 0.0465; *F*-value, 1.7900 vs. 1.0849), suggesting that, when there is low private information content in stock prices for managers to use (i.e., a low *PIN*), the explanatory power of firm characteristics dominates acquirers' M&A *CAR*.

Then, we investigate the CEO fixed effects of firms with high and low *MA_SCORE* values in high-*PIN* states and report the results in Panels D and E of Table 6, respectively. Panel D suggests that CEOs with superior managerial attributes in high-*PIN* states have greater explanatory power than firm fixed effects (adj. R^2, 0.5720 vs. 0.0242; *F*-value, 3.5427 vs. 0.9862) highlighting the value-added role of managerial attributes. Panel E, however, shows that the fixed effects of low-skilled CEOs in high-*PIN* states do not differ from firm fixed effects (adj. R^2, 0.0242 vs. 0.0562; *F*-value, 0.9984 vs. 1.0775). Jointly, Panels D and E indicate that when acquires' *PIN* is high, talented managers are of great value added to firm performance, but low-skilled managers are not.

Overall, the results in this section demonstrate that managers matter the most when stock prices contain more private information (i.e., a high *PIN*) and this finding cannot be explained by unobservable firm characteristics. The results support our conjecture that diverse managerial attributes determine the heterogeneous efficiency of using the private information in stock prices and the outcomes of M&A decisions.

[Insert Table 6 about here]

4.4 Multivariate analysis: Announcement-period abnormal returns

In this section, using multivariate analysis, we examine the effect of the interaction between managerial attributes and the amount of private information in acquirer stock prices (*MA_SCORE×HI_PIN*) on the short-term performance of M&A decisions, captured by acquirers' five-day cumulative abnormal stock return *CAR (-2, 2)* around the announcement date. We report the regression results in Table 7. regressions (1) to (3) are benchmark models, which do not include the interaction variable, *MA_SCORE×HI_PIN*. regression (4) is our focused model. regression (5) controls for selection bias, using the two-step Heckman model. We report the results for the overall M&A sample in Panel A, and the results for the public M&A subsample in Panel B.

The results of regression (1) in Panel A of Table 7 indicate that *HI_PIN* alone does not have a significant impact on acquirers' cumulative abnormal stock return, *CAR (-2, 2)*, suggesting that stock price informativeness alone is not sufficient to elicit a significant investor reaction to M&A announcements in the absence of the effective use of the private information in acquirer stock prices. Regressions (2) and (3) show that superior managerial attributes have a positive effect on acquirers' cumulative abnormal stock return, but it is relatively weak (significant at the 10% level). In regression (4), the coefficient of the interaction variable *MA_SCORE×HI_PIN* is 0.0436 and significant at the 1% level. In addition, the coefficient of *MA_SCORE* is -0.0105 and statistically insignificant. These two coefficients indicate that managerial attributes have a positive and significant effect on the market's reaction to M&A announcements only when the acquirer's *PIN* is high after we control for both firm and deal characteristics. This result suggests that the market's reaction to M&A announcements is favorable when acquirers run by managers with high attributes engage in M&A decisions in elevated states of private information in stock prices. Moreover, as shown in regression (5), the inverse Mills ratio is statistically insignificant. Therefore,

the results in regression (4) are not driven by selection bias. The results for acquisitions of public targets, as reported in Panel B of Table 7, are in line with those reported for the entire sample in Panel A.

Overall, these results confirm our previous finding that, when high-ability managers announce M&A decisions under conditions of high stock price informativeness, *HI_PIN*, shareholders experience positive announcement cumulative stock returns, supporting our conjecture that skilled managers use the private information in acquirers' stock prices, enabling them to make promising M&A investment decisions that elicit positive and significant market reactions when announced. The results also suggest that investors can reaffirm the superior skills of such managers and react positively when these managers announce their M&A decisions.

[Insert Table 7 about here]

4.5 Long-term acquirer operating performance: CEO fixed effects and multivariate analysis

Although we have shown that superior managerial attributes interacted with high stock price informativeness, *MA_SCORE×HI_PIN*, lead to high abnormal announcement stock returns, this result could merely be due to a market overreaction. We thus need to investigate the effect of *MA_SCORE×HI_PIN* on post-merger operating performance, to determine whether the M&A decisions made by skilled managers under conditions of high stock price informativeness improve the post-M&A period operating performance of acquiring firms, *OPER_PERF*. The variable *OPER_PERF* is the average post-merger industry-adjusted operating performance during the three years after the deal completion date, calculated by using accounting variables. Therefore, it is insensitive to investors' trading activities.

Before we examine the results of multivariate analysis, we first test for the CEO fixed effects on *OPER_PERF* under high and low *PIN* levels. This test is the same as in Section 4.3, except that now we use *OPER_PERF* instead of *CAR* as the dependent variable. The results are reported in Table 8.

Panel A of Table 8 reports the explanatory power of the CEO fixed effects on *OPER_PERF* for the entire sample of M&As The results show that the CEO fixed effects significantly explain *OPER_PERF*, with an *F*-value of 7.5666, increasing the adjusted R^2 from 0.2005 (i.e., the R^2 of the regression with no fixed effects) to 0.7398. Panel B reports the results of the same test for the subsample of acquirers with high stock price informativeness (*PIN*). The results show that the CEO fixed effects improve the adjusted R^2 from 0.1526 (i.e., the R^2 of the regression with no fixed effects) to 0.7685. This improvement of 0.6159 is higher than the improvement in Panel A (i.e., 0.5393). Panel C reports the results for the subsample of low-*PIN* acquirers. These results show that the CEO fixed effects improve adjusted R^2 from 0.2823 (i.e., the R^2 of the regression with no fixed effects) to 0.7386, for a difference of 0.4563. This amount of improvement is less than that reported in Panels A and B. Overall, these results, consistent with those presented in Section 4.3, indicate that CEOs matter the most when acquirer stock prices contain more private information (i.e., high-*PIN* conditions).

[Insert Table 8 about here]

Next, we examine the effect of *MA_SCORE×HI_PIN* in multivariate analysis. Specifically, we estimate Equation (5) using OLS regression and a Heckman two-stage selection model, and report the results based on the entire sample of M&As and the subsample of public M&As in Panels A and B of Table 9, respectively.

The results of regression (1) in Panel A of Table 9 indicate that *HI_PIN* alone does not have a significant impact on acquirers' post-merger operating performance, suggesting that stock price informativeness alone is not sufficient to elicit long-term M&A performance in the absence of superior managerial attributes. Regressions (2) and (3), however, show that managerial attributes have a positive effect on acquirer post-merger operating performance. In regression (4), the coefficient of the interaction variable *MA_SCORE×HI_PIN* is 0.7349, significant at the 5% level, indicating that the long-term post-M&A operating performance of M&As initiated by talented managers under high levels of acquirer private stock price informativeness is greatly improved. The results suggest that high-skilled managers contribute to long-term M&A performance through their efficient use of the private information in stock prices, which facilitates the smooth integration of merging companies, yielding superior synergy gains, a task that low-skilled managers often fail to accomplish. The results reported in Panel B, based on acquisitions of public targets, are in line with those reported in Panel A. The coefficient of our main variable of interest, *MA_SCORE×HI_PIN*, is positive and significant at the 1% level, and, as before, this relation is not sensitive to selection bias.

[Insert Table 9 about here]

In sum, the results in this section suggest that the M&A decisions carried out by skilled managers under states of high stock price informativeness improve firm value.

4.6 Robustness: Alternative measures of managerial attributes and stock price informativeness

In this section, we examine whether the multivariate analysis results we presented in Sections 4.4 and 4.5 hold when we use the first principal component (*MA_PC*) of *MA_SCORE, CEO_FIX, HIS_RET*, and *CEO_TENURE* as the alternative managerial attributes measure, and stock price

nonsynchronicity (*NSY*), idiosyncratic volatility (*IVOL*), and the bid–ask spread (*BASPD*) as our alternative measures of stock price informativeness, respectively. The results based on the overall M&A sample are reported in Table 10.[28] Specifically, in Panels A and B, the dependent variables are acquirers' announcement cumulative abnormal returns, *CAR*, and three-year post-merger operating performance, *OPER_PERF*, respectively.

Generally, our main results are robust to alternative measures of managerial attributes and stock price informativeness, demonstrating that, when high-attribute managers announce M&A decisions under conditions of high stock price informativeness, acquiring firms realize superior abnormal announcement stock returns and post-merger operating performance. The exception is shown in Panel A of Table A.5 of the Online Appendix, where we regress *CAR* on *MA×INFO* for the subsample of public M&As. The only positive and significant result between *CAR* and our interaction measures of managerial attributes and stock price informativeness is when *PIN* is used as the stock price informativeness measure. This result suggests that *PIN*, due to its stronger theoretical foundation among alternative proxies of stock price informativeness, is a better metric of stock price informativeness. This could also be due to the smaller sample size of public targets used in the estimation of our regression specification.[29] To further mitigate the concern of measurement error, we test our conjecture using other managerial attributes measures, including the fitted value of CEO fixed effects (*CEO_FIX*), as well as CEO compensation (*CEO_COMP*)

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[28] The results based on the public M&A subsample are reported in Table A.5 of the Online Appendix and available upon request.

[29] The public M&A subsample, with 1,049 observations, is much smaller than the overall M&A sample, with 8,128 observations. As stated above these results are reported in Table A.2 of the Online Appendix and available upon request.

(Demerjian et al. 2012) and investment inefficiency (*INEFFINV*) (Richardson 2006; Biddle et al. 2009). Our results hold for these measures.[30]

In sum, the results in this section suggest that our results reported in Sections 4.4 and 4.5 are robust to different managerial attributes and stock price informativeness measures.

[Insert Table 10 about here]

4.7 Target stock price informativeness and M&A performance

So far, we have shown that skilled managers use private information in acquirers' stock prices to make M&A investment decisions that increase firm value. However, an additional source of private information that skilled managers of acquiring firms could use is their targets' stock prices.

In this section, we explore this issue by classifying acquirers into two groups based on the level of their own stock price informativeness (*A_INFO*) and that of their targets (*T_INFO*). Specifically, we examine the role of managerial attributes (*MA_SCORE*) on M&A performance under four different scenarios in terms of acquirer and target stock price informativeness: 1) both the acquirer's and target's stock price informativeness is high, 2) only the acquirer's stock price informativeness is high, 3) only the target's stock price informativeness is high, and 4) both the acquirer's and target's stock price informativeness is low. We capture these four pairs of stock price informativeness using the following four dummies, respectively: 1) *HI_A_INFO & HI_T_INFO*, 2) *HI_A_INFO & LO_T_INFO*, 3) *LO_A_INFO & HI_T_INFO*, and 4) *LO_A_INFO & LO_T_INFO*. Next, we interact these variables with *MA_SCORE*. As before, we also control for the firm and deal characteristics used in the previous sections.

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[30] The results are reported in Table A.2 of the Online Appendix and available upon request.

The results are reported in Table 11. The dependent variables are the acquiring firms' *CAR,* and *OPER_PERF*, in regressions (1) to (4) and regressions (5) to (8), respectively. We focus on regressions (1) and (5), which use the acquirers' *MA_SCORE* as the measure of managerial attributes and the aggregate (i.e., acquirer and target) *PIN* as the measure of stock price informativeness, since the different regression specifications yield similar results. In regression (1), the coefficient of *MA_SCORE×HI_A_PIN & HI_T_PIN* is 0.0560 and significant at the 1% level, suggesting that superior managerial attributes significantly improve M&A *CAR* values when acquiring managers make M&A decisions when both acquirers and targets are experiencing high stock price informativeness (*HI_A_PIN & HI_T_PIN*). The coefficients of the other three interaction terms are all nonsignificant, showing that, in public M&As, managerial attributes matter the most when both acquirers and targets are characterized by high stock price informativeness.

The results of our three-year post-merger operating performance analysis, reported in regressions (5) to (8), are consistent with the results of the M&A *CAR* analysis. Specifically, in regression (5), the coefficient of *MA_SCORE×HI_A_PIN & HI_T_PIN* is 1.7458 and significant at the 1% level, indicating that M&A decisions carried out by skilled managers significantly improve acquirers' long-term operating performance when both acquirers and targets experience high stock price informativeness (*HI_A_PIN & HI_T_PIN*). These findings demonstrate that superior managerial attributes matter the most when both acquirers and targets have high stock price informativeness. This pattern remains robust to the use of alternative measures of managerial attributes, *MA_PC,* and stock price informativeness, *INFO*. [31]

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[31] The results, based on *MA_PC*, are reported in Table A.6 of the Online Appendix and available upon request.

Jointly, the findings in this section reveal that high-attribute managers of acquiring firms appear to pay attention and use the private information in both acquirers' and targets' stock prices, resulting, in turn, in significant short- and long-term shareholder M&A gains.

[Insert Table 11 about here]

4.8 M&A decision and future stock price informativeness

Dow and Gorton (1997) argue that traders will attempt to produce information about a firm's prospects only if the firm's managers will respond to the resulting price signal through the trading process. If this argument is valid, the M&A decisions made by skilled managers under high stock price informativeness (i.e., managers' responses to the resulting stock prices) should lead to high future stock price informativeness. That is, traders will produce additional private information and incorporate it into stock prices through this feedback process. In this section, we examine the validity of this premise, that is, whether M&A decisions made by skilled managers under high stock price informativeness improve the acquiring firm's future stock price informativeness. This test is expected to shed light on whether investment (M&A) decisions based on managers' effective use of the private information in stock prices incentivize traders to produce more private information and thus further enhance stock price informativeness and economic efficiency through superior investments. Specifically, we estimate Equation (6) and report the results in Table 12.

Regression (1) in Table 12 demonstrates that, among all the interaction variables involving *M&A_INVST*, only *MA*×*HI_ INFO*×*M&A_INVST* has a significant positive coefficient for acquirers' future stock price informativeness, *INFO_F*. This result indicates that only M&As initiated by acquirers with high managerial attributes (*MA*) and high stock price informativeness (*INFO*) improve acquirers' future stock price informativeness (*INFO_F*). This finding indicates

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that M&A decisions initiated by skilled managers under high stock price informativeness do improve the future stock price informativeness of the firms they manage, in line with our prediction that managerial attributes affect the link between stock market efficiency and economic efficiency. This result also reveals that high-attribute managers care about their reputation capital and thus align their own interests to shareholders' interests and firms' future value through their efforts to improve the stock price informativeness of the firms they manage beyond the completion of acquisition transactions.

In sum, our findings indicate that efficient M&A decisions made by skilled managers under conditions of high stock price informativeness improve acquirers' future stock price informativeness, implying that high managerial attributes improve future stock price informativeness through ongoing efficient use of the private information in stock prices.

[Insert Table 12 about here]

5. Conclusion

In this study, we investigate whether the interaction of corporate managerial attributes and the private information embedded in stock prices (i.e., stock price informativeness) affects the merger and acquisition decisions and the performance of acquiring firms. This examination is motivated by the key question in financial economics of whether a firm's value hinges on its access to managerial human capital (attributes) and the assertion of the theoretical literature in corporate finance that managers can infer the prospects of their corporate decisions from the private information in stock prices in conjunction with their own private information to engage in value maximizing investment decisions.

We find that talented managers are more likely to initiate value-maximizing M&As in the presence of high private information in acquirers' stock prices and that M&A cancellations are more likely to be associated with M&A decisions made by their low-skilled counterparts, indicating that the variation in acquirers' M&A outcomes (i.e., announcement-period abnormal stock returns and three-year post-merger operating performance) is attributed to the interaction of heterogeneous corporate managerial attributes and the private information embedded in stock prices. We also find M&A decisions carried out by CEOs with high managerial attributes enhance not only acquirers' post-merger performance, but also the future stock price informativeness of the firms they manage. Our results lead to the conclusion that managers with superior attributes have both the capacity and incentives to use the private information in stock prices and thus make superior M&A investment decisions. Moreover, we document that the fixed effects of managerial attributes have distinct and greater explanatory power than firm fixed effects and deal characteristics on the performance of acquirers, mitigating endogeneity concerns that our results are driven by unobservable firm characteristics. Our findings are also robust to different measures of stock price informativeness and managerial attributes.

This article extends our knowledge by showing that heterogeneous use of the private information in stock prices is associated with heterogeneity in managerial attributes and documents the important role managerial attributes play in putting into effect the link between stock price efficiency and economic efficiency. Specifically, skilled managers facilitate a virtuous cycle between stock price efficiency and economic efficiency since they efficiently use the private information in stock prices and thus encourage stock traders to make stock prices even more informative. In contrast, low-skilled managers lead to a vicious cycle because they ignore trader-generated private information in stock prices in their investment decisions, which, in turn,

discourages traders from producing more information. Overall, this study provides new evidence that the variation in M&A outcomes is ingrained in the interaction of heterogeneous managerial attributes and the private information in stock prices. Most importantly, our evidence demonstrates that stock prices in secondary financial markets are not a sideshow. They do exert significant influence on real economic activity.

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Table 1 Descriptive statistics

Panel A reports descriptive statistics of the firm–year observations in the full sample. Panels B and C report descriptive statistics of the acquirers in the overall M&As sample and public M&A subsample, respectively. The detailed definitions of the variables are listed in Appendix A.

Variables	N	Mean	Std. Dev.	P25	P50	P75
Panel A. Full Sample (all the firm–year observations)						
MA_SCORE	28186	-0.0048	0.1527	-0.0955	-0.0299	0.0513
MA_PC	28186	-0.0108	0.9876	-0.7308	-0.1964	0.5248
PIN	28186	0.1307	0.0481	0.0973	0.1192	0.1527
NSY	28186	1.1180	1.3501	0.2264	0.9758	1.8358
IVOL	28181	0.0223	0.0137	0.0132	0.0190	0.0277
BASPD	28186	0.0088	0.0050	0.0054	0.0074	0.0106
CEO_DELTA	28186	5.0420	1.8104	4.0711	5.1868	6.2465
CEO_VEGA	28186	3.4956	1.8875	2.2541	3.7657	4.8964
ABSDA	28186	0.0913	0.1100	0.0230	0.0555	0.1156
LEV	28186	0.2116	0.1780	0.0516	0.1967	0.3191
SPLUS_CASH	28186	0.0785	0.0958	0.0266	0.0680	0.1242
Tobin's Q	28186	1.9750	1.3286	1.1488	1.5375	2.2598
NWCR	28186	0.0560	0.1593	-0.0325	0.0535	0.1534
STOCK_RET	28186	-0.0482	0.3606	-0.2574	-0.0762	0.1046
SALE_GROWTH	28186	0.0705	0.2122	-0.0122	0.0636	0.1511
SIZE	28186	7.3681	1.5782	6.3041	7.3126	8.4260
FAGE	28186	3.2024	0.6700	2.7081	3.2189	3.8067
Panel B. Overall M&A sample (M&A deals involving both public and private targets)						
MA_SCORE	8128	0.0081	0.1672	-0.0970	-0.0301	0.0712
MA_PC	8128	0.1044	1.0709	-0.6893	-0.0855	0.6803
PIN	8128	0.1287	0.0487	0.0953	0.1171	0.1500
NSY	8128	0.8886	1.2445	0.0818	0.8086	1.5853
IVOL	8128	0.0206	0.0116	0.0126	0.0180	0.0256
BASPD	8128	0.0084	0.0045	0.0053	0.0072	0.0101
CAR	8128	0.0066	0.0812	-0.0239	0.0039	0.0355
OPER_PERF	7347	0.0200	0.0203	0.0086	0.0171	0.0283
CEO_DELTA	8128	5.5347	1.7952	4.6258	5.6649	6.6638
CEO_VEGA	8128	3.9483	1.8844	2.8886	4.1978	5.3290
ABSDA	8128	0.0984	0.1183	0.0250	0.0592	0.1242
Tobin's Q	8128	2.2273	1.4865	1.3169	1.7655	2.5541
MRKT_CAP	8128	8.0914	1.7257	6.8195	7.8747	9.2539
LEV	8128	0.2036	0.1671	0.0590	0.1898	0.3022
SPLUS_CASH	8128	0.0942	0.0965	0.0375	0.0811	0.1404
DEAL_RATIO	8128	-3.5228	1.8073	-4.6405	-3.3864	-2.2954
Panel C. Public M&A subsample (M&A deals involving only public targets)						
MA_SCORE	1049	0.0027	0.1666	-0.0995	-0.0352	0.0661
MA_PC	1049	-0.0276	1.0197	-0.7885	-0.2755	0.5665
PIN	1049	0.1212	0.0458	0.0906	0.1109	0.1412
NSY	1049	0.6601	1.2128	-0.1484	0.5916	1.3825
IVOL	1049	0.0191	0.0111	0.0113	0.0166	0.0234
BASPD	1049	0.0080	0.0043	0.0050	0.0069	0.0095
CAR	1049	-0.0129	0.0737	-0.0460	-0.0061	0.0255
OPER_PERF	974	0.0205	0.0176	0.0087	0.0180	0.0288
CEO_DELTA	1049	5.9220	1.7687	5.0436	6.1118	7.0418
CEO_VEGA	1049	4.4291	1.8739	3.3979	4.7574	5.7796

ABSDA	1049	0.0962	0.1171	0.0257	0.0578	0.1161
Tobin's Q	1049	2.2906	1.4901	1.3133	1.8276	2.6691
MRKT_CAP	1049	8.8774	1.7705	7.5683	8.8522	10.2671
LEV	1049	0.2079	0.1564	0.0897	0.1887	0.2981
SPLUS_CASH	1049	0.1028	0.1036	0.0370	0.0908	0.1591
DEAL_RATIO	1049	-2.5031	1.8160	-3.6249	-2.2923	-1.1647

Table 2 The effects of private information in stock prices and managerial attributes on investment sensitivity

This table reports the multivariate analysis results of corporate investment sensitivity. From Panels A to D, the dependent variables are the sum of acquirer's M&A deal values in a given year scaled by assets value (*M&A_DEAL_VALUE*), the capital expenditure plus R&D scaled by assets (*CAPXRND)*, the capital expenditure scaled by assets (*CAPX)*, and the total assets scaled by the beginning-of-year total assets (*ASSET_G*), respectively. We report the results in the full sample (M&A and non-M&A firms) and overall M&A sample (M&A acquirers), respectively. We use the probability of informed trading (*PIN*), stock price nonsynchronicity (*NSY*), ideocratic volatility (*IVOL*), and bid-ask spread (*BASPD*) as our measure of private information in stock prices (*INFO*), alternately. Other control variables, which are not presented in the table, include *CEO_DELTA*, *CEO_VEGA*, *DUAL_CEO*, *ABSDA,* 1/Book value of assets*, Tobin's Q*, *LEV*, *DIVIDEND, FAGE*, *SALE_GROWTH*, and *SPLUS_CASH,* industry dummies and year dummies. The detailed definitions of the variables are listed in Appendix A. Standard errors reported in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

	Full Sample				Overall M&A sample (M&A acquirers)			
Panel A: *M&A_DEAL_VALUE*								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INFO	PIN	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA_SCORE × HI_INFO	1.4712***	1.7677***	1.3019***	0.1406	3.3088**	3.7281***	3.1927**	2.6483*
	(0.4553)	(0.4839)	(0.4057)	(0.6787)	(1.4144)	(1.2352)	(1.4571)	(1.3788)
MA_SCORE	0.2072	-0.0270	0.2937	0.9376	0.5409	0.2486	0.6936	1.1513*
	(0.3132)	(0.5300)	(0.4118)	(0.6452)	(0.8152)	(0.8860)	(0.7416)	(0.6986)
HI_INFO	0.1134	0.1050	0.0747	-0.1072	0.1005	0.2436	0.5545**	-0.0221
	(0.0837)	(0.0996)	(0.0756)	(0.1133)	(0.2218)	(0.3136)	(0.2728)	(0.3948)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: *CAPXRND*								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INFO	PIN	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA_SCORE × HI_INFO	0.0693***	0.0548**	0.0712**	0.0433*	0.2978***	0.1273	0.2891**	0.2569**
	(0.0231)	(0.0241)	(0.0287)	(0.0260)	(0.1067)	(0.0918)	(0.1153)	(0.1130)
MA_SCORE	-0.0345**	-0.0277	-0.0358**	-0.0192	0.0789	0.1783**	0.0914*	0.1142**
	(0.0142)	(0.0185)	(0.0144)	(0.0158)	(0.0486)	(0.0712)	(0.0506)	(0.0553)
HI_INFO	-0.0038	-0.0070	0.0138***	0.0087	-0.0009	-0.0309	0.0131	-0.0156
	(0.0048)	(0.0057)	(0.0040)	(0.0062)	(0.0169)	(0.0242)	(0.0169)	(0.0269)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: *CAPX*								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INFO	PIN	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA_SCORE × HI_INFO	0.0647***	0.0520***	0.0740***	0.0539***	0.2226***	0.1164**	0.2274***	0.1943**
	(0.0156)	(0.0153)	(0.0191)	(0.0170)	(0.0732)	(0.0581)	(0.0784)	(0.0761)
MA_SCORE	0.0064	0.0121	0.0005	0.0123	0.0587**	0.1214***	0.0623**	0.0815***
	(0.0087)	(0.0099)	(0.0081)	(0.0095)	(0.0279)	(0.0393)	(0.0274)	(0.0304)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HI_INFO	-0.0034	-0.0053	0.0005	-0.0047	-0.0084	-0.0269	-0.0120	-0.0289
	(0.0034)	(0.0042)	(0.0027)	(0.0045)	(0.0098)	(0.0184)	(0.0122)	(0.0187)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel D: *ASSET_G*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
INFO	*PIN*	*NSY*	*IVOL*	*BASPD*	*PIN*	*NSY*	*IVOL*	*BASPD*
MA_SCORE × *HI_INFO*	1.5235***	1.5399***	2.0292***	1.2571***	6.9887***	5.0166**	7.5190***	5.3482**
	(0.4999)	(0.5273)	(0.6394)	(0.4765)	(2.4366)	(2.1369)	(2.7282)	(2.1912)
MA_SCORE	0.5623**	0.5214*	0.2612	0.07042***	1.4733	2.6709*	1.3830	2.5787***
	(0.2527)	(0.2775)	(0.2729)	(0.2175)	(1.2283)	(1.3656)	(1.2891)	(0.8689)
HI_INFO	-0.1764	-0.1877	-0.1410	-0.1812	-0.4280	-0.8470	-0.4976	-0.7419
	(0.1113)	(0.1258)	(0.0923)	(0.1188)	(0.3806)	(0.5467)	(0.3994)	(0.5246)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Table 3 The effects of private information in stock prices and managerial attributes on M&A decisions

Panel A reports the means of acquirer's managerial attributes, measured by *MA_SCORE*, conditional on the private information in stock prices, measured by *PIN*. Panels B and C present the interactive effect of managerial attributes (*MA*) and the private information in stock prices (*INFO*) on the propensity of firms' M&A decisions. Specifically, we estimate the following equation:

$$M\&A\_INVST = \alpha + \beta \times MA \times HI\_INFO + \gamma Controls + \varepsilon,$$

where *M&A_INVST* is the M&A dummy, which takes the value of one if the firm announces an M&A in a given year, and zero otherwise. We use *MA_SCORE* and *MA_PC* as the *MA* measures, respectively. *MA_SCORE* is the managerial ability score estimated following Demerjian et al. (2012)'s approach, and *MA_PC* is the first principal component of *MA_SCORE, CEO_FIX, HIS_RET,* and *CEO_TENURE*. We use the probability of informed trading (*PIN*), stock price nonsynchronicity (*NSY*), ideocratic volatility (*IVOL*), and bid-ask spread (*BASPD*) as our *INFO* measures, alternately. *HI_INFO* is a dummy that is equal to one if a firm's *INFO* value is above the median in its FF48 industry, and zero otherwise. Other controls are *CEO_DELTA*, *CEO_VEGA*, *DUAL_CEO*, *ABSDA, LEV*, *SPLUS_CASH*, *Tobin's Q*, *NWCR*, *STOCK_RET*, *SALE_FROWTH*, *SIZE*, *FAGE*, industry dummies, and year dummies. The detailed definitions of the variables are listed in Appendix A. In Panel B, regressions (1) to (4) and regressions (5) and (6) are estimated using logit and probit regressions, respectively. In Panel C, all models are estimated by probit regressions. Standard errors in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

Panel A: The average managerial ability score conditional on the level of *PIN*

	Full Sample (all the firm–year observations)			Overall M&A sample		
	High-PIN	Low-PIN	High-Low	High-PIN	Low-PIN	High-Low
MA_SCORE	-0.0057***	-0.0039***	-0.0019	0.0224***	-0.0041*	0.0265***

Panel B: Results using *HI_PIN* and managerial attributes measures

	(1)	(2)	(3)	(4)	(5)	(6)
	Logit	Logit	Logit	Logit	Probit	Probit
MA proxy	*MA_SCORE*	*MA_SCORE*	*MA_SCORE*	*MA_SCORE*	*MA_SCORE*	*MA_PC*
MA_SCORE × *HI_PIN*				0.7879***	0.4583***	0.0687***
				(0.2208)	(0.1289)	(0.0209)
MA_SCORE		0.3565**	0.3570**	-0.0713	-0.0311	0.0281
		(0.1578)	(0.1578)	(0.2156)	(0.1258)	(0.0217)
HI_PIN	-0.0058		-0.0084	-0.0115	-0.0096	-0.0131
	(0.0397)		(0.0398)	(0.0398)	(0.0229)	(0.0228)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28186	28186	28186	28186	28186	28186
Pseudo R^2	0.0573	0.0578	0.0578	0.0583	0.0586	0.0594

Panel C: Alternative stock price informativeness and managerial attributes measures

	(1)	(2)	(3)	(4)	(5)	(6)
	Probit	Probit	Probit	Probit	Probit	Probit
INFO	NSY	IVOL	BASPD	NSY	IVOL	BASPD
MA	*MA_SCORE*	*MA_SCORE*	*MA_SCORE*	*MA_PC*	*MA_PC*	*MA_PC*
MA × *HI_INFO*	0.4685***	0.5134***	0.0798	0.0838***	0.0581***	-0.00394
	(0.1383)	(0.1317)	(0.1399)	(0.0221)	(0.0211)	(0.0222)
MA_ABILITY	-0.0231	-0.0594	0.1715	0.0219	0.0339	0.0659***
	(0.1300)	(0.1265)	(0.1280)	(0.0221)	(0.0214)	(0.0217)
HI_INFO	-0.1711***	-0.1848***	-0.0980***	-0.1767***	-0.1880***	-0.0956***
	(0.0250)	(0.0263)	(0.0256)	(0.0250)	(0.0264)	(0.0256)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28186	28186	28186	28186	28186	28186
Pseudo R^2	0.0607	0.0610	0.0588	0.0618	0.0616	0.0596

Table 4 Managerial attributes, stock price informativeness, and acquirer abnormal returns

This table reports the means of acquirer announcement cumulative abnormal returns, *CAR* (*-2, 2*), conditional on the private information in stock prices, measured by *PIN,* and managerial attributes, measured by *MA_SCORE*. *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. *A_PIN* is acquirers' *PIN* and *T_PIN* is their targets' *PIN*. We assign acquirers into two *PIN*-quantiles within their FF48 industries. We identify the top and bottom *PIN*-quantiles as high- and low-*PIN*. We identify an acquirer as a high-*MA* acquirer if its *MA_SCORE* value is above the median in its FF48 industry, otherwise a low-*MA* acquirer. High-Low indicates the difference in *CAR*s between high- and low-*MA* acquirers. Panel A reports the acquirers' average *CAR* conditional on the acquirers' *A_PIN* and *MA_SCORE* in the overall M&A sample. Panel B presents the difference in *CAR*s between high- and low-*MA* acquirers in the M&A subsample public targets. We report the differences in *CAR*s under different levels of *A_PIN* and *T_PIN*. The *t*-statistics are reported in parentheses. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

Panel A: Average acquirer's *CAR* of M&As conditional on *PIN* and *MA_SCORE*

CAR	High-*A_PIN*		Low-*A_PIN*		High-Low	
	0.0084***		0.0050***		0.0034*	
	(5.09)		(5.59)		(1.78)	

CAR	High-*A_ PIN*			Low-*A_PIN*		
	High *MA*	**Low *MA***	**High-Low**	**High *MA***	**Low *MA***	**High-Low**
	0.0138***	0.0029	0.0109***	0.0056***	0.0045***	0.0011
	(5.21)	(1.48)	(3.34)	(4.15)	(3.75)	(0.64)

Panel B: Average acquirer's *CAR* of M&As involving only public targets

CAR	High-*A_PIN*		Low-*A_PIN*	
	High-*T_PIN*	**Low-*T_PIN***	**High-*T_PIN***	**Low-*T_PIN***
	High-Low *MA*	**High-Low *MA***	**High-Low *MA***	**High-Low *MA***
	0.0223**	0.0007	-0.0109	-0.0025
	(2.54)	(0.54)	(1.23)	(0.36)

Table 5 Announcement abnormal returns, managerial attributes, and private information in stock prices of completed and withdrawn M&A deals

This table reports the average announcement abnormal returns, managerial attributes, and private information in stock prices of completed and withdrawn M&A deals. *CAR (-2, +2)* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. The measure of managerial attributes (*MA_SCORE*) is the managerial ability score estimated following Demerjian et al. (2012)'s approach. The private information in stock prices is measured by *PIN*, the probability of informed trading. *HI_PIN* is a dummy that is equal to one if a firm's *PIN* value is above the median in its FF48 industry, and zero otherwise. The detailed definitions of the variables listed in Appendix A. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

The average *CAR*, *MA_SCORE*, *PIN*, *MA_SCORE× HI_PIN,* and *MA_SCORE× PIN*		
	Completed [8128 deals]	Withdrawn [283 deals]	Difference
CAR (-2, +2)	0.0066***	-0.0032	0.0098**
MA_SCORE	0.0081***	-0.0196**	0.0097**
PIN	0.1287***	0.1257***	0.0030
MA_SCORE× HI_PIN	0.0103***	-0.0063	0.0166**
MA_SCORE× PIN	0.0018***	-0.0023*	0.0041***

Table 6 Fixed effects of CEO managerial attributes on acquirer abnormal returns

This table reports the fixed effects of CEO managerial attributes, CEO FE, on acquirer announcement cumulative abnormal returns, *CAR (-2, 2)*. *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. In Panels A to E, we report results based on the overall M&A sample and the subsamples conditional on the acquirers' private information in stock prices (*PIN*) and managerial attributes (*MA_SCORE*). An acquirer is considered as a high-*PIN* (a low-*PIN*) acquirer if the firm's *PIN* is above (below) the median in its FF48 industry. Also, an acquirer is considered as a high-*MA_SCORE* (low- *MA_SCORE*) acquirer if its *MA_SCORE* value is above (below) the median in its FF48 industry. In each panel, we report results for four different specifications: "None", "CEO FE", "Acquirer FE", and "CEO FE and Year FE". In the "None" specification, no dummies are included. In the "CEO FE" and "Acquirer FE" specifications, CEO and acquirer dummies are included, respectively. In the "CEO FE and Year FE" specification, both CEO and year dummies are included. *F*-statistics for the joint significance of CEO/Acquirer FE are reported, along with the corresponding p-values and the number of CEOs/firms (categories). The R squared and the adjusted R squared are also reported. Other control variables are *CEO_VEGA*, *CEO_DELTA*, *DUAL_CEO*, *ABSDA, Tobin's Q*, *MRKT_CAP*, *LEV*, *CASH_D*, *STOCK_D*, *SPLUS_CASH*, *PUBLIC_D*, *TENDER_D*, *TECH_D*, *HOSTILE_D*, *DIV_D*, and *DEAL_RATIO*. The detailed definitions of the variables are listed in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CEO/Acquirer FE F-test	#obs.	R squared	Adj R squared
Panel A: Overall M&As				
None	-	8128	0.0196	0.0176
CEO FE	2.5811*** (0.000, 2542)	8128	0.5497	0.3430
Acquirer FE	1.5806*** (0.000, 1618)	8128	0.2964	0.1195
CEO FE and Year FE	2.5759*** (0.000, 2542)	8128	0.5537	0.3461
Panel B: M&As involving acquirers with high *PIN*				
None	-	3740	0.0229	0.0187
CEO FE	2.2958*** (0.000, 1658)	3740	0.6561	0.3776
Acquirer FE	1.0849** (0.046, 1278)	3740	0.3762	0.0465
CEO FE and Year FE	2.2592*** (0.000, 1658)	3740	0.6600	0.3777
Panel C: M&As involving acquirers with low *PIN*				
None	-	4388	0.0204	0.0168
CEO FE	1.6872*** (0.000, 1689)	4388	0.5248	0.2230
Acquirer FE	1.7900*** (0.000, 1131)	4388	0.3968	0.1835
CEO FE and Year FE	1.6895*** (0.000, 1689)	4388	0.5302	0.2251
Panel D: M&As involving acquirers with high *MA_SCORE* and high *PIN*				
None	-	1936	0.0308	0.0237
CEO FE	3.5427*** (0.000, 945)	1936	0.7840	0.5720
Acquirer FE	0.9682 (0.688, 803)	1936	0.4365	0.0242
CEO FE and Year FE	3.4387*** (0.000, 945)	1936	0.7876	0.5690
Panel E: M&As involving acquirers with low *MA_SCORE* and high *PIN*				
None	-	1804	0.0322	0.0246
CEO FE	0.9984 (0.510, 933)	1804	0.5365	0.0242
Acquirer FE	1.0775 (0.134, 763)	1804	0.4627	0.0562
CEO FE and Year FE	0.9684 (0.684, 933)	1804	0.5469	0.0200

Table 7 Multivariate analysis of acquirer abnormal returns

This table reports the effects of the interaction between acquirer's managerial attributes (*MA*_SCORE) and private information in stock prices (*PIN*) on acquirer's announcement cumulative abnormal returns, *CAR* (*-2, 2*). Specifically, we estimate the following equation:

$$CAR = \alpha + \beta \times MA\_SCORE \times HI\_PIN + \gamma Controls + \varepsilon,$$

where *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. *MA_SCORE* is estimated following Demerjian et al. (2012)'s approach. *HI_PIN* is a dummy that equals one if *PIN* value is above the median in its FF48 industry, otherwise zero. Other controls are *CEO_DELTA*, *CEO_VEGA*, *DUAL_CEO*, *ABSDA, Tobin's Q*, *MRKT_CAP*, *LEV*, *CASH_D*, *STOCK_D*, *SPLUS_CASH*, *PUBLIC_D*, *TENDER_D*, *TECH_D*, *HOSTILE_D*, *DIV_D*, and *DEAL_RATIO*. The detailed definitions of the variables are listed in Appendix A. We also control for industry- and year-fixed effects in all the specifications. Regressions (1) and (4) are estimated using OLS regression model. Regression (5) is the second stage results of the two-step Heckman model. The specification of the first stage probit model is the same as regression (5) of Panel B in Table 3. is the inverse of Mills' ratio. Panel A reports the result based on the overall M&A sample (M&A deals involving both public and private targets). Panel B reports the results based on a public M&A subsample (M&A deals involving only public targets). Standard errors reported in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

DV: Acquirer M&A *CAR (-2, 2)*					
Panel A. Overall M&A sample (M&A deals involving both public and private targets)					
	(1)	(2)	(3)	(4)	(5)
	OLS	*OLS*	*OLS*	*OLS*	*Heckman*
MA_SCORE× *HI_PIN*				0.0436***	0.0418***
				(0.0169)	(0.0114)
MA_SCORE		0.0146*	0.0145*	-0.0105	-0.0108
		(0.0080)	(0.0080)	(0.0072)	(0.0083)
HI_PIN	0.0006		0.0004	0.0000	0.0000
	(0.0022)		(0.0022)	(0.0021)	(0.0022)
IMR					-0.0049
					(0.0091)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes
Observations	8,128	8,128	8,128	8,128	8,128
Adjusted R^2	0.0223	0.0231	0.0230	0.0248	0.0248
Panel B. Public M&A subsample (M&A deals involving only public targets)					
	(1)	(2)	(3)	(4)	(5)
	OLS	*OLS*	*OLS*	*OLS*	*Heckman*
MA_SCORE× *HI_PIN*				0.0787***	0.0807***
				(0.0281)	(0.0266)
MA_SCORE		0.0090	0.0095	-0.0336	-0.0337*
		(0.0145)	(0.0145)	(0.0226)	(0.0195)
HI_PIN	-0.0076		-0.0077	-0.0079	-0.0080
	(0.0056)		(0.0056)	(0.0056)	(0.0054)
IMR					0.0071
					(0.0185)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes
Observations	1049	1049	1049	1049	1049
Adjusted R^2	0.1297	0.1284	0.1292	0.1358	0.1314

Table 8 Fixed effects of CEO managerial attributes on post-M&A operating performance

This table reports the fixed effects of CEO managerial attributes, CEO FE, on acquirer's three-year post-merger operating performance, *OPER_PERF*. From Panels A to E, we report results based on the overall M&A sample and the subsamples conditional on levels of acquirers' *PIN* and *MA_SCORE*. An acquirer is considered as a high-*PIN* (a low-*PIN*) acquirer if its probability of informed trading (*PIN*) value is above (below) the median in its FF48 industry. Also, an acquirer is considered as a high-*MA* acquirer if the firm's managerial ability score (*MA_SCORE*) value is above the median in its FF48 industry, a low-*MA* acquirer otherwise. In each panel, we report the results under four different specifications: "None", "CEO FE", "Acquirer FE", and "CEO FE and Year FE". In the "None" specification, no dummies are included. In the "CEO FE" and "Acquirer FE" specifications, CEO and acquirer dummies are included, respectively. In the "CEO FE and Year FE" specification, both CEO and year dummies are included. *F*-statistics for the joint significance of CEO/Acquirer FE are reported, along with the corresponding p-values and the number of CEOs/firms (categories). The R squared and the adjusted R squared of the regressions are also reported. Other control variables are *CEO_VEGA*, *CEO_DELTA*, *DUAL_CEO*, *ABSDA, Tobin's Q*, *MRKT_CAP*, *LEV*, *CASH_D*, *STOCK_D*, *SPLUS_CASH*, *PUBLIC_D*, *TENDER_D*, *TECH_D*, *HOSTILE_D*, *DIV_D*, and *DEAL_RATIO*. The detailed definitions of the variables are listed in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	CEO/FE F-test	#obs.	R squared	Adj R squared
Panel A All M&As				
None	-	7347	0.2023	0.2005
CEO FE	7.5666*** (0.000, 2315)	7347	0.8224	0.7398
Acquirer FE	7.6911*** (0.000, 1536)	7347	0.7374	0.6671
CEO FE and Year FE	7.4915*** (0.000, 2315)	7347	0.8267	0.7451
Panel B M&As involving acquirers with *HIGH_ PIN*				
None	-	3546	0.1564	0.1526
CEO FE	7.0451*** (0.000, 1554)	3546	0.8710	0.7685
Acquirer FE	6.8520*** (0.000, 1218)	3546	0.8169	0.7192
CEO FE and Year FE	6.9624*** (0.000, 1554)	3546	0.8758	0.7747
Panel C M&As involving acquirers with *LOW_ PIN*				
None	-	3801	0.2853	0.2823
CEO FE	5.4059*** (0.000, 1500)	3801	0.8428	0.7386
Acquirer FE	5.2930*** (0.000, 1056)	3801	0.7717	0.6834
CEO FE and Year FE	5.6666*** (0.000, 1500)	3801	0.8536	0.7543
Panel D: M&As involving acquirers with high *MA_SCORE* and high *PIN*				
None	-	1845	0.2052	0.1992
CEO FE	7.0775*** (0.000, 886)	1845	0.8958	0.7967
Acquirer FE	6.1144*** (0.000, 761)	1845	0.8512	0.7436
CEO FE and Year FE	6.9691*** (0.000, 886)	1845	0.8996	0.7996
Panel E: M&As involving acquirers with low *MA_SCORE* and high *PIN*				
None	-	1701	0.1727	0.1659
CEO FE	6.4346*** (0.000, 875)	1701	0.8956	0.7815
Acquirer FE	6.1780*** (0.000, 725)	1701	0.8536	0.7412
CEO FE and Year FE	6.6858*** (0.000, 875)	1701	0.9074	0.8010

Table 9 Multivariate analysis of acquirer three-year post-merger operating performance

This table reports the effects of the interaction between acquirer's managerial attributes (*MA*_SCORE) and private information in stock prices (*PIN*) on acquirer's three-year post-merger operating performance. Specifically, we estimate the following equation:

$$OPER\_PERF = \alpha + \beta \times MA\_SCORE \times HI\_PIN + \gamma Controls + \varepsilon,$$

where *OPER_PERF* is an acquirer's three-year post-merger operating performance after the deal completion date. *MA_SCORE* is estimated following Demerjian et al. (2012)'s approach. *HI_PIN* is a dummy that equals one if an acquirer's *PIN* value is above the median in its Fama-French 48 industry, otherwise zero. Other controls are *CEO_DELTA*, *CEO_VEGA*, *DUAL_CEO*, *ABSDA, Tobin's Q*, *MRKT_CAP*, *LEV*, *CASH_D*, *STOCK_D*, *SPLUS_CASH*, *PUBLIC_D*, *TENDER_D*, *TECH_D*, *HOSTILE_D*, *DIV_D*, and *DEAL_RATIO*. The detailed definitions of the variables are listed in Appendix A. We also control for industry- and year-fixed effects in all the specifications. Regressions (1) and (4) are estimated using OLS regression model. Regression (5) is the second stage results of a two-step Heckman model. The specification of the first stage probit model is the same as regression (5) of Panel B in Table 3. *IMR* is the inverse of Mills' ratio. Panel A reports the result based on the overall M&A sample (M&A deals involving both public and private targets). Panel B reports the results based on a public M&A subsample (M&A deals involving only public targets). Standard errors reported in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

DV: Acquirer three-year post-merger operating performance					
Panel A: Overall M&A sample (M&A deals involving both public and private targets)					
	(1)	(2)	(3)	(4)	(5)
	OLS	*OLS*	*OLS*	*OLS*	*Heckman*
MA_SCORE× HI_PIN				0.7349**	0.6511**
				(0.3431)	(0.2613)
MA_SCORE		0.9250***	0.9295***	0.4907*	0.4808**
		(0.2207)	(0.2207)	(0.2640)	(0.1946)
HI_PIN	-0.0609		-0.0703	-0.0773	-0.0792
	(0.0604)		(0.0602)	(0.0599)	(0.0503)
IMR					-0.2019
					(0.1972)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes
Observations	7,347	7,347	7,347	7,347	7,347
Adjusted R²	0.2620	0.2619	0.2620	0.2628	0.2626
Panel B: Public M&A subsample (M&A deals involving only public targets)					
	(1)	(2)	(3)	(4)	(5)
	OLS	*OLS*	*OLS*	*OLS*	*Heckman*
MA_SCORE× HI_PIN				1.6549***	1.6067***
				(0.6086)	(0.5646)
MA_SCORE		0.9504**	0.9467**	0.0188	0.0098
		(0.3856)	(0.3867)	(0.4717)	(0.4220)
HI_PIN	0.0617		0.0508	0.0488	0.0498
	(0.1190)		(0.1186)	(0.1190)	(0.1131)
IMR					-0.1899
					(0.3902)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes
Observations	974	974	974	974	974
Adjusted R²	0.3460	0.3532	0.3526	0.3577	0.3528

Table 10 Acquirer announcement returns, and three-year post-merger operating performance based on alternative managerial attribute and private information in stock prices measures

This table reports the effects of the interaction between acquirer's managerial attributes (*MA*), and private information in stock prices (*INFO*) on acquirer's announcement cumulative abnormal returns, *CAR (-2, 2)*, and three-year post-merger operating performance, *OPER_PERF*. *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. *OPER_PERF* is the acquirer's three-year post-merger operating performance after the deal completion date. We use *MA_SCORE* and *MA_PC* as our *MA* measures, alternately. *MA_SCORE* is the managerial ability score estimated following Demerjian et al. (2012)'s approach, and *MA_PC* is the first principal component of *MA_SCORE, CEO_FIX, HIS_RET,* and *CEO_TENURE*. We use the probability of informed trading (*PIN*), stock price nonsynchronicity (*NSY*), idiosyncratic volatility (*IVOL*), and bid-ask spread (*BASPD*) as our *INFO* measures, alternately. *HI_INFO* is a dummy that equals one if a firm's *INFO* vale is above the median in its FF48 industry, otherwise zero. All models are estimated using two-step Heckman model and the results of the second stage are reported. The specifications of the first stage probit model are the same as Eq. (3). In Panels A and B, the dependent variable is acquirers' *CAR* and *OPER_PERF*, respectively. Control variables in the second stage are the same as those used in regression (5) of Table 7. *IMR* is the inverse of Mills' ratio. The detailed definitions of the variables are listed in Appendix A. Standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

Panel A: The interactive effect of managerial attributes and stock price informativeness on M&A *CAR (-2, 2)* (overall M&A sample)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	CAR (-2, 2)	CAR (-2, 2)	CAR (-2, 2)	CAR (-2, 2)	CAR (-2, 2)	CAR (-2, 2)	CAR (-2, 2)
Managerial Attributes (MA)	MA_SCORE	MA_SCORE	MA_SCORE	MA_PC	MA_PC	MA_PC	MA_PC
Stock price informativeness (INFO)	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA × HI_INFO	0.0266**	0.0340***	0.0407***	0.0058***	0.0033*	0.0051***	0.0044***
	(0.0118)	(0.0119)	(0.0109)	(0.0018)	(0.0019)	(0.0018)	(0.0017)
MA	-0.0027	-0.0046	-0.0071	-0.0001	0.0012	0.0005	0.0009
	(0.0084)	(0.0082)	(0.0081)	(0.0014)	(0.0014)	(0.0014)	(0.0015)
HI_INFO	0.0047*	0.0037	0.0045**	-0.0004	0.0038	0.0027	0.0042*
	(0.0026)	(0.0025)	(0.0023)	(0.0022)	(0.0026)	(0.0026)	(0.0023)
IMR	-0.0044	0.0004	-0.0020	-0.0008	-0.0001	0.0047	0.0011
	(0.0091)	(0.0091)	(0.0090)	(0.0096)	(0.0097)	(0.0095)	(0.0095)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.0241	0.0243	0.0252	0.0246	0.0240	0.0245	0.0246

Panel B: The interactive effect of managerial attributes and stock price informativeness on *OPER_PERF* (overall M&A sample)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	OPER_PERF	OPER_PERF	OPER_PERF	OPER_PERF	OPER_PERF	OPER_PERF	OPER_PERF
Managerial Attributes (MA)	MA_SCORE	MA_SCORE	MA_SCORE	MA_PC	MA_PC	MA_PC	MA_PC
Stock price informativeness (INFO)	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA × HI_INFO	0.3069	0.8538***	1.0937***	0.0941**	0.0472	0.1900***	0.2016***
	(0.2685)	(0.2699)	(0.2448)	(0.0407)	(0.0432)	(0.0409)	(0.0383)
MA	0.6667***	0.4122**	0.2524	0.0978***	0.1225***	0.0548*	0.0374
	(0.1909)	(0.1888)	(0.1865)	(0.0327)	(0.0319)	(0.0324)	(0.0341)
HI_INFO	0.2197***	-0.1729***	-0.3262***	-0.0916*	0.2133***	-0.2045***	-0.3439***
	(0.0565)	(0.0560)	(0.0518)	(0.0504)	(0.0579)	(0.0570)	(0.0521)
IMR	-0.1344	-0.1310	-0.1719	-0.2297	-0.1402	-0.1193	-0.2134
	(0.1969)	(0.1974)	(0.1941)	(0.2079)	(0.2083)	(0.2059)	(0.2037)

Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.2633	0.2639	0.2675	0.2628	0.2635	0.2655	0.2686

Table 11 Managerial attributes, acquirer, and target stock price informativeness, short- and long-term M&A performance

This table reports the effects of the interaction of acquirer's managerial attributes measures (*MA_SCORE*) and stock price informativeness (*INFO*) of the acquirer and its target the acquirer's announcement cumulative abnormal returns, *CAR (-2, 2)*, and three-year post-merger operating performance, *OPER_PERF*. The results are estimated in the public M&A subsample (M&A deals involving only public targets). *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. *OPER_PERF* is an acquirer's three-year post-merger operating performance after the deal completion date. We investigate the effect of *MA_SCORE* on *CAR* and *OPER_PERF* under different levels of acquirers' and their targets' *INFO* measures. *MA_SCORE* is the managerial ability score estimated following Demerjian et al. (2012)'s approach. We use the probability of informed trading (*PIN*), stock price nonsynchronicity (*NSY*), idiosyncratic volatility (*IVOL*), and bid-ask spread (*BASPD*) as our *INFO* measures, alternately. We identify a deal as *HI_A_INFO* if the acquirer's *INFO* value is above the median in its FF48 industry, otherwise *LO_A_ INFO*. Similarly, we identify a deal as *HI_T_ INFO* if their target's *INFO* value is above the median in its FF48 industry, otherwise *LO_T_ INFO*. And then, we create four dummies to capture the four pairs of stock price informativeness: *HI_A_INFO & HI_T_INFO, HI_A_INFO & LO_T_INFO, LO_A_INFO & HI_T_INFO,* and *LO_A_INFO & LO_T_INFO*. The dependent variable in regressions (1) to (4) is *CAR*. The dependent variable in regressions (5) to (8) is *OPER_PERF*. Other control variables used in Tables 7 and 9 are included as well. Standard errors reported in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

DV:	Acquirer M&A *CAR (-2, 2)*				DV: Acquirer *OPER_PERF*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stock price informativeness (INFO)	*PIN*	*NSY*	*IVOL*	*BASPD*	*PIN*	*NSY*	*IVOL*	*BASPD*
MA_ SCORE×HI_A_INFO&HI_T_INFO	0.0560***	-0.0199	0.0517*	0.0300	1.7458***	1.5573***	1.7783***	2.1451***
	(0.0202)	(0.0261)	(0.0276)	(0.0303)	(0.5993)	(0.5967)	(0.6590)	(0.5884)
MA_ SCORE×HI_A_INFO&LO_T_INFO	0.0297	0.0470	-0.0081	0.0035	1.3051**	0.4994	0.9658	0.6988
	(0.0272)	(0.0302)	(0.0294)	(0.0295)	(0.6610)	(0.6984)	(0.6730)	(0.6403)
MA_ SCORE×LO_A_INFO&HI_T_INFO	-0.0374	0.0568**	-0.0228	-0.0143	0.6338	0.7178	-0.0212	0.5098
	(0.0316)	(0.0271)	(0.0281)	(0.0240)	(0.7122)	(0.7838)	(0.6625)	(0.8068)
MA_ SCORE×LO_A_INFO&LO_T_INFO	-0.0541	-0.0317	-0.0066	0.0111	-0.7883	0.3761	0.4637	-0.4660
	(0.0341)	(0.0239)	(0.0234)	(0.0223)	(0.5525)	(0.6602)	(0.6284)	(0.5680)
HI_A_INFO	-0.0077	-0.0008	-0.0026	-0.0075	0.0625	0.2635**	-0.2083	-0.2641*
	(0.0056)	(0.0063)	(0.0070)	(0.0061)	(0.1220)	(0.1337)	(0.1585)	(0.1425)
HI_T_INFO	-0.0009	0.0038	-0.0109**	-0.0137***	0.0640	-0.1890*	-0.1440	-0.1926**
	(0.0057)	(0.0052)	(0.0051)	(0.0048)	(0.1058)	(0.1047)	(0.1023)	(0.0925)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1049	1049	1049	1049	974	974	974	974
Adjusted R^2	0.1358	0.1312	0.1322	0.1339	0.3572	0.3573	0.3560	0.3617

Table 12 Multivariate analysis of future stock price informativeness

This table reports the effect of interaction of acquirer's managerial attributes proxy (*MA*), acquirer's stock price informativeness proxy (*INFO*), and M&A decision (*M&A_INVST*) on the future stock price informativeness (*INFO_F*). Specifically, we estimate the following equation:

$$INFO\_F = \alpha + \beta \times MA \times HI\_INFO \times DEAL\_DUMMY + \gamma Controls + \varepsilon,$$

where *INFO_F* is future stock price informativeness, which is *INFO* estimated at the end of *t* + 1 year. We use the probability of informed trading (*PIN*), stock price nonsynchronicity (*NSY*), ideocratic volatility (*IVOL*), and bid-ask spread (*BASPD*) as our *INFO* measures, alternately. *MA* is *MA_SCORE* and *MA_PC*, alternately. *MA_SCORE* is the managerial ability score estimated following Demerjian et al. (2012)'s approach, and *MA_PC* is the first principal component of *MA_SCORE, the* fitted value of CEO fixed effects, historical stock return, and CEO tenure. *INFO* is the measure of stock price informativeness. *HI_INFO* is a dummy that equals one if the firm's *INFO* value is above the median in its FF48 industry, otherwise zero. *M&A_INVST* is a dummy, which equals one if the firm initiates at least one M&A in a given year, zero otherwise. Other controls are *CEO_DELTA*, *CEO_VEGA*, *DUAL_CEO*, *ABSDA, LEV, SPLUS_CASH*, *Tobin's Q*, *NWCR*, *STOCK_RET*, *SALE_FROWTH*, *SIZE*, and *FAGE*. The detailed definitions of the variables are listed in Appendix A. We also control for industry- and year-fixed effects in all the specifications. The results are estimated by using OLS regression model. Standard errors reported in parentheses are heteroskedasticity robust and are clustered at the firm level. ***, **, and * indicate significance at 1%, 5% and 10%, respectively.

	DV: *INFO_F*							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Managerial Attributes (MA)	MA_SCORE	MA_SCORE	MA_SCORE	MA_SCORE	MA_PC	MA_PC	MA_PC	MA_PC
Stock price informativeness (INFO)	PIN	NSY	IVOL	BASPD	PIN	NSY	IVOL	BASPD
MA×HI_INFO× M&A_INVST	0.0161**	0.2880*	0.0037**	0.0023**	0.0023**	0.0506*	0.0007**	0.0002
	(0.0078)	(0.1644)	(0.0019)	(0.0009)	(0.0009)	(0.0263)	(0.0003)	(0.0001)
MA× M&A_INVST	-0.0057	0.0159	0.0011	-0.0004	-0.0004	-0.0096	0.0002	0.0000
	(0.0047)	(0.1199)	(0.0010)	(0.0004)	(0.0004)	(0.0198)	(0.0002)	(0.0001)
HI_INFO× M&A_INVST	-0.0065***	-0.0729**	-0.0011***	-0.0003**	-0.0003**	-0.0776***	-0.0010***	-0.0003*
	(0.0012)	(0.0286)	(0.0003)	(0.0001)	(0.0001)	(0.0287)	(0.0003)	(0.0002)
M&A_INVST	0.0003	-0.0417**	0.0001	-0.0000	-0.0000	-0.0411**	0.0001	-0.0001
	(0.0007)	(0.0183)	(0.0002)	(0.0001)	(0.0001)	(0.0181)	(0.0002)	(0.0001)
MA×HI_INFO	-0.0108**	-0.1394	-0.0053***	-0.0029***	-0.0029***	0.0243	-0.0011***	-0.0006***
	(0.0050)	(0.1138)	(0.0012)	(0.0005)	(0.0005)	(0.0181)	(0.0002)	(0.0001)
MA	0.0072**	0.1514*	-0.0016**	-0.0003	-0.0003	-0.0083	-0.0003**	-0.0001*
	(0.0030)	(0.0895)	(0.0007)	(0.0003)	(0.0003)	(0.0152)	(0.0001)	(0.0001)
HI_INFO	0.0168***	0.6085***	0.0082***	0.0036***	0.0036***	0.6102***	0.0082***	0.0036***
	(0.0007)	(0.0201)	(0.0002)	(0.0001)	(0.0001)	(0.0200)	(0.0002)	(0.0001)
Controls & Fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25830	25830	25830	25830	25830	7347	7347	7347
Adjusted R^2	0.3772	0.5743	0.5292	0.4470	0.3772	0.5743	0.5309	0.4492

Appendix A: Definitions of variables

ABSDA: Absolute value of discretionary accruals. We estimate the discretionary accruals by using Kothari et al. (2005)'s approach.

ASSET_G: The change in the total assets scaled by the beginning-of-year total assets.

BASPD: Bid-ask spread. *BASPD* is estimated within a 12-month period using the approach of Corwin and Schultz (2012).

CASH_D: Cash dummy, which equals one if the payment is fully in cash, and zero otherwise.

CAR: Acquirer's five-day cumulative abnormal stock return *CAR (-2, 2)*. The variable *CAR* is the stock cumulative abnormal return over the five-day window [-2, 2] around the M&A announcement date, based on the Fama–French three-factor model. We use a 120-day estimation window to estimate an acquirer's factor loading on the three Fama–French factors. We leave a 10-day gap between the *CAR* window and the estimation window.

CAPX: The capital expenditure scaled by the book value of the total assets.

CAPXRND: The capital expenditure plus R&D scaled by the book value of the total assets.

CEO_COMP: CEO total compensation scaled by firm's market capitalization. CEO total compensation (TDC1 in ExecuComp) is the sum of a CEO's salary, bonus, other annual compensation, restricted stocks, grants, LTIP, payouts all others, value of option grants.

CEO_DELTA and *CEO_VEGA*: Ln (1 +Delta) and Ln (1+ VEGA). Delta and Vega are the delta and vega of CEO's compensation, which are estimated by using Black-Scholes model (Black and Scholes 1973; Merton 1973). Specifically, I use Core and Guay (2002)'s approach to estimate the delta and vega prior 2006. We use the full information method (Caliskan and Doukas 2015) to estimate the delta and vega for the observations from 2006 to 2019.

CEO_FIX: The fitted value of CEO fixed effect, which is the fitted value of CEO dummies on firm efficiency. The firm efficiency is estimated using Demerjian et al. (2012)'s approach.

CEO_TENURE: Ln (CEO Tenure). CEO Tenure is the number of years that a CEO has held the CEO title at the current firm.

DEAL_RATIO: Ln (the value of M&A deal/acquirer's market capitalization).

DIV_D: Diversifying dummy, which equals one if the acquirer and target do not belong to the same 4-dight SIC code industry, and zero otherwise.

DIVIDEND: The dividend ratio is the dividend per share scaled by the stock price.

DUAL_CEO: CEO duality, which takes the value of one if a CEO also holds the position of the chair of the board, and zero otherwise.

FAGE: Ln (1+firm age). The firm age is the number of years the firm presented in Compustat.

HIS_RET: Historical stock return, which is the five-year historical value-weighted industry-adjusted return (from year t-5 to year t -1). The industry is identified based on Fama-French 48 industry classification.

HOSTILE_D: Hostile dummy, which equals one if an M&A deal is a hostile takeover, and zero otherwise.

INEFFINV: Investment inefficiency. We regress the total investment on *Tobin's Q*, FF48 industry dummies and year dummies. The total investment is the sum of capital expenditure, R&D expenditure, and acquisitions minus the sales of PPE and necessary maintenance for assets in place, scaled by total assets at the end of the prior year. We take the residuals of the regression as our *INEFFINV*.

IVOL: Idiosyncratic volatility. we regress daily stock returns on market returns and industry returns within 12 months. *IVOL* is the standard deviation of the residuals from the regression.

LEV: Book leverage, which is the book value of long-term debt scaled by the total assets.

M&A_INVST: M&A deal dummy, which takes a value of one if a firm announces an M&A in a year, and zero otherwise.

MA_PC: Managerial attributes first principal component factor is the first principal component factor of four managerial attributes measures, which are the managerial ability score, the fitted value of CEO dummies, historical return, and CEO tenure. These four proxies are calculated following Demerjian et al. (2012).

MA_SCORE: Managerial ability score estimated by using Demerjian et al. (2012)'s approach.

Tobin's Q: The market value of the total asset scaled by the book value of total assets.

MRKT_CAP: ln (1+ firm market capitalization). The firm market capitalization equals stock price multiplied by the total shares outstanding.

NWCR; Noncash working capital ratio, which is (Current Assets − Current Liabilities − Cash and Cash Equivalents) / Total Assets.

NSY: Stock price nonsynchronicity, which is $1 - R^2$. R^2 is estimated by regressing the daily stock returns on the market returns and industry returns within 12 months.

OPER_PERF: Acquirer's three-year post-merger operating performance, which is an average industry-adjusted return on assets during the three years after the deal completion date. The return on assets ratio is earnings before interest, tax, and depreciation and amortization (EBITDA) scaled by the book value of assets. The matched portfolio includes firms that are in the same FF48 industry as the sample firm, have not been involved in any M&As over the last 3 years, and have an operating performance within the range of 60%–115% that of the sample firm.

PIN: Probability of informed trading. Our *PIN* is estimated following Lin and Ke (2011). We classify trades by using Ellis, Michaely, and O'Hara (2000)'s approach.

PUBLIC_D: Public dummy, which equals one if the target is a publicly listed firm, and zero otherwise.

SALE_GROWTH: Sales growth rate, which is the current sales scaled by the prior sales.

SIZE: Firm size, which is Ln (1+Sales).

SPLUS_CASH: Surplus cash to total assets ratio, which is (Operating Activities Net Cash Flow − Depreciation and Amortization + R&D Expense) / Total Assets.

STOCK_D: Stock dummy, which equals one if the payment is fully in stock, and zero otherwise.

STOCK_RET: Past 12-month stock return.

TECH_D: High-tech dummy, which takes a value of one if an acquirer belongs to any of the following 4-digit SIC industries: 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3677, 3678, 3679, 3812, 3823, 3825, 3826, 3827, 3829, 3841, 3845, 4812, 4813, 4899, 7371–7375, 7378, or 7379, and zero otherwise.

TENDER_D: Tender dummy, which equals one if an M&A deal is conducted through a tender offer, and zero otherwise.