Time trends and determinants of the method of payment in M&As☆

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A R T I C L E   I N F O

A B S T R A C T

We examine the time trends and determinants of the method of payment in M&As spanning four decades. The fraction of mixed payments tripled from about 10% before the turn of the century to 30% in the new century, while the fraction of stock (cash) payments peaked (bottomed out) in the late 1990s but has since plunged (surged). We can explain a portion, but not all, of these trends using explanatory variables linked to adverse selection theory, taxation, and contracting costs. We also show that mixed payments are not merely hybrids between cash and stock payments, but have unique determinants and features.

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1. Introduction

Many studies examine the choice of payment in mergers and acquisitions, including the theoretical studies of Hansen (1987), Fishman (1989), and Eckbo et al. (1990) and the empirical studies of Carleton et al. (1983), Amihud et al. (1990), Martin (1996), and Faccio and Masulis (2005). These studies primarily focus on the choice of stock versus cash, although empirical studies often include mixed payments in their samples.[4] Other studies examine more narrow payment terms, such as collars in stock acquisitions (Officer (2004)) and earnouts Kohers and Ang (2000) and Cain et al. (forthcoming).

We reexamine the payment choice for two reasons. First, there has been a dramatic increase in M&A activity in recent decades, yet the prominent studies of the payment choice are based on small samples before this surge. We study a period spanning four decades, which allows us to observe longer-term time trends in the payment choice and affords an extensive sample to examine the determinants of the choice.

Second, prior studies have examined mixed payments as part of the continuum of choices between pure cash and pure stock, e.g., by analyzing the fraction of stock used (Heron and Lie (2002), Faccio and Masulis (2005), and Harford et al. (2009)). We

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[4] To our knowledge, Eckbo et al. (1990) model is the only one that proves the existence of mixed offers in an equilibrium setting assuming two-sided information asymmetry. While Hansen (1987) and Fishman (1989) assume two-sided information asymmetry, they did not explicitly consider mixed-payment deals.

show that mixed payments are fundamentally different from both cash and stock payments and come with their own rich diversity, and they should therefore be treated as a separate payment category.

In our sample of more than 2500 deals, we document pronounced time trends in the payment methods. At their peak in the 1990s stock payments represented more than 60% of the sample, but they have since plunged to under 20% of deals in recent years. In contrast, cash payments exhibit a trough in the late 1990s (at about 25% of the sample), but have soared in the last couple of years to comprise more than 50% of the sample, just like they did in the late 1980s. Meanwhile mixed payments, which were relatively rare in the 1980s, steadily rose in popularity through the 1990s and the beginning of the new century, but have since stabilized. Before the turn of the century, mixed payments were used in about 10% of the deals, and since the turn of the century this fraction has tripled to about 30%. This evidence suggests that mixed payments deserve more than the cursory attention they have received in past studies.

Next, we compare mixed payment acquisitions to pure stock and cash payment acquisitions. We test several hypotheses from the prior literature based on adverse selection, taxation, and costly contracting. We report several results consistent with these hypotheses, but also some results that seem inconsistent. Consistent with Hansen's (1987) adverse selection model, acquirers use at least some stock payment (either all-stock or a mix of cash and stock) when the targets are relatively large. Greater valuation uncertainty regarding either the acquirer or the target, as measured by the standard deviation of returns, is also associated with at least some stock as payment. Consistent with costly contracting (i.e., the costs associated with renegotiating the terms during the period before completion as a result of changes in firm values), a higher correlation in the stock returns of the acquirer and the target increases the probability of mixed payments relative to cash payments. However, the correlation does not affect the choice between all-stock and either mixed or all-cash payments.

The evidence on the effect of taxes on the payment choice is mixed, as it is in the past literature (Ayers et al., 2003, 2004; Erickson, 1998). We show novel and compelling evidence that a small number of the cash deals are expedited to occur before increases in capital gains tax rates, which would increase the tax burden for target shareholders in cash deals. But our measure for capital gains does not reduce the probability of cash deals. A high prevailing capital gains tax rate increases the probability of stock offers to either cash offers or mixed offers, consistent with the notion that stock is more appealing when taxes are high. We also find that a high tax rate increases the probability of cash offers to mixed offers, counter to the predicted tax effect.

The comparison of payment methods also reveals that, whereas some characteristics of firms involved in mixed payment acquisitions fall between the characteristics of firms involved in cash and stock acquisitions, other characteristics do not, suggesting that mixed payments should not be viewed as merely a hybrid between cash and stock payments. For example, mixed and stock offers are both much more likely to occur in the financial sector than cash offers. Furthermore, mixed offers are often used to provide individual target shareholders the choice of whether to receive cash or stock, which obviously is not be possible for pure stock and cash deals.

In the last part, we examine whether variations in the explanatory variables over time can explain the time trends in the payment methods. It is, for example, likely that changes in tax regulations or industry merger waves induce shifts in payment methods. We compare predicted fractions of payment methods to actual fractions for subperiods of five years each. We find that our explanatory variables can explain some, but not all, of the time variation in payment methods. The explanatory variables predict an increase in mixed payments around the turn of the century, but not as much as the realized increase. Moreover, the recent collapse in the use of stock payments and the boom in cash payments are more dramatic than predicted.

The remainder of the paper proceeds as follows. The next section describes the sample and the methodology. Section 3 presents empirical results. Finally, Section 4 summarizes and concludes.

2. Hypothesis development

The literature on payment choice in M&As rests heavily on adverse selection, tax considerations, and, to a lesser extent, costly contracting. Hansen (1987) develops a model based on adverse selection that predicts that acquirers offer stock when the target has superior information regarding its own value. This outcome occurs because stock serves as a contingent price mechanism, and the effect is especially pronounced when the target is relatively large. In the presence of double-sided information asymmetry, acquirers are more likely to offer stock when they are overvalued and cash when they are undervalued. Brown and Ryngaert (1991) develop a model in which bidders that believe their own stock is fairly valued or overvalued will choose stock payment to avoid the adverse tax consequences of a cash deal. In contrast, bidders who think their own stock is undervalued will choose cash payment, even though the price might be higher due to the tax consequence. One implication is that stock payments reveal more negative information about the bidder than do cash payments.

Tax considerations arise as a result of the differential taxation of stock and cash payments (Ayers et al., 2003, 2004; Erickson, 1998). When stock is used as a payment, there is generally no immediate taxation for target shareholders. That is, target shareholders defer tax payments until they choose to sell the new shares. In contrast, when cash is used as a payment, the target shareholders are taxed immediately (or at least in the prevailing tax year) as if they sold their shares in a conventional way. This tax naturally depends on the accumulated capital gains on these shares and the capital gains tax rate.

The empirical literature generally finds support of the adverse selection argument in the context of mergers, whereas the support for tax effects is mixed. Houston and Ryngaert (1997) examine both effects by comparing (a) fixed exchange-ratio stock deals, (b) fixed value stock deals, and (c) cash deals. They argue that any difference in the effect between fixed exchange-ratio stock deals and cash deals can be due to both adverse selection and taxation, so studying the less common fixed stock value deals into the analysis allows them to distinguish between these two effects. The authors find evidence consistent with an adverse selection effect. Specifically they show that measure of price protection, which captures the difference between two types of stock deals, explains bidder returns. However, they find no incremental effect from the fraction of cash offered, which they interpret to mean that there is no tax effect. Savor and

Lu (2009) find more recent evidence that firms choose stock when their equity is overvalued. In particular, they report that stock bidders significantly underperform both cash bidders and other benchmarks, even if the bids fail for exogenous reasons.

Erickson (1998) studies the effect of taxes on the structure of corporate acquisitions. He predicts that the probability that an acquisition is financed with cash is negatively related to target shareholder capital gains, but finds no relation between deal structure and target shareholder gains. He further reports that the capital gain tax liabilities are economically insignificant. Consequently, he concludes that capital gains taxes are inconsequential in determining acquisition structure.

On the other hand, Ayers et al. (2003) find that higher capital gains tax rates for individual investors inflate the premium paid in cash acquisitions. Moreover, Ayers et al. (2004) report 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 et al. (2004) fail to find a significant relation between capital gains for target shareholders and deal structure.

Houston and Ryngaert (1997) and Officer (2004) put forth a costly contracting hypothesis, even though neither develops a model that explores it theoretically. The idea is simply that the acquiring and target firms' values fluctuate before completion of the deal, which might require costly renegotiation if the deal terms are no longer considered to be fair. Such costly renegotiation would be less likely if the values of the firms are highly correlated and stock is the medium of payment. Consistent with this hypothesis, both Houston and Ryngaert (1997) and Officer (2004) find that the probability of stock payment increases with the correlation of stock returns between the acquirer and target.

In summary, adverse selection, taxes, and costly contracting all have predictions for the choice between stock, cash, and mixed payment. First, adverse selection implies that the fraction of stock increases with (i) relative size (see Hansen (1987)) and (ii) the value uncertainty of the acquirer and the target firms. To measure value uncertainty, we use the standard deviation of stock returns. In addition, we use the market-to-book ratio and past stock returns, with the logic that firms with high market-to-book ratios and high recent stock returns have greater intangibles and growth opportunities that are harder to value.

Second, the taxation of target shareholders implies that stock payment should be more likely when the capital gain of the target is high and when the capital gains tax rate is high. We use the stock return for the target during the year before the deal announcement as a proxy for the capital gain. A limitation is that the actual capital gain varies across the target shareholders depending on when they bought the shares. We use the maximum capital gains tax rate at the time of the deal as a proxy for the capital gains tax rate. Like the capital gains, the tax rate varies across the target shareholders. In an attempt to capture some of the cross-sectional variation in the tax rate, we resort to the dividend yield. The tax-based dividend clientele hypothesis posits that shareholders with high tax rates hold disproportionately more shares in non-dividend paying stocks. Graham and Kumar (2006) report supporting evidence based on the dividend levels of share holdings across taxable and tax-deferred accounts. Therefore, we conjecture that a low dividend yield for the target firm induces stock payment.

Third, costly contracting implies that the fraction of stock increases with the correlation of returns between the acquiring and target firms. As noted earlier, this measure follows from past studies. A caveat is that a low correlation might suggest greater adverse selection, which, in turn, predicts stock payment.

3. Sample

We examine acquisitions announced between January 1985 and October 2013. The source of our sample is the Securities Data Company's (SDC) Mergers and Acquisitions database. While we obtain information about the transactions from SDC, we also search various news sources for additional information about the acquisitions, and, in some cases, to correct the SDC information. We require that (i) the acquiring firm sought 100% of the shares of the target firm, (ii) the status is known and not pending, (iii) both the target and the acquiring firm are publicly traded and have available information on *CRSP* and *Compustat*, (iv) the target shares are ordinary common shares, (v) the payment only includes cash and/or stock, and (vi) any mixed payment includes at least 10% cash and 10% stock. This process leads to a total sample of 2590 observations.

Fig. 1 shows the distribution of the sample over time by payment method. The number of transactions is relatively steady from 1985 through 1993. But, there is an extraordinary rise in the number of transactions from 1993 through 1997, followed by a sharp decline from 1999 to 2002. A smaller wave of takeovers occurred from 2003 until the financial crisis hit in 2008. The number of takeovers has subsequently leveled off, but is still higher than it was during the first part of the sample period.

The fraction of cash deals declined gradually from the beginning of the sample period until 1997, and has steadily increased afterward. The trend for the fraction of all-stock deals is the opposite, increasing gradually until 1997, and decreasing thereafter. Finally, the proportion of mixed payment deals hovered around 10% from 1985 to 2000, but has subsequently increased dramatically, representing as many as 30% of all deals during the 2001–2013 time period.

Fig. 2 shows a further breakdown of the stock deals over time. In particular, we partition the stock deals into those that have a fixed exchange ratio (labeled as regular stock deals in the figure), those that have a fixed value (i.e., the exchange ratio fluctuates over time such that the dollar value of the stock used as payment remains fixed), and those that come with a collar.[5] Only 4% of the stock deals have a fixed value, and this fraction has declined during the sample period. Collar deals represent 23% of the stock deals. Their popularity, both in terms of absolute numbers and as a fraction of all stock deals, reached a peak in the 1990s and the first couple of years of the current century. Thus, the overall trend is for both fixed value stock deals and collar deals to have gone out of favor in recent years.

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[5] Officer (2004) describes collars in detail. Collar deals are essentially a hybrid between fixed exchange ratio deals and fixed value deals. They can be based on either a fixed exchange ratio deal or a fixed value deal, but provide a minimum and maximum exchange ratio or fixed value, respectively, depending on the stock price of the acquirer.
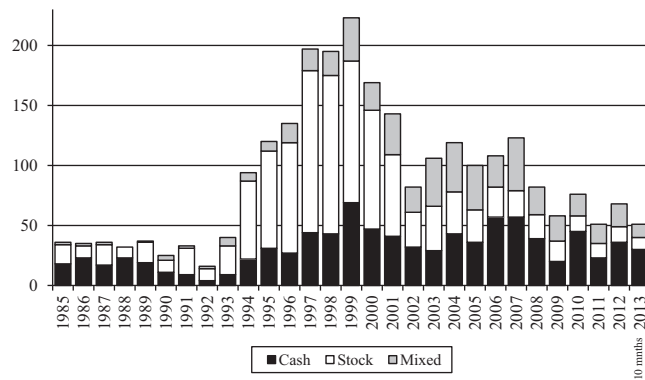
Fig. 1. Distribution of sample over time by payment method. The figure shows the yearly distribution of the sample of 2590 acquisitions announced between January 1985 and October 2013 by payment method (cash, stock, or mixed).

Although widely ignored in prior studies, acquirers that pay with a mix of cash and stock often consider the preferences of individual target shareholders. Fig. 3 shows the distribution of mixed payment deals partitioned on the basis of whether the target shareholders are given a choice between stock and cash. As noted earlier, there is a dramatic increase in the use of mixed payments over time, particularly from 1998 to 2007, but there is no clear trend in whether shareholders are given a payment choice. During the entire sample period, the fraction of mixed payments that leave target shareholders a choice is 49%.[6]

Overall, the figures suggest that the mixed payment category has emerged as a popular payment choice, while all-stock deals, especially those that have a fixed value or a collar, have become less popular. In our later analysis, we will explore the determinants of these trends.

4. Empirical results

4.1. Comparing payment types using descriptive statistics

Table 1 presents descriptive statistics for the acquiring firms, target firms, and the transactions by payment type. Consistent with extant literature (e.g., Martin (1996) and Faccio and Masulis (2005)), acquirers that use stock have higher market-to-book ratios resulting from recent stock price run-ups. The stock price reaction to announcements of stock deals is on average negative for the acquirers, even when a mix of stock and cash is used, whereas the stock price reaction to announcements of cash deals is on average positive for the acquirers. Similarly, Moeller et al. (2004) report that, for a sample of acquisitions of public targets between 1980 and 2001, the average stock price reactions for the acquirers are negative and statistically different from zero when the payment type is stock or mixed and positive and statistically indistinguishable from zero when the payment type is cash. Savor and Lu (2009) also find that the average stock price reaction for acquirers is negative and statistically different from zero for stock deals and positive and statistically indistinguishable from zero for cash deals, but for the small subsample of failed cash deals the stock price reaction for acquirers is negative and statistically different from zero. The average stock price reaction for the target firm is, as expected, very positive across all payment types. This average exceeds 30% for cash deals and it is roughly 20% for the other payment categories. Therefore, on the basis of the stock price reactions for both the acquiring and target firms, the mixed payment deals are more similar to stock deals than to cash deals.

Fig. 4 presents the distribution of deals in our sample by both the acquirer and target industry. Cash deals appear to be relatively more popular in the consumer non-durables, manufacturing, and business equipment industries, while mixed payment deals are relatively more popular in the energy and financial sectors. In the multivariate regression, we use indicator variables to control for the business equipment industry and the financial industry, because those industries are clearly the most prevalent in our sample.

4.1. Comparing payment methods in a multivariate framework

Table 2 presents results from a multinomial logit regression of cash, stock, and mixed payments. We discuss the evidence on adverse selection, taxation, and costly contracting hypothesis separately. The regression also includes control variables for the two most prominent industries in the sample, the business equipment industry and the financial industry. The regression suggests that the indicator variable for the business equipment industry is not related to the payment choice, whereas firms in the financial sector are less likely to use all cash as payment.

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[6] 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.
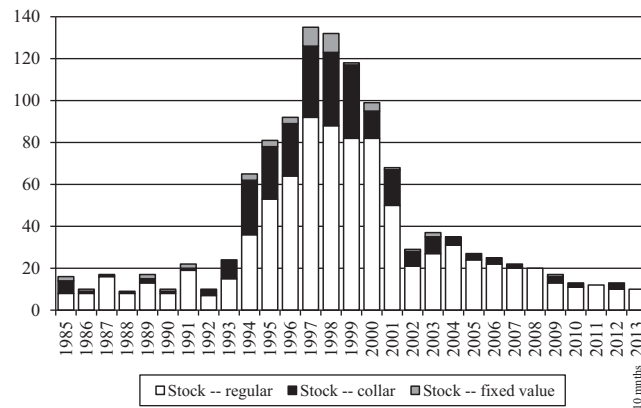
Fig. 2. Distribution of stock deals over time. The figure shows the distribution of the sample of 1185 stock acquisitions announced between January 1985 and October 2013 by the use of some kind of price guarantee (regular with no guarantee, collar, or fixed value).

In addition, we use the specification from the regressions to predict the fractions of the different payment methods by year, and compare the predicted fractions to the actual observed fractions. This procedure allows us to gauge how much of the time trend in the actual fractions can be explained by variations over time in the explanatory variables.

4.1.1. Adverse selection

Consistent with Hansen's (1987) adverse selection model, the larger the target relative to the acquirer, the less likely it is for the acquirer to make an all-cash offer relative to both all-stock offers and mixed offers. However, the relative size does not seem to affect the choice between mixed and all-stock offers.

When acquirers have experienced a large stock price run-up during the prior year and have a high market-to-book ratio, they are more likely to use stock to pay for the takeover, especially in relation to pure cash. To the extent that the price run-up and market-to-book ratio capture intangibles and growth opportunities that are hard to value, these results are consistent with adverse selection. The effect of the targets' stock value is more ambiguous. Stock payment is more likely than cash payment when the market-to-book ratio of the target is high and when the stock return during the prior year is low.

We find that a high standard deviation of returns for acquirers reduces the probability of using cash in the transactions, especially when compared to pure stock. These findings suggest that acquirers make all-stock or partial-stock offers when the uncertainty about their own value is greater. Because inside information is particularly valuable when valuation uncertainty is great, this result might be interpreted as evidence that bidder managers use equity as payment when they have an informational advantage (i.e., the valuation uncertainty is considerable) and they believe the acquirer is overvalued by the market, and cash when they do not possess much of an informational advantage or their informational advantage leads them to believe that the stock is undervalued. This can be interpreted as consistent with adverse selection.

The higher the standard deviation of the target firm, the more likely it is for the bidder to make an all-stock offer than a mixed offer. The results are consistent with the adverse selection theory. According to Hansen (1987), acquirers use more stock as payment in the face of high uncertainty regarding the target value, because this payment structure forces the target shareholders to share any post-acquisition loss in the case that the target is overvalued. Thus, we would expect that the higher the standard deviation of target
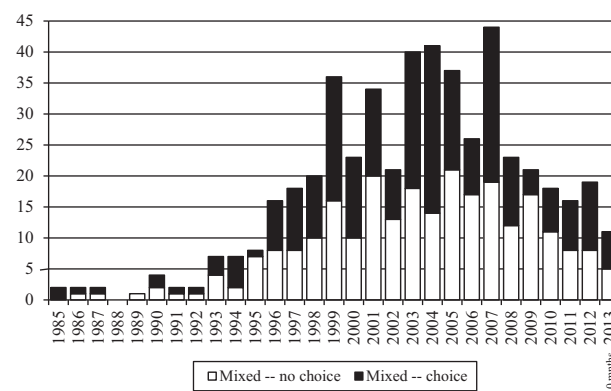

Fig. 3. Distribution of mixed payments over time. The figure shows the yearly distribution of the sample of 501 mixed payment acquisitions announced between January 1985 and October 2013 by the offer to give target shareholders a choice of payment type or not.

Table 1

Descriptive statistics. The table provides descriptive statistics for the sample of 2590 acquisitions announced between January 1985 and October 2013. The market capitalization is estimated five days before the acquisition announcement. The total debt ratio (long and short-term debt scaled by book value of assets), cash ratio (cash and cash equivalents scaled by book value of assets), and market-to-book ratio are measured at the end of the fiscal year before the acquisition announcement. The announcement return is the abnormal stock return measured from the day before through the day after the acquisition announcement using a one-factor market model, where the value-weighted index is used to proxy overall market returns and the estimation period spans from 250 to 10 days prior to the announcement. The prior one-year stock return and the standard deviation of stock return are measured during the year ending five days before the acquisition announcement. The correlation of returns is the correlation of the stock returns of the acquirer and the target during the year ending five days before the announcement. 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.

	Cash payment (n = 904)		Stock payment (n = 1185)		Mixed payment (n = 501)	
	Mean	Median	Mean	Median	Mean	Median
Panel A: acquirer						
Market cap. (in million $)	20,776	2976	10,627	1293	7874	1377
Book value of assets	20,230	2770	18,634	1812	20,635	2704
Debt ratio	0.204	0.179	0.189	0.159	0.219	0.184
Cash ratio	0.150	0.085	0.159	0.068	0.124	0.049
Market-to-book ratio	1.984	1.625	2.511	1.437	1.627	1.167
Announcement return	0.010[a]	0.005[a]	−0.029[a]	−0.024[a]	−0.022[a]	−0.022[a]
Prior one-year return	0.363	0.223	0.480	0.297	0.403	0.238
Std. dev. of returns	0.023	0.021	0.029	0.025	0.025	0.022
Panel B: target						
Market cap. (in million $)	553	142	1057	143	1227	163
Book value of assets	682	161	3961	276	2335	524
Debt ratio	0.185	0.108	0.178	0.130	0.196	0.152
Cash ratio	0.212	0.113	0.182	0.076	0.138	0.046
Market-to-book ratio	1.754	1.392	2.037	1.230	1.488	1.104
Announcement return	0.330[a]	0.269[a]	0.183[a]	0.141[a]	0.223[a]	0.188[a]
Prior one-year return	0.346	0.220	0.279	0.150	0.387	0.245
Std. dev. of returns	0.036	0.032	0.039	0.033	0.030	0.026
Dividend yield	0.008	0.000	0.011	0.000	0.013	0.000
Panel C: other						
Relative market cap. of target	0.104	0.055	0.170	0.125	0.198	0.161
Correlation of returns	0.168	0.126	0.167	0.114	0.214	0.160

[a] Indicates that the mean or median announcement return differs statistically from zero at the one percent level.

returns, the more likely an all-stock offer is made. However, there is no evidence that a high standard deviation of the target increases the probability of all stock versus all cash, or mixed versus cash, so the evidence is a bit ambiguous.

4.1.2. Taxation

We find mixed evidence that capital gains taxes affect the payment decision. The prior return of the target, which is correlated with the average capital gains that investors have accumulated, tends to raise the fraction of cash in the payment. That is, the prior target return increases the probability of mixed offers relative to all-stock offers, and the probability of all-cash offers relative to all-stock offers. This result is contrary to what the tax hypothesis would predict. A caveat here is that the target return might capture adverse selection, as discussed earlier. The regression also indicates that the target dividend yield, which should capture the tax clientele of the target firms, is unrelated to the payment method.

During our sample period, the maximum capital gains tax rate increased from 20% to 28% in 1987, decreased to 20% in 1997 and then to 15% in 2003, and increased again to 20% in 2013. The regression results suggest that the maximum capital gains tax rate at the time of the acquisitions is an important explanatory variable. Consistent with the tax hypothesis, a higher capital gains tax rate reduces the probability of all-cash offers relative to all-stock offers and the probability of mixed offers relative to all-stock offers. However, inconsistent with the tax hypothesis, a higher capital gains tax rate increases the probability of all-cash offers relative to mixed offers. It is conceivable that the explanatory power of the maximum capital gains tax rate is due to a common time trend between the capital gains tax rate and payment method that is merely coincidental.

We also conduct an alternative and cleaner test of the effect of the capital gains tax rate on acquisitions. Specifically, we examine whether cash acquisitions are expedited to close before scheduled tax rate increases in an effort to minimize the tax burden for target investors. To do so, we create a histogram of the completions of M&As by payment method during the weeks around the capital gains tax rate increases in 1987 and 2013. Fig. 5 displays the histogram. Clearly, more cash deals were completed during the four weeks before the tax rate increases than other deals; 15 cash deals were completed during this period versus only two stock deals and two mixed deals. Of the 15 cash deals, seven were completed during the week before the tax rate increases. Furthermore, what the figure does not depict is that four of the cash deals were completed the day immediately before the tax rate increases. During the four weeks after the tax rate increases, only three deals in total were completed.[7]

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[7] We also made an analogous histogram of deal completions around capital gains tax rate decreases to see whether cash deals are delayed to occur after such decreases. However, we find no evidence of such delays.
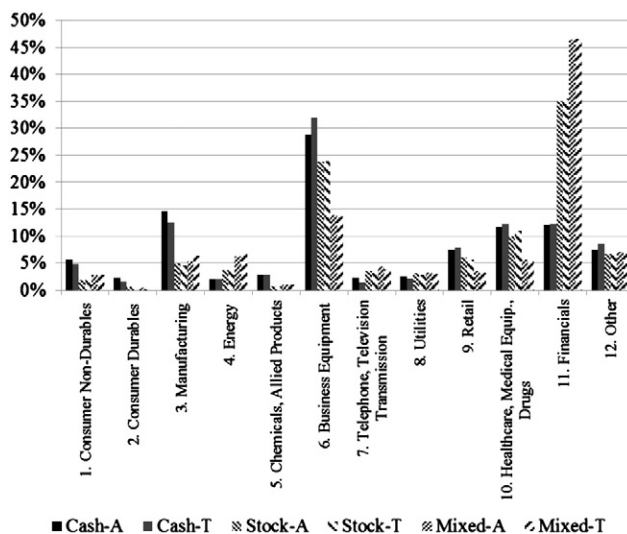
Fig. 4. Distribution by industry. This figure displays the proportion of cash deals, stock deals, and mixed payment deals by acquirer and target industry (based on the Fama-French 12 industry classifications). "A" and "T" in the legends stand for acquirers and targets, respectively.

Additional evidence that the cash deals in the histogram were expedited to finalize before the pending tax rate increases comes from statistics on the time between the announcement date and the completion dates. The mean (median) number of days between announcement and completion for cash deals in the sample is 99 (77). In comparison, the mean (median) for the seven cash deals that were completed during the week before the tax rate increases is 83 (61), and for the four cash deals that were completed the day before the tax rate increases it is only 63 (54).

Overall, there is compelling evidence that some cash deals were rushed to occur before increases in capital gains tax rates, presumably to reduce the tax burden for target shareholders. Yet, the evidence presented here only pertains to about a dozen cash deals, representing a little more than a percent of all cash deals in our sample. Furthermore, the tests on completion timing are, of course, different than testing the effect of tax rates on the choice of payment methods. The dubious effect of capital gains on the payment choice is in line with past studies. Perhaps capital gains taxes are sufficiently important that they affect the timing of some acquisitions

Table 2
Multinomial logit regression of payment type. The table presents results from multinomial logit regression of payment types. The market capitalization is estimated five days before the acquisition announcement, and is transformed using the logarithm. 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 market-to-book ratio, cash ratio (cash and cash equivalents scaled by book value of assets), and debt ratio (debt scaled by book value of assets) are measured at the end of the fiscal year before the acquisitions' announcement. Dividend yield is calculated as dividends over the market value of equity. Capital gains tax rate is 20% before 1987, 28% for the period 1987–1996, 20% for 1997–2002, 15% for 2003–2012 and 20% for 2013. The prior one-year stock return and the standard deviation of stock return are measured during the year ending five days before the acquisitions announcement. The correlation of returns is the correlation of the stock returns of the acquirer and the target during the year ending five days before the announcement. The business equipment (financial) industry dummy equals one if both the acquirer and the target are classified in that industry. If the acquirer is in the business equipment (financial) industry, the target is in the same industry in 85% (97%) of the cases. There are 2590 observations. The pseudo R^2 is 16.8%.

|	Mixed versus cash payment		Mixed versus stock payment		Cash versus stock payment	
	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value
Intercept	−0.292	0.752	5.596	0.000	5.888	0.000
Market capitalization of acquirer	−0.106	0.042	−0.153	0.002	−0.047	0.249
Relative mkt. cap. of target	3.933	0.000	−0.252	0.615	−4.185	0.000
Debt ratio of acquirer	0.627	0.129	0.665	0.076	0.038	0.915
Debt ratio of target	0.450	0.201	0.129	0.700	−0.321	0.255
Cash ratio of acquirer	−0.142	0.775	0.297	0.523	0.439	0.265
Cash ratio of target	−0.691	0.101	0.244	0.556	0.935	0.004
Market-to-book ratio of acquirer	0.162	0.018	−0.117	0.057	−0.279	0.000
Market-to-book ratio of target	0.092	0.184	−0.100	0.092	−0.191	0.000
Dividend yield of target	−1.442	0.778	−6.332	0.165	−4.890	0.254
Capital gains tax rate	−7.275	0.000	−17.291	0.000	−10.016	0.000
Correlation of returns	0.979	0.019	0.560	0.130	−0.419	0.243
Std. dev. of returns of acquirer	38.216	0.000	−9.256	0.122	−47.472	0.000
Std. dev. of returns of target	−7.548	0.130	−12.394	0.007	−4.846	0.183
Prior one-year return of acquirer	0.150	0.214	−0.222	0.038	−0.372	0.000
Prior one-year return of target	0.040	0.598	0.234	0.007	0.195	0.012
Business equip. industry dummy	−0.381	0.065	−0.231	0.261	0.150	0.320
Financial industry dummy	2.400	0.000	−0.066	0.684	−2.466	0.000
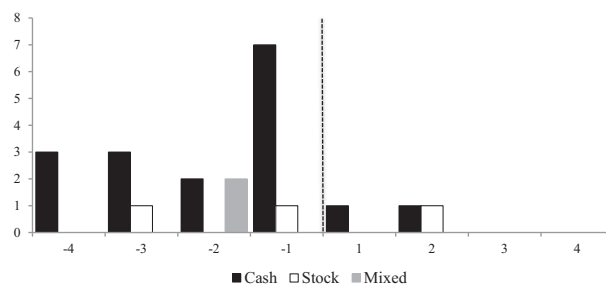
Fig. 5. Completion of M&As during the weeks around capital gains tax rate increases. This figure displays the number of deals that were completed during the four weeks before and four weeks after the capital gains tax rate increases in 1987 and 2013.

that are bound to occur anyway, but not important enough to dictate the terms, including the payment method, of the acquisitions. Indeed, target shareholders have other ways of mitigating the tax bill associated with cash transactions. For example, they might have realized capital losses on other transactions that cancel out any gains on the cash transactions in our sample. This would weaken the effect of both capital gains and the capital gains tax rate on the payment choice.

4.1.3. Costly contracting

Finally, we test the costly contracting hypothesis that the fraction of stock increases with the correlation of returns across the acquirers and targets. Consistent with the costly contracting hypothesis, we find the higher the return correlation across the acquirers and targets, the more likely a mixed offer relative to an all-cash offer. However, the return correlation does not affect the choice between all-stock offers and mixed offers or between all-stock offers and all-cash offers.

4.1.4. Time trends

We have documented that the payment methods exhibit pronounced time trends. In addition, we have identified a number of variables that help explain the choice of payment method, although the pseudo R-squared of 16.8% in our regression suggests that most of
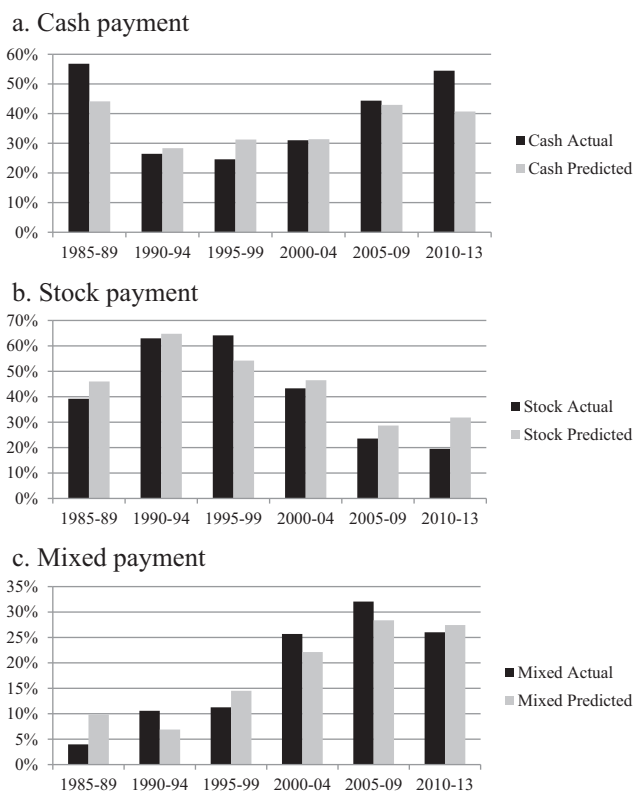

Fig. 6. Actual versus predicted fractions of payment methods. This figure displays the actual versus predicted fractions of payment methods across time. The predicted fractions are estimated using the multinomial logit regression presented in Table 2.

the choice is left unexplained. We now examine whether time-varying changes in the explanatory variables explain the time trends in payment methods.

We first predict the probabilities that the deals will be paid for with cash, stock, or a mix based on our multinomial logit regression. Then we aggregate these probabilities to predict the fractions of cash, stock, and mixed payments for separate five-year periods. Fig. 6 displays these predicted fractions along with the actual fractions. It is evident that the predicted fractions vary over time in a similar way to the actual fractions. Yet, some of the actual time trend cannot be explained by the prediction model. For example, while our model predicts an increase in the fraction of mixed payments and a decrease in the fraction of all-stock payments around the turn of the century, the actual increase and decrease are more pronounced than predicted.

In sum, our prediction model can explain some of the time trends in payment methods, but not all. One could argue that our prediction model is biased toward explaining the time trends because some of the explanatory variables might be correlated with the payment trends by coincidence. Alternatively, one could argue that our prediction model does not include variables that should have been included, either because they cannot easily be measured (such as the exact tax effect) or because we have failed to identify them. Nevertheless, we interpret our results to mean that the propensity to use mixed payments has increased since the end of the last century, while the propensity use stock has decreased, and these propensities cannot be explained by our measures designed to capture traditional theories for the payment choice.

5. Summary and conclusion

The last decades have witnessed an increase of M&A activity, but the prominent studies of the method of payment in M&As primarily rely on data that precede this surge. In addition, these studies pay only cursory attention to mixed payments, which have represented an essential part of M&A activity in recent years and come with unique features, such as flexibility to offer target shareholders the choice between cash and stock. On this backdrop, we undertake a comprehensive study of time trends and determinants of the method of payment in M&As from 1985 to 2013.

We find that the fraction of mixed payments has tripled from about 10% before the turn of the century to about 30% so far in the new century. The fractions of pure cash and stock deals exhibit opposite trends; the fraction of stock deals peaked in the late 1990s at more than 60% and has since plunged to less than 20% in recent years, whereas the fraction of cash deals bottomed out in the late 1990s at about 25% and has since doubled to more than 50% in recent years.

Next, we examine the determinants of the payment choice. We report evidence consistent with the adverse selection theory in which the fraction of stock increases with the valuation uncertainty of the acquirer and the target firms. This relation is particularly evident when we use the standard deviation of stock returns to proxy for the possibility that the firms might be overvalued. We also report that capital gains taxation affects acquisition decisions. In particular, we find compelling evidence that a looming tax rate increase expedites some pure cash deals. However, consistent with past studies, the evidence that capital gains taxation affects the choice of payment method is more tenuous.

Finally, we report that our explanatory variables can explain some of the observed time trends in the payment methods, but not all. On this basis, we conclude that the last couple of decades have witnessed a rise in the use of both cash and mixed payments that is attributable to an increased propensity to pay target shareholders with at least some cash. As such, our conclusion is analogous to the conclusion of Fama and French (2001) that the decline in dividends over time is due to both changing firm characteristics and a lower propensity to pay dividends.

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