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2010/58/FIN

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August, 2010

We Would like to thank Denis Gromb, Pekka Hietala, Massimo Massa, Urs Peyer, Sudi Sudarsanam, Jun Zhou as well as participants in the seminars at INSEAD, the Luxembourg School of Finance, the University of Antwerp and Chulalongkorn University.

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Abstract

This paper tests whether major changes in capital structure as a result of acquisitions, share repurchases and equity issues are consistent with the prediction of empirical trade-off models of capital structure. The answer is affirmative for acquisitions and buybacks, but not for equity issues. The paper also asks whether deviations from predictions of the trade-off theory are driven by market timing. Here the answer is “yes” for all capital structure decisions, with one qualification: issuing overvalued stock in acquisitions is only possible if the financing choice can also be motivated by the trade-off theory.

Keywords: Mergers and Acquisitions; Capital Structure; Market Timing; Equity Issues; Share Buybacks; Mispricing

JEL Classification: G14; G34

In this paper we examine how firms make capital structure decisions in the context of acquisitions, equity issues, and share buybacks. In particular, we ask two questions. First, are capital structure decisions consistent with the predictions of the “best” empirical capital structure models, i.e. the models that have the largest predictive power of leverage ratios in the literature ? Second, can deviations from these predictions be explained by market timing?

Empirical capital structure models, such as Kayhan and Titman (2007), estimate the relation between financial leverage and a number of variables, such as profitability, growth opportunities, firm size, and tangibility of assets. The relevance of these variables is predicted by theories that argue that firms trade off tax benefits and benefits from reduced agency costs of debt financing against the expected costs of financial distress [Miller and Modigliani (1963), Harris and Raviv (1991), Myers (1977), Jensen and Meckling (1976)]. However, trade-off models do not offer an explanation for the long-run abnormal returns after capital structure decisions documented by a large body of research.[1]

On the other hand, the evidence of long-run abnormal returns is consistent with the market timing hypothesis, which predicts that firms want to issue stock when their shares are overvalued and buy back shares when their shares are undervalued.[2] The pure market timing hypothesis, however, is inconsistent with the empirical evidence that firms adjust their capital

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[1] Long term negative abnormal returns after seasoned equity issues have been reported by Taggart (1977), Marsh (1982), Asquith and Mullins (1986), and Loughran and Ritter (1995). Long term positive abnormal returns after share buybacks have been reported by Ikenberry, Lakonishok, and Vermaelen (1995). Long term negative abnormal returns after equity financed transactions and positive long-term abnormal returns after cash financed transactions are reported by Asquith (1983), Loughran and Vijh (1997), Rau and Vermaelen (1998), Agrawal, Jaffee, and Mandelker (1992), and Dong et al. (2006).

[2] See Baker and Wurgler (2002), Schleifer and Vishny (2003), and Welch (2004).

structure towards a time-varying target [Hovakimian, Opler, and Titman (2001), Leary and Roberts (2005), Flannery and Rangan (2006), or Kayhan and Titman (2007)].

The goal of this paper is to show under which conditions market timing can dominate the the trade-off theory predictions, especially in the context of acquisition finance. Acquisition finance provides a unique opportunity to test the basic assumption of the market timing hypothesis, i.e. that it is possible to fool investors by issuing overvalued stock. In an acquisition the bidder faces a target management, advised by investment bankers and other experts in valuation. This makes it difficult to pay with overvalued stock, unless the financing decision can be justified on the basis of economic fundamentals proposed by the trade-off theory.[3] On the other hand, when a firm issues or buys back shares in the open market, it deals with uninformed investors. As a consequence, open market capital structure adjustment may succeed even if the capital structure decision is inconsistent with the predictions of the trade-off model.

Consistent with this argument, we find that only 1% of the 2,978 firms in our acquisition sample make stock-financing decisions that cannot be justified by a trade-off model, controlling for transaction characteristics. A closer look at all *announced* (including unsuccessful) deals involving unanticipated stock payment reveals that only 42% of such attempted acquisitions succeeds. Moreover, 52% of the unanticipated stock transactions are perceived as hostile, in contrast to 1% of anticipated stock transactions. Hence, issuing stock when the trade-off theory suggests the bidder should be pay with cash is nearly impossible. Acquirers that are able to pay

[3] While it is true that acquirers can also make unsolicited bids to shareholders directly, they are more likely to trigger takeover defense mechanisms, and are therefore much more costly and less likely to succeed (Schwert, 2000).

with overvalued stock and can justify their payment choice on the basis of the trade-off theory, i.e., the predicted equity payers, experience long-term significant negative abnormal returns.

In contrast, firms succeed in issuing overvalued equity in seasoned equity offerings, even if the empirical trade-off model recommends that the firm issues debt. This is consistent with some recent evidence reported by others [e.g., Lemmon, Roberts, and Zender (2008), Barclay, Fu, and Smith (2009)]. Equity issues seem to be driven by opportunism: regardless of whether the firm is under- or overleveraged, firms issue stock when their shares are overvalued. As Barclay, Fu, and Smith (2009) argue, such strategic financing behavior makes sense as the costs of being underlevered are much less significant than the costs of being overlevered. Consistent with their argument, we find that the typical repurchasing firm is *underlevered* before the buyback. Firms that buy back stock and move away from target leverage are also significantly more undervalued than other repurchasing firms.

Our results also suggest that buybacks are not simply the mirror of equity issues, an assumption made by researchers who uses net equity issues (equity issues minus share buybacks) to measure capital structure policy. First, the costs of being overlevered are higher than the costs of being underlevered. Second, for a repurchasing firm the benefit from a leverage increase may not be only the profits from buying undervalued stock. Repurchasing firms also benefit from signaling undervaluation, especially in the case of repurchase tender offers, the focus of this paper. The need to pay a significant premium above market prices reduces the ability to benefit from repurchasing shares below fair value, but on the other hand provides a signal that the firm's shares are undervalued [as argued by Vermaelen (1984)]. Sending signals about its value does not make sense for an overvalued firm, making signaling an unlikely motive for equity issuers.

To summarize, we test the following two working hypotheses:

Hypothesis (1): *Firms make unpredicted capital structure decisions because they are motivated by market timing. If this is true, firms that make capital structure adjustments that cannot be explained by the trade-off theory are more likely to be mispriced.*

Hypothesis (2): *Issuing (or paying with) overvalued stock is only possible with uninformed investors or if it can be justified by the trade-off theory. If this is true, we also expect that firms only deviate from the action predicted by the trade-off theory in public offerings but not in stock-financed acquisitions.*

There is a large body of research on mergers and acquisitions, equity issues and share buybacks. However, the main contribution of this paper is to examine all three decisions simultaneously in an integrative framework. Using the same static predictive model of capital structure, we test to what extent deviations of these static predictions can be explained by one particular dynamic consideration: misvaluation of the company stock.

The remainder of the paper is organized as follows. In section 1, we test to what extent acquisition financing decisions can be explained by the trade-off hypothesis. Section 2 extends our analysis to repurchase tender offers, section 3 to equity issues. Section 4 summarizes our conclusions.

1. Acquisition Finance

In this section we proceed as follows. First we describe our data set and methodology. Second, we present empirical results documenting to what extent companies follow the trade-off model when financing acquisitions. Third, we take a closer look at firms that deviate from the trade-off prediction. Finally, we examine post-acquisition returns.

1.1. Data and Methodology

We use a sample of mergers and acquisitions drawn from the Securities Data Corporation mergers and acquisitions database (SDC). To be included in our sample, the transaction must be completed, the first announcement date must lie between January 1, 1980 and December 31, 2005, both acquirer and target must be US public companies, the acquirer does not operate in the financial services or real estate sector, and at least 50% of the target is acquired by the bidder. This last criterion is necessary to ensure that the acquirer must consolidate the target firm's balance sheet after the transaction.

Our sample of 2,978 completed transactions contains 787 cash transactions, 1,396 equity transactions and 795 hybrid transactions. We show summary statistics in Table 1. The median target market capitalization is $0.3 billion, approximately four times the median of firms listed on Compustat. In the typical acquisition study, targets tend to be smaller than bidders. For example, the median target firm size in the sample of Harford, Klasa, and Walcott (2009) is 39% of the firm size of the bidder. Our sample does not contain private targets, which are usually smaller, and the median target is 51% of the enterprise value of the bidder. This also means that the bidder cannot simply look at its own capital structure when deciding the payment method. Target firms are more levered than the median firm, while acquirers are less so: acquirers have a median (market) leverage ratio of 22% and targets of 35%, vs. 27% for Compustat firms.

To test whether financial decisions are driven by the trade-off hypothesis, we predict an "optimal" leverage and compare the firms that move towards it to those that deviate from it. We follow Kayhan and Titman's (2007) approach to predict leverage, as described in Appendix A.[4]

Essentially L* is estimated as the fitted value of a firm characteristics regression using all firms listed on Compustat. The firm characteristics include proxies for growth opportunities, profitability, and potential collateral. As a robustness check, we also employ the specifications used by Hovakimian, Opler, and Titman (2001), Fama and French (2002) and Flannery and Rangan (2006). Our results are generally consistent with the previous literature. Specifically, leverage is significantly negatively related to proxies for growth opportunities (such as market-to-book, R&D) and positively related to the importance of tangible assets. Return on assets, a measure of profitability, is negatively related to leverage, a result that seems to go against the prediction that profitable firms pay more taxes and therefore issue more debt. Myers and Majluf (1984) argue that the negative association is consistent with a pecking order theory: highly profitable firms prefer internal finance to external finance. However, Strebulaev (2007) shows that this relation is consistent with the a dynamic trade-off theory with adjustment costs : if firms

[4] The cross-sectional leverage prediction model of Kayhan and Titman (2007) has been widely used in the related literature as the basis for leverage prediction models, e.g., Harford, Klasa and Walcott (2009) or Chang and Dasgupta (2009). To demonstrate that our results are not dependent on this specific model, we repeat our analysis with a series of alternative models and report that the results are similar.

cannot instantaneously increase their leverage, an increase in profitability increases firm value and therefore lowers leverage. Another, strategic reason for the negative association between leverage and profitability is given by Bolton and Scharfstein (1990), who suggest that more profitable firms prefer low leverage ratios because they deter entry of potential rivals. Regardless of the interpretation of this model, we will refer to it as the "trade-off model".

While it is straight-forward to compare over- and underlevered firms prior to equity issues and share buybacks, in the context of acquisitions we have to build hypothetical balance sheets for the combined firm. This allows us to calculate the consequences of the acquisition financing choice. This is important because paying with cash or stock can result in substantially different leverage ratios for the subsequently combined firm. Between the announcement and the effective date of an acquisition paid by cash, the average acquirer leverage increases by 21%. In contrast, the median acquirer leverage decreases by 2% if the acquisition is paid with equity. These effects would be ignored if we focused on pre-acquisition bidder leverage, as it has been common practice in the acquisition finance literature (e.g., Harford, Klasa, and Walcott, 2009).

To obtain an estimate of the combined firm's accounting ratios and, subsequently, its optimal leverage ratio, we build pro-forma balance sheets for the combined firm using the methodology described in Appendix B. Specifically, we calculate the post-acquisition leverage ratios of the combined firm, conditional upon paying with equity, L(equity), and paying with cash, L(cash), as follows:

$$L(equity) = \frac{Debt_A + Debt_T}{Debt_A + Debt_T + Equity_A + transaction\ value} \tag{1}$$

$$L(cash) = \frac{Debt_A + Debt_T + new\ debt\ issued}{Debt_A + Debt_T + Equity_A + transaction\ value}, \tag{2}$$

where the subscripts A and T denote acquirer and target, respectively.[5]

Next, we calculate leverage deviation as the absolute difference between L* and L(cash), which we call Δ(cash) and between L* and L(stock), which we call Δ(stock). Finally, we can create a variable that compares the effects of cash and stock payment directly. We call it Λ and calculate it as Δ(cash) – Δ(stock). When Λ is positive, equity payment is better than cash payment, and vice versa, conditional on other variables that have been shown to be relevant in prior research on acquisition finance.

Eckbo (2009) provides an excellent overview of the literature in this area. According to the risk-sharing hypothesis of Hansen (1987), if the target is large, the bidder wants to share the risk with the target and pay with stock. So, we control for the size of the target relative to the bidder. If the bidder is interested in completing the transaction quickly (perhaps to avoid competing bids), it is better to pay cash (because of SEC registration requirements). This applies

[5] While it is common in the literature to use market values rather than book values when measuring leverage, to avoid internal inconsistency with the market timing hypothesis, we prefer to use book values. Managers should use the "true" value to measure deviations from the static trade-off optimum, not market values. While the sum of pre-announcement book value of the bidder and the transaction value is a good proxy for the post-acquisition combined book value, the same conclusion does not necessarily hold for market values: assuming that the combined market value is equal to the pre-market bidder value plus the transaction value assumes that all acquisitions are zero net present value projects. Although we believe book values are more appropriate, we also report results based on market values, to illustrate the robustness of our conclusions.

to tender offers [Martin (1996)], hostile offers, and to transactions involving large premiums. Indeed, offering a large premium can be seen as a strategy to discourage competing bidders. We include indicators for tender offers and hostile transactions, as well as the premium paid.

One caveat: the decision to proceed with a tender offer (i.e., the choice of transaction mode) could be endogenous with the payment method decision. In other words, firms with debt capacity prefer tender offers. We reduce this endogeneity bias with a two-stage specification.[6] We instrument the transaction mode with the Herfindahl index and an indicator for diversifying transactions. Berkovitch and Khanna (1991) argue that mergers are negotiation games between the acquirer and the target, while tender offers are auctions. Given a certain synergy level, when acquiring firms expect more rivals in an auction, they can afford mergers, but no tender offers in which synergies would be bargained away between the competitors. Therefore, tender offers should be more common in conglomerate transactions and concentrated industries in which the acquirer expects fewer rivals. On the other hand, these variables are unlikely to affect the choice of payment method other than via their influence on the modal choice. For the negotiation process and the choice of transaction mode, the *acquirer* industry characteristics are the ones that matter. For the resulting capital structure, however, the *combined* acquirer and target industry characteristics are more important: we incorporated them into the trade-off measure.

1.2. Empirical Results

[6] Note that even though *tenderoffer* is a discrete variable, we estimate it using ordinary least squares (OLS) since a probit or a logit first stage can harm the consistency of the estimates (Angrist and Krueger, 2001).

For all the combined bidder-target firms in our sample, we obtain an average predicted leverage L* of 34% using book leverage (see Table 1). The average L(cash) and L(equity) are 64% and 37%[7]. The magnitude of the difference between leverage ratios resulting from cash and equity payment strongly suggests that capital structure concerns are relevant for the payment method choice, which is the basic proposition of this paper. The average Λ using book leverage is 5% and statistically significantly positive. This means that, ceteris paribus, we expect that more firms will prefer equity payment. Consistent with this prediction, equity represents 47% and cash 26% of the acquisition payment in our sample. Λ (in book values) is higher for equity transactions (6%) than cash transactions (2%), consistent with the prediction that higher Λ transactions should be rather paid with equity than cash.

To predict the method of payment according to the trade-off theory, we regress the percentage of stock used as payment on Λ, controlling for variables that have been shown to affect the method of payment in previous studies. According to the trade-off theory prediction, equity is optimal if $\Lambda > 0$, and cash is optimal if $\Lambda < 0$. That is, the percentage of stock paid should be positively related to Λ.

We find support for the hypothesis that firms behave according to the trade-off theory. Column 1 in Panel A of Table 2 shows the coefficients for the regression of the percentage of stock paid on Λ and the control variables. The coefficient of Λ is positive and statistically, as

[7] Leverage after completion of the acquisition is in line with our pro-forma leverage calculations. The median acquirer who paid with cash has a book leverage of 49% and a market leverage of 30% after the acquisition becomes effective, compared to the pro-forma ratios of 58% and 35%. The median acquirer who paid with equity has a book leverage of 36% and a market leverage of 16%, compared to the pro-forma ratios of 33% and 17%.

well as economically significant. In our standard specification of the two-stage Tobit regression, if all other variables are at their means, increasing Λ by one standard deviation enlarges the probability of paying with stock by 11% (t = 3.74).

Column 1 in Panel C of Table 2 reports the classifications of our sample into anticipated (unanticipated) cash and equity transactions. We predict stock (cash) payment if the Tobit model estimates a probability of 1 to pay with stock (cash), and otherwise a hybrid prediction.[8] Overall, the Tobit specification with control variables correctly predicts the payment method in 1,741 or around 80% of the transactions.[9] In only 17 of 442 transactions in which the actual payment method differed from the predicted method, firms paid with stock. This means that 96% of the 442 "abnormal" payment decisions involve paying cash rather than following the trade-off prediction to issue stock. So there is asymmetry in the types of deviations from the optimum financing method. When the trade-off model predicts cash payment, almost all firms follow the recommendation.

These results are consistent with the hypothesis (2): if the target observes that the bidder is deviating from the trade-off theory prediction to pay cash, the target knows that the bidder's shares are overvalued. As a result, the overvalued bidder has to increase the consideration which will mean that bidders who try to pay with stock will fail to obtain a benefit that compensates for

[8] We repeat the analysis as a Probit estimation to make sure that our results do not depend on potential influences from assigning acquirers with 100% probability of paying stock (cash) as predicted stock (cash) payers as opposed to another, less conservative cutoff level that could be correct in a Probit model. We do not observe significant differences in the prediction of the non-hybrid cases.

[9] The power of our test might be reduced if many firms issue shares in a separate transaction to re-finance a cash offer. Of the 2,978 firms in our sample, 269 announced a secondary equity issue in the same year as the M&A announcement, of which 43 are classified by Dealogic as "use of proceeds for acquisitions". Only eight of these transactions were made by firms that we classified as cash financed acquisitions in our sample.

the cost of deviating from the trade-off theory. Hence the bidder could decide to pay with cash or cancel the bid. Of course, when the bidder wants to pay with cash, the target has no reason to object, and we will observe cash transactions.

Note that our results are inconsistent with the hypothesis that deviations from the trade-off theory are driven by agency costs or personal taxes. Gilson, Scholes and Wolfson (1987) argue that the choice of payment method can be driven by differential taxation of cash and stock offers: if a firm pays with cash, the selling shareholders have to realize capital gains taxes, but when a firm pays with stock, shareholders can defer the gain. To the extent that bidders have to compensate target shareholders for higher taxes (through a higher bid price), bidders prefer stock payment. Second, some managers prefer equity financing to debt financing because debt acts like a disciplining device, preventing managers from spending free cash flow on negative net present value projects [Jensen (1986)]. According to this agency cost hypothesis, firms that deviate from the trade-off hypothesis are predicted to pay cash, but issue equity instead. However, both explanations would predict unanticipated equity issuers, not unanticipated cash payers and are therefore not consistent with our findings.

Column 1 of Panel A in Table 2 also reports the regression coefficients of the control variables. Of all the control variables considered, the instrumented dummy on tender offers has the highest explanatory power. With all other variables at their means, a tender offer raises the predicted probability of a cash payment to 100% (t = -4.45). This is consistent with the argument that the need for speed in tender offers motivates acquirers to pay with cash. Furthermore, the relative size of the target firm is significantly (t = 1.88) positively related to the percentage stock payment. This is consistent with the risk-sharing argument suggested by Hansen (1987).

Column 1 in Panel B of Table 2 shows the results of the first stage in which we estimate the probability of a tender offer. Acquirers in concentrated industries with a higher Herfindahl index are more likely to conduct a tender offer (t = 4.00), consistent with the argument that more direct rivals prefer tender offers to merger negotiations with the management. Diversifying transactions are more often tender offers (t = 3.69), consistent with the argument that conglomerate acquirers prefer acquisitions to mergers of equals. The F-statistic of 12.12 suggests that that our instruments are not weak: the critical value for 5% significance is 11.59 [Stock, Wright, and Yogo (2002)].

Columns 2 to 7 of Table 2 provides robustness checks of our payment method regressions using alternative methods to estimate Λ. In particular, our conclusions do not change when we use gross debt (which assumes all cash is operating cash) or net debt (which assumes all cash is excess cash) to estimate leverage. Further robustness checks are shown in Appendix C in which we test for the relevance of a number of explanatory variables suggested by others, such as target ownership [Ghosh and Ruland (1998), or Baker, Coval, and Stein (2007)], governance characteristics [Hartzell, Ofek, and Yermack (2004)], acquirer governance [Harford (1999) or Jensen (1986)], liquidity and tax characteristics [Graham (2000)], transaction structure [Eckbo (2009) and Sudarsanam (1995)], target shareholder characteristics [Baker and Wurgler (2004)], or time-fixed effects [Harford (2005), or Zhang (2009)]. Regardless of the model specification, Λ is always statistically significant and has the predicted sign.

1.3 Unexpected Equity Transactions: A Closer Look

We found that few firms succeed in paying with stock when the trade-off theory suggests they should pay cash. That does not mean that firms do not try, perhaps by making a hostile tender offer directly to investors as a last resort. To the extent that investors want to sell out directly after the acquisition or are not fully aware of the predictions of the trade-off theory, they will accept the offer. To investigate this issue further we also collected data on announced, but failed offers for unanticipated stock payers, and, for comparison, anticipated stock payers.

Table 3, Panel A, shows that, when stock payment is consistent with the trade-off theory, the acquisition succeeds in 90% of the cases, only 1% of the deals are hostile, and all transactions are mergers. When the equity issue is unpredicted by the trade-off theory, we obtain significantly different results: 42% of the announced deals fail (only 10% of anticipated stock transactions do), 52% of the deals are hostile (vs. 1% of anticipated stock transactions),[10] and 45% are tender offers (vs. 0% of anticipated stock transactions). Note that in 12% of these unanticipated equity bids, there are competing bidders, in contrast to the sample of anticipated bids which are uncontested in 97% of the cases. Unanticipated stock deals are also revised in 18% of the cases (by 11% on average), more substantial than when the equity payment is

[10] Note that we obtain information about the target management's attitude toward the bid (i.e., hostile or friendly) from SDC. SDC is rather conservative in its assignment of hostile attitude. According to the SDC classification, 5% of all bids are hostile: 10% of all cash bids vs. 2% of all equity bids. Among completed transactions, 2% of all bids are hostile: 3% of cash bids vs. less than 1% of equity bids.

consistent with the trade-off theory. Table 3, Panel B, splits up the unanticipated equity sample into two sub-samples: the companies that succeed in paying with stock and those that fail. Note that 93% of the failed bids are hostile and 21% attract competing bidders (presumably white knights). Moreover, 74% of the completed transactions are tender offers.

All these results suggest that target firms resist equity payment when the bidder cannot justify payment with stock on the basis of the trade-off theory. While some bidders respond by paying cash, or revise the bid upwards, others try to get around managerial opposition with hostile tender offers. That is, we do not observe that the target management maximizes only short-term, and not long-term shareholder value. Our results suggest that target managements are able to interpret unjustified equity bids as signals for overvaluation and act on behalf of their long-term shareholders.

1.4 Long-term Returns

If bidders make financing decisions according to the trade-off theory, but deviate mainly because of market timing considerations, we expect that, in some sub-samples at least, bidders should experience long-run significant abnormal returns. Indeed, the market timing theory is a behavioral theory: it assumes that markets can under-react to company-specific events such as acquisitions.

We employ the return across securities and time (RATS) methodology proposed by Ibbotson (1975), assuming that normal returns are generated by the Fama and French (1993) three-factor model. Specifically, we run the following regression for every month j relative to the event month 0 (j = 1,…., 24):

$$(R_{i,t} - R_{f,t}) = a_j + b_j(R_{m,t} - R_{f,t}) + c_j SMB_t + d_j HML_t + \varepsilon_{i,t}\,, \qquad (3)$$

where $R_{i,t}$ is the monthly return on security i in month t. $R_{f,t}$ and $R_{m,t}$ are respectively the risk free rate and the return on the equally weighted CRSP index. SMB_t and HML_t are respectively the monthly return on the size and book-to-market factor in month t. The numbers reported are sums of the intercepts of cross-sectional regressions over the relevant event-time periods. The advantage of this methodology is that it accounts better for changes in the riskiness of the equity from before to after the acquisition. This is because the factor loadings are allowed to change month to month after the acquisition.

Panel A of Table 4 reports the long-run abnormal returns for the bidder 24 months after the announcement month, and Figure 1 shows the CAR from the month of the announcement until 24 months afterwards, for the sub-samples of unexpected and expected cash payers as well as expected stock payers. We do not have sufficient observations in the group of unexpected equity transactions. When bidders follow the trade-off prediction and pay with cash, long-term abnormal returns are -2.01% (t = -0.76) after 24 months, which is not significantly different from zero, as expected. Some bidders are undervalued and others overvalued, but on average there is no reason to expect that managers are timing the market. If you are overvalued, you cannot issue stock because this payment choice will reveal your overvaluation to the target firm, so that it becomes preferable to stick with the trade-off prediction and pay cash.

However, when bidders should pay with stock, according to the trade-off theory, and decide to pay with cash instead (the unanticipated cash payers), this must be because they believe their stock is undervalued. The significant (t = 2.24) 24-month, post-announcement return of 5.15% is consistent with this hypothesis. Finally, when bidders pay with stock according to the trade-off hypothesis, 24-month, post-acquisition abnormal returns are equal to -12.92% (t = -8.78), consistent with the hypotheses that overvalued firms can time the market successfully, even if they face a sophisticated counter-party, if they can justify the decision based on the trade-off theory.

As an additional test, we implement the Fama and French (1993) calendar-time portfolio approach as advocated by Fama (1998) and Mitchell and Stafford (2000). The results of the calendar-time approach are shown in Panel B of Table 4. As with the RATS method, we do not find significant abnormal returns for anticipated cash payers but significantly positive long-term returns for expected cash payers. For anticipated stock payers, we find significantly negative abnormal returns. Overall, we conclude that the calendar-time approach confirms our results from the RATS approach.

2. Share Buybacks and Capital Structure Management

So far we have focused on acquisitions and have found strong support for the static trade-off theory (after adjusting for the fact that tender offers are typically made for cash), as well as for the hypothesis that firms deviate from the static trade-off theory because of misvaluation. In this section we examine whether this is also true for economically significant repurchases. We focus on buyback tender offers as open market repurchases are not firm commitments and, with the exception of small open market buyback programs that have a minor impact on capital structure, they have to be executed over long periods of time. Although we do not study open market buybacks it should be noted that the finding of Peyer and Vermaelen (2009) that long run (3 year) post-announcement excess returns are negatively correlated with short term (6 month) pre-announcement returns is consistent with hypotheses (1) and (2). Indeed, when a firm's stock price declines significantly in the six months before the buyback decision, it is likely that it has become overlevered. If it then makes a capital structure adjustment that is unpredicted by the trade-off theory, hypothesis (1) predicts that this decision is driven by significant undervaluation.

Share repurchase tender offers can move a firm's capital structure toward or away from the optimum. As in the acquisition context, we predict that transactions that are suboptimal for a firm's capital structure are more likely to be driven by mispricing. A share repurchase by an underlevered firm can be interpreted as a move toward optimal capital structure. For an overlevered firm, repurchasing shares can only be a profitable strategy if the losses from moving further away from the optimal capital structure are compensated by other benefits. In the context of tender offers we consider two different benefits. First, signalling benefits from correcting undervaluation. By correcting misvaluation the firm increases its stock price, which makes it better equipped to fight hostile take-over bids motivated by an undervalued stock price as argued by Vermaelen (1984). Second, to the extent the firm is able to repurchase shares below fair value, it will also benefit long-term shareholders. Note that because in repurchase tender offers significant premiums have to be paid above pre-announcement prices, pure market timing benefits will be more difficult to realize than in the case of open market buybacks.

2.1 Data

We use 155 fixed price and 59 Dutch auction repurchase tender offer announcements drawn from the SDC's mergers and acquisitions and repurchase databases announced by US-based public firms between January 1, 1980 and December 31, 2005. We stop collecting announcements in 2005 because we want to be able to examine long-term returns. We apply the restrictions of Peyer and Vermaelen (2009) and exclude repurchases where the firm intends to go private (i.e., repurchasing more than 50% of all shares outstanding), repurchases of closed-end funds, odd-lot repurchases,[11] and repurchases where the stock price 20 days prior to the announcement was less than $3.[12] We exclude repurchases of less than 10% of outstanding equity because they do not change the buyer's capital structure significantly. We exclude privately negotiated share repurchases because they are likely to be initiated by the seller [Peyer and Vermaelen (2005)]. As mentioned, we do not include open market share repurchases because neither the final amount nor the timing of the repurchases is known at the announcement. This makes it impossible to assess the transaction's potential influence on capital structure.

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[11] Odd-lot repurchases are exclusively directed towards small shareholders with fewer than (usually) 100 shares. These are typically small transactions.

[12] Peyer and Vermaelen (2009) argue that bid-ask spreads in firms with small stock prices could result in relatively large returns without the possibility of an arbitrageur exploiting such returns.

Table 5 reports descriptive statistics. The average company is making a tender offer to buy back $244 million of stock or 22% of the outstanding shares prior to the transaction. The average repurchase premium is 18%,[13] which illustrates the difficulty in using the mechanism to move to a target leverage ratio. In order to induce shareholders to tender their shares, a significant premium has to be paid. However, unless if the gains from moving to the target leverage are at least as large as the premium, a buyback tender offer will hurt long-term stockholders[14] . For example, in order to justify paying an 18 % premium for 22 % of the shares outstanding, the value of the (pre-repurchase) equity has to increase by 18 %. But as the company only repurchases 22 % of its equity, for every $ increase in leverage, (pre-repurchase) equity value has to increase by 22/18 = 81 cents. It is obvious that the trade-off theory has a difficult time to explain such a large increase in firm value, especially if the capital structure change was expected (i.e. the firm was below its target leverage).

2.2 Leverage predictions

As described in Appendix A, we use the empirical model of Kayhan and Titman (2007) to predict target leverage. Prior to a buyback offer, the median firm is underlevered by 4.2% in book terms and 3.9% in market terms. So the first conclusion is that repurchasers make a leverage move in the right direction. Moreover, repurchasers overshoot their target leverage: after the transaction, the median repurchaser results in 12.7% above its target capital structure

[13] For fixed price tender offer the premium is calculated as the tender offer price relative to the stock price 20 days before the announcement. For Dutch auctions the premium is the actual price paid relative to the stock price 20 days before the announcement.

[14] Unless, of course, every shareholder tenders his/her shares. Empirically, however, very few shareholders tender, in spite of the large premiums paid [See Peyer and Vermaelen (2009)].

using book values and 11.5% using market values.[15] Next, we stratify our samples to firms that move toward and away from predicted leverage. Because firms with little over- or underleverage can switch their classification with only small changes in some of the balance sheet items, we repeat our analysis with the most overlevered and the most underlevered quintiles. Panels D and E of Table 5 report summary statistics for the sub-samples. A first glance at the table reveals no economically significant differences in the repurchase size of the various sub-samples. The only major difference seems to be the repurchase premiums: overlevered firms tend to pay larger repurchase premiums. This is especially the case in the two samples based on the extreme quintiles: on average, the 20% most underlevered firms pay a premium of 11.4%, which is significantly (t = -2.63) below the 25.1% premium paid in the most overlevered sample. Hence the firms that should benefit (lose) the most according to the trade-off theory actually pay the smallest (largest) premiums, a result clearly unpredicted by the trade-off hypothesis. On the other hand, as paying a premium above fair value is a costly signal [Vermaelen (1984)] the result is consistent with the hypothesis that overlevered firms are more undervalued.

2.3 Abnormal Returns

We compute abnormal returns for the sub-sample of firms that were overlevered or underlevered prior to the transaction. As with the acquisition sample, we use the Fama-French (1993) three-factor model combined with Ibbotson's RATS methodology to compute abnormal

[15] Post-transaction market values are based on the stock price 20 days after the completion of the buyback or the equity issue.

returns. Figure 2, Panel A shows the cumulative abnormal return from six months before the buyback tender offer announcement until 36 months afterwards.

From the announcement month until two months afterwards[16], the average cumulative abnormal return for the overlevered sample is 10.3% ($t = 5.92$), not significantly different ($t = 0.54$) from the abnormal return of 8.1% ($t = 2.29$) for the underlevered sample. Cumulative abnormal returns are also not significantly different between the overlevered (14.1%) and the underlevered (9.2%) quintiles ($t = 0.82$). Note that this is the abnormal return experienced by the non-tendering shareholders. In order to measure the total value increase as a result of the offer we calculate the total return, which is the weighted average of the repurchase premium and the cumulative abnormal return to the non-tendering shareholders (Peyer and Vermaelen, 2005, page 384):

$$Total\ return = F_P \frac{P_T - P_{-20}}{P_{-20}} + (1 - F_P)\ CAR\ , \qquad (4)$$

where F_P is the number of shares repurchased relative to the number of shares outstanding prior to the repurchase, P_T and P_{-20} are the tender offer price and the stock price 20 days prior to the announcement date, respectively. CAR is the abnormal return over the period between 20 days prior to the announcement and 20 days after expiration, computed using the market model with the equally weighted CRSP index as the market return.

[16] As a typical repurchase tender offer is open for one month, measuring the abnormal returns until 2 months after the announcement date is equivalent to measuring the abnormal return until after the offers expires.

We report the total returns in table 5, Panel D and E. The total return for the underlevered firms (8.2 %) is not significantly different from the total return for the overlevered ones (10.3 %). The difference is more pronounced for the extreme quintiles: the total return is significantly (t = -1.76) smaller in the underlevered quintile (7.7%) than in the overlevered sample (16.1%). This is consistent with hypothesis (1). Indeed, according to the trade-off hypothesis, firms that are making the sub-optimal decision to increase leverage when they should lower it (i.e. the overlevered firms), should experience stock price declines. However, the fact that they tend to experience larger excess returns than the firms that move to their target capital structure must mean that the overlevered firms were more undervalued prior to the buyback.

To the extent the market is semi-strong inefficient, it also makes sense to examine long-run excess returns. From two month after the announcement the overlevered sample experiences significant cumulative abnormal returns of 15.6% (20.1%) 24 months (36 months) after the repurchase (see Table 6, Panel A; t = 3.04 and 3.08, respectively). The underlevered sample experiences insignificant abnormal returns of 10.1 (1.7%) 24 months (36 months) after the repurchase (t = 0.88 and 0.12, respectively). Furthermore, the overlevered sample is able to repurchase stock at a significant discount below fair value. Specifically, Figure 2, Panel A shows that for both samples cumulative abnormal returns calculated from before the announcement month become equal to the repurchase premium 19 months after repurchase. However, Table 6, Panel B shows that, afterwards, overlevered firms earn additional significant abnormal returns of 6.9% (11.4%) above the premium 24 (36) months after the repurchase announcement (t = 2.26 and 2.26, respectively). This is consistent with hypothesis (2): some companies are able to take advantage of uninformed investors by buying undervalued stock, even after paying large premiums above pre-announcement value. Stock prices of underlevered firms do not rise significantly above the tender price. Note that, although the premiums of the overlevered (20.2%) and the underlevered sample (15.7%) are different, they overlap in Figure 2. The reason is that the premiums are calculated relative to the stock price 20 days before the announcement.

This general conclusion is supported by the results for the overlevered and underlevered quintile. Figure 2, Panel B shows that from two months after the announcement until 24 (36) afterwards the overlevered sample experience significant (t=1.66 and 1.85) excess returns of 21.3% (31.1%). In contrast, two months after the repurchase, the underlevered sample experiences no significant abnormal returns during the next 3 years.

In short, the results for buybacks are consistent with hypothesis (1). Firms that deviate from the prediction of the static trade-off theory and lever up when that theory recommends de-leveraging, do this because they are more undervalued than firms who behave consistent with the trade-off theory. Besides gains from signalling undervaluation, overlevered firms also benefit from fooling investors by repurchasing shares below fair value. We believe that “fooling the market” is possible because, in contrast to the acquisition case in which a bidder is facing a seller advised by investment bankers, the firm is facing a large body of uninformed investors (hypothesis 2).

3. Equity Issues and Capital Structure Management

In this section we examine whether firms issue equity in order to move to their target leverage and whether they deviate in order to take advantage of overvaluation. Note the difference with buyback tender offers, in which a deviation can be justified on the basis of signalling motives as well as of buying back stock cheap from uninformed investors.

3.1 Data

We use 2,048 announcements from the Dealogic Equity Capital Markets (ECM) database announced between January 1, 1980 and December 31, 2005. We apply the data restrictions of Gao and Ritter (2009) and exclude offers made on a best efforts basis, non SEC-registered offers, offers made under SEC rule 144A, private placements, rights offers, unit offers, offers of closed-end funds and REITs, pure secondary offers and accelerated offers that are spent more than three days from filing to offer. The issuers must be US-based public and listed on the NYSE, AMEX, or NASDAQ. We exclude issues of less than 10% of outstanding equity. The average equity issue raises $117 million, or 22%, of the value of the equity prior to issue. The equity issues discount relative to the stock price 20 days before the issue is 2.92%, comparable to the average discount of 2.75% in Gao and Ritter (2009).

3.2 Leverage Prediction

We again employ the model of Kayhan and Titman (2007) to predict target leverage. Table 7 shows that prior to the equity issue, most firms are not overlevered: in market values, the median equity issuer is already underlevered by 6.2% (in book values, the median equity issuer is minimally overlevered, by 0.4%. Unlike acquisitions, equity issues are typically not made to reduce excess leverage [as also reported by e.g. Barclay, Fu, and Smith (2009)]. Indeed, equity issuers move further away from the predicted capital structure, to an average underleverage of 19.5% using book values and 16.8% using market values.

3.3 Abnormal Returns

Figure 3 and Table 8 report the long-term abnormal returns for the equity issue samples, starting from six months before the equity issue until 36 months afterwards. We do not find evidence in support of the hypothesis that firms typically trade off the costs of deviating from target leverage against the benefits from issuing overvalued stock. In the 36 months after the announcement of an equity issue, the pre-issue overlevered sub-sample had abnormal returns of -18.6% (t = -3.53), while the pre-issue underlevered sub-sample had abnormal returns of -16.1% (t = -4.59). Both are well below their average discounts of -2.6% and -3.1%, respectively. That is, issuers who had fundamental, trade-off theory related reasons to raise equity actually perform worse (although not statistically significantly so) than issuers who do not have such reason. We obtain the same picture when we focus on the two extreme quintiles.

Visual inspection of Figure 3A and 3B shows that all samples experience very similar stock price behavior: stock prices rise abnormally between 28 to 48% in the six months before the equity issue and then underperform during the next 36 months. All the results are consistent with our hypotheses: occasionally companies become overvalued and use this window of opportunity to issue overvalued stock. Although many firms end up with leverage far below the "target" leverage derived from the static trade-off theory, they do not consider this a major drawback. Apparently, the costs of being temporarily underlevered by parking excess cash are not so important that they outweigh the benefits of market timing [as argued by Barclay, Fu, and Smith (2009)]. [17] Note also that our results are inconsistent with the predictions of the pecking order hypothesis [Myers and Majluf (1984)]: equity issues are not last-resort financing decisions, after all other financing options are exhausted. Finally, the market timing theory does not predict that each time the stock is overvalued, managers will issue equity. Obviously managers are not always smarter than the market, as pointed out by De Angelo et al (2010).

4. Conclusion

In this paper we examine to what extent acquisition finance, share buybacks, and equity issues can be explained by the trade-off theory summarized by empirical models such as Kayhan and Titman (2007) and the market timing theory. Comparing predicted and actual financing decisions, we find that in 80% of the transactions, acquirers make financing decisions that brings them closer to their target leverage. Nevertheless, some acquirers deviate from the payment method predicted by the trade-off hypothesis. These deviations are not symmetric: while many predicted stock payers deviate by paying cash, only very few predicted cash payers deviate by

[17] Of course this finding is not inconsistent with DeAngelo, DeAngelo, and Stulz (2010) who find that one year after the issue, firms spend the money on capital expenditures, as part of their life cycle. The relevant question is whether firms are pushed by excess leverage to issue equity. Consistent with our findings, DeAngelo et al (2010) report (page 292) that "leverage rebalancing is not a first order determinant of the SEO decision". They also report that without the offer proceeds, the majority of issuers would run out of cash. But that does not mean that firms had to issue equity, if their capital structure level would have allowed them to issue debt. The fact is that they chose to issue equity rather than debt because a belief that their shares were not undervalued, and possibly overvalued.

paying stock and when they do their bids are often hostile and fail. This result is consistent with the hypothesis that target management identifies stock-paying deviators as overvalued. As a result, overvalued bidders are unable to compensate the cost of deviating from the trade-off prediction by paying with overvalued stock. They can, on the other hand, take advantage of their overvaluation by arguing that their financing choice is driven by fundamental economic reasons (summarized by the trade-off theory).

Long-run abnormal returns after the announcement provide further support for the presence of both trade-off and market timing arguments. In the two years after the announcement of unexpected cash payers, abnormal returns are significantly positive, supporting the view that these acquirers were undervalued and therefore choose to deviate from the trade-off model. Long-term abnormal returns are not positive after the announcement of expected cash payment. Finally, abnormal returns are significantly negative to anticipated stock payers, consistent with a combined argument, which considers that heavily overvalued firms in this group try to hide behind the fact that issuing equity makes sense, based on the trade-off theory.

The major conclusion of this paper is that market timing is possible, in an acquisition context, if it can be motivated by fundamental economic reasons. We believe that this is unique to acquisition finance as in this case the bidder faces a sophisticated target, assisted by investment bankers and other specialists on company valuation. The situation is different when firms are trying to buy back undervalued stock and issuing overvalued shares to investors in financial markets. Indeed, we find that markets do not fully incorporate the fact that when a firm makes a share buyback or an equity issue that moves the firm's capital structure away from its target, it is mainly driven by mispricing of the stock. As a result, firms are able to take advantage of uninformed investors by issuing overvalued stock. However, because of the significant premiums paid in repurchase tender offers, the ability to buy back shares below fair value is much smaller than in open market buybacks [as reported by Peyer and Vermaelen (2009)]. Deviating from target leverage seems mostly driven by the benefits from signaling undervaluation.

While acquisitions and buybacks seem to be driven by both static trade-off and capital structure considerations, equity issues seem to be driven by market timing only. Apparently the costs of being underlevered (i.e. holding on to excess cash) are much smaller than the costs of being overlevered (i.e. the costs of financial distress). One implication of our results is that buybacks are not simply a mirror of equity issues. The common practice of examining capital structure decisions by measuring "net equity issues" is perhaps not the most appropriate method to improve our understanding of firms' financing choices.

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Table 1
Acquisitions: Descriptive Statistics

This table reports descriptive statistics of the acquisitions sample. Panel A reports median values of transaction characteristics. *STOCK PAID* is the reported percentage of equity in payment according to SDC. *PREMIUM* is the transaction value less the average of the target's market value four weeks prior to announcement divided by the latter. *RELATIVE SIZE* is the average of the target's enterprise values 42-30 days prior to announcement divided by the acquirer's enterprise value.

Panels B and C report medians of acquirer and target characteristics. *LEVERAGE* equals net debt divided by the book value of assets in the year prior to the announcement. *MARKET LEVERAGE* equals book net debt divided by the average market value of assets 42-30 days prior to the announcement. Net debt is calculated as the sum of current liabilities and long-term debt minus cash above the industry average level (normalized by assets). If current liabilities or long-term debt are not available, net debt is calculated as total debt less other liabilities, deferred taxes and investment tax credit, and cash. *MARKET/BOOK* ratios are computed as the sum of the book value of assets and the difference between the market and the book value of equity divided by the book value of assets. *MARKET CAP* and *ENTERPRISE VALUE* are computed as the average of the values 42-30 days prior to the announcement. *TOTAL ASSETS* is the value of book assets in the fiscal year prior to the announcement.

Panel D reports average leverage ratios, and Λ. L^* is the predicted leverage for the combined firm, calculated with the methodology described in Appendix A. *L(cash)* and *L(equity)* are the pro-forma leverage ratios of the combined firm assuming cash and equity payment, respectively. Λ is the difference between predicted and optimal leverage assuming cash payment minus the difference between predicted and optimal leverage assuming equity payment, |L(cash) - L*| - |L(equity) - L*|. All non-censored variables are winsored at the 1% level.

Variables	**All Transactions**	**Cash Only**	**Equity Only**	**Mixed Payment**
Panel A: Median transaction characteristics				
STOCK PAID	82%	0%	100%	53%
PREMIUM (%)	29.61	34.97	27.22	28.44
RELATIVE SIZE	51%	48%	52%	53%
Panel B: Median acquirer characteristics				
LEVERAGE	40%	32%	53%	42%
MARKET LEVERAGE	22%	17%	34%	23%
MARKET/BOOK	1.42	1.56	1.27	1.47
MARKET CAP (m US$)	957	1,290	865	953
TOTAL ASSETS (m US$)	1,484	1,668	1,466	1,410
ENTERPRISE VALUE (m US$)	2,658	2,649	2,820	2,424
Panel C: Median target characteristics				
LEVERAGE	44%	35%	55%	50%
MARKET LEVERAGE	35%	24%	40%	37%
MARKET/BOOK	1.19	1.30	1.13	1.23
MARKET CAP (m US$)	307	256	315	347
TOTAL ASSETS (m US$)	612	468	624	737
ENTERPRISE VALUE (m US$)	974	665	1,107	1,060
Panel D: Average leverage ratios and lambdas				
*L**	34.0%	40.1%	28.1%	38.7%
L(cash)	63.7%	57.7%	66.2%	66.9%
L(equity)	36.6%	40.6%	32.6%	37.3%
LAMBDA	4.9%	1.6%	5.9%	6.3%
Observations	2,978	787	1,396	795

Table 2
Payment Method Prediction

This table shows the results for the prediction of the payment method. Panel A reports results of the main regression, Panel B reports results from the first stage of the instrumental-variables regression, and Panel C reports the fraction of transactions with anticipated and unanticipated payment methods. All columns except for Column 9 (“excl. Hybrids”) are Tobit regressions in which the dependent variable is the percentage of stock used as payment. In Column 9, we use a Probit regression in which the dependent variable equals 1 for pure stock payment and zero for pure cash payment, excluding hybrid transactions. The independent variables are the following. Λ is the difference between predicted and optimal leverage assuming cash payment minus the difference between predicted and optimal leverage assuming equity payment, $|L(cash) – L^*| - |L(equity) – L^*|$. In all columns except columns 3-5, Λ is based on the Kayhan and Titman (2007) specification. In Column 3, we use a Λ based on the Hovakimian, Opler, and Titman (2001) specification, in Column 4 based on the Fama and French (2002) specification, and in Column 5 based on the Flannery and Rangan (2006) specification. Λ is based on book values in all columns except Column 6 (“Market”), where it is based on market values. Debt used for Λ is calculated net of cash in excess of the industry average in all columns except for 7 and 8, gross debt in Column 7, and debt net of all cash in Column 8. *PREMIUM* is the transaction value less the average of the target’s market value four weeks prior to announcement divided by the latter. *HOSTILE* equals 1 for hostile and zero for friendly transactions. *RELATIVE SIZE* is the value of the target’s enterprise value (average 42-30 days before the announcement) divided by the enterprise value of the acquirer. *EXCESS CASH* is the value of the sum of acquirer and target cash in excess of the industry average. *TENDER OFFER* equals 1for tender offers and zero for mergers. In Column 1 (labeled “2 stage”), this variable is instrumented with the variables shown in Panel B. The instruments are the acquirer *HERFINDAHL* index, and a *DIVERSIFICATION* dummy that equals 1 if the acquirer operates in another SIC code than that of the target. All non-censored variables are winsored at 1% level.

Panel A reports coefficients and t-statistics for the regression with the percentage of equity payment as the dependent variable and the number of observations. Panel B reports coefficients and t-statistics for the first stage instrumented regression with the tender offer dummy as the dependent variable, F statistics, and p-values for the tests of joint significance and overidentification. Panel C reports the fraction of anticipated and unanticipated cash and equity transactions for the regressions reported in Panels A and B. For the probit specifications, a transaction is called anticipated if the predicted probability of using the observed payment method exceeds 50%. For the Tobit specifications, a transaction is called anticipated if the predicted percentage of stock equals the observed percentage of stock used in the payment (cash [stock] if the predicted percentage of stock equals zero [1]). Predictions for observed hybrid transactions are omitted.

Panel A: Main regression. Dependent variable = percentage of equity used in payment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			Lambda OHT	Lambda FF	Lambda FR	Market	Lambda Gross	Lambda Net	excl. Hybrids
	2 stage	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit	Probit
LAMBDA	0.66 ***	0.81 ***	0.48 ***	0.56 ***	0.69 ***	0.60 ***	0.36 ***	0.72 ***	1.55 ***
	(3.74)	(5.45)	(3.38)	(6.97)	(7.47)	(8.19)	(3.62)	(5.66)	(7.08)
TENDER OFFER	-3.14 ***	-1.83 ***	-1.83 ***	-1.75 ***	-1.74 ***	-1.69 ***	-1.82 ***	-1.82 ***	-2.47 ***
	(-4.45)	(-22.27)	(-22.26)	(-21.5)	(-21.46)	(-20.82)	(-21.28)	(-22.22)	(-19.58)
PREMIUM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 **
	(0.86)	(-1.08)	(-0.89)	(-0.72)	(-0.86)	(-0.33)	(-0.58)	(-1.12)	(-2.29)
HOSTILE	0.60	-0.18	-0.15	-0.15	-0.18	-0.11	-0.17	-0.18	0.21
	(1.28)	(-0.93)	(-0.73)	(-0.75)	(-0.89)	(-0.55)	(-0.8)	(-0.93)	(0.67)
RELATIVE SIZE	0.12 *	0.11 *	0.10 *	0.04	0.04	-0.05	0.08	0.11 *	0.14 *
	(1.88)	(1.84)	(1.74)	(0.68)	(0.64)	(-0.74)	(1.22)	(1.81)	(1.84)
EXCESS CASH							0.12 ***		
							(2.64)		
INTERCEPT	1.19 ***	1.02 ***	1.10 ***	1.02 ***	1.02 ***	0.95 ***	1.15 ***	1.05 ***	0.58 ***
	(11.15)	(19.07)	(20.73)	(19.18)	(19.33)	(17.75)	(20.21)	(19.88)	(8.74)
Observations	2,978	2,978	2,978	2,978	2,978	2,978	2,978	3,097	2,183

Panel B: 1st stage instrumented regression for the choice between tender offer and merger

LAMBDA	-0.13 ***
	(-3.06)
PREMIUM	0.00 ***
	(7.1)
HOSTILE	0.59 ***
	(11.66)
RELATIVE SIZE	0.01
	(0.8)
HERFINDAHL	0.43 ***
	(4)
DIVERSIFICATION	0.05 ***
	(3.69)
INTERCEPT	0.06 ***
	(3.45)
F	12.12

Panel C: Classification of transactions

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Lambda OHT	Lambda FF	Lambda FR	Market	Lambda gross	Lambda net	excl. Hybrids
		2 stage	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit	Probit
ANTICIPATED	*CASH*	16.6%	18.1%	17.5%	19.8%	20.1%	23.4%	16.6%	18.1%	16.6%
ANTICIPATED	*STOCK*	63.5%	63.0%	62.6%	62.4%	62.7%	60.9%	62.9%	62.4%	63.0%
UNANTICIPATED	*CASH*	19.2%	18.0%	19.1%	16.9%	16.2%	14.6%	19.7%	18.7%	19.4%
UNANTICIPATED	*STOCK*	0.7%	0.9%	0.8%	0.9%	0.9%	1.1%	0.8%	0.9%	1.0%

Table 3
Descriptive Statistics for Announced Equity Paid Transactions

Panel A shows characteristics of announced equity-paid transactions, separated by prediction, and Panel B shows the same characteristics for unanticipated equity-paid transactions only, separated by completion. *COMPLETION* equals 1 if the transaction has been consummated before 2009. *REVISION* (frequency) equals 1 if the percentage change from the final price paid per share to the initial price offered per share equals zero, and *BY* (%) reports the average revision in percent of the total transaction value. *COLLARS* equals 1 if the bid included a collar. *HOSTILE* equals 1 for hostile and unsolicited transactions. *TENDER OFFER* equals 1 for tender offers and zero for mergers. *COMPETITORS* equals 1 if there are multiple bidders. The tables report means and t-statistics for a test if the means differ.

Panel A: Average transaction characteristics by prediction

	Anticipated Stock	Unanticipated Stock	T-stat	
COMPLETION	90%	58%	(-5.8)	***
REVISION	11%	18%	(1.38)	
…BY (%)	-0.89	11.37	(1.7)	*
COLLARS	15%	15%	(-0.01)	
HOSTILE	1%	52%	(20.37)	***
TENDEROFFER	0%	45%	(30.94)	***
COMPETITORS	3%	12%	(2.89)	***
Observations	1,151	33		

Panel B: Average characteristics for unanticipated equity transactions, by completion

	Failed	Completed	T-stat	
REVISION	21%	16%	(0.4)	
…BY (%)	18.97	3.78	(1.66)	*
COLLARS	7%	21%	(-1.09)	
HOSTILE	93%	21%	(5.61)	***
TENDEROFFER	7%	74%	(-4.9)	***
COMPETITORS	21%	5%	(1.41)	
Observations	14	19		

* p<0.1, ** p<0.05, *** p<0.01

Table 4
Post-acquisition Long-run Abnormal Returns

This table reports cumulative long-run abnormal returns for the merged firms 6, 12, and 24 months after the announcement month, for the sub-samples of acquirers who pay with cash or stock and were expected or not expected to do so, respectively. The sub-sample of unexpected stock payers is suppressed because of the limited number of observations. Panel A reports returns calculated with the Ibbotson (1975) returns across securities and times (RATS) method combined with the Fama and French (1993) three-factor model. The following regression is run for every month j relative to the event month 0 (j = 1,…., 24):

$$(R_{i,t} - R_{f,t}) = a_j + b_j (R_{m,t} - R_{f,t}) + c_j SMB_t + d_j HML_t + \varepsilon_{i,t}\,,$$

where $R_{i,\,t}$ is the monthly return on security i in month t. $R_{f,\,t}$ and $R_{m,\,t}$ are the risk-free rate and the return on the equally weighted CRSP index, respectively. SMB_t and HML_t are the monthly return on the size and book-to-market factor in month t, respectively. The numbers reported are sums of the intercepts of cross-sectional regressions over the relevant event-time periods. The standard error for a window is the square root of the sum of the squares of the monthly standard error.

Panel B reports monthly average announcement returns of equally weighted calendar-time portfolios using the Fama-French (1993) three-factor model. In this model, acquirers who have announced an acquisition in the past 6 (12, 24) calendar months form the basis of the calendar-month portfolio. A single time-series regression is run with the excess return of the calendar portfolio as the dependent variable and the return on the three factors as the independent variables (the excess market return, a high-minus-low BM, and a small-minus-big capitalization factor). The table reports means and t-statistics for a test if the means are different than zero underneath.

		Panel A: Ibbotson RATS (in months)						**Panel B: Fama French calender-time (in months)**					
		(1,6)		(1,12)		(1,24)		(1,6)		(1,12)		(1,24)	
ANTICIPATED	*CASH*	1.40%		1.70%		-2.01%		0.20%		0.10%		0.10%	
		(1.06)		(0.9)		(-0.76)		(0.83)		(0.72)		(0.66)	
ANTICIPATED	*STOCK*	-2.10%	***	-5.53%	***	-12.92%	***	-0.20%		-0.30%	**	-0.30%	***
		(-2.96)		(-5.43)		(-8.78)		(-1.36)		(-2.39)		(-2.73)	
UNANTICIPATED	*CASH*	2.33%	**	4.04%	**	5.15%	**	0.30%		0.60%	***	0.30%	**
		(2.03)		(2.47)		(2.24)		(1.34)		(2.7)		(2.21)	
UNANTICIPATED	*STOCK*	-3.96%		-4.12%		-27.04%	*	NA		NA		NA	
		(-0.52)		(-0.42)		(-1.94)							

Table 5
Share Buybacks: Descriptive Statistics

This table reports univariate statistics for samples of repurchases. Panel A reports average transaction characteristics. *VALUE* is the offering price times the number of shares sought. *PERCENTAGE* is the number the company seeks to repurchase relative to the number of shares outstanding before the transaction. *PREMIUM/DISCOUNT* is measured as the difference between the offering price and the stock price 20 days before the announcement, divided by the latter. Panel B reports medians of firm characteristics. *LEVERAGE* equals net debt divided by the book value of assets in the year prior to the announcement. *MARKET LEVERAGE* equals book net debt divided by the average market value of assets 42-30 days prior to the announcement. Net debt is calculated as the sum of current liabilities and long-term debt minus cash above the industry average level (normalized by assets). If current liabilities or long-term debt are not available, net debt is calculated as total debt less other liabilities, deferred taxes and investment tax credit, and cash. *MARKET/BOOK* ratios are computed as the sum of the book value of assets and the difference between the market and the book value of equity divided by the book value of assets. *MARKET CAP* and *ENTERPRISE VALUE* are computed as the average of the values 42-30 days prior to the announcement. *TOTAL ASSETS* is the value of book assets in the fiscal year prior to the announcement. Panel C reports the median leverage deviations prior to and after the transaction. Deviation is calculated with the methodology we describe in Appendix A, and the deviation after the transaction is calculated with the stock price 20 days after the transaction. All non-censored variables are winsored at the 1% level. Panel D reports means for sub-samples stratified by their leverage deviation prior to the transaction. Panel D stratifies the sample into firms with negative vs. positive deviation, and Panel E reports the means of the most underlevered and overlevered deviation quintiles. Total returns are calculated as

$$Total\ return = F_P \frac{P_T - P_{-20}}{P_{-20}} + (1 - F_P)\ CAR\ ,$$

where F_P is the number of shares repurchased relative to the number of shares outstanding prior to the repurchase. P_T and P_{-20} are the tender offer price and the stock price 20 days prior to the announcement date. CAR is the abnormal return over the period between 20 days prior to the announcement and 20 days after expiration, computed using the market model with the equally weighted CRSP index as the market return. T-statistics of differences between the overlevered and underlevered sub-samples are reported in the column on the right, in brackets.

Variables	**Repurchases**
Panel A: Average transaction characteristics	
VALUE (m US$)	244
PERCENTAGE	22%
PREMIUM/DISCOUNT (%)	18%
Panel B: Median firm characteristics	
LEVERAGE	38%
MARKET LEVERAGE	29%
MARKET/BOOK	1.59
MARKET CAP (m US$)	333
TOTAL ASSETS (m US$)	388
ENTERPRISE VALUE (m US$)	478
Panel C: Median deviation from predicted leverage	
Book values	
Prior to the transaction	-4.2%
After the transaction	12.7%
Market values	
Prior to the transaction	-3.9%
After the transaction	11.5%
Observations	216

Variable	Panel D: Stratification by negative and positive deviation			Panel E: Stratification by deviation quintiles		
	Underlevered	**Overlevered**	**t-stat**	**Underlevered**	**Overlevered**	**t-stat**
VALUE (m US$)	294	146	(1.77)	259	102	(1.73)
PERCENTAGE	23.2	22.4	(0.46)	21.6	23.1	(-0.71)
PREMIUM (%)	15.7%	20.2%	(-1.74)	11.4%	25.1%	(-2.63)
TOTAL RETURN	8.2%	10.3%	(-0.78)	7.7%	16.1%	(-1.76)

Table 6
Long-run Abnormal Returns After Share Repurchase Announcements

This table reports the average premium and cumulative long-run abnormal returns calculated with the Ibbotson (1975) returns across securities and times (RATS) method combined with the Fama and French (1993) three-factor model 24 months and 36 months after the announcement month of a share repurchase. For a description of the methodology, see Table 4. Columns 1 and 2 report results for firms that were underlevered or overlevered prior to the transaction, respectively. Columns 3 and 4 report results for the most and the least overlevered quintiles. Panel A reports returns from announcement on and t-statistics for a test if the means are different from zero underneath. Panel B reports the first month in which cumulative returns exceed the average premium, returns from the described month up to 24 and 36 months after announcement, respectively, and t-statistics for a test if the means are different from zero underneath.

	Stratification by negative / positive deviation		Stratification by deviation quintiles	
	(1) Underlevered	(2) Overlevered	(3) Underlevered	(4) Overlevered
Panel A: Cumulative abnormal returns after a repurchase announcement				
(0,2)	8.1%	10.3%	9.2%	14.1%
	(2.29)	(5.92)	(2.94)	(2.8)
(2,24)	10.1%	15.6% ***	8.3%	21.3% *
	(0.88)	(3.04)	(0.77)	(1.66)
(2,36)	1.7%	20.1% ***	-11.8%	31.1% *
	(0.12)	(3.08)	(-0.89)	(1.85)
Panel B: Cumulative abnormal returns starting from the first month in which cumulative abnormal returns exceed the average premium				
t	19	19	5	19
(t,24)	4.7%	6.9% **	7.4%	26.5% ***
	(1.09)	(2.26)	(0.7)	(3.27)
(t,36)	-3.7%	11.4% **	-12.8%	21.0%
	(-0.41)	(2.26)	(-0.98)	(1.56)

Table 7
Equity Issues: Descriptive Statistics

This table reports univariate statistics for equity issues. Panel A reports average transaction characteristics. *VALUE* is the offering price times the number of shares sought. *PERCENTAGE* is the number the company seeks to issue relative to the number of shares outstanding before the transaction. *PREMIUM/DISCOUNT* is measured as the difference between the offering price and the stock price 20 days before the announcement, divided by the latter. Panel B reports medians of firm characteristics. *LEVERAGE* equals net debt divided by the book value of assets in the year prior to the announcement. *MARKET LEVERAGE* equals book net debt divided by the average market value of assets 42-30 days prior to the announcement. Net debt is calculated as the sum of current liabilities and long-term debt minus cash above the industry average level (normalized by assets). If current liabilities or long-term debt are not available, net debt is calculated as total debt less other liabilities, deferred taxes and investment tax credit, and cash. *MARKET/BOOK* ratios are computed as the sum of the book value of assets and the difference between the market and the book value of equity divided by the book value of assets. *MARKET CAP* and *ENTERPRISE VALUE* are computed as the average of the values 42-30 days prior to the announcement. *TOTAL ASSETS* is the value of book assets in the fiscal year prior to the announcement. Panel C reports the median leverage deviations prior to and after the transaction. Deviation is calculated with the methodology we describe in Appendix A, and the deviation after the transaction is calculated with the stock price 20 days after the transaction. All non-censored variables are winsored at the 1% level. Panel D and E report means for sub-samples stratified by their leverage deviation prior to the transaction. Panel D stratifies the sample into firms with negative vs. positive deviation, and Panel E reports the means of the most underlevered and overlevered deviation quintiles. T-statistics of differences between the overlevered and underlevered sub-samples are reported in the column on the right, in brackets.

Variables	**SEOs**
Panel A: Average transaction characteristics	
VALUE (m US$)	117
PERCENTAGE	22%
PREMIUM/DISCOUNT (%)	-2.92
Panel B: Median firm characteristics	
LEVERAGE	39%
MARKET LEVERAGE	20%
MARKET/BOOK	2.36
MARKET CAP (m US$)	257
TOTAL ASSETS (m US$)	226
ENTERPRISE VALUE (m US$)	391
Panel C: Median deviation from predicted leverage	
Book values	
Prior to the transaction	0.4%
After the transaction	-19.5%
Market values	
Prior to the transaction	-6.2%
After the transaction	-16.8%
Observations	2,048

	Panel D: Stratification by negative and positive deviation			**Panel E: Stratification by deviation quintiles**		
Variable	**Underlevered**	**Overlevered**	**t-stat**	**Underlevered**	**Overlevered**	**t-stat**
VALUE (m US$)	117	118	(-0.11)	70	119	(-4.31)
PERCENTAGE	22.0	25.0	(-4.89)	28.3	25.7	(1.43)
DISCOUNT (%)	-3.1%	-2.6%	(-1.57)	-3.8%	-2.9%	(-1.68)
Observations	1252	796		410	409	

Table 8
Long-run Abnormal Returns After Seasoned Equity Offering Announcements

This table reports the cumulative long-run abnormal returns 24 months and 36 months after the announcement month of a seasoned equity offering calculated with the Ibbotson (1975) returns across securities and times (RATS) method combined with the Fama and French (1993) three-factor model. For a description of the methodology, see Table 4. Columns 1 and 2 report returns for all firms that are underlevered or overlevered prior to the transaction, and Columns 3 and 4 returns for the most and the least overlevered quintiles.

Month around announcement	Stratification by negative / positive deviation		Stratification by deviation quintiles	
	(1) Underlevered	(2) Overlevered	(3) Underlevered	(4) Overlevered
(0,24)	-11.7% ***	-16.1% ***	-6.8%	-15.7% ***
	(-4.12)	(-3.67)	(-1.17)	(-3.21)
(0,36)	-16.1% ***	-18.6% ***	-10.2%	-21.2% ***
	(-4.59)	(-3.53)	(-1.44)	(-3.48)

Figure 1. Long-run abnormal returns after acquisition announcements.

Cumulative abnormal returns based on the Fama-French three-factor model and RATS. See Table 4 for a description of the methodology.

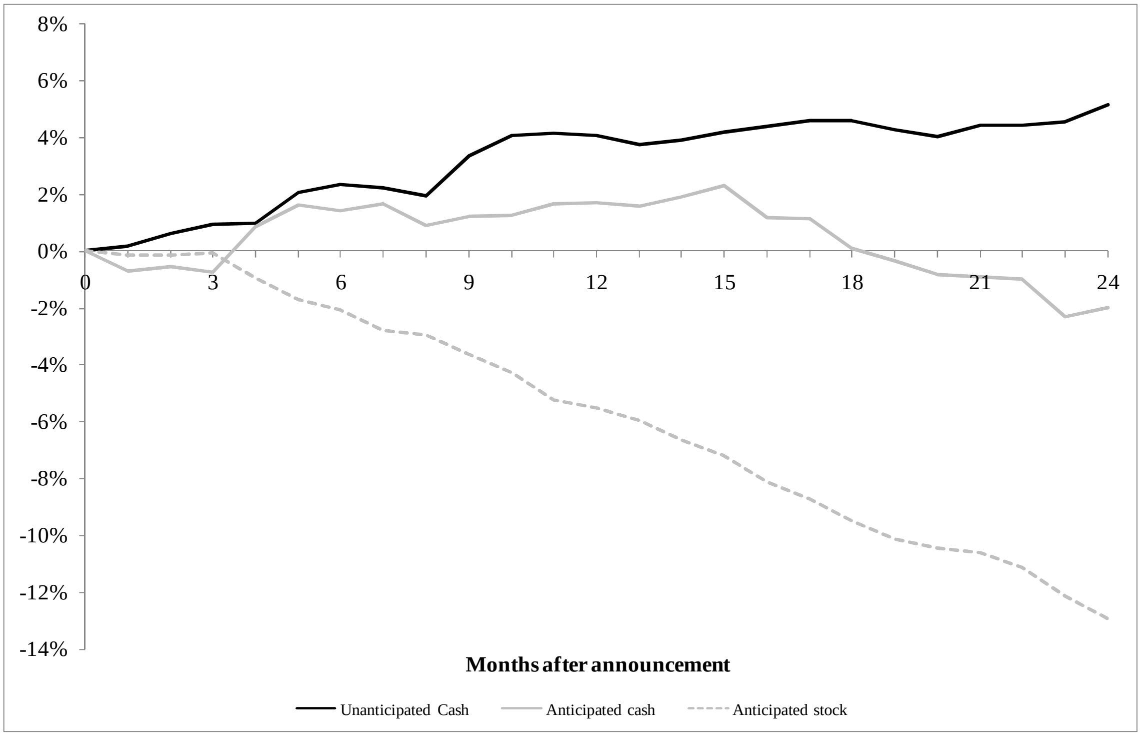
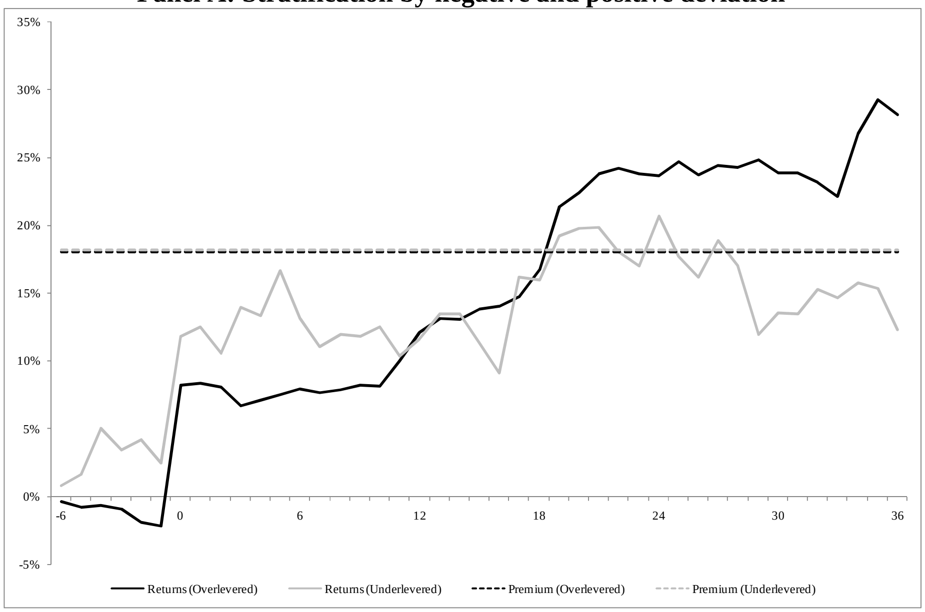


Figure 2. Long-run abnormal returns after share repurchase announcements.

The figure presents cumulative abnormal returns based on the Fama-French three-factor model and RATS. See Table 4 for a description of the methodology. Panel A reports the returns and average premium of the overlevered and the underlevered sub-samples, and Panel B reports the returns and the average premium of the most overlevered and underlevered quintiles.

Panel A: Stratification by negative and positive deviation



Panel B: Stratification by deviation quintiles

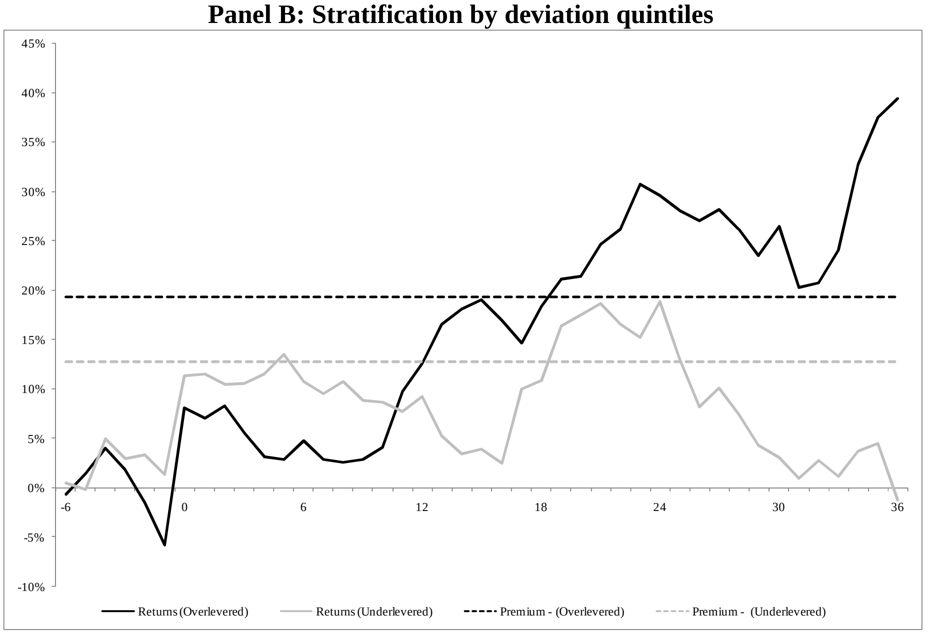
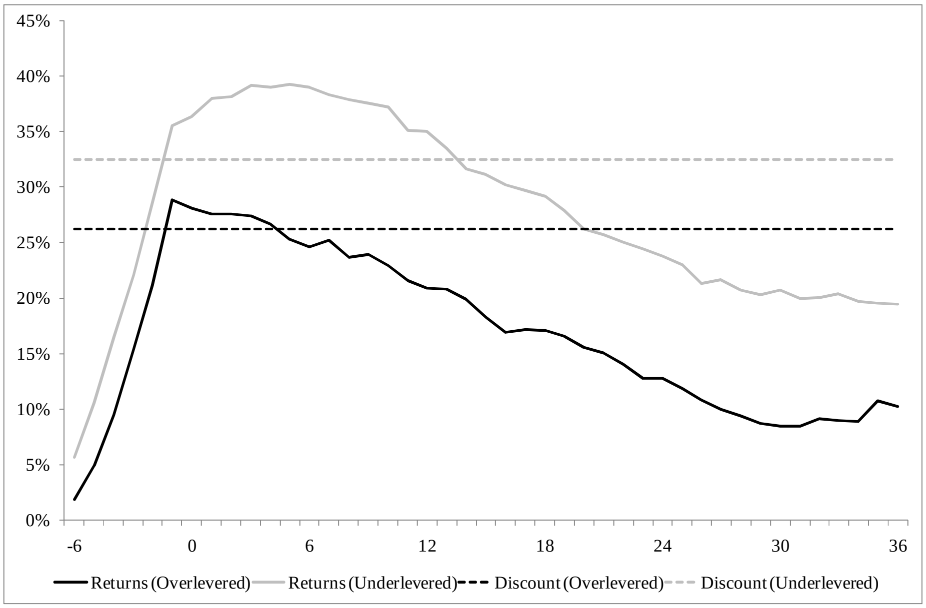


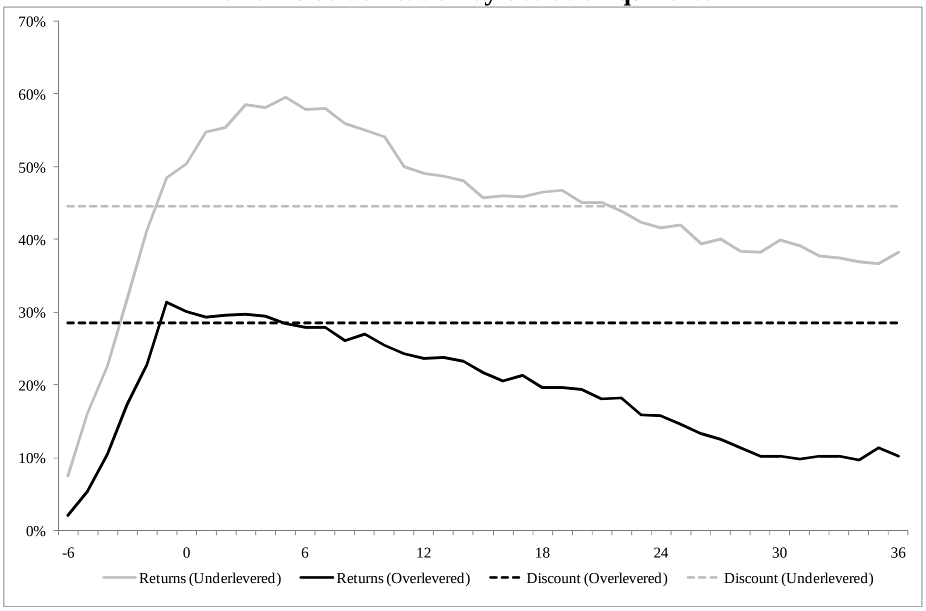
Figure 3. Long-run abnormal returns after seasoned equity offering announcements.

The figure presents cumulative abnormal returns based on the Fama-French three-factor model and RATS. See Table 4 for a description of the methodology. Panel A reports the returns and average premium of the overlevered and the underlevered sub-samples, and Panel B reports the returns and the average premium of overlevered and the most underlevered quintiles.

Panel A: Stratification by negative and positive deviation



Panel B: Stratification by deviation quintiles



Appendix A: Leverage Prediction

We adopt the methodology of Kayhan and Titman (2007) to predict leverage and check for robustness using the methodologies of Hovakimian, Opler, and Titman (2001), Fama and French (2002) and Flannery and Rangan (2006). The cited literature constructs a proxy for an optimal leverage ratio as the predicted value from a regression of debt ratios on variables shown to be relevant for leverage. Our dependent variable, the leverage ratio, is based on net debt adjusted for operating cash. Because the literature often uses debt including non-operating cash or debt excluding all cash, we repeat our analysis using these alternative measures of debt. The independent variables are the following.

Profitability: As Graham (2000) argues, more profitable firms pay more tax and benefit more from debt tax shields. A negative relation between profitability and leverage [reported by e.g. Friend and Hasbrouck (1988), or Titman and Wessels (1988)] can be explained by the fact that profitable firms can use retained earnings to finance new projects and do not need to issue debt [Kayhan and Titman (2007)]. A strategic argument, as discussed by Bolton and Scharfstein (1990), suggests that more profitable firms prefer low leverage ratios because they deter the entry of potential rivals. Myers and Majluf (1984) argue that the negative relation is consistent with a pecking order theory, where firms prefer internal funds over external funds. Hovakimian, Opler and Titman (2001) and Strebulaev (2007) argue that the negative relation is consistent with adjustment costs: firms that become profitable can only adjust their leverage with some delay. Meanwhile, the increase in profitability increases firm value, leading to lower leverage.

Investment opportunities: Myers (1977) argues that firms with larger growth and investment opportunities should avoid debt because they have higher expected costs of financial distress. We include the market-to-book ratio as well as the R&D expense (as a ratio of sales) as a proxy for growth and investment, as, for example, suggested by Bradley, Desai, and Kim (1988) and Long and Malitz (1985). Because R&D expenses are not reported by all firms, we include a dummy when they are available.

Potential collateral value: Firms with more potential collateral have easier and cheaper access to debt and are therefore expected to have higher leverage. Potential collateral, as suggested by Titman and Wessels (1988) or Long and Malitz (1985), is more valuable the higher the value of tangible assets, total assets, or sales and the lower the advertising - or selling - cost as a fraction of sales, because the former can serve as collateral itself, and the latter makes a firm's assets more unique or less deployable for banks. Uniqueness is also associated with the market-to-book ratio and R&D expenses.

Tax shields: Firms might not have to resort to interest tax shields if they can use depreciation deductions to save tax instead. Like Fama and French (2002) and Flannery and Rangan (2006), we use the ratio of depreciation and amortization over book assets as a proxy for other tax shields than leverage for their respective specifications.

Firm size: Larger firms should have more debt capacity [Titman and Wessels (1988) and Long and Malitz (1985)].

Finally, we include *year and Fama-French industry time fixed effects*. Among others, these account for time-varying cost of debt, market preferences for leverage, and economic conditions. Note that the Fama-French industry classification is coarser than the SIC classification system, thus circumventing some industry measurement problems recently pointed out by, e.g., Hoberg and Phillips (forthcoming).

The results reported in Table A.1 are consistent with the previous literature. The coefficient of profitability is significantly negative, a widely discussed result [see, for example, Hovakimian, Opler, and Titman (2001)]. Leverage is negatively related to proxies for growth opportunities measured by the market-to-book ratio and R&D expenses. The coefficient on tangibility is significantly positive. Moreover, selling expenses has a negative coefficient in the leverage regression. These expenses are also associated with more unique products, which are less suitable as collateral and thus lead to lower leverage levels. Sales and total assets are positively correlated with leverage, which is consistent with the argument that larger firms have more debt capacity. The coefficient on depreciation is positive, against the prediction that it may serve as an alternative tax shield to debt. Fama and French (2002) also document positive coefficients on depreciation (as well as negative coefficients for another sample) and comment on the weakness of depreciation as a proxy for tax shield. The results are not significantly different when we calculate debt net of all cash or not deducting cash at all.

Table A.1
Predicting Leverage (Tobit Regressions)

This table reports coefficients and corresponding statistics used (in brackets) for leverage ratio prediction. We derive them using a Tobit specification, in which the predicted value of the leverage ratio is restricted to be below 1. Columns 1, 2 and 9-12 report the regression results based on the specification used in Kayhan and Titman (2007), Columns 3 and 4 the regression results based on the specification used in Hovakimian, Opler, and Titman (2001), Columns 5 and 6 the regression results based on the specification used in Fama and French (2002), and Columns 7 and 8 the regression results based on the specification used in Flannery and Rangan (2006). Columns 1-9 report results based on leverage where debt is net cash above the industry average level (normalized by assets), Columns 9 and 10 based on leverage calculated with total debt, and Columns 11 and 12 based on leverage net of all cash. Columns 1, 3, 5, 7, 9 and 11 use book values, and Columns 2, 4, 6, 8, 10 and 12 use market values. The sample consists of all firms in Compustat between 1979 and 2005. *MARKET/BOOK* is computed as the (market value of equity + book value of assets – book value of equity)/book value of assets. *TANGIBILITY* is property, plant, and equipment divided by sales. *R&D/SALES* is research and development expense divided by sales, and *R&D DUMMY* is equal to 1 if the firm has R&D expense and zero otherwise. *LN SALES* and *LN ASSETS* are the natural logarithm of sales and assets, respectively. *SGA/SALES* are sales and general administrative expenses divided by sales. *TAXSHIELD* is depreciation and amortization over total assets. All independent variables are from the year prior to the dependent variable observation, except for *AVERAGE ROA*, which is the average return on assets of the three years' before the year prior to the dependent variable. The statistics for year and industry dummies are suppressed.

Dependent variable = Leverage

	(1)		(2)		(3)		(4)		(5)		(6)	
	Kayhan & Titman				Hovikimian, Opler & Titman				Fama & French			
	Book		Market		Book		Market		Book		Market	
ROA	-0.40	***	-0.42	***					-0.15	***	-0.11	***
	(-40.63)		(-43.18)						(-19.08)		(-14.8)	
MARKET/BOOK	-0.01	***	-0.05	***	-0.02	***	-0.05	***	-0.03	***	-0.05	***
	(-9.21)		(-57.97)		(-20.87)		(-49.72)		(-29.19)		(-56.99)	
TANGIBILITY	0.10	***	0.08	***	0.23	***	0.21	***				
	(14.12)		(10.94)		(27.9)		(27.03)					
R&D/SALES	-0.17	***	-0.16	***	-0.19	***	-0.12	***	-0.17	***	-0.15	***
	(-15.88)		(-14.09)		(-16.52)		(-11.58)		(-28.23)		(-25.74)	
R&D DUMMY	-0.04	***	-0.04	***	-0.03	***	-0.04	***	0.00		-0.01	
	(-12.03)		(-13.88)		(-8.03)		(-11.56)		(0.66)		(-1.53)	
SGA/SALES	-0.09	***	-0.12	***	-0.14	***	-0.15	***				
	(-13.89)		(-18.68)		(-20.84)		(-24.68)					
LN SALES	0.03	***	0.00									
	(43.08)		(1.17)									
AVERAGE ROA					-0.47	***	-0.38	***				
					(-38.52)		(-34.64)					
LN ASSETS					0.01	***	0.01	***	0.01	***	0.02	***
					(14.17)		(19.59)		(12.25)		(22.64)	
TAXSHIELD									0.91	***	0.70	***
									(21.88)		(18.19)	
INTERCEPT	0.21	***	0.42	***	0.38	***	0.42	***	0.60	***	0.33	***
	(5.39)		(10.21)		(8.09)		(12.53)		(17.96)		(8.37)	
INDUSTRY FIXED	Yes		Yes		Yes		Yes		Yes		Yes	
YEAR FIXED	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	41,530		41,362		41,617		41,532		50,414		50,267	

Dependent variable = Leverage

	(7)	(8)	(9)	(10)	(11)	(12)
	Flannery & Rangan		Kayhan & Titman (gross)		Kayhan & Titman (net)	
	Book	Market	Book	Market	Book	Market
ROA	-0.16 ***	-0.12 ***	-0.38 ***	-0.44 ***	-0.54 ***	-0.49 ***
	(-20.91)	(-16.62)	(-43.52)	(-47.54)	(-48.44)	(-44.42)
MARKET/BOOK	-0.02 ***	-0.04 ***	-0.01 ***	-0.06 ***	-0.02 ***	-0.04 ***
	(-28.08)	(-56.11)	(-7.99)	(-63.77)	(-21.9)	(-35.99)
TANGIBILITY	0.24 ***	0.22 ***	0.08 ***	0.05 ***	0.21 ***	0.18 ***
	(30.24)	(30.95)	(11.55)	(7.55)	(24.14)	(21.32)
R&D/SALES	-0.17 ***	-0.14 ***	-0.06 ***	-0.07 ***	-0.28 ***	-0.21 ***
	(-27.95)	(-25.41)	(-6.22)	(-6.85)	(-23.36)	(-17.79)
R&D DUMMY	0.01 **	0.00	-0.04 ***	-0.04 ***	-0.05 ***	-0.04 ***
	(2.24)	(0.14)	(-12.45)	(-14.42)	(-12.48)	(-11.1)
SGA/SALES			-0.06 ***	-0.08 ***	-0.12 ***	-0.15 ***
			(-9.87)	(-13.74)	(-17.46)	(-22.09)
LN SALES			0.03 ***	0.01 ***	0.04 ***	0.01 ***
			(47.6)	(14.05)	(50.49)	(13.37)
AVERAGE ROA						
LN ASSETS	0.01 ***	0.01 ***				
	(9.12)	(19.51)				
TAXSHIELD	0.41 ***	0.23 ***				
	(9.22)	(5.54)				
INTERCEPT	0.38 ***	0.44 ***	0.23 ***	0.64 ***	0.13 ***	0.34 ***
	(8.56)	(14.4)	(6.69)	(18.61)	(2.94)	(7.62)
INDUSTRY FIXED	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FIXED	Yes	Yes	Yes	Yes	Yes	Yes
Observations	50,147	50,000	46,934	46,934	46,934	46,934

Appendix B: Pro-Forma Balance Sheets

We illustrate the methodology used for the pro-forma balance sheets with the following example. On November 11, 2005, the media company McClatchy announced its takeover of Knight Ridder, the second largest newspaper publisher at that time. While Knight Ridder had been publicly searching for a potential buyer, McClatchy's interest was somewhat surprising: not only was it considered to be too risk-averse to consider takeovers in that scale, but it was also half the size of Knight Ridder [Lieberman (2006)].

Variable	**Bidder**	**Target**	**Pro forma assuming payment with...**			
(in $ millions)	(McClatchy)	(Knight Ridder)	**stock**		**cash**	
Debt	656	2,751				
Book equity	1,216	1,447	1,216+4,572 =	5,788		1,216
Book assets	1,872	4,198				
Cash	3	24				
Non-operating cash	0	0	max (27 - 9% * 9,195; 0) =	0	max (27 - 9% * 9,195; 0)=	0
Market value equity	1,323	4,279	1,323+4,572 =	5,895		1,323
Transaction value		4,572				
Net Debt	656	2,751	656+2,751 =	3,407	656+2,751+4,572 =	7,979
Book value of assets	1,872	4,198	1,872+2,751+4,572 =	9,195		9,195
Enterprise value	1,979	7,030	1,979+2,751+4,572=	9,302		9,302
Leverage	35%	66%	3,407/9,195 =	37%	7,979/9,195 =	87%
Market leverage	50%	64%	3,407/9,302 =	37%	7,979/9,302 =	86%

Figure B.1. Calculation of pro-forma variables – example of McClatchy and KnightRidder transaction.

First, let us illustrate how we calculate leverage. Both firms are in the "printing and publishing" industry (Fama French industry 8), which has an average cash to assets ratio of 9%. This means that neither McClatchy nor KnightRidder has non-operating cash, and their leverage is simply debt over assets, or debt over enterprise value.

For the pro-forma sums, we assume that the bidder, McClatchy, seeks to acquire the target, Knight Ridder, either by 100% cash or by 100% stock. Let us consider what effect each method of payment has on the bidder and then on the target. The value of the bid, i.e., the amount of value paid for the target, is represented by the transaction value – here $4,572 million.

If the bidder pays by stock, it will fund the transaction value of $4,572 million through the exchange of its own shares to acquire the target. The effect will be reflected in an increase in the book and market value of equity of McClatchy by exactly the amount of the transaction value, effectively a method of valuing the assets of the target to the acquirer. As in combining or "consolidating" the balance sheets of the two companies upon acquisition, the equity of the target is eliminated and replaced with the equity payment paid by the bidder. When acquiring a company the acquirer must also take on the target's debt. In this example, the target has a large amount of debt in its capital structure (66%), so the equity financed bid generates a post-acquisition book leverage ratio that is higher than the bidder's pre-acquisition leverage.

By contrast, if the bidder chooses to pay 100% cash for the acquisition, the bidder must first raise its debt to finance the purchase of the target and then also assume the debt of the target firm. This is reflected in the significant additional debt held by the combined entity and the reduction in equity of the target by the transaction value – its shareholders have been "bought out". The resulting impact has a very important effect on the leverage structure of the combined entity – raising its debt to total book value to 87% in book terms or 86% in market terms.

In reality, McClatchy paid a mix of cash and stock. It financed the cash payment by raising bank debt, while announcing plans to get its high resulting debt level down by selling 12 of KnightRidder's 32 newspapers.

Appendix C: Payment Method Predictions - Robustness

We repeat our analysis by changing the estimation methodology as follows: (i) we leave out the first stage, use the (ii) Hovakimian, Opler, and Titman (2001), (iii) Fama and French (2002) and (iv) Flannery and Rangan (2006) methodology to estimate Λ, use (v) market values, use (vi) gross debt or (vii) debt net of all cash to calculate leverage, and (viii) exclude the hybrid cases. In the specification using gross debt, we control for cash in excess of the industry average level. For the specification excluding the hybrid cases, we use a Probit specification. In the specification reported, we label acquirers expected stock (cash) payers if the predicted probability of paying stock (cash) is over 50%. In addition, we test for the effect of the following variables related to the payment method.

Ownership: managers who own a significant share of the target firm may want to retain their control over the resulting firm and therefore prefer stock payment [Ghosh and Ruland (1998)]. Also, Baker, Coval, and Stein (2007) argue that private shareholders are inert and therefore more willing to accept acquirer stock as a form of payment than institutional shareholders would be.

Governance: the governance structure of the target firm could affect the target management's attitude toward the negotiation. Hartzell, Ofek, and Yermack (2004) describe governance provisions that affect the target management's willingness to accept acquisition offers. In particular, classified boards with multiple proxy voting meeting requirements make it difficult for the acquirer to win a hostile bid. Golden parachutes, on the other side, give the target management a higher incentive to accept takeover offers.

Liquidity: target shareholders could be reluctant to accept illiquid acquirer stock. We control for this with Amihud's (2002) illiquidity measure.

Transaction structure: Eckbo (2009) and Sudarsanam (1995) describe the relation between transaction structure characteristics and the choice of payment method. When multiple bidders participate in a contest, an acquirer could prefer cash payment because it facilitates the filing process. Conversely, when an acquirer already owns target shares before the bid, it could face a smoother negotiation process and not care about speed. Lock-up periods and termination fees could also affect the need for a faster process.

Time fixed effects: macroeconomic factors [Harford (2005)] and time-specific sentiments [Zhang (2009)] could affect the target's willingness to accept equity as payment. Because equity payment was particularly popular in the internet-related merger boom, we repeat the regression with a dummy variable that equals 1 for the years between 1998 and 2001.

Agency costs: managers may not care about maximizing shareholder value. Instead, they may prefer equity financing to debt financing because debt prevents managers from spending free cash flow on negative NPV projects [Jensen (1986)]. In particular, Harford (1999) shows that acquirers with excess cash are more prone to conduct value-destroying acquisitions. We control for agency costs with the acquirer debt in excess of the industry average (normalized by assets).

Tax (shareholders): target shareholders can differ in their preference for cash or stock for tax or other reasons [Baker and Wurgler (2004)]. "Catering" for these preferences can change the acquisition method. We include a dummy variable for dividend payers because they are more likely to prefer cash.

Tax (corporate): firms can have particular tax shields that reduce the benefits of additional debt [Graham (2000)]. Although we controlled for tax considerations in the prediction of leverage, we repeat the payment method prediction with the tax rate, the investment tax credits, and depreciation and amortization expenses to see if they add firm-specific variation.

Panel A of Table 2 and Table C.1 show that, regardless of the specification, the coefficient on Λ is always significantly positive. Note that the effect of Lambda is accentuated in the specification using net debt, with a coefficient of 0.72 ($t = 5.66$), and weaker in the specification using gross debt, with a coefficient of 0.36 ($t = 3.62$). Institutional ownership in the target firm increases the probability of paying with cash (Column 2). This is consistent with the argument that non-institutional target shareholders exhibit inertia and thereby make stock payment more attractive. Target firms with golden parachutes (Column 3) are more likely to accept cash, consistent with the argument that departing target management prefers selling private stock holdings for cash rather than exchanging its stock for shares in the combined firm. Competing offers are associated with a higher probability of cash payment (Column 5), consistent with the argument that the speed effect of cash payment is important in a bidding contest. Transactions with lockup periods are more likely to be financed in equity (Column 5). Finally, as expected, acquirers are more likely to pay with stock in the years between 1998 and

2001 (Column 7). The other control variables do not affect the choice of acquisition finance significantly.

Panel B of Table C.1 shows that the payment method does not change significantly across specifications: in particular, the fraction of unanticipated stock payment never exceeds 1%. Note also that the predictions of the Probit regression do not change significantly if we choose different cutoff levels: less than 5% of the transactions have a predicted probability of paying with stock between one-third and two-thirds.

Table C.1
Payment Method Prediction – Robustness

This table shows the results of robustness tests for the prediction of the payment method. Panel A reports results of the main regression, and Panel B reports the fraction of transactions with anticipated and unanticipated payment methods. All columns are Tobit regressions in which the dependent variable is the percentage of stock used as payment. The independent variables are the following. *Λ, TENDER OFFER, PREMIUM, HOSTILE,* and *RELATIVE SIZE* are as defined in Table 2. *INSIDER OWNERSHIP* equals 1 if ownership of inside shareholders in the target firm equals or exceeds 5%, as reported in the SEC files 3, 4, 5, or 144, and zero otherwise. *INSTITUTIONAL OWNERSHIP* equals 1 if ownership of institutional shareholders in the target firm equals or exceeds 5%, as reported in the SEC 13f filing, and zero otherwise. *GOVERNANCE* is the index by Gompers, Ishii and Metrick (2003). *CLASSIFIED BOARDS* equals 1 if the target firm's boards of directors is divided, for the purpose of election, into separate classes and zero otherwise. *GOLDEN PARACHUTES* equals 1 if the target firm has a severance agreement with its executives contingent upon a change in corporate control and zero otherwise. *AMIHUD ILLIQUIDITY* is for stock i during quarter t is defined as: $\min\left(\frac{1}{M_{it}}\sum_{d-1}^{M_{it}}\frac{|R_{id}|}{dv_{id}}, \frac{29.75}{0.3C_{t-1}}\right)$, in which R_{id} is the return of stock i during day d, dv_{id} is its dollar volume in millions of dollars (number of shares traded during day d times the stock price at the end of day d) and M_{it} is the number of valid observations during quarter t. C_{t-1} is the total market capitalization at t-1 divided by the total market capitalization at the end of July 1962. *MULTIPLE BIDDERS* equals 1 if other bidders also seek to acquire the target firm and zero otherwise. *TOEHOLD* equals 1 if the acquirer owns more than 0.5% of the target prior to the transaction, and 0 otherwise. *LOCKUP* equals 1 if the transaction includes a lockup agreement and zero otherwise. *TERMINATION* equals 1 if the transaction includes a termination agreement and zero otherwise. 1998-2001 equals 1 if the transaction was announced in a year between 1998 and 2001. *EXCESS CASH* is cash in excess of the industry level (normalized by assets). *DIVIDEND PAYER* is a dummy variable that equals 1 for target firms that paid a dividend in the year prior to the acquisition and zero otherwise. *TAXRATE* is the combined firm's income tax over net income. *TAXSHIELD1* is the combined firm's investment tax credit over sales. *TAXSHIELD2* is the combined firm's depreciation and amortization expenses over sales. All non-censored variables are winsored at 1% level.

Panel A reports coefficients and t-statistics for the regression with the percentage of equity payment as the dependent variable and the number of observations. Panel B reports the fraction of anticipated and unanticipated cash and equity transactions for the regressions reported in Panel A and B. For the probit specifications, a transaction is called anticipated if the predicted probability of using the observed payment method exceeds 50%. For the Tobit specifications, a transaction is called anticipated if the predicted percentage of stock equals the observed percentage of stock used in the payment. Predictions for hybrid transactions are omitted.

Panel A: Main regression. Dependent variable = percentage of equity used in payment

	(1) Insider ownership	(2) Institutional ownership	(3) Target governance characteristics	(4) Acquirer Illiquidity	(5) Transaction characteristics
LAMBDA	0.474 *	0.856 ***	0.550 **	0.822 ***	1.102 ***
	(1.83)	(5.55)	(2.15)	(5.46)	(5.25)
TENDER OFFER	-1.806 ***	-1.771 ***	-1.328 ***	-1.766 ***	-1.839 ***
	(-13.49)	(-20.84)	(-9.78)	(-21.14)	(-14.37)
PREMIUM	0.000	0.000	-0.002	0.000	0.000
	(0.35)	(-0.77)	(-1.39)	(-0.98)	(-0.5)
HOSTILE	0.080	-0.182	-0.012	-0.254	-0.133
	(0.28)	(-0.91)	(-0.04)	(-1.21)	(-0.44)
RELATIVE SIZE	0.433 ***	0.080	0.249 **	0.138 **	0.156 *
	(3.73)	(1.27)	(2.19)	(2.28)	(1.74)
INSIDER OWNERSHIP	-0.049				
	(-0.45)				
INSTITUTIONAL OWN.		-0.189 ***			
		(-3.37)			
GOVERNANCE			0.033 *		
			(1.69)		
CLASSIFIED BOARD			-0.193 *		
			(-1.81)		
GOLDEN PARACHUTES			-0.225 **		
			(-2.19)		
AMIHUD ILLIQUIDITY				-0.211	
				(-1.26)	
MULTIPLE BIDDERS					-0.422 **
					(-2.28)
TOEHOLD					-2.281
					(-0.16)
LOCKUP					0.832 ***
					(8.11)
TERMINATION					0.048
					(0.64)
INTERCEPT	0.869 ***	1.128 ***	0.880 ***	1.008 ***	0.756 ***
	(6.84)	(16.76)	(5)	(18.68)	(8.4)
Observations	987	2,460	587	2,619	1,368

Panel B: Classification of transactions

	(1)	(2)	(3)	(4)	(5)
ANTICIPATED CASH	16.9%	22.7%	21.1%	18.1%	26.0%
ANTICIPATED STOCK	66.7%	61.1%	64.8%	64.5%	64.6%
UNANTICIPATED CASH	15.5%	15.2%	13.7%	16.6%	8.6%
UNANTICIPATED STOCK	0.9%	1.0%	0.4%	0.8%	0.9%

Panel A: Main regression. Dependent variable = percentage of equity used in payment

	(6)	(7)	(8)	(9)	(10)
	Year dummies	1998-2001	Agency	Tax (shareholder)	Tax(corporate)
LAMBDA	0.685 ***	0.785 ***	0.832 ***	0.801 ***	1.240 ***
	(3.9)	(5.29)	(5.29)	(5.36)	(8.33)
TENDER OFFER	-1.784 ***	-1.828 ***	-1.835 ***	-1.822 ***	-1.471 ***
	(-17.55)	(-22.33)	(-21.67)	(-22.2)	(-19.12)
PREMIUM	-0.001 *	-0.001	-0.001	-0.001	0.000
	(-1.85)	(-1.55)	(-1.03)	(-1.1)	(0.49)
HOSTILE	-0.134	-0.148	-0.142	-0.188	-0.107
	(-0.76)	(-0.75)	(-0.69)	(-0.95)	(-0.59)
RELATIVE SIZE	0.117 **	0.122 **	0.126 **	0.108 *	-0.149 **
	(2.12)	(2.05)	(2.06)	(1.81)	(-2.23)
1998-2001		0.225 ***			
		(4.22)			
EXCESS CASH			0.225		
			(1.3)		
DIVIDEND PAYER				-0.043	
				(-0.82)	
TAXRATE					0.000
					(-0.05)
TAXSHIELD 1					5.403
					(1.27)
TAXSHIELD 2					0.182
					(1.14)
YEAR FIXED EFFECTS	Yes				
INTERCEPT	0.258 **	0.955 ***	1.008 ***	1.052 ***	0.813 ***
	(2.16)	(17.26)	(18.17)	(16.28)	(14.3)
Observations	3,261	3,261	2,871	2,978	1,955

Panel B: Classification of transactions

ANTICIPATED CASH	22.3%	20.2%	18.6%	18.3%	15.5%
ANTICIPATED STOCK	66.5%	63.1%	62.5%	62.7%	63.2%
UNANTICIPATED CASH	10.2%	15.8%	18.0%	18.0%	20.5%
UNANTICIPATED STOCK	1.0%	0.9%	0.9%	0.9%	0.8%

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