The Probability of Informed Trading and Mergers and Acquisitions

ABSTRACT

This paper investigates the role of the probability of informed trading (PIN) in mergers and acquisitions. We show that acquirers with higher PINs use more cash to finance their deals due to their higher cost of equity, and acquirers use more equity financing when acquiring targets with higher PINs to share the information risk with the target shareholders. We also find that acquirers and targets with higher PINs both experience higher announcement returns when cash financing is used indicating that PINs are priced in the M&A market.

JEL Classification: J33, M41

***Keywords**:* Mergers and Acquisitions; Probability of Informed Trading; Method of payment

1. Introduction

There is an extensive literature that investigates the role of information asymmetry in mergers and acquisitions (M&A). These studies typically focus on the role of target and bidder firms' private information about their own values and the influence of this asymmetric information on various M&A outcomes. For example, Hansen (1987) suggests that acquirers are more likely to use stock to acquire targets with higher information asymmetry to share the information risk with target shareholders, while Moeller, Schlingemann, and Stulz (2007) find that acquirers with higher information asymmetry experience lower announcement returns when using stock financing due to the adverse selection problem documented by Myers and Maljuf (1984). These findings are related to information asymmetry that is intrinsic to the firm and arises because managers of the acquirers and targets possess better information than the counterparty.

In this study, we examine the role of the probability of informed trading (PIN) in M&As. The notion of PIN stems from market microstructure research where equity investors are viewed as being informed and uninformed. In this respect, informed investors profit at the expense of uninformed investors due to their information advantage about the firm's intrinsic value. Uninformed investors thus face information asymmetry risk that relies on the frequency and composition of information events and the population of informed and uninformed investors.

Our focus on PIN contrasts to previous M&A research which analyses the role of information asymmetry arising from managers' private information, measured using for example analyst forecast bias and dispersion and the quality of financial information. PIN differs from these commonly used measures and possesses its advantages in at least three aspects. First, the PIN measure is derived from a market microstructure model

that analyses the private information from market traders. It has strong theoretical foundation and also enables researchers to directly estimate information asymmetry using observed trading data. Second, common information asymmetry measures tend to have several but sometimes conflictual interpretations, and are often found to inadequately proxy for information asymmetry between insiders and other market players.[1] We show for instance, that PIN has low correlation with various measures of information asymmetry, such as tangibility of a firm's assets, the dispersion of analyst forecasts (Chemmanur, Paeglis, and Simonyan, 2009; Moeller, Schlingemann, and Stulz, 2007), analyst forecast errors (Chemmanur, Paeglis, and Simonyan, 2009) and earnings quality (McNichols and Stubben, 2015), confirming that PIN captures a component of information asymmetry substantially different from other measures. Finally, PIN is arguably a superior proxy, even compared to other information asymmetry measures based on market microstructure such as various components of bid-ask spreads. Bharath et al. (2009) document that PIN is most highly related to a composite index of information asymmetry and likely to capture the commonality of information asymmetry.

Our study is motivated by prior research which documents that the probability of informed trading plays an important role in asset pricing and corporate policies. For example, Easley, Hvidkjaer, and O'Hara (2002) document a positive association between PIN and average stock returns, and Bharath, Pasquariello, and Wu (2009) demonstrate PIN affects the cost of capital as uninformed investors require higher returns to compensate for the risk of trading in stocks where they face greater information risk. Furthermore, Chen, Goldstein, and Jiang (2006) show that PIN affects

[1] See Pasquariello and Vega (2007) and Sadka and Scherbina (2007) for the interpretation of analyst forecast dispersion, and Dang et al. (2018) for firm size. Frankel and Li (2004) and Huddart and Ke (2007) document that analyst coverage, forecast dispersion and institutional ownership cannot capture and explain insider trading activity and profits. See section 2.1 for further discussion.

the sensitivity of corporate investment to stock price, while Brown and Hillegeist (2007) find a negative relation between a firm's disclosure quality and PIN due to the reduction of the likelihood that investors would be able to discover and trade on private information.

This study applies the notion of PIN, which captures information asymmetry between informed and uninformed equity investors, to the choice of payment method in mergers and acquisitions. We argue that since uninformed equity investors face greater information asymmetry, in equilibrium they demand higher returns to hold the stock, which increases the cost of equity for the firm. Since the valuation of cash payment is less sensitive to private information, it is predicted to be the preferred payment method choice for bidders with higher PINs. On the other hand, bidders with lower PINs are expected to choose stock or a hybrid method of payment. Thus, we expect that there exists a "pecking order", and the choice of payment method is driven by a trade-off between the increased cost of equity resulting from PINs and the costs and benefits of using cash financing.

In contrast, the association between PIN of the target firm and the payment method is more ambiguous than it is in the case of the acquiring firm, and conflicting evidence have been found in prior studies. On the one hand, when acquiring target firms with higher PINs, bidders may pay a higher proportion of equity to share the information risk with target shareholders (Hansen 1987). On the other hand, bidders may use more cash financing as it has the advantage of increasing the success rate of the bid and deterring competition from rival bidders since it signals that the bidder has a high private valuation for the target firm (Chemmanur, Paeglis, and Simonyan, 2009).

We examine the association between target and acquiring firms' PINs and the method of payment using a large sample of US merger and acquisitions. Consistent

with our expectations, acquirers with higher PINs use a higher percentage of cash to finance their M&A deals. In addition, acquirers use more equity financing when acquiring targets with higher PINs, which is in line with Hansen's (1987) argument that acquirers use equity financing to share the information risk with the target shareholders.

Next, we examine whether PIN is associated with acquirer announcement returns. The extant literature suggests that acquisitions are generally at best wealth neutral for acquiring firm shareholders, and potentially wealth destroying upon deal announcement (Andrade, Mitchell, and Stafford, 2001; Moeller, Schlingemann, and Stulz, 2005). One explanation of the negative acquirer announcement returns is that, in the presence of information asymmetry, the market considers a share-for-share bid as a signal of overvaluation of the bidder's stock which leads to negative announcement-period returns (Myers and Majluf, 1984; Travlos, 1987). Consistent with this argument, we expect bidders with a higher PIN to experience higher announcement returns in cash financed deals, as cash deals are likely to be considered positive signals that the bidder firm's equity is worth more than its market value (Moeller, Schlingemann, and Stulz, 2007). This predicts a positive association between bidder PINs and announcement returns for cash deals. On the other hand, negative acquirer announcement-period returns can be due to a high PIN of the targets, because a high degree of information asymmetry in the targets are likely to result in reduced precision in the estimate of target firm value and an increased chance of overvaluation. This predicts a negative relation between target PINs and bidder announcement returns, especially for cash deals.

Measuring announcement returns using 5-day cumulative abnormal returns (CARs) centered on the acquisition announcement date, we find a significant and positive association between acquirer PINs and acquirer CARs for cash deals only. This result is consistent with the findings of Moeller, Schlingemann, and Stulz (2007) that

cash offers made by bidders with higher information asymmetry are considered a signal of undervaluation of the bidder's equity. In terms of economic magnitudes, we find that, for cash deals, a one standard deviation increase in acquirer PIN around the mean increases acquirer CAR by 496 basis points. We also find a negative and significant relation between target PINs and bidder announcement returns, supporting that bidders obtain lower announcement returns when acquiring targets with a high degree of information asymmetry. For cash deals, a one standard deviation increase in target PIN around the mean reduces acquirer CAR by 319 basis points.

Lastly, we investigate the relationship between PINs and target announcement returns. Prior research consistently documents that average target firm CARs around the deal announcement are positive (Dong et al., 2006; Ahern, 2012). One of the well documented reasons for the positive target announcement returns is the "winner's curse", in that the bidder who mostly overestimates the value of the target firm will be the winning bidder (Bazerman and Samuelson, 1983). As the likelihood of overpaying increases with the level of asymmetric information, we hypothesize that target PINs increases the likelihood that the bidder overpays for the target. We thus predict a positive relation between target PINs and target announcement returns. However, we expect the positive relation to be diminished when equity financing is used, as the acquirer is likely to have detected the high level of information asymmetry in the target firm and hence chooses to share the information risk with target shareholders.

Consistent with our expectations, our results show that target announcement returns are positively associated with target firm PINs, but are negatively related to bidder PINs. Similar to bidder announcement returns, the effects of bidder and target PINs on target announcement-period returns are of economic significance. When testing the relation for cash, mixed and stock deals separately, we find that the

significant association between PINs and target CARs is concentrated in cash deals, and the association disappears for equity financed deals. This supports the view that targets do not benefit when acquirers have a high degree of information asymmetry among investors, or when acquirers use equity financing to share the high information risk with the target firm shareholders.

Our results are robust to an alternative measure of PIN developed by Easley, Hvidkjaer, and O'Hara (2002), an industry-adjusted PIN measure to account for potential outliers, the inclusion of commonly used measures of information asymmetry for both the acquirer and the target as controls in the regressions, a variety of firm-level and deal-specific controls affecting the M&A outcomes, and the possible confounding effect of liquidity on PINs (Amihud 2002; Duarte and Young 2009). We analyse acquisition offer premium and find that targets with higher PINs tend to have a higher takeover premium especially in cash deals. Finally, we examine if the role of PINs in M&A depends on a firm's governance and regulation environments. Our results show that, when facing less external disciplining (more anti-takeover provisions), bidders with high PINs tend to use less cash financing, but use more cash when acquiring targets with high levels of information asymmetry. This is in line with Masulis et al. (2007) that the managerial tendency of engaging in value-destroying takeovers increases with less disciplining from a firm's governance mechanism. We also find that, after the implementation of Regulation FD in 2000, bidders with high PINs are less likely to use cash financing for M&As, but continue to rely on more equity financing when acquiring targets with high PINs.

Our study on the probability of informed trading makes a contribution to both the market microstructure and the M&A literature. Prior research highlights the importance of PIN on asset prices (Easley, Hvidkjaer, and O'Hara, 2002; Easley and O'Hara, 2004),

capital structure choices (Bharath, Pasquariello, and Wu, 2009), investment efficiency (Chen, Goldstein, and Jiang, 2006) and disclosure policy (Brown and Hillegeist, 2007). Our study adds to this strand of research by examining the extent to which the degree of PINs of *both* acquirers and targets affects the choice of payment method, announcement-period returns and the offer premium in mergers and acquisitions.

This study also contributes to the literature on mergers and acquisitions by highlighting the importance of PINs. While previous studies focus on information asymmetry between inside managers and outside investors (Moeller, Schlingemann, and Stulz, 2007; Chemmanur, Paeglis, and Simonyan, 2009), we show that payment method choice and announcement returns for the acquirers and targets are also dependent on a firm's external information environment across investor groups, as reflected in the probability of information based trading.

The rest of this paper is organized as follows. Section 2 presents a review of the literature and develops the hypotheses. Section 3 describes our data and provides summary statistics. The main results and additional tests are presented in Section 4 and Section 5 respectively, and Section 6 concludes.

2. Literature review and hypotheses development

2.1 PIN and information asymmetry

The notion of the probability of informed trading stems from the market microstructure literature, where investors are viewed as informed or uninformed. Although uninformed traders are unaware of the specific information possessed by informed traders, they realize that such information influences the trades of informed traders, thereby attaching information content to the composition of trades. Thus, an imbalance of buy or sell orders leads uninformed investors to update their beliefs and

eventually cause market prices to converge to values based on the new information. Easley, Hvidkjaer, and O'Hara (2002) examine the role of asymmetric information across investors and show that PIN is positively associated with average asset returns. Easley and O'Hara (2004) further suggest that in equilibrium uninformed traders require a higher rate of return when the probability of informed trading is higher, leading to a positive association between PINs and returns. Chen et al. (2007) show that PIN is positively associated with the sensitivity of firm-level investment to stock prices, supporting the view that managers learn from private information that is incorporated into stock trades. Ferreira and Laux (2007) document a positive association between PIN and strong corporate governance, and interpret the results as evidence that enhanced corporate governance leads to private information collection and informed trading by market participants.

Traditionally, the corporate finance literature commonly measures a firm's degree of information asymmetry according to firm characteristics such as its size, growth opportunities, or tangibility of its assets. PIN differs from these measures and has its unique advantages in several aspects. First and theoretically, the PIN measure is based on a structural market microstructural model, where order imbalance increases among buy and sell orders with informed trading. It is reasonable to believe that market players in close touch with a firm and its business possess better information about the firm and trade based on this superior information. Market microstructure research models the trading behaviour of market players and analyses the information asymmetry about the payoffs of a firm's securities. In such respect, information asymmetry measures derived from market microstructure research such as PIN have strong theoretical foundation, which accordingly enable researchers to directly capture the degree of information asymmetry using observed trading data, compared to common firm-level measures.

Second, common firm-level measures are often found to inadequately proxy for the degree of information asymmetry between insiders and other market players. For example, Frankel and Li (2004) and Huddart and Ke (2007) show that insider trading activity and profits can hardly be explained by analyst coverage, forecast dispersion and institutional ownership. In addition, these measures tend to have several, sometimes conflictual, interpretations. For instance, analyst forecast dispersion is found to be a superior proxy for differences in opinion rather than information asymmetry (Pasquariello and Vega 2007; Sadka and Scherbina 2007), while firm size can represent a firm's financial attributes, regulatory status, or organizational complexity (Dang et al. 2018) that are all substantially distinguished from information asymmetry. On the other hand, the PIN measure is grounded on market microstructure models and is instead designed to capture financial market participants' time-varying perception of the information advantage held by firm insiders (Bharath, Pasquariello, and Wu, 2009). In Section 3.4, we show that PIN has a low correlation with common firm-level measures of information asymmetry, highlighting the empirical difference between PIN and other information asymmetry measures.

Finally, even compared to other microstructure-based measures of information asymmetry such as the components of bid-ask spreads, PIN is arguably a superior proxy. For example, bid-ask spreads tend to capture not only adverse selection costs but also inventory holding costs. Bharath et al. (2009) compare *seven* different measures of information asymmetry, including the adverse selection component of both quoted and effective bid-ask spreads, PIN, the interaction between stock returns and trading volume (Llorente et al. 2002) and liquidity measures. They find that their composite index of information asymmetry is most highly associated with PIN (coefficient = 0.51), while the correlation coefficients for other information asymmetry measures are all below

0.30.

2.2 The choice of payment method in mergers and acquisitions

The choice of payment method in M&As has been extensive examined. Prior literature documents that the choice of payment method can be explained by differential tax treatment (Gilson, Scholes, and Wolfson, 1988; Brown and Ryngaert, 1991), information asymmetry (Myers and Majluf, 1984; Hansen, 1987), capital structure and corporate control motives (Jensen, 1986; Stulz, 1988), and behavioural arguments (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004).

Accordingly, a number of firm characteristics such as firm size, asset tangibility, growth opportunities, financial leverage, and stock price run-up have been found to explain the choice of payment method. For example, larger firms are likely to have better access to debt markets making cash financing more feasible (Faccio and Masulis, 2005). In addition, firms with more tangible assets have a lower cost of debt which makes cash financing more attractive (Myers, 1977), whilst managers of firms with valuable investment opportunities prefer to finance investments with stock because it allows them to retain valuable cash resources (Jung, Kim, and Stulz, 1996; Martin, 1996). Bidders with higher financial leverage are likely to find it difficult to issue further debt which therefore increases the likelihood of stock payment (DeAngelo and Masulis, 1980; Faccio and Masulis, 2005), and bidders with a recent stock price run-up prefer to finance acquisitions with equity (Myers and Majluf, 1984; Hansen, 1987).

2.3 PIN, information asymmetry, and the choice of payment method

In this paper, our focus is on the role PIN plays in M&As. Before a deal occurs, both the bidder and target are asymmetrically informed about the true value of their

respective firm, as one would expect managers to have superior knowledge of their own firm's value compared with an outsider. In this case, the choice of payment method is likely to reveal information about the over/undervaluation of the firm and affect the division of synergy gains. A key distinction between a cash deal and a stock deal is that the value of a stock deal depends on the cash flows of the combined firm which in turn is driven by the 'true' value of the bidder, the target and any synergy gains. However, the value of a cash deal is independent of these parameters.

We predict that the choice of payment method is influenced by an acquiring firm's PIN. Target firm shareholders who face greater external information risk about the bidder are likely to demand higher returns to hold the acquiring firm's stock. This will require the bidder to offer a greater number of shares as payment to convince target shareholders to accept the bid, thus increasing the cost of the acquisition. We therefore expect that cash payment, which is less sensitive to private information, will be the preferred choice of payment method for bidders with a higher degree of private information (higher PINs). On the other hand, firms with lower PINs are more likely to choose stock or a hybrid method of payment as their stock is less likely to be discounted by target firm shareholders. This leads to our first hypothesis:

H1: Bidders with higher PINs use a higher proportion of cash financing.

In contrast to the relation between acquiring firms' information asymmetry and payment method, two opposing arguments have been documented in regards to the relation between target firms' information asymmetry and the method of payment. On the one hand, Hansen (1987) argues that bidders who plan to acquire targets with higher information risk are less likely to pay cash since cash payment increases the risk of

overpaying. In consequence these bidders are more likely to use equity financing as it enables the bidder to share the target's information risk with the target firm shareholders since the value of a stock offer depends on the cash flows of the acquirer, the target and any synergy gains. Empirically, Raman, Shivakumar, and Tamayo (2013) use the quality of financial reporting as a proxy for information risk and find consistent with Hansen's (1987) argument that bidders tend to share the information risk with target shareholders by using more equity financing to acquire targets with poor financial reporting quality (i.e., high information risk).

On the other hand, Chemmanur, Paeglis, and Simonyan (2009) argue and find that the choice of payment method in M&As is driven by the trade-off between the cost of overpayment (higher in a cash offer) and the likelihood of bid success (higher in a cash offer). In the presence of rival bidders who also face such a trade-off, a cash offer by a bidder signals to potential rival bidders that its private valuation of the target is higher, thereby helps to deter competition from other rival bidders and hence increases the probability of success. Furthermore, the advantage of deterring competition is greater when the level of the target's information asymmetry faced by rival bidders is higher. As a result, Chemmanur, Paeglis, and Simonyan (2009) find that bidders are more likely to use cash financing rather than stock financing when they face a high level of information asymmetry in evaluating the target.

Given the contrasting evidence documented, we believe a further examination of the association between payment method and target firm PINs is warranted and we consider the direction of the association an empirical question. This leads to our second hypothesis:

H2: There is an association between cash payment and target firm PINs.

2.4 Acquirer PIN and acquirer announcement returns

Acquisitions may provide firms with potential benefits including economics of scale, vertical integration and synergies. However, prior literature has generally found that acquisitions are at best wealth neutral for acquiring firm shareholders, and potentially wealth destroying upon deal announcement (Andrade, Mitchell, and Stafford, 2001; Moeller, Schlingemann, and Stulz, 2005). For example, Betton, Eckbo, and Thorburn (2008) show that the average cumulative abnormal return (CAR) around the announcement of an M&A deal is close to zero. The worst-case scenario is when large bidders make acquisitions of a public target in an all equity deal.

One traditional explanation for the negative bidder announcement returns is information asymmetry. Myers and Majluf (1984) and Travlos (1987) suggest that by making equity financed bids managers are likely to provide a signal to the market that their firm's common stock is overvalued. Consistent with this prediction, Chang (1998) and Fuller, Netter, and Stegemoller (2002) show that equity offers are associated with poorer acquirer returns, while Moeller, Schlingemann, and Stulz (2007) document that acquirers with higher information asymmetry experience higher announcement returns in cash financed deals.

Consistent with the finding of Moeller, Schlingemann, and Stulz (2007), we predict acquirers with a higher PIN experience higher abnormal returns in cash deals as it is viewed as a positive signal by the market, but lower abnormal returns in stock deals which is perceived as a sign of share price overvaluation. Thus, we expect a positive association between PINs and acquirers' announcement-period returns for cash deals, but a negative relation between PINs and announcement returns for stock deals. This give rise to our third hypothesis:

H3a: Bidders with higher PINs obtain higher announcement returns when

paying by cash.

H3b: Bidders with higher PINs obtain lower announcement returns when paying by stock.

2.5 Target firm announcement returns and PIN

On the flip side, prior literature provides unambiguous evidence that target firm shareholders are generally the winners in M&A transactions. Andrade, Mitchell, and Stafford (2001) and Betton, Eckbo, and Thorburn (2008) report that the average announcement abnormal returns for target firms are significantly positive at around 15%, and are approximately 20% for all-cash deals. The well documented "winner's curse" is one of the main reasons for the positive abnormal announcements returns for target firms. Bazerman and Samuelson (1983) suggest that the bidder who mostly overestimates the value of the target firm will be the winning bidder, and the failure to discount bids in response to greater uncertainty increases the magnitude of the winner's curse. McNichols and Stubben (2015) find empirical evidence to show that targets with higher information risk (a lower quality of accounting information) are more difficult to value and are more likely to result in overvaluation by acquirers.

Consistent with prior findings, we expect that bidders are more likely to overpay when acquiring targets with higher PINs, as the reduced precision in the estimate of target firm value increases the likelihood that the bidder offers an overvalued price. We therefore expect a positive association between target announcement returns and target PINs, and a negative relation between bidder announcement returns and target PINs. Furthermore, we expect the above associations to only exist in cash deals as Hansen (1987) suggests that acquirers use equity financing to acquire targets that they know to have high information risk in order to share the high information risk with the target's

shareholders. Hence, one would expect an equity financed acquirer to not overpay for the target as they have already discovered the high level of information risk in the target firm. These lead to our fourth hypothesis:

H4a: Targets with higher PINs obtain higher announcement returns in cash deals.

H4b: Bidders obtain lower announcement returns when acquiring targets with high PINs in cash deals.

3. Data and descriptive statistics

3.1. The sample

We obtain our sample of US mergers and acquisitions from the Thomson Financial SDC M&A Database. Our sample meets the following criteria: 1) observations are from the period of 1994-2011; 2) deals are completed; 3) the method of payment is known; 4) the transaction is greater than US$1 million and at least 1% of the acquirer's market value of equity; 5) the acquirer and target firms are not from the financial or utility industry and have financial statement information and stock return data available on Compustat and CRSP respectively; 6) the PIN measure for the acquirer and target is available.[2] Our final sample includes 1,724 mergers and acquisitions made by 1,235 acquirers. The definitions of all variables are provided in Table 1.

Table 2 reports the distribution of the mergers and acquisitions by year and industry. Panel A shows that the number of M&A deals dropped significantly in 2001-02 and 2009, at the end of the tech-boom and the global financial crisis periods

[2] We thank Stephen Brown for making yearly PINs for the period from 1993 and 2010 publicly available at scholar.rhsmith.umd.edu/sbrown/pin-data. See Brown and Hillegeist (2007) for details in constructing the PINs.

respectively. Panel B shows that a majority of the acquirers are from the manufacturing, services, and transportation and communications industry.

[Insert Table 1 and 2 here]

3.2. Probability of informed trading

The yearly PIN measure provided by Stephen Brown are computed using the Venter and de Jongh (2006) model and is an extended version of the popular EKO market microstructure model (Easley, Kiefer, and O'Hara, 1997). PIN is a firm-specific estimate of the probability that a trade originates from a privately informed investor and therefore it directly captures the amount of PINs among investors in the secondary market. The extension by Venter and de Jongh (2006) improves the model's ability to fit data in the real world by allowing for a strong positive correlation between buy and sell orders, which in turn accommodates for the arrival of public information in the market without necessarily attributing it to trading on private information. Overall, PINs computed using the Venter and de Jongh (2006) model better capture the asymmetric information component of PIN as opposed to the liquidity component of PIN as argued by Duarte and Young (2009). Nevertheless, we control for firm liquidity using the Amihud (2002) illiquidity measure in all of our regressions to ensure that our results are not driven by liquidity captured in the PIN component.

3.3. Summary statistics

Table 3 provides summary statistics. Yearly PINs and firm characteristics are all measured at the fiscal year-end prior to the acquisition announcement. Panel A reports that the average acquirer and target PIN are 0.14 and 0.17 respectively, and on average deals are funded by 68% cash (*Cashper*). Panel B shows that the average announcement-period acquirer CARs are approximately 0% while the average CARs

for the targets are much higher at around 14%, which is consistent with the findings in prior literature (Dong et al., 2006; Ahern, 2012). Panels C and D show that the average acquirer is larger and has stock that is more liquid than the average target firm. Lastly Panel E shows that within the sample, 23% of M&As are tender offers and 18% are cross-industry deals.

[Insert Table 3 here]

3.4. Correlations between PIN, firm characteristics and information asymmetry

The key contribution of our paper is in examining the role of PIN in M&As, as there is already a battery of papers that documents the association between commonly used information asymmetry measures and M&A outcomes. To confirm that PINs differ systematically from the measures of information asymmetry commonly used in the literature, we present a correlation matrix between PINs, firm characteristics, and several measures of information asymmetry for both the acquirer and the target firms. Specifically, we use tangibility of a firm's assets, the dispersion of analyst forecasts (Chemmanur, Paeglis, and Simonyan, 2009; Moeller, Schlingemann, and Stulz, 2007), analyst forecast errors (Chemmanur, Paeglis, and Simonyan, 2009), earnings quality (McNichols and Stubben, 2015), idiosyncratic volatility and the number of large shareholders (Moeller, Schlingemann, and Stulz, 2007) as explicit measures of information asymmetry. Table 4 shows that firms with higher PINs are smaller and have less liquid stocks and a lower valuation. More importantly, consistent with our expectations, the results show that PIN has a very low correlation with common measures of information asymmetry (<0.09), suggesting that PIN differs systematically from the information asymmetry measures commonly used in the M&A literature.

[Insert Table 4 here]

4. Results

4.1 Results on PIN and method of payment

Table 5 reports the regression results of the relationship between acquirer PIN, target PIN, and the method of payment in M&As controlling for various acquirer and target firm characteristics and deal characteristics. To capture the incremental impact of PIN on M&A outcomes, we control for several measures of information asymmetry for both the acquirer and the target. Specifically, we control for the difference between acquirer's and target's dispersion of analyst forecasts (Moeller, Schlingemann, and Stulz, 2007; Chemmanur, Paeglis, and Simonyan, 2009), analyst forecast errors (Chemmanur, Paeglis, and Simonyan, 2009), earnings quality measured by abnormal accruals (McNichols and Stubben, 2015), idiosyncratic volatility and the number of large shareholders (Moeller, Schlingemann, and Stulz, 2007).[3] To ensure that stock illiquidity is not driving our results, we also include the Amihud (2002) illiquidity measure as a control variable. In addition, due to the presence of serial acquirers in our sample, the residuals in our regressions can be correlated and therefore may overstate the *t*-statistics (Petersen, 2009). To control for this potential issue, we cluster standard errors by acquiring firm in all our regressions. We also control for time and industry fixed effects in all of our regression models.

We start with a two-boundary Tobit model that regresses the percentage of cash financing on acquirer PIN and target PIN controlling for various acquirer and target firm characteristics. The results in Column (1) show that acquirers with higher PINs use a higher percentage of cash in financing their M&A deals, and also acquirers tend

[3] Controlling for the difference in various information asymmetry measures helps us to better interpret the results. Our results are similar if we control for various information asymmetry measures separately for acquirers and targets.

to use more equity financing when acquiring targets with higher PINs. Both of these relationships are statistically significant at the 1% level.

The coefficients of firm-level control variables exhibit the expected signs. Larger firms tend to use more cash due to their better access to debt financing (Faccio and Masulis, 2005); firms with more tangible assets have a lower cost of debt, which makes cash financing more attractive (Myers, 1977); firms with more investment opportunities prefer to use equity financing because it allows them to have more discretion over their internal capital (Martin, 1996); highly leverage firms are more constrained in their ability to issue debt and as a consequence are more likely use stock financing (Faccio and Masulis, 2005); bidders prefer to finance with stock when their equity experiences a recent stock price run-up and has a higher market valuation (Myers and Majluf, 1984; Hansen, 1987); and highly leveraged targets have higher level of information risk and hence bidders are more likely to use equity financing to share the target's high information risk (Petacchi, 2015). Furthermore, we see that all of the variables capturing the difference in information asymmetry between the acquirer and target are positively related (at the 1% level) to the percentage of cash financing, which is consistent with the view that acquirers with higher information asymmetry are more likely to use cash financing due to their high cost of equity.

Next, we include deal level controls in Column (2). The results show that the coefficient estimates of acquirer PIN and target PIN continue to be significant at the 1% level. The coefficients of our deal-level control variables also exhibit the expected signs. Acquirers tend to use cash as the method of payment in tender offers in order to avoid long delays as tender offers involving stock as the financing method must be made in accordance with the Securities Act of 1933 (Gilson, 1986; Fishman, 1989); bidders acquiring large targets are more likely to use equity financing to share the information

risk as information asymmetry is likely to rise as target assets rise in value relative to those of a bidder (Hansen, 1987); and bidders are more likely to use equity financing to acquire targets in a different industry to share the target's information risk due to their lack of knowledge in the target industry.

[Insert Table 5 here]

For robustness, we follow Faccio and Masulis (2005) and use an ordered Probit model to examine the association between acquirer and target PINs and the method of payment in M&As. The dependent variable takes the value of 1 for pure stock deals, 2 for mixed stock and cash and 3 for all-cash deals. The results are reported in Columns (3) and (4). Consistent with the results in Columns (1) and (2), we show that acquirers with higher PINs are more likely to use cash financing, and acquirers are more likely to use equity financing when acquiring targets with higher PINs. Overall, the results in Table 5 confirms the first and second hypothesis that acquirers with a higher PIN are more likely to use cash financing as cash is less sensitive to private information than stock, and bidders use more equity financing to acquire targets with a higher PIN to share the target's information risk with the target's shareholders as suggested by Hansen (1987).

4.2 Results on PIN and acquirer announcement returns

Next, we examine the relation between PIN and acquirer announcement returns. To calculate acquirer abnormal returns around the deal announcement, we follow Masulis, Wang, and Xie (2007) by first estimating the market model for each acquirer over a 200-day period ending 11 days before the announcement date (-210, -11) with the CRSP value-weighted return used as the reference market return. We then use the estimated parameters to calculate the cumulative abnormal returns (CARs) over a five-

day (-2, 2) event window centered on the announcement date.

The results in Table 5 suggest that the choice of method of payment in takeovers is non-random, and are associated with bidder and target firm characteristics. In addition, acquisition decisions, like many other firm decisions, are also non-random and influenced by managerial expectations and firm characteristics. To control for possible self-selection bias, we follow Huang et al. (2014) and use a two-stage Heckman model (Heckman, 1979). In particular, in the first stage, we employ a probit regression of the likelihood of takeovers for the full sample, where firm size, Tobin's Q, leverage, asset tangibility, leverage, stock price run-up, sales growth and price-to-earnings ratio are used as the explanatory variables (Huang et al. 2014). For cash, mixed or stock deals, we model the likelihood of cash (or stock) deals using the specification in Column 4 of Table 5 as the first-stage probit model. In the second stage, we include the Inverse Mills ratio as an explanatory variable in the analyses of announcement returns. Table 6 presents the results of the second stage regression on the relationship between PINs and acquirer CARs around the deal announcement date.

The results in Column 1 of Table 6 show that acquirers with higher PINs are more likely to experience higher CARs around the deal announcement date. When dividing the sample into cash-only deals, mixed deals, and stock-only deals, we find that the positive relationship between acquirer PINs and announcement-period CARs is only evident in cash deals (at the 1% level), consistent with H3a that acquirers with a higher PIN are likely to obtain a higher abnormal announcement return for cash deals. However, we fail to find supportive evidence on H3b that bidders with higher PINs obtain lower announcement returns when paying by stock, as the coefficient on bidder PINs is negative but insignificant for stock deals. This suggests that, different from other common measures of information asymmetry, the association between PINs and

announcement returns is not existent when stock is used as a medium of exchange in takeovers.

We also include target PINs and examine its relation with acquirer announcement returns. Consistent with the view that higher PINs of the targets are likely to lead to reduced precision in the estimate of target firm value and an increased likelihood of overvalued offer prices, we find a negative and significant association between target PINs and acquirer returns, especially for cash deals. This supports H4b that bidders obtain lower announcement returns when acquiring targets with high PINs in cash deals.

Overall, our results of a positive relation between acquirers' PINs and announcement returns for cash offers are consistent with the finding of Moeller, Schlingemann, and Stulz (2007) that cash offers made by bidders with high information asymmetry are considered a signal of undervaluation of the bidder's equity, thereby leading to higher announcement-period abnormal returns.

[Insert Table 6 here]

4.3 Results on Target PIN and target announcement returns

Lastly, we examine the relation between PINs and target firm announcement returns. Table 7 presents the regression results on the relation between acquirer PINs, target PINs and target CARs around the deal announcement date. We use the same procedure to calculate target firms' 5-day CAR around the deal announcement as employed for acquiring firms, and the Heckman two-stage model to address possible selection bias. The results in Column (1) show that, on average, targets with higher PINs have higher announcement-period CARs. When separating deals into cash, mixed and stock deals, we find that the positive and significant association between target PINs and CARs is only evident in the sample of cash deals (at the 5% level). The results

are consistent with H4a that target firms with higher PINs obtain higher announcement returns when receiving cash payment. This finding also supports the view that bidders who have discovered the high level of information asymmetry in the target firm are likely to use more equity financing when acquiring targets to share the information risk with the target's shareholders.

[Insert Table 7 here]

5. Further analysis

5.1 Offer premium and PIN

Since the actual offer prices of deals are often available, prior research also analyse takeover premiums in addition to the announcement-period abnormal returns of the target firms. Similar to the argument for the targets announcement-period CARs, we expect target PINs to be positively related to takeover premiums and to be concentrated in cash deals. Table 8 reports the regression results on the relation between PIN and takeover premiums. Following prior studies (Lin, Officer, and Zou, 2011; Golubov, Petmezas, and Travlos, 2012), the takeover premium is defined as the 4-week bid premium in percentage reported by SDC (field PREM4WK). The 4-week bid premium is calculated as the offer price over target's closing stock price 4 weeks prior to the announcement date.

Similar to the results for announcement-period CARs in Table 7, the results in Column 1 show that bidders tend to pay a higher takeover premium when acquiring targets with higher PINs. However, acquirer PINs are not significantly associated with takeover premium. When considering cash, mixed and stock deals separately, we find that a positive relationship between targets' PIN and takeover premium only occurs in cash deals (significant at the 10% level). Interestingly, the association between target

PIN and takeover premiums in equity deals is negative, suggesting that the sharing of information risk with target shareholders results in reduced offer prices. Overall, the results in Table 8 confirm that targets with higher PINs tend to receive a higher takeover premium in cash deals.

[Insert Table 8 here]

5.2 Alternative measure of PIN

Many of the seminal empirical studies (e.g. Easley, Hvidkjaer, and O'Hara, 2002; Easley and O'Hara, 2004) investigating the role of PIN on asset pricing and corporate policies use the EKO PIN measure developed by Easley, Hvidkjaer, and O'Hara (2002). For our results to be comparable to those in these previous studies, we also use the EKO PIN provided by Soeren Hvidkjaer to examine the relationship between PIN and acquisition outcomes. This alternative PIN measure covers the period from 1983 to 2001.[4] In addition, we acknowledge that more than half of our sample firms are from the manufacturing industry. While industry fixed effect is included in our analysis, we also use an industry-adjusted PIN measure to minimize the effect of potential outliers.[5] Table 9 presents the results that use the industry-adjusted PIN measure and the EKO PIN measure. We find that our main results continue to hold.

[Insert Table 9 here]

5.3 PIN and method of payment: The role of corporate governance and Reg FD

Agency theory predicts that, due to conflict of interest, managers do not always act in the best interest of shareholders in corporate decisions such as mergers and

[4]Source: https://sites.google.com/site/hvidkjaer/data. We thank Soeren Hvidkjaer for making the data publicly available.

[5] We thank the reviewer for suggesting the use of the industry-adjusted PIN measure.

acquisitions. Thus, corporate governance mechanisms can play an important role in preventing managers from engaging in value-destroying acquisitions. For example, Masulis et al. (2007) document that acquiring firms with more antitakeover provisions obtain lower announcement returns, suggesting managers who are immune to the disciplining of the takeover market tend to engage in value-destroying takeovers. However, it is important to note that "corporate governance does not have a single and unique impact on takeovers (Aktas et al. 2016: p.248)". Accordingly, it is unclear whether the association between PINs and acquisition outcomes would be more pronounced or weaker among firms with strong governance environments.

On the one hand, the relation between PINs and acquisition outcomes can be weaker if a better governance environment and monitoring reduce information asymmetry and insider trading. On the other hand, Ferreira and Laux (2007) show that firms with fewer antitakeover provisions (more external disciplining) demonstrate a higher degree of private information flow, indicating a more pronounced relation between PINs and takeover outcomes. To examine the effect of governance, we follow Masulis et al. (2007) to include the G-Index based on a firm's antitakeover provisions in the regression models and its interaction with PIN. The results reported in Column (1) of Table 10 show that, compared to acquirers with fewer antitakeover provisions, bidders with less external disciplining (i.e., more provisions) are less inclined to use cash financing when its own PIN is high, but tend to use more cash financing when acquiring targets with a high PIN to share the target's information risk (Hansen 1987).[6] The finding is consistent with Masulis et al. (2007) that managerial tendency of engaging in value-destroying takeovers increases with less disciplining from a firm's

[6] We also conduct the tests for announcement returns but do not find any significant difference for firms with more antitakeover provisions (i.e., high G-index).

governance mechanisms.

Regulation Fair Disclosure (FD) imposed by the Securities and Exchange Commission (SEC) in 2000 aimed to prohibit disclosure of material private information to selected market participants. However, prior research documents mixed evidence on the effectiveness of Regulation FD in reducing a firm's degree of information asymmetry. Sidhu et al. (2008) show that Nasdaq's stocks' degree of information asymmetry increases by about 40% after the adoption of Regulation FD. On the other hand, Eleswarapu et al. (2004) document a significant decline in information asymmetry following Regulation FD. Given the mixed evidence on the effectiveness of Regulation FD, it is unclear whether and how the implementation of Regulation FD affects the relation between PINs and acquisition outcomes. We assess the impact of Regulation FD by interacting the indicator of Regulation FD with PIN. The results of our analysis in Table 10 shows that, after the implementation of Regulation FD in 2000, bidders with high PINs are less likely to use cash financing for mergers and acquisitions, but continue to rely on more equity financing when acquiring targets with high PINs.[7]

[Insert Table 10 here]

6. Conclusion

Previous M&A research documents that information asymmetry plays an important role in mergers and acquisitions. This study extends this body of research to examine the incremental role of information asymmetry across investor groups (i.e., PIN) on the choice of payment method in M&As. We suggest that cash, being less sensitive to private information held by investors than stock, is the preferred choice of

[7] Our tests for announcement returns reveal no significant difference before and after the adoption of Regulation FD.

payment method for bidders with large amounts of private information. We find that acquirers with higher PINs use a greater proportion of cash in financing their M&A deals after controlling for various information asymmetry measures. We also find that acquirers are more likely to use stock financing to acquire targets with higher PINs, confirming the notion that acquirers use equity to share the information risk with target shareholders.

We then consider the association between PIN and acquirers' and targets' cumulative abnormal returns around the deal announcement date. Our results demonstrate that acquirers with higher PINs obtain higher CARs around the deal announcement in cash financed deals as the market considers cash offers as a signal that the acquirer's stock is undervalued. Similarly, targets with higher PINs are found to experience higher CARs and offer premiums in cash financed deals since paying by cash shows that the acquirer is not likely to have noticed the information risk in the target firm and is likely to have overpaid.

Overall, our paper contributes to the extant literature on M&As by showing that PIN plays a crucial role in affecting M&A outcomes beyond other commonly used information asymmetry measures. Future research in this area may focus on examining whether PIN affects other types of corporate policies such as managerial compensation structures and managerial risk-taking.

References

Ahern, K.R., 2012, Bargaining power and industry dependence in mergers. Journal of Financial Economics 103, 530–550.

Aktas, N., E., Croci, and S.A., Simsir, 2016, Corporate governance and takeover outcomes, Corporate Governance: An International Review 3(24), 242-252.

Amihud, Y., 2002, Illiquidity and stock returns: cross-section and time-series effects. Journal of Financial Markets 5, 31–56.

Andrade, G., M. Mitchell, and E. Stafford, 2001, New evidence and perspectives on mergers. Journal of Economic Perspectives 15, 103–120.

Bazerman, M., and W. Samuelson, 1983, I won the auction but don't want the prize, Journal of Conflict Resolution 27, 618–634.

Betton, S., B.E. Eckbo, and K. Thorburn. 2008, Corporate takeovers, In: Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 2, Eckbo, B.E. (Ed.), p. 291–430. North-Holland: Elsevier.

Bharath, S., P.T. Pasquariello, and G. Wu, 2009, Does asymmetric information drive capital structure decisions? Review of Financial Studies 22, 3211–3243.

Brown, D. T. and M.D. Ryngaert, 1991, The mode of acquisition in takeovers: Taxes and asymmetric Information, Journal of Finance 46, 653–669.

Brown, S., and S.A. Hillegeist, 2007, How disclosure quality affects the level of information asymmetry. Review of Accounting Studies 12, 443–477.

Chang, S., 1998, Takeovers of privately held targets, method of payment, and bidder returns. Journal of Finance 53, 773–784.

Chen, Q., I. Goldstein, and W. Jiang, 2007, Price informativeness and investment sensitivity to stock price, Review of Financial Studies 20, 619–650.

Chemmanur, T., I. Paeglis, and K. Simonyan, 2009, The medium of exchange in acquisitions: Does the private information of both acquirer and target matter? Journal of Corporate Finance 15, 523–542.

Dang, C., Z.F., Li, and C., Yang, 2018, Measuring firm size in empirical corporate finance, Journal of Banking & Finance 86, 159-176.

DeAngelo, H., and R.W. Masulis, 1980, Optimal capital structure under corporate and personal taxation, Journal of Financial Economics 8, 3–29.

Dechow, P., R. Sloan, and A. Sweeney, 1995, Detecting earnings management. Accounting Review 70, 193–226.

Dong, M., D. Hirshleifer, S. Richardson, and S.H. Teoh, 2006. Does investor misevaluation drive the takeover market? Journal of Finance 61, 725–762.

Duarte, J. and Young, L., 2009. Why is PIN priced? Journal of Financial Economics, 91, 119–138.

Easley D. and M. O'Hara, 2004, Information and the cost of capital, Journal of Finance 59, 1553–1583.

Easley, D., N.M. Kiefer, and M. O'Hara, 1997, One day in the life of a very common stock, Review of Financial Studies 10, 805–835.

Easley, D., S. Hvidkjaer, and M. O'Hara, 2002, Is information risk a determinant of asset returns? Journal of Finance 57, 2185–2221.

Eleswarapu, V.R., R., Thompson, and K., Venkataraman, 2004, The impact of Regulation Fair Disclosure: Trading costs and information asymmetry, Journal of Financial and Quantitative Analysis 39(2), 209-225.

Faccio, M. and R.W. Masulis, 2005, The choice of payment method in european mergers and acquisitions, Journal of Finance 3, 1345–1388.

Ferreira, M.A. and P.A., Laux, 2007, Corporate governance, idiosyncratic risk, and

information flow, The Journal of Finance, 62, 951–989.
Fishman, M., 1989, Preemptive bidding and the role of the medium of exchange in acquisitions, Journal of Finance 44, 41–57.
Fuller, K., J. Netter, and M. Stegemoller, 2002, What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. Journal of Finance 67, 1763–1793.
Gilson, R. J., M. S. Scholes, and M. A.Wolfson, 1988, Taxation and the dynamics of corporate control: The uncertain case for tax-motivated acquisitions. in J. C. Coffe, L. Lowenstein and S. Rose-Ackerman (Ed.), Knights, Raiders and Targets: The Impact of the Hostile Takeover. (Oxford University Press, New York).
Golubov, A., D. Petmezas, and N.G. Travlos, 2012, When it pays to pay your investment banker: New evidence on the role of financial advisors in M&As, Journal of Finance 67, 271–311.
Hansen, R.G., 1987, A theory for the choice of exchange medium in mergers and acquisitions, Journal of Business 60, 75–95.
Jensen, M.C, 1986, Agency costs of free cash flow, corporate finance, and takeovers, American Economic Review 76, 323–29.
Jones, J., 1991, Earnings management during import relief investigation. Journal of Accounting Research 29, 193–228.
Jung, K., Y.C. Kim, and R.M. Stulz, 1996, Timing, investment opportunities, managerial discretion, and the security issue decision, Journal of Financial Economics 42, 159–185.
Lin, C., M.S. Officer, and H. Zou, 2011, Directors' and officers' liability insurance and acquisition outcomes, Journal of Financial Economics 102, 507–525.
Martin, K.J., 1996, The method of payment in corporate acquisitions, investment opportunities, and management ownership, Journal of Finance 51, 1227–1246.
Masulis, R.W., C., Wang, and F., Xie, 2007, Corporate governance and acquirer returns, The Journal of Finance 62(4), 1851-1889.
McNichols, F., and S.R. Stubben, 2015, The effect of target-firm accounting quality on valuation in acquisitions, Review of Accounting Studies 20, 110–140.
Moeller, S., F. Schlingemann, and R.M. Stulz, 2005, Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave, Journal of Finance 60, 757–782.
Moeller, S.B., F.P. Schlingemann and R.M. Stulz, 2007, How do diversity of opinion and information asymmetry affect acquirer returns? Review of Financial Studies 20, 2047–2078.
Myers, S.C., 1977, Determinants of corporate borrowing, Journal of Financial Economics 5, 147–175.
Myers, S.C., and N.S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, Journal of Financial Economics 13, 187–221.
Pasquariello, P., and C., Vega, 2007, Informed and strategic order flow in the bond markets, Review of Financial Studies 20,1975–2019.
Petachhi, R., 2015, Information asymmetry and capital structure: Evidence from regulation FD, Journal of Accounting and Economics 59, 143–162.
Peterson, M.A., 2009, Estimating standard errors in financial panel data sets: Comparing approaches, Review of Financial studies 22, 435–480.
Raman, K., L. Shivakumar, and A. Tamayo, 2013, Target's earnings quality and bidders' takeover decisions, Review of Accounting Studies 18, 1050–1087.

Rhodes-Kropf, M. and S. Viswanathan, 2004, Market valuation and merger waves, Journal of Finance 59, 2685–2718.
Sadka, R., and A., Scherbina, 2007, Analyst disagreement, mispricing, and liquidity, Journal of Finance 62, 2367–2403.
Shleifer, A. and R. Vishny, 2003, Stock market driven acquisitions, Journal of Financial Economics 70, 295–311.
Sidhu, B., T., Smith, R.E., Whaley, and R.H., Willis, 2008, Regulation fair disclosure and the cost of adverse selection, Journal of Accounting Research 46(3), 697-728.
Stulz, R., 1988, Managerial control of voting rights: Financing policies and the market for corporate control. Journal of Financial Economics 20, 25–54.
Travlos, N.G., 1987, Corporate takeover bids, method of payment, and bidding firms' stock returns, Journal of Finance 42, 943–963.
Venter, J.H., and D. De Jongh, 2006. Extending the eko model to estimate the probability of informed trading. Studies in Economics and Econometrics 30, 25–39.

Table 1: Variable Definitions

Variable	Definition
Panel A: PIN and method of payment	
PIN	The probability of informed trading measure used in Brown and Hillegeist (2007) for the firm at the end of the year before the acquisition. Source: http://scholar.rhsmith.umd.edu/sbrown/pin-data
EKO PIN	The probability of informed trading measure computed using the EKO model in Easley, Hvidkjaer, and O'Hara (2010) for the firm at the end of the year before the acquisition. Source:http://scholar.rhsmith.umd.edu/sbrown/probability-informed-trade-easley-et-al-model
Cashper	Cash as percentage of the overall value of the payment. Cash includes actual cash, liabilities and newly issued notes. Source: SDC.
Choice	Equal to 1 for pure stock deals, 2 for mixed stock and cash and 3 for all cash deals. Source: SDC
Panel B: CAR and takeover premium	
Acquirer CAR (-2,+2)	Acquiring firm five day cumulative abnormal return calculated using the market model. The market model parameters are estimated over the period (-210,-11) with the CRSP equally weighted return as the market index. Source: CRSP
Target CAR (-2,+2)	Target firm five day cumulative abnormal return calculated using the market model. The market model parameters are estimated over the period (-210,-11) with the CRSP equally weighted return as the market index. Source: CRSP
Premium	Difference between the offer price and the target share price 4 weeks prior to the announcement, expressed as a percentage. Source: SDC
Panel C: Firm characteristics	
Firm size	The log of net sales (SALE) of the acquirer at the end of the year before the acquisition. Source: Compustat.
Asset tangibility	Acquirer's ratio of fixed assets (PPE) to total assets (AT) at the end of the year before the acquisition. Source: Compustat.
Tobin's q	Acquirer's market value of assets over book value of assets (AT - CEQ + CSHO*PRCC)/AT) at the end of the year before the acquisition. Source: Compustat.
Leverage	Acquirer's book value of debt (DLTT+DLC) divided by book value of total assets (AT) at the end of the year before the acquisition. Source: Compustat.
Stock price run-up	Acquirer's buy and hold abnormal return (BHAR) during the period (-210,-11) days. The market index is the CRSP value-weighted return. Source: CRSP.
Illiquidity	Amihud (2002) illiquidity ratio measured as annual average of the daily ratio of absolute value of stock return divided by dollar trading volume in the year before the deal announcement.

	Source: CRSP.
Forecast dispersion	The standard deviation of analyst earnings forecasts over the absolute value of the mean earnings forecasts before the deal announcement. Source: I/B/E/S.
Forecast error	The difference between the mean earnings forecast before the deal announcement and the actual earnings, divided by share price. Source: I/B/E/S.
Abnormal accruals	The absolute value of discretionary accruals estimated from the modified version of the Jones model (Jones, 1991; Dechow, Sloan and Sweeney, 1995). Source: Compustat
Dividend payer	Dummy variable that equals one if the company paid a dividend, and zero otherwise. Source: Compustat
No. of Blockholders	Number of institutional investors with a holding of 5% of more. Source: 13f filings
Idiosyncratic volatility	The standard deviation of monthly returns over the year. Source: CRSP.
G-Index	Governance index based on 24 antitakeover provisions. Source: Gompers et al. (2003)
Reg FD	Dummy variable that equals one for years 2001 and onwards, and zero otherwise.
Panel D: Deal characteristics	
Tender offer	Dummy variable that equals one if the deal is a tender offer and zero otherwise. Source: SDC.
Relative deal size	Ratio of the deal value to the deal value plus the acquirer's market capitalization at the end of the year before the acquisition. Source: SDC and Compustat.
Cross industry	Dummy variable that equals one if the acquirer and target do not share a 2-digit SIC industry. Source: SDC.

Table 2: Year and Industry Distribution of M&As

This table reports the year (Panel A) and industry distribution (Panel B) of the M&A transactions.

Panel A: M&A sample distribution by year		
Year	Frequency	%
1994	95	5.51
1995	127	7.37
1996	131	7.6
1997	136	7.89
1998	195	11.31
1999	148	8.58
2000	152	8.82
2001	60	3.48
2002	46	2.67
2003	60	3.48
2004	74	4.29
2005	87	5.05
2006	94	5.45
2007	107	6.21
2008	68	3.94
2009	18	1.04
2010	56	3.25
2011	70	4.06
Total	1,724	100.00
Panel B: M&A sample distribution by industry		
SIC code	Frequency	%
01-09 Agriculture, Forestry and Fishing	3	0.17
10-14 Mining	79	4.58
15-17 Construction	10	0.58
20-39 Manufacturing	888	51.51
40-48 Transportation and Communications	154	8.93
50-51 Wholesale Trade	58	3.36
52-59 Retail Trade	154	8.93
70-89 Services	377	21.87
90-99 Nonclassifiable	1	0.06
Total	1,724	100.00

Table 3: Summary Statistics

This table reports summary statistics for variables constructed based on the sample of 1,724 completed mergers and acquisitions (listed in SDC) between 1994 and 2011. Panel A reports summary statistics for PIN and method of payment. Panel B reports summary statistics for CARs and takeover premiums. Panel C reports summary statistics for acquirer characteristics. Panel D reports summary statistics for target characteristics. Panel E reports summary statistics for deal characteristics. Variable definitions are provided in Table 1.

Variable	Mean	St Dev	Q1	Median	Q3
Panel A: PIN and Method of Payment					
Acquirer PIN	0.14	0.08	0.09	0.13	0.18
Target PIN	0.17	0.09	0.11	0.15	0.21
Cashper	68.22	43.89	0.00	100.00	100.00
Choice	2.42	0.80	2.00	3.00	3.00
Panel B: CAR and Takeover premium					
Acquirer CAR (%)	-0.05	9.41	-4.27	0.28	4.39
Target CAR (%)	13.66	21.02	1.04	7.77	21.43
Premium (%)	29.99	36.23	5.44	26.26	48.74
Panel C: Bidder Characteristics					
Firm size	7.41	1.91	6.09	7.31	8.82
Asset tangibility	0.51	0.37	0.21	0.41	0.73
Dividend payer	0.54	0.50	0.00	1.00	1.00
Tobin's q	2.35	2.32	1.34	1.80	2.60
Leverage	0.20	0.17	0.05	0.18	0.31
Amihud illiquidity	0.07	0.47	0.00	0.00	0.01
Stock price run-up	-0.04	0.51	-0.28	-0.03	0.23
Idiosyncratic volatility	0.02	0.01	0.02	0.02	0.03
Number of blockholders	1.92	1.58	1.00	1.75	2.75
Forecast dispersion	0.07	0.19	0.01	0.02	0.05
Forecast error	0.04	1.32	0.00	0.00	0.00
Abnormal accruals	0.09	0.10	0.03	0.06	0.12
Panel D: Target Characteristics					
Firm size	6.43	1.94	5.07	6.25	7.68
Asset tangibility	0.50	0.38	0.20	0.41	0.70
Tobin's q	2.17	1.67	1.28	1.68	2.39
Leverage	0.20	0.20	0.02	0.17	0.31
Amihud illiquidity	0.21	1.90	0.00	0.01	0.05
Stock price run-up	-0.03	0.60	-0.32	-0.03	0.27
Idiosyncratic volatility	0.03	0.02	0.02	0.03	0.04
Number of blockholders	1.91	1.54	1.00	1.75	2.75
Forecast dispersion	0.10	0.31	0.01	0.03	0.07
Forecast error	0.04	1.32	0.00	0.00	0.00
Abnormal accruals	0.07	0.08	0.02	0.04	0.08
Panel E: Deal Characteristics					
Tender offer	0.23	0.42	0.00	0.00	0.00
Relative deal size	0.27	0.42	0.05	0.11	0.29
Cross industry	0.18	0.38	0.00	0.00	0.00

Table 4: Correlation between PIN, Firm Characteristics and Various Information Asymmetry Measures

This table presents the correlation matrix between PIN, firm characteristics, and various information asymmetry measures. Panel A reports correlations between acquirer PIN and acquirer firm characteristics and information asymmetry. Panel B reports correlations between target PIN and target firm characteristics and information asymmetry. Variable definitions are provided in Table 1.

Panel A

	Acquirer PIN	Firm size	Asset tangibility	Tobin's q	Leverage	illiquidity	Stock price run-up	Idiosyncratic volatility	Number of blockholders	Forecast dispersion	Forecast error	Abnormal accruals
Acquirer PIN	1.00											
Firm size	-0.36	1.00										
Asset tangibility	0.08	0.18	1.00									
Tobin's q	-0.15	-0.11	-0.15	1.00								
Leverage	0.08	0.19	0.26	-0.21	1.00							
illiquidity	0.17	-0.09	-0.01	-0.03	0.00	1.00						
Stock price run-up	0.02	0.04	0.04	-0.06	0.02	0.02	1.00					
Idiosyncratic volatility	0.07	-0.54	-0.20	0.17	-0.15	0.10	-0.05	1.00				
Number of blockholders	-0.01	-0.23	-0.10	-0.08	-0.02	-0.01	-0.01	0.01	1.00			
Forecast dispersion	0.08	-0.04	0.05	-0.01	0.04	0.01	0.00	0.06	-0.02	1.00		
Forecast error	0.01	-0.01	0.00	-0.01	0.02	0.00	-0.01	0.06	-0.01	0.01	1.00	
Abnormal accruals	0.00	-0.19	-0.15	0.19	-0.11	0.00	-0.03	0.25	-0.02	-0.01	0.01	1.00

Panel B

	Target PIN	Firm size	Asset tangibility	Tobin's q	Leverage	illiquidity	Stock price run-up	Idiosyncratic volatility	Number of blockholders	Forecast dispersion	Forecast error	Abnormal accruals
Target PIN	1.00											
Firm size	-0.32	1.00										
Asset tangibility	0.03	0.27	1.00									
Tobin's q	-0.20	-0.15	-0.17	1.00								
Leverage	0.05	0.23	0.30	-0.19	1.00							
illiquidity	0.18	-0.11	-0.03	-0.03	0.04	1.00						
Stock price run-up	0.10	-0.02	0.03	-0.15	0.01	0.07	1.00					
Idiosyncratic volatility	0.09	-0.58	-0.28	0.15	-0.12	0.14	0.02	1.00				
Number of blockholders	0.00	-0.09	-0.05	-0.06	0.01	-0.02	-0.01	-0.08	1.00			
Forecast dispersion	0.07	-0.09	0.06	-0.08	0.08	0.04	0.09	0.15	0.01	1.00		
Forecast error	0.01	-0.01	0.00	-0.01	0.08	0.00	-0.05	0.10	-0.01	0.05	1.00	
Abnormal accruals	0.04	-0.23	-0.19	0.14	-0.05	-0.01	-0.05	0.33	-0.01	0.04	0.12	1.00

Table 5: PIN and Method of Payment

This table reports the regressions of the method of payment in M&As on acquirer and target firm PIN. The estimations in columns (1) and (2) are based on a two-boundary Tobit model to reflect the lower and upper bound on the dependent variable (*Cashper*). The estimations in columns (3) and (4) are based on an ordered Probit model. Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

	Dep. = Cashper		Dep.=Choice	
	(1)	(2)	(3)	(4)
Acquirer PIN	457.467***	522.266***	1.927**	2.472***
	(14.127)	(18.746)	(2.481)	(2.936)
Target PIN	-248.493***	-376.302***	-0.937	-1.642**
	(-8.862)	(-15.772)	(-1.473)	(-2.159)
Firm size	-0.290	-13.518***	0.010	-0.052*
	(-0.370)	(-20.171)	(0.344)	(-1.718)
Asset tangibility	67.355***	56.106***	0.331**	0.340**
	(9.120)	(8.670)	(2.403)	(2.296)
Dividend payer	55.879***	36.379***	0.236***	0.194**
	(10.450)	(7.737)	(2.577)	(2.034)
Tobin's q	-29.650***	-28.615***	-0.152***	-0.179***
	(-17.997)	(-20.850)	(-4.823)	(-5.291)
Leverage	-163.218***	-84.222***	-0.901***	-0.672**
	(-10.640)	(-6.285)	(-3.397)	(-2.456)
Illiquidity	103.642***	62.129***	0.469**	0.364*
	(16.070)	(11.063)	(2.409)	(1.859)
Stock price run-up	-74.168***	-39.820***	-0.322***	-0.213**
	(-31.857)	(-18.415)	(-3.769)	(-2.417)
Target Tobin's q	6.672***	12.740***	0.024	0.061**
	(4.074)	(9.182)	(0.864)	(2.142)
Target Leverage	-143.993***	-73.854***	-0.335	-0.013
	(-10.688)	(-6.278)	(-1.528)	(-0.055)
Target Illiquidity	-5.836***	-2.884*	-0.037	-0.033
	(-4.381)	(-1.915)	(-0.691)	(-0.587)
Target stock price run-up	10.209***	14.303***	0.012	0.039
	(5.143)	(8.169)	(0.167)	(0.560)
Diff in forecast dispersion	28.311***	15.994***	0.085	0.045
	(14.534)	(10.267)	(1.023)	(0.567)
Diff in forecast error	-19.081**	7.309	0.062	0.203
	(-2.482)	(1.199)	(0.147)	(0.444)
Diff in abnormal accruals	-21.760***	18.742***	-0.094	0.016
	(-2.870)	(3.071)	(-0.302)	(0.049)
Diff in idiosyncratic vol.	4082.038***	4226.532***	19.158***	23.775***
	(21.974)	(27.479)	(5.209)	(6.456)
Diff in no. of blockholders	-8.797***	-2.938***	-0.056**	-0.049*
	(-22.098)	(-8.017)	(-2.286)	(-1.879)
Tender offer		128.530***		0.640***
		(28.296)		(6.335)
Relative deal size		-242.139***		-1.210***
		(-54.760)		(-10.222)
Cross-industry		-94.278***		-0.586***
		(-24.899)		(-6.340)
Intercept 1	1372.236***	999.092***	-5.842***	-5.390***
	(216.828)	(184.088)	(-16.180)	(-12.325)
Intercept 2			-5.128***	-4.529***
			(-13.640)	(-36.535)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1724	1724	1724	1724
Pseudo R^2	0.107	0.183	0.165	0.272

Table 6: PIN and Acquirer CAR

This table reports the regressions of acquirer CAR around the deal announcement date on acquirer and target PIN. Columns (1) reports regression results for the entire sample. Columns (2) reports regression results for pure cash deals. Columns (3) reports regression results for mixed deals. Columns (4) reports regression results for pure stock deals. Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

Dep. = Acquirer CAR	All deals	Cash deals	Mixed deals	Stock deals
	(1)	(2)	(3)	(4)
Acquirer PIN	36.840**	61.976***	185.072	-140.647
	(1.989)	(4.271)	(1.055)	(-0.501)
Target PIN	-19.413	-35.481***	-112.698	90.387
	(-1.536)	(-3.362)	(-0.952)	(0.486)
Firm size	-1.082**	-1.679***	-3.825	2.784
	(-2.550)	(-4.731)	(-0.980)	(0.468)
Asset tangibility	3.584	6.957***	25.318	-21.076
	(1.369)	(3.444)	(1.028)	(-0.551)
Dividend payer	2.768*	4.950***	13.950	-10.784
	(1.783)	(4.175)	(0.985)	(-0.483)
Tobin's q	-2.550*	-4.396***	-12.491	9.333
	(-1.921)	(-4.365)	(-0.957)	(0.453)
Leverage	-6.935	-15.817***	-41.165	39.037
	(-1.297)	(-3.685)	(-0.851)	(0.513)
Illiquidity	3.601	7.027***	31.638	-9.935
	(1.456)	(4.006)	(1.188)	(-0.236)
Stock price run-up	-3.238*	-6.015***	-16.348	13.240
	(-1.880)	(-3.858)	(-1.047)	(0.549)
Target Tobin's q	0.567	1.282***	4.084	-3.808
	(1.195)	(2.860)	(0.919)	(-0.555)
Target Leverage	0.483	1.556	-2.947	-3.002
	(0.320)	(0.632)	(-1.019)	(-0.860)
Target Illiquidity	-0.497*	-0.550*	-3.261	1.690
	(-1.794)	(-1.691)	(-1.165)	(0.439)
Target stock price run-up	0.756	1.349	3.908	-2.065
	(1.238)	(1.474)	(1.283)	(-0.467)
Diff in forecast dispersion	-0.575	2.062	0.670	-2.304
	(-0.655)	(1.376)	(0.203)	(-0.456)
Diff in forecast error	8.467**	26.931***	8.869	-10.575
	(2.032)	(3.538)	(0.594)	(-0.449)
Diff in abnormal accruals	2.550	2.937	-1.653	-0.004
	(1.149)	(1.058)	(-0.301)	(-0.001)
Diff in idiosyncratic vol.	275.545	564.482***	1472.573	-1295.184
	(1.590)	(4.215)	(0.856)	(-0.478)
Diff in no. of blockholders	-0.206	-1.112***	-2.869	2.317
	(-0.511)	(-3.192)	(-0.801)	(0.412)
Tender offer	10.025**	16.846***	45.121	-31.538
	(2.192)	(5.166)	(0.984)	(-0.440)
Relative deal size	-17.247*	-23.786***	-84.551	57.784
	(-1.954)	(-3.602)	(-0.962)	(0.419)
Cross-industry	-7.120*	-15.232***	-40.520	31.052
	(-1.651)	(-4.949)	(-0.956)	(0.464)
Inverse mills ratio	10.335	23.087***	69.563	-55.356
	(1.362)	(4.173)	(0.925)	(-0.471)
Constant	-13.860*	-26.883***	-383.546	268.703
	(-1.692)	(-4.431)	(-0.931)	(0.493)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1723	1062	324	337
Pseudo R^2	0.153	0.108	0.164	0.238

Table 7: PIN and Target CAR

This table reports the regressions of target CAR around the deal announcement date on acquirer and target PIN. Columns (1) reports regression results for the entire sample. Columns (2) reports regression results for pure cash deals. Columns (3) reports regression results for mixed deals. Columns (4) reports regression results for pure stock deals. Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

Dep. = Target CAR	All deals	Cash deals	Mixed deals	Stock deals
	(1)	(2)	(3)	(4)
Acquirer PIN	-108.827**	-77.360**	-551.909	-485.943
	(-2.576)	(-2.426)	(-0.918)	(-0.933)
Target PIN	91.015***	76.157***	407.700	311.240
	(3.144)	(3.133)	(1.003)	(0.898)
Firm size	1.506	0.618	11.271	9.157
	(1.626)	(0.982)	(0.890)	(0.850)
Asset tangibility	-9.730*	-2.489	-73.410	-71.699
	(-1.733)	(-0.629)	(-0.881)	(-1.021)
Dividend payer	-3.973	-0.850	-45.238	-32.519
	(-1.173)	(-0.362)	(-0.978)	(-0.798)
Tobin's q	5.140*	1.973	42.177	33.139
	(1.705)	(0.914)	(0.959)	(0.870)
Leverage	18.177	8.979	155.069	123.295
	(1.501)	(0.849)	(0.935)	(0.875)
Illiquidity	-6.898	-1.191	-94.402	-66.772
	(-1.264)	(-0.337)	(-1.051)	(-0.879)
Stock price run-up	4.261	0.749	46.269	37.887
	(1.165)	(0.215)	(0.900)	(0.836)
Target Tobin's q	-3.754***	-2.619**	-17.541	-12.650
	(-3.431)	(-2.387)	(-1.155)	(-0.990)
Target Leverage	-6.295	-12.074	5.740	-6.013
	(-1.523)	(-1.577)	(0.549)	(-0.728)
Target Illiquidity	0.422	0.803	3.851	6.133
	(0.743)	(0.824)	(0.472)	(0.874)
Target stock price run-up	-2.933*	-1.711	-15.712	-8.097
	(-1.803)	(-0.625)	(-1.497)	(-0.977)
Diff in forecast dispersion	-0.865	0.351	-9.358	-8.659
	(-0.555)	(0.141)	(-0.839)	(-0.864)
Diff in forecast error	-11.286*	-1.475	-54.621	-40.407
	(-1.790)	(-0.116)	(-1.146)	(-0.835)
Diff in abnormal accruals	4.443	2.033	6.405	0.337
	(0.830)	(0.383)	(0.227)	(0.036)
Diff in idiosyncratic vol.	-1054.138***	-844.760***	-5832.747	-4289.564
	(-2.637)	(-2.900)	(-0.990)	(-0.866)
Diff in no. of blockholders	0.328	-0.659	10.062	8.440
	(0.371)	(-0.803)	(0.830)	(0.801)
Tender offer	-4.893	7.619	-139.804	-126.727
	(-0.480)	(1.152)	(-0.907)	(-0.960)
Relative deal size	32.123	12.614	287.168	209.152
	(1.602)	(0.956)	(0.959)	(0.822)
Cross-industry	17.720*	6.349	134.435	106.171
	(1.899)	(1.001)	(0.941)	(0.865)
Inverse mills ratio	-22.679	-4.163	-245.820	-184.898
	(-1.335)	(-0.373)	(-0.959)	(-0.856)
Constant	16.580	-4.687	1355.279	893.336
	(0.914)	(-0.378)	(0.964)	(0.890)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1723	1062	324	337
Pseudo R^2	0.213	0.404	0.067	0.055

Table 8: PIN and Takeover Premium

This table reports the regressions of takeover offer premium on acquirer and target firm PIN. Column (1) reports regression results for the entire sample. Column (2) reports regression results for pure cash deals. Column (3) reports regression results for mixed deals. Column (4) reports regression results for pure stock deals. Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

Dep. = Premium	All deals	Cash deals	Mixed deals	Stock deals
	(1)	(2)	(3)	(4)
Acquirer PIN	-82.515	-76.166	587.744	1931.513**
	(-1.169)	(-1.205)	(0.693)	(1.975)
Target PIN	89.185*	79.843*	-331.308	-1267.950*
	(1.914)	(1.726)	(-0.575)	(-1.936)
Firm size	2.304	4.498***	-13.333	-47.334**
	(1.504)	(3.086)	(-0.733)	(-2.252)
Asset tangibility	-10.336	-5.994	77.320	261.746*
	(-1.063)	(-0.724)	(0.646)	(1.941)
Dividend payer	-3.727	-5.346	50.583	165.231**
	(-0.680)	(-1.030)	(0.753)	(2.102)
Tobin's q	3.799	1.692	-33.520	-145.655**
	(0.762)	(0.363)	(-0.532)	(-2.012)
Leverage	12.360	-4.334	-153.707	-538.895**
	(0.618)	(-0.217)	(-0.663)	(-1.999)
Illiquidity	-1.743	4.315	51.252	267.968*
	(-0.187)	(0.501)	(0.395)	(1.817)
Stock price run-up	2.869	-1.055	-47.645	-175.092**
	(0.453)	(-0.174)	(-0.642)	(-2.070)
Target Tobin's q	-2.926	-2.621	5.501	49.052**
	(-1.551)	(-1.376)	(0.256)	(2.021)
Target Leverage	-5.265	-0.368	-13.497	-5.349
	(-0.744)	(-0.037)	(-0.938)	(-0.327)
Target Illiquidity	-0.661	0.894	-6.679	-27.945**
	(-0.693)	(0.505)	(-0.557)	(-2.068)
Target stock price run-up	0.922	2.846	7.126	35.040**
	(0.351)	(0.849)	(0.486)	(2.143)
Diff in forecast dispersion	4.821	-0.044	21.768	37.394**
	(1.295)	(-0.011)	(1.237)	(2.055)
Diff in forecast error	5.563	-5.818	57.728	148.671*
	(0.397)	(-0.133)	(0.829)	(1.808)
Diff in abnormal accruals	4.726	-3.689	27.454	14.195
	(0.507)	(-0.354)	(0.919)	(1.108)
Diff in idiosyncratic vol.	-1189.686*	-1253.805**	4389.829	18736.280**
	(-1.869)	(-2.110)	(0.524)	(1.973)
Diff in no. of blockholders	0.149	0.010	-11.079	-39.186**
	(0.101)	(0.007)	(-0.656)	(-1.981)
Tender offer	7.890	15.795	147.057	529.452**
	(0.466)	(1.062)	(0.660)	(2.088)
Relative deal size	30.386	16.010	-244.573	-973.458**
	(0.946)	(0.559)	(-0.575)	(-2.011)
Cross-industry	13.591	5.101	-119.368	-465.777**
	(0.856)	(0.358)	(-0.579)	(-1.979)
Inverse mills ratio	-8.521	-1.528	219.370	829.795**
	(-0.305)	(-0.062)	(0.601)	(2.011)
Constant	-10.343	-29.824	-1161.807	-3748.822*
	(-0.332)	(-1.084)	(-0.579)	(-1.958)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
N	1307	693	303	311
Pseudo R^2	0.232	0.435	0.142	0.128

Table 9: Robustness tests using alternative measures of PIN

This table reports the regressions using alternative measures of PIN. Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

Panel A: Industry-year adjusted PIN						
Dependent variable	Payment method		Acquirer CAR		Target CAR	
	Cashper	Choice	Cash	Stock	Cash	Stock
Acquirer industry-year adjusted PIN	474.656***	2.124***	36.435***	-10.184	-132.620***	-125.840**
	(2.978)	(3.006)	(3.609)	(-0.372)	(-5.039)	(-2.221)
Target industry-year adjusted PIN	-483.593***	-2.075***	-27.639***	19.486	129.006***	116.535**
	(-3.640)	(-3.065)	(-2.822)	(0.747)	(5.042)	(1.987)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
N	1724	1724	1062	337	1062	337
Pseudo/Adjusted R^2	0.122	0.188	0.101	0.195	0.407	0.126
Panel B: EKO PIN						
Dependent variable	Payment method		Acquirer CAR		Target CAR	
	Cashper	Choice	Cash	Stock	Cash	Stock
Acquirer EKO PIN	481.387***	2.372***	65.138***	-49.460	-57.103*	-189.061
	(18.246)	(3.057)	(4.190)	(-0.120)	(-1.883)	(-0.286)
Target EKO PIN	-544.196***	-3.004***	-74.443***	50.687	63.481*	211.458
	(-23.929)	(-4.494)	(-4.039)	(0.097)	(1.874)	(0.252)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1613	1613	989	318	989	318
Pseudo/Adjusted R^2	0.190	0.280	0.101	0.198	0.399	0.070

Table 10: PIN and Method of Payment: The Role of Corporate Governance and Reg FD

This table reports the regressions of the method of payment in M&As on acquirer and target PIN conditional upon corporate governance and Reg FD. The estimations are based on a two-boundary Tobit model to reflect the lower and upper bound on the dependent variable (Cashper). Variable definitions are provided in Table 1. T-statistics are calculated from robust standard errors clustered by firm and are displayed in parentheses. Statistical significance at the 10, 5, 1% level is indicated by *, **, and ***, respectively.

	Dep. = Cashper (1)	Dep. = Cashper (2)
Acquirer PIN	1746.703***	789.435***
	(41.920)	(28.548)
Target PIN	-925.154***	-358.143***
	(-28.590)	(-14.993)
Acquirer PIN x G-Index	-138.303***	
	(-34.700)	
Target PIN x G-Index	38.552***	
	(12.621)	
G-Index	11.496***	
	(18.169)	
Acquirer PIN x Reg FD		-1101.530***
		(-26.159)
Target PIN x Reg FD		-14.861
		(-0.466)
Reg FD		327.341***
		(54.261)
Firm size	-22.780***	-15.148***
	(-29.548)	(-22.942)
Asset tangibility	55.509***	65.666***
	(7.658)	(10.465)
Dividend payer	29.671***	36.837***
	(5.333)	(8.028)
Tobin's q	-30.801***	-29.917***
	(-19.057)	(-22.136)
Leverage	-46.449***	-67.840***
	(-2.848)	(-5.188)
Illiquidity	371.542***	50.119***
	(8.529)	(10.805)
Stock price run-up	-35.098***	-40.631***
	(-12.096)	(-19.544)
Target Tobin's q	16.655***	13.364***
	(9.813)	(9.819)
Target Leverage	-83.227***	-74.237***
	(-6.457)	(-6.488)
Target Illiquidity	5.837	-1.206
	(1.258)	(-0.881)
Target stock price run-up	14.997***	19.276***
	(7.053)	(11.309)
Diff in forecast dispersion	-4.556**	12.917***
	(-1.980)	(8.137)
Diff in forecast error	23.526***	-5.448
	(2.831)	(-0.909)
Diff in abnormal accruals	78.896***	1.326
	(9.799)	(0.220)
Diff in idiosyncratic vol.	3852.290***	4600.055***
	(17.676)	(30.435)
Diff in no. of blockholders	-0.377	-3.212***

	(-0.587)	(-8.964)
Tender offer	114.797***	130.236***
	(20.200)	(29.972)
Relative deal size	-270.635***	-234.935***
	(-50.831)	(-53.102)
Cross-industry	-101.016***	-97.538***
	(-20.752)	(-25.899)
Intercept 1	878.493***	967.558***
	(135.657)	(181.249)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	950	1724
Pseudo R^2	0.187	0.289