Investor Inattention and Stock Prices: Evidence from Acquisitions with a Choice of Payment Type

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Abstract

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1. Introduction

Odean (1999) and Barber and Odean (2000) show that active trading impedes portfolio returns, and French (2008) concludes in his presidential address that "…the average investor would increase his return if he switched to a passive strategy." But being overly passive can also be harmful. For example, the value from the embedded flexibility in some securities, such as stock options and convertible bonds, relies on investor attention. More generally, Hirshleifer and Teoh (2003) argue that "inattentive investors lose money by ignoring aspects of the economic environment."

For individual stock investors, inattention is usually inconsequential. For example, a shareholder's lack of attention to a company's new product launch is not expected to destroy shareholder value. Even neglecting shareholder elections, such as who should be on the board or directors or whether a firm should be sold, is trivial unless the outcome of the vote has significant value implications *and* the investor's vote is likely to affect the outcome (which is not true for most investors).

There are, however, transactions in which firms discriminate against certain shareholders, and shareholders need to be attentive to avoid being victimized. This study examines shareholder inattention in one type of transaction where shareholders might face discrimination, namely acquisitions that leave the choice of payment type to target shareholders. In these acquisitions, shareholders can choose between cash and stock, and if they fail to make a choice, they typically receive the less popular payment type. The relative value of the cash and stock payments varies considerably, such that the choice of payments can have great value consequences for individual shareholders and inattention can be costly. The complexity of the payment terms also varies, with some being so

complex that shareholders might find it hard to be attentive to all relevant information. Thus, acquisitions with a choice of payment type can provide unique insight into individual shareholders' choices, including the extent of shareholder inattention and its consequences for shareholders and stock prices.

In a sample of acquisitions with payment choice between 1985 and 2014 that have complete election results, I find that, on average, target shareholders elect stock payment for 51% of their shares and cash payment for 38%. No election was deemed for the remaining 11%. Regressions reveal that target shareholders primarily base their choice of payment type on the relative value of the cash and stock payments. In fact, a value wedge measure explains two thirds of the variation in the choices of stock and cash payments. Interestingly, if the values for the stock and cash choices are similar, shareholders favor stock to cash. But if the deal terms are complex, shareholders tend to shy away from stock (which is generally harder to value) in favor of cash, consistent with theories of ambiguity aversion (Epstein and Schneider, 2008; Ju and Miao, 2012).

Shareholders' indifference could explain non-elections for cases with either similar values for the cash and stock payments or moderately higher value for the cash payment due to the differential taxation. Because I am interested in non-elections that stem from inattention, and not indifference, I focus on a subsample of cases where the stock value exceeds the cash value by at least five percent or the cash value exceeds the stock value by more than the maximum possible tax liability for cash payments. In this subsample, the fraction of non-elections is 7.4%. Thus, I argue that shareholders holding a combined 7.4% of the shares are inattentive to the payment decision, and would have expected to do better even with a random election. For the same subsample, I find that

7.3% of the shares, on average, are submitted for the inferior payment type. I argue that this represents a conservative estimate of the fraction of shares held by partially inattentive shareholders, i.e., shareholders who recognize that they can make a choice but are not sufficiently attentive to the details of the terms to make a fully informed choice. In sum, shareholders representing about 15% appear to be completely or partially inattentive to the election of payment type.

There are two non-mutually exclusive possibilities for the apparent inattention to the payment decisions. One possibility is that shareholders generally disregard relevant information regarding the individual shares in their portfolios. Another possibility is that they find it hard to remain attentive and process all relevant information in the face of complexity or information overload (Hirshleifer and Teoh, 2003; Agnew and Szykman, 2005). Consistent with the latter, the fraction of non-elections increases with the complexity of the payment terms. That is, when shareholders confront complex decisions, some apparently lose attention and withdraw from the decision making process.

The results discussed thus far suggest that inattentive shareholders effectively leave money on the table for attentive shareholders. A novel question is whether attentive shareholders bid up the price in anticipation of a forthcoming wealth transfer. To answer this, I examine the ratio of the stock price to the weighted deal value per share on the election day (the deadline for shareholders to make a payment choice). In the absence of both a wealth transfer and uncertainty about deal completion, I expect the price ratio to equal one on the election day. If the anticipated wealth transfer is priced, I conjecture that the price ratio increases with the value wedge between the payment types

on the election day, because the value wedge serves as a proxy for the possible wealth transfer. On the day after the election day, only shares that have not been submitted for election are trading. Because these shares receive the less popular payment type, I conjecture that the price ratio declines, especially when the value wedge is pronounced.

On average, the price ratio is 0.99 on the election day, suggesting some uncertainty about acquisition completion. More importantly for the purpose of this study, the price ratio exceeds one in 37% of the cases. And consistent with the conjecture above, the fraction above one increases from 12% of the cases where the absolute value wedge is below one percent, to 37% of the cases where the absolute value wedge is between one and ten percent, and 59% of the cases where the absolute value wedge exceeds ten percent. I interpret this as evidence that shareholders' inattention gives rise to an expected wealth transfer to attentive shareholders that, in turn, affects stock prices.

On the post-election day, the average price ratio drops by two percent to 0.97, and only 14% of the price ratios remain above one. The magnitude of the drop increases with the value wedge, from no decline when the value wedge is zero to a six percent average decline when the absolute value wedge is in the upper tertile. These results suggest that shares that have not been submitted for election are worth less, especially if the value wedge is large such that the adverse consequence of not having made an election is also large. I further interpret the results to mean that the average cost of inattention to payment elections is two percent, ranging from no cost when there is no value wedge to a six percent average cost when the absolute value wedge is in the upper tertile.

An extensive and relevant literature on investor inattention has emerged in recent years. Hirshleifer and Teoh (2003), Peng and Xiong (2006), DellaVigna and Pollet

(2007), Hirshleifer, Lim, and Teoh (2011), and Andrei and Hasler (2015) develop models that predict that investor inattention (e.g., neglecting footnotes in financial statements) affects stock prices and subsequent returns. Huberman and Regev (2001), Tetlock (2011), Gilbert et al. (2012) document empirically that announcements of stale news affect stock prices, suggesting investor inattention. Hirshleifer, Lim, and Teoh (2009) and DellaVigna and Pollet (2009) find, respectively, that the stock market responds more slowly to earnings surprises on days when the sheer number of earnings announcements dilutes attention and on Fridays when attention is conjectured to be low. DeHaan, Shevlin, and Thornock (2015) employ a different methodology to show that investor attention is lower after market closes and on busy reporting days (but not any different on Fridays), and that managers tend to issue bad earnings when attention is expected to be low. Cohen and Frazzini (2008) document return predictability across firms linked through supplier/customer relations, an effect they attribute to investor inattention. And Barber and Odean (2008) find that individual investors are net buyers of stocks with news stories or extreme returns that likely catch investors' attention.[1]

This study contributes to the literature on investor inattention in several ways. First, this study is unique in that it examines individual shareholder choices. As such, I can estimate the extent of inattention among shareholders when they are confronted with a potentially important choice. To my knowledge, the only comparable estimate based on US shareholder data is that of Holderness and Pontiff (2015), who report that the

[1] Pervasive investor inertia and inattition have also been documented in pension plans (Madrian and Shea, 2001; Agnew, Balduzzi, and Sundén, 2003; Dahlquist and Martinez, 2015), and, relatedly, employee stock purchase plans (Babenko and Sen, 2014). But participants in pension plans invest mostly in funds and are possibly less informed and attentive about their investments than are investors in individual stocks. To the extent that participants in pension plans are similar to bank customers, the results in studies on pension plans are comparable to those in Stango and Zinman (2014), who report that increased attention among consumers to overdraft fees decrease the frequency of such fees.

average non-participation rate in rights offerings is 36%, despite an average discount on the expiration day of 13%. Second, by examining the stock prices before and after the election, I can estimate the cost of inattention in a specific context. My estimate illustrates that inattention can be very costly and, thus, warrants further investigation. Third, and most importantly, while other studies show theoretically and empirically that inattention affects stock prices via under- and overreaction to information releases, this study suggests a different way in which inattention affects stock prices that is unrelated to mispricing. In particular, I conjecture and present evidence that stock prices reflect an anticipated wealth transfer from inattentive to attentive shareholders. Such a wealth transfer could occur in any transaction in which shareholders receive heterogeneous treatment based on their choices, such as self-tender offers, inter-firm tender offers, rights offerings, and split-offs.

2. Background on acquisitions with payment choices

Boone, Lie, and Liu (2014) document an upward time trend in the fraction of acquisitions of public firms that are paid for with a mix of stock and cash relative to pure stock or pure cash, especially during the period from 1998 to 2007. They also document that about half of the acquisitions involving a mix of stock and cash payment leave target shareholders a choice of payment. Importantly, there is great heterogeneity in the deals involving a payment choice along multiple dimensions, including the structure of the payment choices.

Figure 1 shows a timeline of typical M&A transactions involving a choice of payment, from the announcement of the deal to the election and finally closing. The

values of the cash and stock payments are generally set to be similar at the announcement of the transaction.[2] The values might further be designed to remain similar, or they might be allowed to diverge during the period leading up to the deadline for making an election (the "election date").[3] For example, in Microsoft Corporation's notorious acquisition attempt of Yahoo Inc. in 2008, Microsoft indicated that it would give Yahoo holders the choice between $31 in cash per share and 0.9509 of a Microsoft share. This structure initially pegged the values of the cash and stock payments to be the same, but they quickly diverged as Microsoft's stock price dropped during the subsequent days.

The simplest terms for the payment choices entail a fixed dollar value for the cash payment and a fixed exchange ratio for the stock payment. An example of this follows from Ecolab Inc's S-4 filing dated August 2011:

> Nalco stockholders may elect to receive either 0.7005 shares of Ecolab common stock or $38.80 in cash, without interest, per share of Nalco common stock, provided that approximately 70% of the issued and outstanding shares of Nalco common stock immediately prior to the effective time will be converted into the right to receive Ecolab common stock and approximately 30% of issued and outstanding shares of Nalco common stock immediately prior to the effective time will be converted into the right to receive cash.

[2] Exceptions include Berkshire Hathaway's acquisitions of FlightSafety International in 1996 and International Dairy Queen in 1997, in which the cash values were set deliberately to exceed the stock values. Neither of these transactions is in the final sample.

[3] The election date generally comes shortly before the completion of the merger. In our sample, the mean (median) number of calendar days between the announcement date and the election date is 158 (149), and between the election date and the completion date it is 10 (7).

More complex payment terms are often used to equalize the values, or at least prevent a large divergence in the values of the cash and stock payments on the election date. An example of this follows from Merrill Lynch & Co Inc's S-4 filing dated June 2007:

> For each share of First Republic common stock you hold immediately prior to completion of the merger, you will receive, at your election, either $55.00 in cash or $55.00 in Merrill Lynch common stock, but subject to certain proration procedures designed to ensure that the aggregate consideration to be paid by Merrill Lynch will be, as nearly as practicable, 50% cash and 50% common stock. If you elect to receive Merrill Lynch common stock for your shares of First Republic common stock, the number of shares of Merrill Lynch common stock you will receive for each share of First Republic common stock will be equal to (1) $55.00 divided by (2) the average of the last reported sales prices of Merrill Lynch common stock for the last five trading days prior to the date on which the merger is completed.

Incidentally, Merrill Lynch set the election date to be the first day of the five-day period used to estimate the exchange ratio for the stock payment, such that the exchange ratio was not settled on the election date. A different example follows from CME Group Inc's S-4 filing dated June 2008:

> The cash consideration per share of NYMEX Holdings common stock for which a valid cash election has been made will be equal to the sum of (a) $36.00 plus (b) the product of (1) 0.1323 and (2) the average closing sale price of CME Group Class A common stock on the New York Stock Exchange LLC, or the "NYSE," for the period of ten consecutive trading days ending on the second full trading day prior to the effective time of the merger. We call this average the "Average CME Group Share Price." The stock consideration per share of NYMEX Holdings common stock for which a valid stock election has been made will be the number of shares of CME Group Class A common stock equal to the cash consideration per share divided by the Average CME Group Share Price.

CME Group set the election date to be the last day of the ten-day period used to calculate the average price that dictates the final payment terms. Thus, it would be possible for a shareholder to calculate the final payment terms immediately before making an election. In other cases similar to this, the election date comes before or during the period underlying the average price, in which case a shareholder would have to make an election based on a prediction of the final payment terms. Indeed, in the final example below, the election date comes during a 30-day period used to calculate the average price, and the payment terms are further confounded by a collar. The following is from priceline.com Inc's S-4 filing dated December 2012:

> Upon completion of the merger, each issued and outstanding share of KAYAK Class A common stock and KAYAK Class B common stock … will be converted

> into the right to receive, at the election of the stockholder, either $40.00 in cash … or a fraction of a share of priceline.com common stock. … KAYAK stockholders who receive the merger consideration as stock will receive for each share of KAYAK common stock a fraction of a share of priceline.com common stock determined by dividing $40.00 by the aggregate volume weighted average price per share of priceline.com common stock for the 30 day trading period ending on the second full trading day prior to the effective date (the "priceline.com average trading price"), provided that the priceline.com average trading price is between (or including) $571.35 and $698.32 per share. If the priceline.com average trading price is below $571.35 then the exchange ratio will be fixed at 0.07001 shares of priceline.com common stock to be delivered for each share of KAYAK common stock. If the priceline.com average trading price is above $698.32 then the exchange ratio will be fixed at 0.05728 shares of priceline.com common stock to be delivered for each share of KAYAK common stock and the value of the stock consideration delivered to holders of KAYAK common stock who receive stock consideration will be higher or lower than $40.00 per share, as applicable.

Some of these examples show that it can be difficult for a shareholder to correctly estimate the values of the cash and stock payments on the election date. In the empirical analysis, I will separate out cases with very simple payment terms from others to see whether simplicity affects the election choices.

The examples also illustrate that, even when target shareholders are offered a choice of payment method, the acquiring company generally restricts the fraction of the

total payment that can be paid out as cash and stock. These fractions might be very specific, approximate, or given as a range, such as a maximum amount of cash to be paid. If too many shareholders request a certain payment method, that payment type will be prorated. Those shares that are deemed not to have made any election will generally be treated similarly as the shares that elected the payment method that did not require proration. For example, suppose that the acquirer specifies that it will pay cash for 50% of the shares and stock for the other 50% of the shares, and that 75% of the shares elected cash, 15% elected stock, and 10% made no election. Then, typically two-thirds of the shares that elected cash will be exchanged for cash, while all other shares will be exchanged for stock. The implication is that, in cases where the values of the cash and stock payments diverge, it can be costly not to make any election.[4]

3. Sample

The initial sample is derived from the Securities Data Company's (SDC) Mergers and Acquisitions database. If necessary, I augment and correct the information in SDC with information from various news sources and company filings with the Securities and Exchange Commission (SEC). I further require that (i) the acquisition was announced between 1985 and 2014, (ii) the acquiring firm sought 100% of the shares of the target firm, (iii) the acquisition is completed, (iv) both the target and the acquiring firm are publicly traded, (v) the target shares are ordinary common shares, and (vi) the payment includes a choice between cash and stock. My criteria result in a sample of 280 observations. Figure 2 displays the distribution of the sample over time. The majority of

[4] Importantly, when there is a substantial value wedge, it is better to make a random election based on a simple coin flip that it is to not make an election, as the latter virtually guarantees the least valuable payment type.

the observations stem from the last two decades, and the yearly variation seems to correlate with the strength of the overall economy.

The first part of my analysis relies on election results. Complete election results are only available for 62 deals. The second part of my analysis relies on estimated values around the election dates. Of the 62 observations with complete election results, 51 also have available data to estimate values around the election dates. In addition, 70 observations with incomplete election results have available data to estimate values around the election dates, yielding a total of 121 observations for the second part of my analysis.

Table 1 presents descriptive statistics for the sample of 62 acquisitions with complete election results and the additional sample of 70 acquisitions with available data to estimate values around the election dates (but incomplete election results). The mean market capitalization of the acquirer (target) for the former subsample is $7.2 billion ($1.5 billion), and for the latter subsample it is $4.4 billion ($0.2 billion). In comparison, Boone et al. (2014) report that the average market capitalization for acquirers (targets) in cash acquisitions is $20.7 billion ($0.5 billion), and in stock acquisitions it is $10.6 billion ($1.1 billion). Thus, compared to other acquisitions involving public acquirers and targets, the acquirers in my sample are small, while the targets are medium in size.

The election results reveal that an average of 51% of the shares were submitted for stock payment, 38% were submitted for cash payment, and 11% were deemed not to have made a valid submission. These preliminary statistics suggest that target shareholders prefer stock to cash payment. Furthermore, shareholders representing a

nontrivial portion of shares seem either indifferent or inattentive to the choice between cash and stock.

Table 1 also presents statistics on a measure for the value wedge between the cash and stock values. The value wedge is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date.[5] The election date is defined to be the trading day immediately before the election deadline.[6] The median value wedge is 0.00, meaning that the cash and stock payments are identical, and the mean value wedge is roughly –0.01, suggesting that the value of the cash payment slightly exceeds the value of the stock payment. Thus, the average value wedge cannot explain the average preference for stock.

Because of the design of many of the payment terms to keep the cash and stock values similar, there is substantial clustering of deals with a value wedge around zero. For example, about 27% of the value wedges fall between –0.01 and +0.01 (or about 32% for the smaller sample with complete election results). But the deals with no such design allow for a significant range in the value wedge. In particular, the value wedge ranges from –0.50 to +0.46 (or –0.48 to +0.30 for the subsample with complete election results), meaning that the difference in the values scaled by the simple average of the values

[5] In cases in which the exchange ratio is fixed, the estimated stock value payment is simply the product of the stated exchange ratio and the closing price of the acquirer on the election date. In other cases, e.g., when the exchange ratio depends on an average price for the acquirer during a pre-specified period or includes a collar, the estimation of the stock value payment is more tedious. Fortunately, there is generally no uncertainty regarding the effect of a collar at the time of election. Furthermore, the majority of the exchange ratio estimates can be verified with ex-post information regarding the election outcome. In the cases where part of the period for estimating the average acquirer price comes after the election date, I make the assumption that, at the time the election, the prices after the election date are expected to be the same as the price on the election date. There might be factors that I have ignored in the value wedge, such as the time value of money for cash from the election date to the date the shareholders receive the cash, but I believe that these should account for a trivial fraction of the perceived value and be inconsequential for my results.

[6] The deadline is typically 5 pm Eastern Time, in which case the value wedge is estimated one hour before the deadline.

ranges from about 49% in favor of cash to about 45% in favor stock. Later analysis exploits this variation in the value wedge to examine the effect on election results and stock prices.

4. Empirical results

4.1 Analysis of election results

The previous section discussed simple statistics for the fraction of shares that were submitted for cash, stock, or neither. Figure 3a displays the fractions of shares submitted for either stock or cash relative to the value wedge. While the clustering of the value wedge around zero is apparent, it is also evident that there is substantial variation in both the value wedge and the election results. Furthermore, there is a clear correlation between the value wedge and the election results; as the value wedge increases, the fraction of shares submitted for stock increases and the fraction of shares submitted for cash decreases. It is also interesting to note the perceptible preference for stock when the value wedge is close to zero, consistent with the preference for stock in the overall sample.

Panel A of Table 2 provides simple statistics for the election results for cases in which the value wedge is below –0.01, between –0.01 and +0.01, or above +0.01. These statistics corroborate the patterns in the Figure 3a: (i) stock is preferred when the value wedge is close to zero, with an average fraction of shares submitted for stock and cash, respectively, of 55% and 32% when the value wedge is between –0.01 and +0.01, and (ii) the fraction of shares submitted for stock (cash) payment increases with the value wedge, with an average fraction of shares submitted for stock and cash, respectively, of 22% and

69% when the value wedge is below –0.01, and 72% and 19% when the value wedge exceeds +0.01.

Panel C of Table 2 presents regressions of the fraction of shares submitted for stock against the value wedge. Because of the non-linearity, or S-shape, of the relation that can be seen in Figure 3a (resulting from the constraint that the fraction falls between 0 and 1), I applied a simple logit transformation of the independent variable. As expected, the coefficient of the value wedge is positive and statistically different from zero in all models, and based on the R-squared statistic, the variation in the value wedge explains about 66% of the variation in the fraction of shares submitted for stock payment. Panel D of Table 2 presents analogous regressions of the fraction of shares submitted for cash against the value wedge. As expected, the coefficient of the value wedge is negative and statistically different from zero in all models, and the variation in the value wedge explains about 66% of the variation in the fraction of shares submitted for cash payment.

Next, I analyze the variation in the fraction of shares that were deemed not to have made a valid election of either stock or cash payment. Figure 3b displays the non-electing fraction relative to the value wedge. There is a notable pattern that the fraction peaks at a value wedge of zero and declines as the value wedge either decreases or increases from zero. Indeed, Panel A of Table 2 reports that the average fraction of non-electing shares is 9.5%, 13.0%, and 9.0%, respectively, when the value wedge is below –0.01, between –0.01 and +0.01, and above +0.01. I also run a regression of the non-electing fraction against the absolute value wedge. The results, which are presented in Panel E of Table 2, suggest that the coefficient of the absolute value wedge is negative

and statistically significant from zero at the one-percent level, confirming that the fraction of non-electing shares peaks decreases as the value wedge deviates from zero.[7]

Shareholders presumably fail to submit a valid election either because they are inattentive or indifferent to the payment choice. It is reasonable to assume that, while the tendency for shareholders to be inattentive is independent of the value wedge, shareholders' indifference peaks when the value wedge is close to zero and diminishes when the absolute value wedge increases. The peak in the fraction of non-electing shares at a value wedge of zero is consistent with this reasoning. When the absolute value wedge is sufficiently large, the non-elections due to indifference should be almost entirely diminished, enabling us to disentangle the fraction of non-electing shares that is due to inattention.

However, tax effects could complicate shareholders' preferences. Several studies, including Erickson (1998) and Ayers, Lefanowicz, and Robinson (2003, 2004) examine the role of the taxation of target shareholders.[8] When shareholders receive cash, they face an immediate tax liability, which depends on (i) the difference between the cash price and how much they paid for the shares and (ii) the capital gains tax (for holdings more than a year) or the income tax rate (for holdings less than a year). To establish an upper limit for this tax liability, I assume that some shareholders bought the shares for the

[7] As noted earlier, the acquiring firms sought 100% of the shares of the target firms in all transactions in the sample. Thus, the non-elections should not be attributable to toeholds held by the acquiring firms. Nevertheless, I also read news announcements and the Synopsis and History File Event in SDC for observations for which the non-elections were significant to rule out toeholds as an explanatory factor.

[8] Erickson (1998) predicts that the probability that an acquisition is financed with stock is financed with cash is negatively related to capital gains of target shareholders. However, he finds no relation between deal structure and target shareholder gains, and he estimates capital gain tax liabilities to be economically insignificant. On the other hand, Ayers, Lefanowicz, and Robinson (2003) report that higher capital gains tax rates for individual investors inflate the premium paid in cash acquisitions. Moreover, Ayers, Lefanowicz, and Robinson (2004) find that the probability of cash acquisitions decreases with the capital gains tax rate for individual investors, especially for low levels of institutional ownership. But even Ayers, Lefanowicz, and Robinson (2004) fail to find a significant relation between capital gains for target shareholders and deal structure.

lowest price during the previous year and paid the maximum income tax rate on the capital gain, and that other shareholder bought the shares for close to $0 (because they invested at the inception of the company) and paid the maximum capital gains tax rate. The maximum tax liability is simply the larger of these two assumed tax liability scenarios. I find that the maximum tax liability could theoretically explain a preference for cash over stock in all cases in which the value wedge is between –0.15 and 0, but it cannot explain the preference for cash in any of the cases in which the value wedge is below –0.15.[9] That further means that some shareholders might rationally be indifferent between cash and stock in cases in which the value wedge is between –0.15 and 0.

My estimation of the maximum tax liability suggests that all shares should be submitted for stock in those cases in which the value wedge is less than –0.15. Furthermore, if the value wedge is nontrivially above zero (I use a cutoff of +0.05 for the purpose of my analysis), all shares should be submitted for shares. Panel B of Table 2 shows the election results for the cases in which the value wedge is below –0.15 or above +0.05. Among the seven cases in which the value wedge is below –0.15, an average of 11.4% of the shares were submitted for stock, and among the 11 cases in which the value wedge exceeds +0.05, an average of 4.7% of the shares were submitted for cash. Combined, the elections of the inferior payment types across the 18 cases with a value wedge below –0.15 or above +0.05 represent a weighted average of 7.3% of the shares. These results complement irrational investor behavior that has been documented in other

[9] The cases closest to the cutoff of –0.15 serve as illustrations. There is one case with a value wedge of –0.12 and another with a value wedge of –0.13, both of which have maximum tax liabilities in excess of 17%. Thus, the tax liability might explain the preference for cash in both of these cases. On the other hand, there is a case with a value wedge of –0.18 and a maximum tax liability of 16%, and any preference for cash in this case cannot be explained solely by the tax liability. Incidentally, there are no cases with a value wedge between –0.14 and –0.17, so I could have stated the cutoff to be any value in this range.

settings (e.g., Poteshman and Serbin (2003) and Coval and Shumway (2005)). The seemingly irrational elections can be viewed as shareholders being inattentive to at least part of the relevant information, i.e., they are partially inattentive. As such, the average of 7.3% of the shares is an estimate of the fraction of shares held by partially inattentive shareholders. A caveat is that this estimate is biased downward, because it does not consider elections by partially inattentive shareholders that turned out to be optimal by luck.

Panel B further shows that the average fraction of non-elections is 5.4% when the value wedge is below –0.15 and 8.7% when it is above +0.05, yielding a weighted average fraction of non-elections across the two categories of 7.4%. The earlier discussion suggests that when the value wedge is below –0.15 or above +0.05, the fraction of shareholders who are truly indifferent between cash and stock payment is minimal. If so, the bulk of the 7.4% can be attributed to inattention. On this basis, I argue that shareholders owning a combined 7.4% are inattentive to the election between cash and stock. In fact, these shareholders seem to be so inattentive that they do not even make a random election, which would at least give them a chance for the better outcome. Combining the 7.3% partially inattentive shareholders and the 7.4% completely inattentive shareholders yields an estimate for the fraction of shares held by completely or partially inattentive shareholders of 14.7%.

Next, I examine the effect of complexity on the payment choice. Based on the notion that investors' ability to stay attentive and process relevant information is challenged when confronted with complexity or information overload (Hirshleifer and Teoh, 2003; Agnew and Szykman, 2005), my primary conjecture is that complexity of

the payment choice inflates the fraction of non-elections. I also put forth a secondary conjecture that complexity induces a relative preference for cash to stock, because the cash option is generally easier to value and might be viewed as safer, much like shareholders flock to stocks with high cash dividends in the midst of economic turmoil. Such an aversion to stock payments when it is harder to value is consistent with theories of ambiguity aversion (Epstein and Schneider, 2008; Ju and Miao, 2012).

I deem payment terms involving a fixed cash value and a fixed exchange ratio to be simple, and all other payment terms to be complex. Then I introduce an indicator variable for whether the payment terms are deemed to be simple as an independent variable in the payment choice regressions. Consistent with my primary conjecture, Panel E of Table 2 shows that the coefficient of the simple terms indicator variable is negative in the regressions of the fraction of no-elections. The p-value for the coefficient is 0.091 in model 2 and 0.015 in model 3 (which also controls for firm size), suggesting that coefficient is statistically different from zero at the ten percent level or better. The magnitude of the coefficient of –0.029 (model 2) or –0.043 (model 3) suggests that complex payment terms induce an economically significant increase in non-elections of about 3–4%.

Consistent with my secondary conjecture, Panel C of Table 2 shows that the coefficient of the simple terms indicator variable is positive in the regressions of the fraction of stock elections, and Panel D of Table 2 shows that it is negative in the regressions of the fraction of cash elections. The p-values are 0.011 or lower. Thus,

investors exhibit a statistically significant preference for cash when the payment terms are complex.[10]

The last of the regression models in each of Panels C, D, and E of Table 2 also include the market capitalization of the target firms as well as the fractions of shares held by officers and directors (O&D) or blockholders other than O&D as control variables. The shareholder type variables are included because O&D and blockholders might be more informed and therefore exhibit more attention or a certain payment preference relative other shareholders. But the coefficients of these control variables are statistically insignificant at the 0.10 level, and the inclusion of these variables does not appear to affect other coefficients. The market capitalization variable is included because small firms might attract less attentive shareholders. Indeed, small firms seem to be associated with a larger fraction of non-elections, and, as noted earlier, the inclusion of this variable strengthens the statistical significance of the simple terms indicator variable.

4.2 Analysis of valuations around election dates

The election results suggest that there are a significant number of inattentive shareholders who leave money on the table for more attentive shareholders. In this section, I quantify this wealth transfer and assess its impact on stock prices around the election day.

I estimate the weighted deal value per share on the election day and the day thereafter as the weighted average of the cash and stock values, where the weights are the fractions of shares that receive cash and stock, respectively. This represents what the

[10] I also tried to interact the simple terms indicator variable with the value wedge to test whether investors are less responsive to the value wedge when the payment terms are complex. However, the interactive effects are statistically insignificant at the ten percent level.

average target shareholder receives in the deal. Then I form a ratio of the stock price of the target to the weighted deal value on each of the two days. In the absence of both a wealth transfer and uncertainty about deal completion, the ratio should equal one on both the election day and the post-election day. But if there is an anticipated wealth transfer, attentive shareholders might bid up the price beyond the weighted deal value on the election day, because they expect to get a better value than the average shareholder.[11] The bid-up should increase with the value wedge, because the value wedge serves as a proxy for the possible wealth transfer. Thus, I conjecture that the ratio on the election day increases with the value wedge.

On the post-election day, only shares that have not been submitted for election are trading. These shares generally receive the less popular payment type, which has a similar or lower value than the weighted deal value, depending on the value wedge. Thus, the ratio of the weighted deal value to the stock price should decrease as long as the value wedge differs from zero. Indeed, I conjecture that the price ratio declines from the election day to the post-election day, and that the decline intensifies with the value wedge.

Figures 4 and 5 depict the price ratios on the election day and the post-election day, respectively, for different values of the value wedge. Panel A and Panel B of Table 3 provides corresponding statistics. On average, the price ratio is 0.99 on the election

[11] Suppose that the stock payment is valued at $9, the cash payment is valued at $11, and half of the shares will receive the cash payment. The weighted deal value, representing the average value of payments across all shares, is then $10. If all investors are fully attentive, they will all chose cash, and the proration will result in everybody receiving the weighted deal value for their shares. If investors owning 20% of the shares are inattentive, such that they receive only stock for their shares, the attentive shareholders owning 80% of the shares will get an average of 50%/80% = 62.5% cash payment and 37.5% stock payment for their shares, with a weighted value of .625 x $11 + 0.375 x $9 = $10.25. If attentive shareholders can accurately estimate the fraction of inattentive shareholders, they should bid up the price on the election date toward $10.25.

day. The discount of one percent from one suggests some imbedded uncertainty about completion of some of the acquisitions. But Figure 4 shows that there are some outliers on the lower end, such that it is hard to tell from the average the extent to which the price ratio is bid above one.[12]

Further analysis shows that the price ratio exceeds one on the election day in 36% of the cases. Panel A of Table 3 shows that the fraction above one increases from 12% of the cases where the absolute value wedge is below one percent, to 38% of the cases where the value wedge exceeds one percent and 54% of the cases where the value wedge is below negative one percent. Furthermore, Panel B of Table 3 shows that the fraction above one is 37% of the cases where the *absolute* value wedge is between one and ten percent and 59% of the cases where the *absolute* value wedge exceeds ten percent. These statistics are consistent with my conjecture, and I interpret them as evidence that shareholders' inattention gives rise to an expected wealth transfer to attentive shareholders that affects stock prices.

On the post-election day, the average price ratio drops by two percent to 0.97, and only 14% of the price ratios remain above one. The magnitude of the drop increases with the value wedge; when the value wedge is zero, there is no decline, and when the absolute value wedge is in the upper tertile (roughly above 0.10), the decline is about six percent. These results suggest that the shares that have not been submitted for election are worth less, especially if the value wedge is large such that the adverse consequence of

[12] The most extreme price ratio on the election day is 0.76. Further examination shows that the price for the target dropped significantly during the election day, and that the price ratio on the morning of the election day was actually close to 1.00. Given the large absolute value wedge for this observation, I expected a large price drop immediately after the election deadline (which, according to my sources, was after the close on the election day), but not before, unless logistical issues made it difficult to submit elections in the hours before the deadline.

not having made an election is large. I further interpret the results to mean that the average cost of inattention to payment elections is two percent, ranging from no cost when there is no value wedge to a six percent average cost when the absolute value wedge is in the upper tertile.

Next, I examine the relation between the bid-up portion of the price (i.e., the price premium) on the election day and the value wedge using a regression framework. I calculate the price premium on the election day as the maximum of zero and the price ratio on the election day less one (e.g., a price ratio of 1.02 yields a premium of 2%). Then I regress the premium against the absolute value wedge. Panel C of Table 3 presents the regression results using all observations, while Panel D of Table 3 presents results when excluding six observations that had a price ratio on the election day of 95% or less. The intercept is zero, suggesting that there is no price premium when the value wedge is zero. The coefficient of the absolute value wedge is 0.022 in Panel C and 0.027 in Panel D (p-values < 0.01), suggesting that the price premium increases with the value wedge, consistent with my earlier conjecture. For example, if the value wedge is ten percent, the regression models predict the price premium to be about 0.22–0.27%.

I run an analogous regression on the post-election day using the price discount, which is calculated as the minimum of zero and the price ratio on the post-election day less one (e.g., a price ratio of 0.98 yields –2%). The results in Panel B and Panel C of Table 3 show that the intercept is –0.006 (p-value is 0.089) and –0.007 (p-value is 0.058), respectively, suggesting that there is a slight discount, if any, when the value wedge is zero. The coefficient of the absolute value wedge is between –0.300 and –0.268 (p-

values < 0.01), suggesting that a greater value wedge is associated with a more pronounced discount.

In my final regression, I regress the change in the price ratio from the election day to the post-election day against the absolute value wedge. The intercept is close to zero, while the coefficient of the value wedge is –0.248 in Panel B and –0.303 in Panel C (p-values < 0.01). This suggests that there is no perceptible change in the price ratio when the value wedge is zero, but as the absolute value wedge increases, the fall in the price ratio becomes pronounced. For example, if the value wedge is ten percent, the price premium is predicted to fall by 2.5–3.0%. These results corroborate my earlier estimates of the cost of inattention.

5. Summary and conclusion

In this study, I examine target shareholders' election between cash and stock as the form of acquisition payment. The main purpose is to gauge the extent of inattention in such elections, and to estimate the cost of inattention for shareholders and the effect of inattention on stock prices.

I find that 51% of the target shares are submitted for stock and 38% are submitted for cash. The preference for stock prevails when controlling for differences in values between the cash and stock payments. More importantly for the purpose of this study, no election is deemed for 11% of the shares, and these shares receive the less popular (effectively the less valuable) form of payment. Even when the discrepancy in value between the cash and stock payments is so substantial that it cannot possibly be explained by differences in taxation, an average of 7.4% shares are not submitted for election, while

an average of 7.3% are submitted for the inferior form of payment. On this basis, I argue that shareholders owning a combined 7.4% of shares are completely inattentive to the election, and shareholders representing another 7.3% are partially inattentive to the set of relevant information.

I further find that the stock price drops significantly from the election day to the post-election day. This shows that shareholders who fail to make an election (and whose shares are the only ones still trading on the post-election day) incur a non-trivial cost. I estimate the average cost of inattention to be two percent, and it increases to five percent for the tertile of transactions with the greatest difference between the cash and stock values.

Finally, I report evidence that the stock price is bid up beyond the deal value on the election day, especially when there is a great discrepancy in value between the cash and stock payments. This suggests that attentive shareholders anticipate a wealth transfer from inattentive shareholders, and this gets incorporated into the stock price.

While many other studies have examined investor inattention, I believe that this study is the first to estimate the extent of inattention and its cost for inattentive shareholders. Of course, the caveat applies that my estimates pertain to a particular setting. On most days, I would expect shareholders to be even less attentive to their individual shares (because there is no important news or decision to be made), but the cost of inattention should also be more modest.

Furthermore, while other studies have theorized and documented empirical evidence that inattention affects stock prices via over- and underreaction to news, I show that inattention affects stock prices via the anticipation of a wealth transfer from

inattentive to attentive shareholders. In my setting, the price effect is temporary, and more research needs to be conducted to examine whether a similar effect is more permanent. That is, perhaps shares with a substantial ownership of inattentive shareholders are consistently priced higher when future situations might arise in which attentive shareholders fleece inattentive shareholders.

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Table 1
Descriptive statistics

The table provides descriptive statistics for a sample of acquisitions announced between 1985 and 2015 where the target shareholders have a choice of payment type. The market capitalization is estimated on the acquisition announcement date. The relative market capitalization of the target is the market capitalization of the target scaled by the sum of the market capitalizations of the acquirer and the target. The fraction of stock payment is the fraction of the target shares that were paid for with stock. The value wedge is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline. The fractions of stock, cash, and no election are the fractions of the target shares that were submitted for stock, cash, or neither stock nor cash payment, respectively. The shareholdings by officers and directors (O&D) and non-O&D blockholders are taken from the targets' proxy statements before the acquisitions.

	Acquisitions with complete election results (n = 62)		Acquisitions with incomplete election results, but data to estimate values around elections (n = 70)	
	Mean	Median	Mean	Median
Market cap of acquirer (in million $)	7,222	2,547	4,413	773
Market cap of target (in million $)	1,546	424	217	114
Relative market cap. of target	0.233	0.213	0.200	0.180
Fraction stock payment	0.559	0.500	0.601	0.600
Value wedge	–0.012	0.000	–0.013	0.000
Fraction stock election	0.509	0.518		
Fraction cash election	0.383	0.308		
Fraction no election	0.107	0.095		
Holdings by O&D	0.140	0.095		
Holdings by non-O&D blockholders	0.196	0.126		
Number of non-O&D blockholders	2.2	2.0		

Table 2
Payment choices

The table provides descriptive statistics for target shareholders' payment choices (panel A) and regressions of those payment choices (panels B, C, and D). The value wedge is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline. The absolute value wedge is the absolute value of the value wedge. The fractions of stock, cash, and no election are the fractions of the target shares that were submitted for stock, cash, or neither stock nor cash payment, respectively. The simple terms indicator variable equals one if the payment choices include a fixed cash value and a fixed stock exchange ratio, and zero otherwise. The market capitalization is estimated on the acquisition announcement date. The shareholdings by officers and directors (O&D) and non-O&D blockholders are taken from the targets' proxy statements before the acquisitions. The sample is restricted to acquisitions where the target shareholders have a choice of payment type and complete election results are available.

Panel A: Mean and median fractions of stock, cash, and no elections by value wedge

	Value wedge below –0.01 (n = 18)		Value wedge between –0.01 and +0.01 (n = 23)		Value wedge above +0.01 (n = 21)	
	Mean	Median	Mean	Median	Mean	Median
Fraction stock election	0.215	0.173	0.550	0.563	0.717	0.751
Fraction cash election	0.690	0.687	0.320	0.279	0.190	0.111
Fraction no election	0.095	0.091	0.130	0.131	0.093	0.087

Panel B: Mean and median fractions of stock, cash, and no elections if value wedge is below –0.15 or above 0.05

	Value wedge below –0.15 (n = 7)		Value wedge above +0.05 (n = 11)		Value wedge below –0.15 or above +0.01 (n = 18)	
	Mean	Median	Mean	Median	Mean	Median
Fraction stock election	0.114	0.091	0.866	0.925		
Fraction cash election	0.833	0.860	0.047	0.021		
Fraction inferior pymt. type	0.114	0.091	0.047	0.021	**0.073**	0.026
Fraction no election	0.054	0.036	0.087	0.067	**0.074**	0.062

Panel C: Regressions of *ln* [Fraction stock election / (1 – Fraction stock election)]

	Model 1		Model 2		Model 3	
	Coeffic.	p-value	Coeffic.	p-value	Coeffic.	p-value
Intercept	0.067	0.223	–0.077	0.313	–0.743	0.130
Value wedge	4.288	0.000	4.421	0.000	4.346	0.000
Simple terms indicator			0.275	0.011	0.350	0.003
ln Market capitalization					0.060	0.071
Holdings by O&D					–0.548	0.241
Holdings by non-O&D blockholders					–0.489	0.115
Adjusted R^2	0.657		0.683		0.725	
Number of observations	62		62		57	

Panel D: Regressions of *ln* [Fraction cash election / (1 – Fraction cash election)]

	Model 1		Model 2		Model 3	
	Coeffic.	p-value	Coeffic.	p-value	Coeffic.	p-value
Intercept	–0.420	0.000	–0.226	0.012	0.430	0.458
Value wedge	–5.042	0.000	–5.221	0.000	–5.119	0.000
Simple terms indicator			–0.369	0.003	–0.430	0.002
ln Market capitalization					–0.059	0.136
Holdings by O&D					0.572	0.304
Holdings by non-O&D blockholders					0.361	0.325
Adjusted R^2	0.654		0.696		0.718	
Number of observations	62		62		57	

Panel E: Regressions of Fraction no election

	Model 1		Model 2		Model 3	
	Coeffic.	p-value	Coeffic.	p-value	Coeffic.	p-value
Intercept	0.125	0.000	0.136	0.000	0.350	0.000
Absolute value wedge	–0.229	0.002	–0.170	0.029	–0.141	0.056
Simple terms indicator			–0.029	0.091	–0.043	0.015
ln Market capitalization					–0.014	0.003
Holdings by O&D					–0.059	0.365
Holdings by non-O&D blockholders					–0.045	0.286
Adjusted R^2	0.141		0.168		0.304	
Number of observations	62		62		57	

Table 3
Price ratios on and after the election day

Panels A and B provide descriptive statistics for price ratios on the election day and the day immediately thereafter. The price ratio is defined as the ratio of the deal value per share to the stock price per share. The deal value is calculated as the weighted average of the stock and cash payments, where the weights are the realized fractions of target shares that receive stock and cash payments, respectively. Panel C provides regressions of the value premium on the election day, the value discount the day after the election day, and the change in the price ratio from the election day to the day afterward. The value premium on the election day is defined as the maximum of zero and the price ratio on the election day less one. The value discount after the election day is defined as the minimum of zero and the price ratio on the day after the election less one. The value wedge is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline. The absolute value wedge is the absolute value of the value wedge. The sample is restricted to acquisitions where the target shareholders have a choice of payment type and data are available to estimate the price ratios on the election day and the day afterward.

Panel A: Simple statistics on price ratios by value wedge

	Value wedge below –0.01 (n = 46)			Value wedge between –0.01 and +0.01 (n = 33)			Value wedge above +0.01 (n = 42)		
	Mean	Median	> 1	Mean	Median	> 1	Mean	Median	> 1
Price ratio on election day	0.991	1.000	54.3%	0.993	0.995	12.1%	0.991	0.998	38.1%
Price ratio after election day	0.971	0.988	15.2%	0.992	0.995	12.1%	0.947	0.968	14.3%
Change in price ratio	–0.020	–0.006		–0.001	0.000		–0.044	–0.017	

Panel B: Simple statistics on price ratios by *absolute* value wedge

	Absolute value wedge below 0.01 (n = 33)			Absolute value wedge between 0.01 and 0.10 (n = 49)			Absolute value wedge above 0.10 (n = 39)		
	Mean	Median	> 1	Mean	Median	> 1	Mean	Median	> 1
Price ratio on election day	0.993	0.995	12.1%	0.993	0.997	36.7%[a]	0.988	1.002	59.0%[b]
Price ratio after election day	0.992	0.995	12.1%	0.986	0.992	18.4%	0.926	0.937	10.3%
Change in price ratio	–0.001	0.000		–0.008	–0.002		–0.062	–0.057	

[a] The p-value for the difference between 36.7% and 12.1% is 0.02.
[b] The p-value for the difference between 59.0% and 36.7% (12.1%) is 0.04 (<0.01).

Panel C: Regressions of value premiums, value discounts, and changes in the price ratio

	Value premium on election day		Value discount after election day		Change in price ratio	
	Coeffic.	p-value	Coeffic.	p-value	Coeffic.	p-value
Intercept	0.001	0.259	–0.006	0.089	–0.001	0.818
Absolute value wedge	0.022	0.000	–0.300	0.000	–0.248	0.000
Adjusted R^2	0.101		0.544		0.379	
Number of observations	121		121		121	

Panel D: Regressions of value premiums, value discounts, and changes in the price ratio (excluding observations with a price ratio on the election day of 95% or less)

	Value premium on election day		Value discount after election day		Change in price ratio	
	Coeffic.	p-value	Coeffic.	p-value	Coeffic.	p-value
Intercept	0.001	0.327	–0.007	0.058	0.000	0.907
Absolute value wedge	0.027	0.000	–0.268	0.000	–0.303	0.000
Adjusted R^2	0.135		0.481		0.508	
Number of observations	115		115		115	

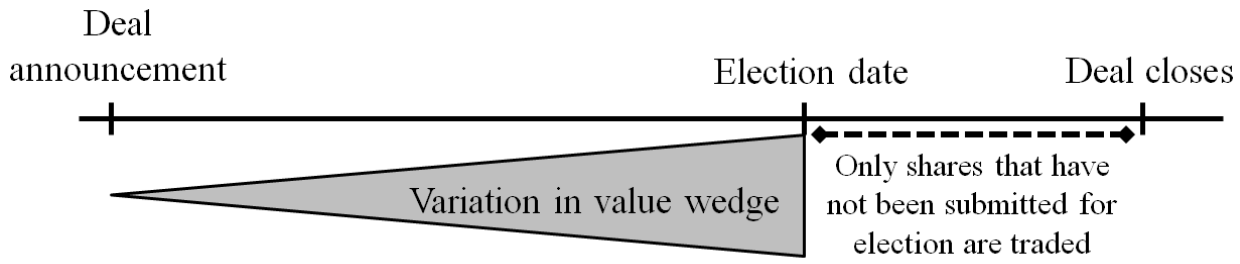


Figure 1
Timeline for typical transactions

The figure shows the timeline for typical M&A transactions in which shareholders can choose the type of payment.

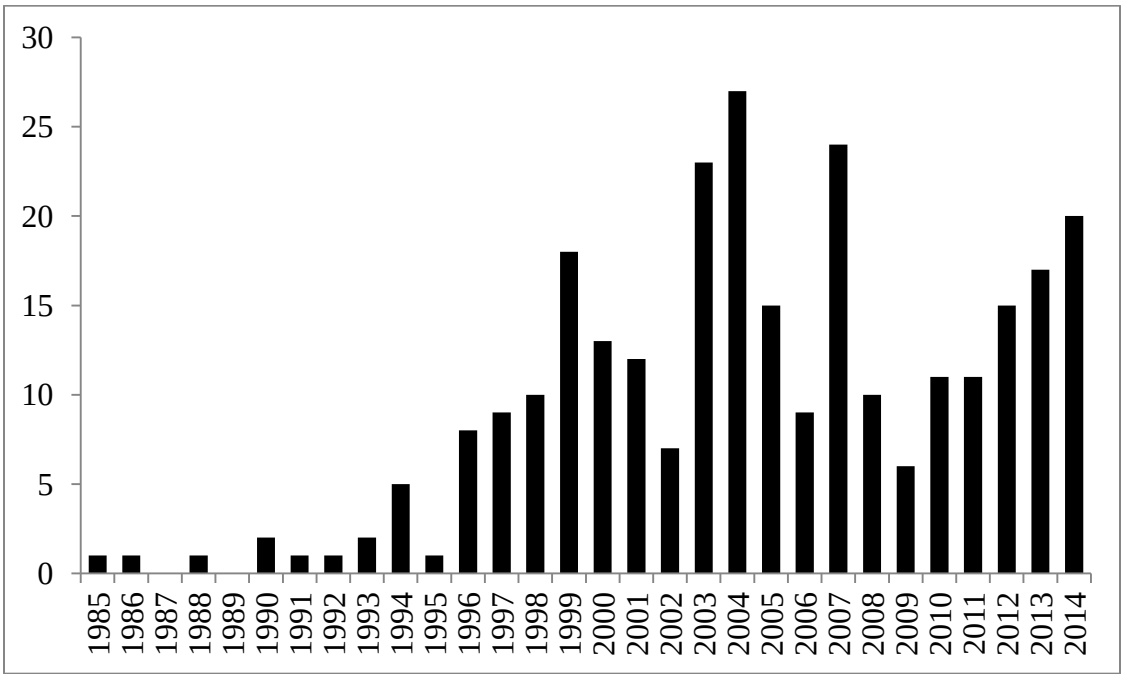
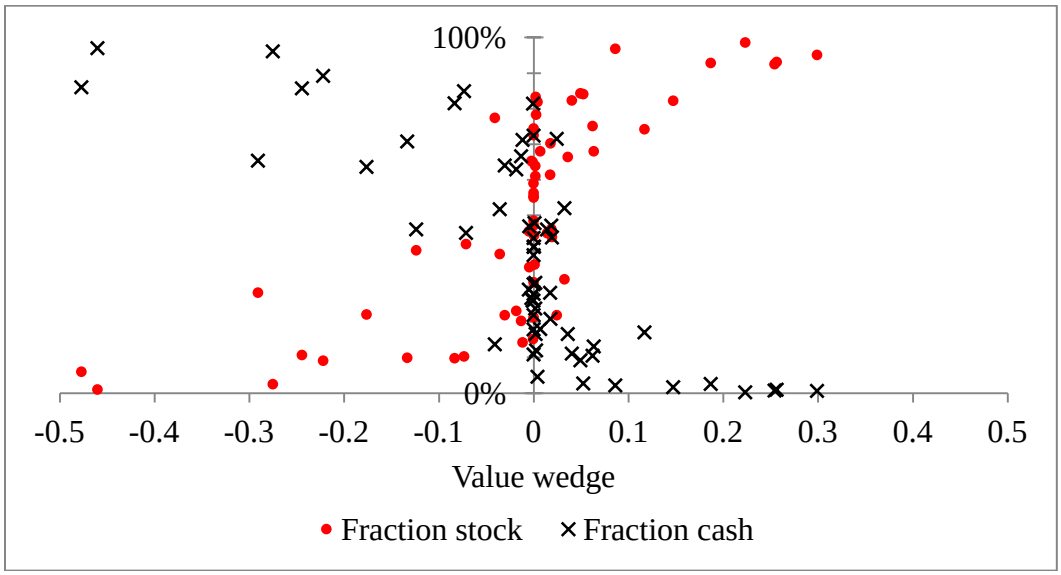
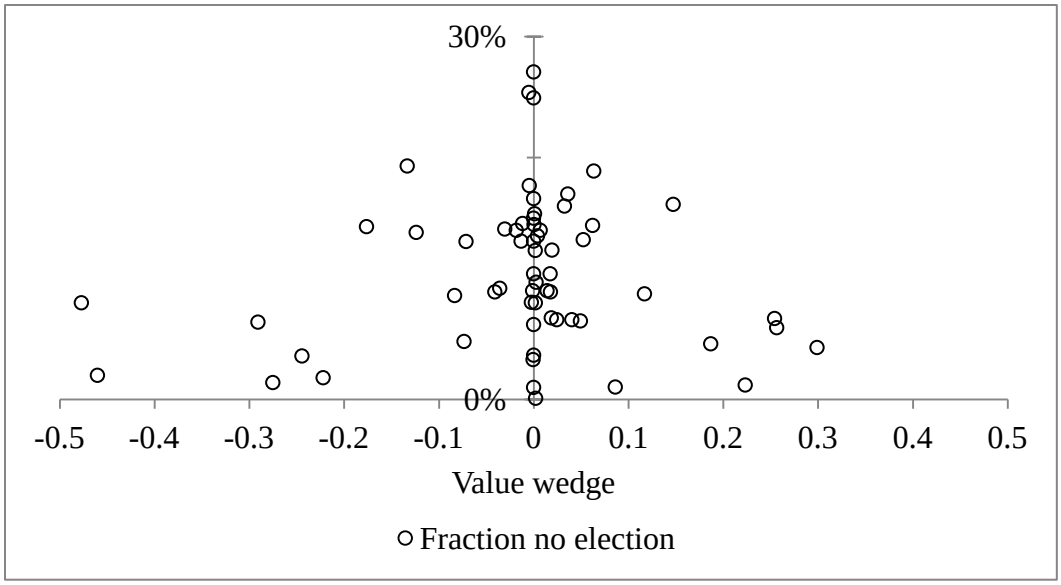


Figure 2
Distribution of acquisitions with payment choice over time

The graph shows the yearly distribution of 280 acquisitions announced between January 1985 and December 2014 where the target shareholders have a choice of payment type.



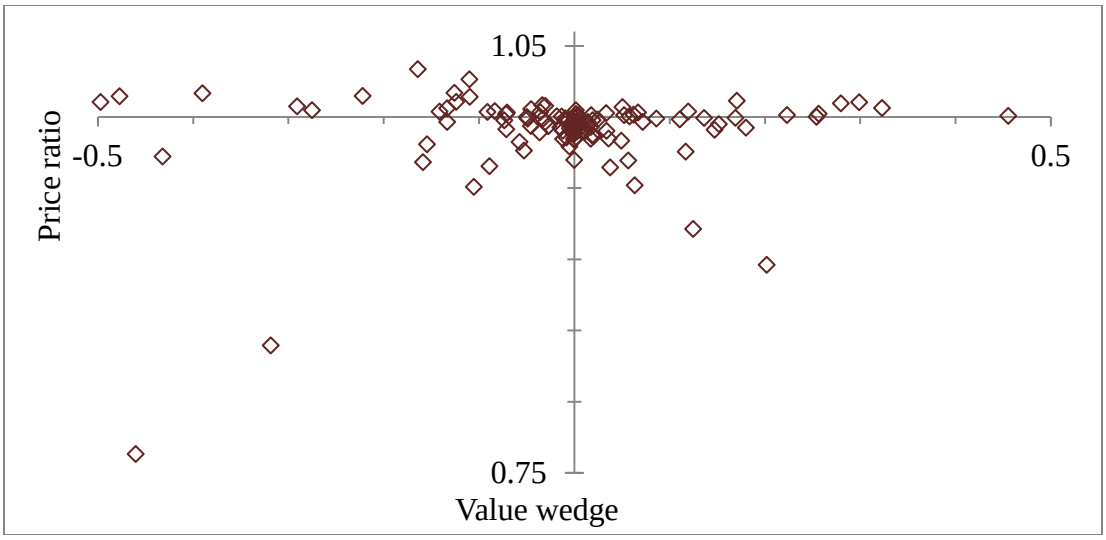
a. Elections of stock and cash payments



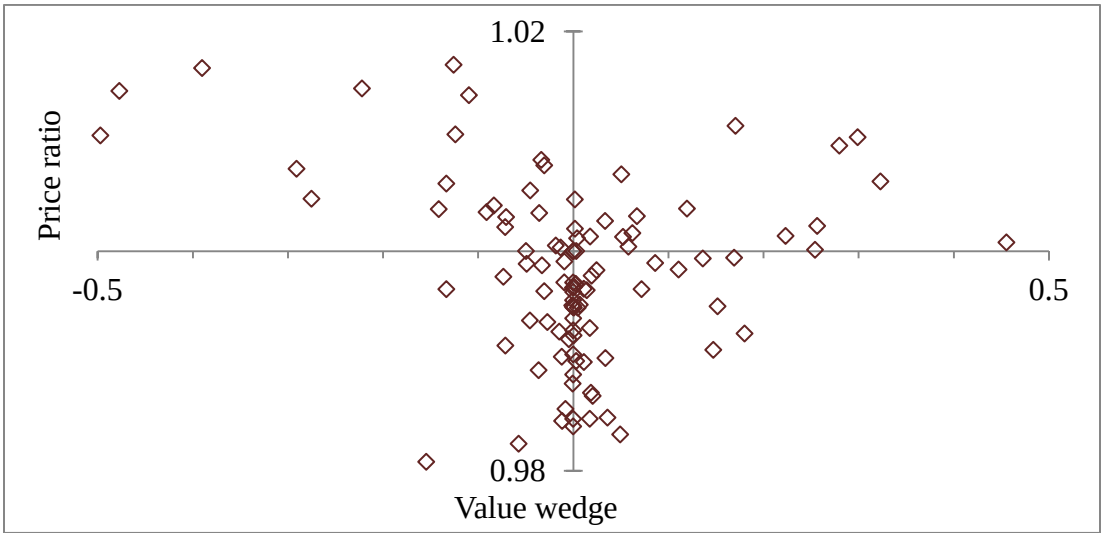
b. Non-elections

Figure 3
Elections of payment by target shareholders

The graphs display the fraction of shares that were submitted for stock or cash payments (Panel a) and the fraction of shares that were deemed not to have been submitted for any particular payment (Panel b). *Value wedge* is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline.



a. All price ratios



b. Price ratios between 0.98 and 1.02

Figure 4
Price ratios on the election day

The graphs display the ratio of the stock price of the target to the deal value on the day of the election deadline. The deal value is calculated as the weighted average of the stock and cash payments, where the weights are the realized fractions of target shares that receive stock and cash payments, respectively. *Value wedge* is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline. Panel A shows all the price ratios, while Panel B only shows price ratios between 0.98 and 1.02.

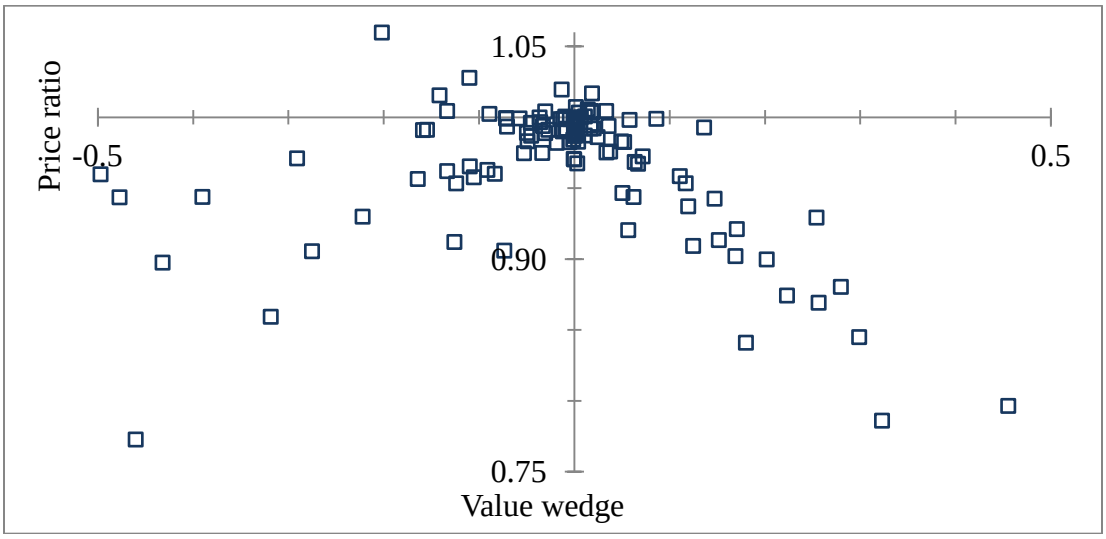


Figure 5
Price ratios after the election

The graphs display the ratio of the stock price of the target to the deal value on the day after the election deadline. The deal value is calculated as the weighted average of the stock and cash payments, where the weights are the realized fractions of target shares that receive stock and cash payments, respectively. *Value wedge* is defined as the natural logarithm of the ratio of the estimated value of the stock payment to the value of the cash payment at the end of the election date, where the election date is the trading day immediately before the election deadline.