Full Stock Payment Marginalization in M&A Transactions

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ABSTRACT

The number of merger and acquisition (M&A) transactions paid for fully in stock in the U.S. market declined sharply after 2001, when pooling and goodwill amortization were abolished by the Financial Accounting Standards Board. Do accounting rule changes really have such far-reaching implications? This study reveals a statistically, economically significant drop in the number of transactions, Canada as a counterfactual. We report also several other results consistent with an impact of pooling abolishment, including (i) the decrease in full stock payment relates to CEO incentives and (ii) previously documented determinants of the M&A mode of payment cannot explain the *post* pooling abolishment pattern. These results also are robust to controls for various factors, such as the Internet bubble, the exclusion of cross-border deals, the presence of Canadian cross-listed firms, the use of a constant sample of acquirers across the pooling and *post* pooling abolishment periods, the use of Europe as an alternative counterfactual, and controls for the SEC Rule 10b-18 share repurchase safe harbor amendments of 2003.

JEL classification: G34

Keywords: mergers and acquisitions; method of payment, pooling of interest, purchase

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The authors thank Cécile Carpentier (Laval), Espen Eckbo (Dartmouth College), Jean-Marc Suret (Laval), Karin Thorburn (NHH), and participants in the ECCCS Monday Finance and NHH Brown Bag seminars for their useful comments.

In the past 25 years, U.S. merger and acquisition (M&A) transactions that have been fully paid in stock have displayed a striking pattern: about half of all transactions featured this payment approach during the 1990s, but the percentage of fully stock-paid transactions has fallen to around 10% in recent years (value-based percentages). We investigate the causes of this long-term evolution.

Research into payment mode choices in M&A transactions has been very active in corporate finance, offering a fertile ground for testing theories and developing a modern view of the firm. Betton et al. (2008) identify four factors that drive payment mode choices: taxes (Section 368 of the U.S. Internal Revenue Code), information asymmetries (Eckbo et al. 1990; Fishman 1989; Hansen 1987), capital structure and control (Harris and Raviv 1988; Stulz 1988), and agency-based and behavioral arguments (Jensen 2005; Rhodes-Kropf and Viswanathan 2004; Shleifer and Vishny 2003). Considerable empirical literature also has tested these proposed models and their predictions. For example, in early research, Travlos (1987) established that equity transaction announcements generated negative market reactions of about 1% for public target companies. Fuller et al. (2002) show that market reactions to stock-paid transactions depend on the consideration offered but also on the target's status, such that they generate positive market reactions if the target is a private company.

The long-term marginalization of fully stock-paid M&A transactions offers a unique context for testing whether classic payment mode theories represent first-order drivers of payment mode choice. To explain the shift in balance toward more cash payments, some of these determinants must have undergone a significant evolution, so identifying them could provide an ex post confirmation of their importance. Boone et al. (2014) seek to do so using a predictive model of payment mode choice, built on many determinants from extant literature, but their model can only partially explain the observed time trend in M&A payment modes. These authors also note that other variables could be correlated by coincidence with the evolution in payment modes, so "propensities (to use mixed payments and stock) cannot be explained by our measures designed to capture traditional theories for the payment choice" (Boone et al. 2014, p. 297). Identifying the main driver of the marginalization of full stock payments in the U.S. thus remains an open issue.

Figure 1 delivers a second puzzling observation: the long-term decrease in uses of full stock payments started in 2001, and the 1990–2000 sub-period displayed no clear trend. In 2000, 62% of transactions were fully paid in stock, but only 23% remained so in 2003. This decline then continued, but at a slower pace, the percentage of fully stock-paid transactions fluctuating around 10% as of 2010 and thereafter. We accordingly note that the Statements of Financial Accounting Standards (SFAS) 141 and 142 were adopted in 2001, which dropped the pooling method of accounting for M&A transactions and the goodwill amortization principle, respectively. The pooling method of accounting, based on Accounting Principles Board (APB) Opinion 16 from 1970, consists of the simple addition of the income and balance sheet items to produce new statements out of the merged entities. The purchase method instead imposes a reevaluation of the target's assets and liabilities at fair value and the recognition of goodwill if a difference exists between the paid price and the reevaluated net assets. If

they opted for pooling,[1] acquirers could avoid penalizing effects on their financial ratios due to their acquisitions, such earning per share (EPS), return on equity (ROE), or return on assets (ROA) (see Reda, 1999). The synchronicity between the sharp drop in the evolution of fully stock-paid M&A transaction frequency (Figure 1) and the adoption of SFAS 141 and 142 is questioning. It suggests that these adoption of the standards can help explain the marginalization of full stock payments in U.S. M&A transactions.

Ali and Kravet (2014) contribute to this suspicion. In studying the role of the Step-Up—or the difference between the purchase price and the target's book value of net assets—for explaining payment mode choices before and after a 2001 reform, they find that a higher Step-Up causes the purchase method to impose greater penalties on the newly merged entity's financial performance. The Step-Up thus helps explain the choice of stock-for-stock financing before 2001, but it cannot do so afterwards. Ali and Kravet (2014) posit that pooling has driven stock-for-stock financing before 2001. In the specific case of AT&T's acquisition of NCR, Lys and Vincent (1995) note that AT&T decided to pay fully in stock, to qualify for pooling. But in the absence of a counterfactual, this inference may be misleading. The adoptions of SFAS 141 and 142 were one-time experiences, and around them, many synchronous events may have had an effect. Nearly any variable displaying a structural break after 2001 could appear to be a statistically significant determinant of the evolution in full stock payments.[2] For example, in the wake of the September 11, 2001, attacks, the U.S. Federal Reserve drastically lowered its federal fund target rate, to avoid an economic recession. This change in interest rate policy affected the cost of raising cash to finance M&A transactions. The bursting of the Internet bubble also was contemporaneous with SFAS 141 and 142 and strongly affected M&A market activity, especially in high-tech industries, and stock paid transactions are known to be more frequent in high growth industries (Eckbo et al., 2015). Therefore, to test whether the rules abolishing pooling exerted an effect, we need an identification strategy.

To apply one, we use Canada as a counterfactual for the U.S. Before 2001, under the Canadian Institute of Chartered Accountants (CICA) Handbook Section 1580, pooling was also allowed. In 2001, as in the US, this possibility was abolished under CICA Handbook Section 1581. Moreover, the U.S. and Canadian economies are closely tied, so Canada is a prime candidate to serve as a counterfactual, as Eckbo (1992) suggested in his effort to identify a possible deterrence effect of M&A regulations. In support of this valid identification strategy though, we note that the U.S. and Canadian conditions for pooling, before its abolishment, differed substantially. In the Canadian case, under CICA Handbook Section 1580, pooling was allowed only if one of the parties could not be identified readily as the acquirer. This strict restriction led to very limited uses of pooling during the 1990s. Accordingly, the abolishment of pooling in Canada would likely have, at best, a *very limited* impact on incentives to opt

[1] More accurately, pooling was not really an option but rather the consequence of fulfilling 12 criteria (see Section 2). Acquirers could structure their transactions to meet these criteria though.
[2] This is a case of spurious regression in time-series analysis (Granger and Newbold 1974).

for stock as a payment medium. In a sense, pooling abolishment in Canada acts as a placebo for the "medication" of pooling abolishment in the U.S. Recently, Cedergren et al. (2015) also use Canada as a counterfactual for the US experience to control for endogeneity concerns in their study of the relation between goodwill amortization abolishment and acquisition profitability and risk.

For our baseline analyses, we collected two large M&A transaction samples, one for the U.S. and one for Canada, from the Thomson SDC database for the 1990–2014 period. We used identical selection criteria: deal size above USD1 million, public acquirers (no restriction on target status), a ratio of deal value to acquirer size of at least 1%, exchange offers, acquisition of assets, acquisition of certain assets, buybacks, recaps and acquisition (of stock) excluded, the percentage of shares acquired between 50% and 100%, 100% of shares held after the transaction, the consideration offered reported in the Thomson SDC database, and financial acquirers (SIC codes 6000 to 6999) excluded. The samples comprise 6,955 U.S. and 1,712 Canadian transactions.

We start by reporting stylized facts about payment mode choices over the 25-year period. As Figure 1 highlights, full stock payments declined abruptly after 2001 in the U.S., but that was not the case in Canada, as confirmed by a Chow test of the structural break. After providing the descriptive statistics for a set of traditionally observed determinants of M&A payment choices, we estimate a linear probability model for stock payment choices in the U.S. and Canada. The results confirm that the data sets are comparable to previous studies; we find similar historical results.

For the main analysis, we use a difference-in-differences test, which is robust to many potential sources of bias (Roberts and Whited, 2013), and merge the U.S. and Canadian samples. We identify pooling and post–pooling abolishment (hereinafter *post*) periods, then test whether full stock payments declined significantly more in the U.S. than in Canada during the post period. They did; this result is highly statistically significant, such that the probability of opting for full stock payments shrank by more than 20 percentage points (pp) (or 30 pp, depending on the difference-in-differences specification) in the U.S. during the post period, compared with Canada.

Among the additional analyses we provide, we investigate why an accounting rule change might have had such a significant impact on the M&A market. If displayed financial performance is important for CEOs (who are key decision makers in M&A processes; Harding and Rovit 2004), then the abolishment of pooling should have had a stronger influence on payment choices when CEO incentives were a stronger function of firm performances. Our results support this prediction, indicating that displayed financial performance matters for CEOs. Through this channel, pooling abolishment could have affected the mode of payment choice. In contrast, when we investigate the combined evolution of classic determinants as a means to explain the evolution of full stock payments, we find strong evidence against this effect, according to a comparison of their predictive power between the U.S. and Canada in the post period. This result corroborates the mixed results reported by Boone et al. (2014). We also study whether, in the U.S., the acquirers who selected full stock payments changed between the pooling and the *post* periods. Indeed, we find that after 2001, acquirers paying in stock

were smaller and more leveraged, owned more tangible assets, distributed dividends more often, and more frequently entered international transactions targeting public firms. By underlining the real change in acquirers' profiles and the characteristics of full stock payment transactions after the abolishment of pooling, we corroborate the material impacts of this abolishment on the M&A market.

As another complementary investigation, we test whether U.S. deals that probably would have used pooling, if it were still allowed, were paid in stock during the post period. They were not though, providing further evidence that pooling represented a motivation to pay in stock during the 1990s. The last additional analysis addresses the value consequences of the abolishment for U.S. acquirers. With a reduced but still sizable sample of 5,148 transactions, we determined that acquirers' cumulative abnormal returns (CAR) around the announcement of a stock-paid M&A transaction fell by 4.63 pp for public targets in the *post* period compared with the pooling period. This value effect is highly significant, both economically and statistically. We also provide the results of a long list of robustness checks for the baseline analysis, such as excluding high-technology firms to control for the Internet bubble, excluding cross-border deals, or using Europe as a counterfactual instead of Canada (among others). As we detail subsequently, all the robustness checks confirmed the baseline results.

With these findings, this article contributes to M&A payment choice literature. The abolishment of pooling offers an interesting setting for judging the relative effectiveness of various theories put forward in finance to explain the acquirer's payment mode choice. Our results highlight that the determinants suggested in traditional finance literature offer only low power for explaining the sharp decline in stock-paid transactions in the U.S. around 2001. The abolishment instead appears to be a first-order factor. Other factors still may have played a role but our results highlight the importance of boosting the displayed financial performance for CEOs. Our results also contribute to financial regulation literature, by showing how far-reaching a change in accounting principles can be for the M&A market in the long run. This insight is critical, considering the weight of the M&A market as a channel for resource allocations (Andrade et al., 2001), and leads us to recommend great caution when devising any changes to a regulatory framework.

1. Data

Our baseline M&A data for both the U.S. and Canadian data[3] came from the Thomson SDC database, with a set of selection criteria similar to those used by Betton et al. (2008):

- Deal size greater than USD1 million.
- Public acquirers (but no restriction on target status).
- Ratio of the deal value to the acquirer size of at least 1%.
- Excluding exchange offers, acquisition of assets, acquisition of certain assets, buybacks, recaps, and acquisition (of stock).

[3] Sample sizes vary from analysis to analysis, depending on the control variables and data availability constraints.

- Percentage of shares acquired between 50% and 100%.
- 100% of shares held after the transaction.
- The consideration offered was included in the Thomson SDC database.
- Excluding financial acquirers (SIC codes 6000 to 6999).

Table 1 contains the number and aggregate value (2010 constant USD) of transactions by year in the U.S. and Canadian samples. The wave of M&As at the end of the 1990s is clearly apparent in the U.S. sample, particularly for value. That period witnessed gigantic, wealth-destroying transactions (Moeller et al., 2005). The rebirth of M&A market activity around 2004–2006 appears in both samples, though with some lag for the Canadian case. The Canadian sample was tiny in the early 1990s, reflecting our relative deal size selection restriction. Computing the relative size requires collecting the acquirer's market value, which is difficult in the Canadian sample for transactions in the early 1990s. André et al. (2004) cite the same challenge. Because we used the Canadian pooling and post subsamples as the control group in our difference-in-differences test—with 266 transactions between 1990 and 2001 and 1,446 transactions between 2001 and 2014—we have sufficient observations. Moreover, the relatively smaller sample size, if anything, reduces the statistical power of the analyses, thus offering a more conservative test.

We collected market data from the CRSP Database for the U.S. and Datastream for Canada. If the prices or number of shares required to compute the market values were unavailable in these databases, we collected market values from the Thompson SDC Database (AMV field). We used the Compustat Merged database for U.S. firms' financial statements and the Compustat North America database for Canadian ones. Macro-economic information (interest rates, consumer price index, credit spread) were from the Federal Reserve Bank of St. Louis's Economics Data website.[4]

2. Stylized Facts About the Method of Payment

2.1. Evolution of Full Stock Payments over Time

Table 2 contains the time series of fully stock-paid M&A transaction percentages in the U.S. and Canada, in value (2010 constant USD) and count. As observed in Figure 1, the U.S. time series shows a sharp decline in 2001 and 2002, which then continues at a reduced pace. No such evolution appears in Canada (yearly average stock-paid transaction percentages in value were 37.22% during 1990–2001 and 37.21% during 2002–2014; the corresponding count-based percentages were 47.01% and 46.48%). To confirm the significantly different evolutions between nations, we implemented a time-series Chow test of the structural break for both countries:

[4] See https://research.stlouisfed.org/fred2/

$$stock\ paid\ \%_t = \alpha + \beta\ Post_{pool_t} + \gamma\ Trend_t + \delta\ \left(Trend_t\ \times Post_{pool_t}\right) + \varepsilon_t \quad (1)$$

where $stock\ paid\ \%_t$ is the fully stock-paid transaction percentage in year t,[5] $Post_{pool_t}$ is a dummy variable taking a value of 1 during the post period (2002 onward), $Trend_t$ is a linear time trend variable, and $Trend_t\ \times Post_{pool_t}$ is the interaction between the linear time trend and the $Post_{pool_t}$ dummy variable. We test for the presence of a structural break in 2001 with a joint test of significance: $\beta = \delta = 0$.

For the U.S. time series, the β coefficient is negative (significant, p = .07), and the Fisher statistic Chow test of the structural break is 12.44 (highly significant, p = .00), confirming the presence of a structural break in 2001. The Canadian experience differs fundamentally: The β coefficient is positive but not significant, and the Fisher statistic is .27 (not significant, p = .76), so there was no structural break.[6] In the U.S. data, the interaction term δ coefficient also is not statistically significant. That is, the structural break is driven by a change in level, not slope.

2.2. Determinants of Stock Payment

We used a large set of determinants of the M&A mode of payment, as identified by prior M&A literature (Eckbo et al. 2014): deal size (USD million), acquirer size (USD million), cash holding, market-to-book ratio, asset tangibility, research and development (R&D), dividend payments, leverage ratio, target status, relative size, horizontal deal, domestic deal, and the 10-year Treasury bond interest rate. All the variable definitions are in Appendix 1. This sample differs from the one that Eckbo et al. (2014) use, in that the covered periods are different. Eckbo et al. (2014) gather a sample of 4,919 U.S. transactions from Thomson SDC over 1980 to 2008, whereas we focus on 1990 to 2014. Although the measures of the acquirer's market-to-book ratio (2.56 in our sample vs. 3.06 in Eckbo et al.), leverage (15% vs. 16.9%), and asset tangibility (38.9% vs. 42.9%) are comparable, our acquirers are significantly smaller (USD1,256 million in average total assets – unreported - .vs USD3,218 million), pay dividends less frequently (24% vs. 44%), and do more R&D (6.1% of total assets vs. 4.4%).

Table 3 reports the descriptive statistics for the U.S. (Panel A) and Canada (Panel B). The first three columns refer to the whole period, 1990 to 2014, and include the mean, median, and standard deviation. The next columns display the means by subperiods; finally, we provide the *p*-value results of a classic test of the difference in means across sub-periods. For both the U.S. and Canada, we find significant differences between the pooling and post periods, which is a noteworthy stylized fact, because it raises the question of whether these evolutions can explain the observed decline in frequency of full stock payments during the post period. In the U.S., the deal size, acquirer size, cash holdings, relative size, and frequency of horizontal transactions all increase. The acquirer's market-to-book ratio and asset tangibility both decrease, as do the frequency of public targets, domestic transactions, and 10-

[5] We obtained similar results when using value-based, fully stock-paid percentages.

[6] We drop the years to 1990–1993 for the Canadian analysis, to avoid the potential for bias if the results depended on years with only a limited number of recorded transactions.

year Treasury bond interest rate level. In Canada, the evolutions of the acquirer's size, cash holdings, asset tangibility, frequency of public targets, domestic deals, and 10-year Treasury bond interest rate are comparable to those for the U.S. However, we observe three differences: an increase in acquirer R&D (absent in U.S.) and decreases in acquirer leverage (absent in U.S.) and relative size (increasing in U.S.).

For more insights on the comparability of our sample with extant samples, we reproduced the classic multivariate probability of stock payment analysis. Yet we opted for a linear probability model; most studies instead use a nonlinear model, because their dependent variable is binary. Our choice is motivated by our willingness to test the statistical significance of the coefficient variations between the pooling and post periods. This test can be implemented easily by stacking observations from the two periods and including interaction terms between the variables of interest and a $Post_{pool}$ dummy variable. But the interaction term coefficients in nonlinear models are not marginal effects and therefore must be interpreted with care (Greene 2010). The linear probability model is immune to this issue.

As the results in Table 4 indicate, the coefficient estimates for the U.S. sample are close to those reported by Eckbo et al. (2014): acquirer market-to-book ratio and R&D increase the probability of full stock payments; dividend payments and leverage decrease it. Acquirer size and asset tangibility retain the same signs, but the former loses its significance, and the latter was not significant in Eckbo et al.[7] Despite the compositional differences revealed in Table 3, our sample thus appears representative of classic samples used in prior M&A literature to study the determinants of payment choice. Finally, the comparison of the multivariate analyses for the U.S. and Canada indicates that all the statistically significant U.S. coefficients retain their signs in the Canadian case (and mostly remain statistically significant). These results confort our decision to use Canada as a counterfactual for the U.S. pooling abolishment experience.

3. Pooling Interests versus Purchase Accounting Methods

To test whether pooling abolishment drove the marginalization of full stock payments in the U.S., we first summarize the relevant accounting regulations in both nations. This initial analysis is important to understand why Canada is a valid counterfactual, namely, because pooling was possible in Canada before 2001.

3.1. The U.S. Case

[7] We cannot compare the results for the public target dummy, because Eckbo et al. also include an interaction term with the target premium.

The SFAS 141 and 142 introduced two major reforms in 2001: abolishing the pooling of interests method[8] and goodwill amortization.[9] Before 2001, M&A accounting methods followed APB Opinion 16, from 1970, which allowed two methods: pooling of interests and purchase. With the pooling method, a simple sum of the income and balance sheet statements of the two merging companies served as the input for the financial statements of the newly merged entity. This procedure avoided any asset reevaluations or goodwill recognition. The purchase method instead used a fair-value reevaluation of target assets and liabilities before incorporating them into the acquirer's financial statements. If the acquisition price represented a premium with respect to the fair-value re-evaluation process, as was usually the case, goodwill was recognized. Before 2001, goodwill amortized over its useful life, with a maximum of 40 years (APB Opinion 17). Another significant difference between pooling and purchase involved the day on which target net incomes were taken into account in the newly merged financial statements. Pooling required such consideration from the beginning of the fiscal year; under the purchase method, it began with the acquisition date. Opting for a pooling or purchase method thus would have different impacts on the displayed financial performance of the newly merged entity. The purchase method and its associated asset reevaluation and goodwill amortization had negative impacts on the displayed EPS, ROE, and ROA (for a clear example, see Reda 1999). Not accounting for the target's revenues between the start of the fiscal year and the acquisition date also could alter the merged entity's initial performance, assuming these revenues were significant.

Before 2001, the M&A accounting method was not, strictly speaking, a choice. Rather, APB Opinion 16 listed 12 criteria that, if met, led to pooling. The merging parties structured the transactions to fulfill (or not) these criteria. The general idea was that pooling should apply to mergers of equals, so the main criteria were autonomy (i.e., merging companies could not be divisions or subsidiaries of one another in the two years before the merger), a single transaction (merger should be a one-step process, completed within a year of its initiation), and an essentially stock-for-stock transaction (at least 90% of the paid price).[10] The method was common for large M&A transactions in the U.S., as Figure 2 displays. It indicates the average percentage of M&A transactions using pooling with deal sizes greater than USD100 million that were fully paid by stock during 1990–2001 (source: Thomson SDC Database). Panel A displays count-based percentages, and Panel B contains value-based percentages. Pooling was used seven times (four times) more frequently in the U.S. than in Canada, according to the count- (value-) based percentages. Reda (1999) reports that, in 1997, the dollar volume of pooling exceeded that of purchase by a factor of 20 in the U.S.. Thus, the pooling method was the method of choice for large, U.S., M&A transactions paid for fully by stock.

[8] Note that SFAS 141 evolved in 2008 to become SFAS 141R. The purchase method was relabeled the acquisition method, and the changes made the acquisition method less attractive in some circumstances. But according to Ali and Kravet (2014), this change affected only a small minority of transactions.

[9] SFAS 142 replaced goodwill amortization with impairments, based on yearly assessments of goodwill value.

[10] The remaining nine criteria imposed strict restrictions on the voting right changes for common stocks.

With this stylized fact, several researchers have considered the relation between pooling and the choice of payment methods, as well as managers' motivations to choose pooling and the value effect for shareholders. Ali and Kravet (2014) use the adoption of SFAS 141 and 142 as a kind of natural experiment to study the relation between accounting regulations and the financing used in M&A transactions. As noted previously, they established a positive relation between the target's Step-Up value and the probability of stock-for-stock financing before 2001. This relation disappeared after the abolishment of pooling and goodwill amortization though, leading the authors to infer that pooling was an important driver of stock-for-stock financing choices. Ayers et al. (2002) confirm that firms using pooling were ready to pay higher acquisition premia. Weber (2004) also studies market reactions to the Security Exchange Commission's (SEC) adoption of SAB 96, a new regulation that forced firms to choose between pooling and undertaking share repurchase programs in the two years following an acquisition. Most firms with pending pooling mergers at the time of SAB 96 adoption maintained pooling as an accounting method, at the cost of renouncing share repurchase programs. Therefore, pooling appears to have a real cost to shareholders. Aboody et al. (2000) further report that pooling was more likely when managers received earnings-based compensation, raising the issue of conflicts of interest with shareholders. With a sample of 324 U.S. stock swap acquisitions between 1990 and 1998, Martinez-Jerez (2008) reports a negative, statistically significant difference in market reactions to pooling versus purchase transactions, of approximately -4 pp, though the differential grows to -8 pp for firms with ineffective corporate governance. The authors conclude that investors interpret the choice of a purchase accounting method as a signal of management's confidence in the success of the transaction.

3.2. The Canadian Case

Before 2001, Canadian regulations allowed the use of pooling (CICA Handbook Section 1580[11]), though they were far more restrictive. According to Farrell and Beechy (2002, p. 92), "if one company can be identified as the acquirer, then there is a widespread agreement that the purchase method should be used." This consensus was the case in cash-paid acquisitions. Even for stock-for-stock mergers though, pooling was possible only in mergers of equals. Shareholders of the merging companies agreed in that case to combine and continue both businesses, as an ongoing concern. Pooling therefore was rare. According to André et al. (2004), among 267 transactions undertaken during 1980–2000, only 8 (4.5% of the sample) relied on pooling. Figure 2 confirms this evidence for the 1990–2001 period, for a sample limited to transactions with deal size greater than USD100 million and paid fully by stock. Then, the pooling method was abolished in 2001 under CICA Handbook Section 1581.

The Canadian experience is particularly interesting with respect to our research question. The pooling abolishment year is the same as that in the U.S., and the nations are close, with closely tied economic environments (Eckbo 1992; Cedergren et al. 2015). The very restrictive pooling usage

[11] See the CICA Exposure Draft on business combinations from September 1999.

conditions in Canada meant that this approach had, at most, a very limited material impact on the payment choice by construction. These arguments motivate our choice of Canada as a counterfactual for the U.S. experience.

4. Full Stock Payment and Pooling Accounting Abolishment

4.1. Difference-in-Differences Tests

In this section, we explicitly test whether pooling abolishment is a valid candidate for explaining the evolution in full stock payments in the U.S. The difference-in-differences test, with Canada as a counterfactual, should be robust to misspecification-based sources of bias, including endogenous missing variables (Roberts and Whited 2013). The statistical robustness of this approach depends on the validity of the counterfactual. The stylized facts in Section 2 and the M&A accounting principles summarized in Section 3 strongly advocate for this validity. Accordingly, we adopt two difference-in-differences specifications (Greene, 2011):

$$stock_i = \alpha + \beta\, US_i + \gamma\, Post_{pool_i} + \delta\, \left(US_i \times Post_{pool_i}\right) + \boldsymbol{\theta}'(\boldsymbol{Sector\ FE}_i) + \boldsymbol{\varphi}'(\boldsymbol{Controls}_i) + \varepsilon_i, \text{ and (2)}$$

$$stock_i = \alpha + \beta\, US_i + \delta\, \left(US_i \times Post_{pool_i}\right) + \boldsymbol{\gamma}\,(\boldsymbol{Year\ FE}_i) + \boldsymbol{\theta}'(\boldsymbol{Sector\ FE}_i) + \boldsymbol{\varphi}'(\boldsymbol{Controls}_i) + \varepsilon_i, \text{ (3)}$$

where i is the deal index, $stock_i$ is a dummy variable equal to 1 for a full stock payment for deal i, US_i is a dummy variable equal to 1 if the acquirer is a U.S. firm but 0 if the acquirer is a Canadian firm, $Post_{pool_i}$ is dummy variable equal to 1 if the deal i announcement date is during the post period (after 30/06/2001), $\boldsymbol{Sector\ FE}_i$ is a vector of sector fixed effects (defined at the SIC two-digit level), $\boldsymbol{Year\ FE}_i$ is a vector of year fixed effects, and $\boldsymbol{Controls}_i$ is vector of control variables. We use bold notation to identify vectors. The set of control variables is the same as in Table 4.

Our two difference-in-differences specifications are linear probability models (LPM), which are generally less well suited to the analysis of binary dependent variables than probit or logit specifications. However, we selected this estimator because Equations 2 and 3 both incorporate interaction terms. Coefficients of interaction terms in nonlinear models cannot be interpreted as marginal effects (Greene, 2010), but in a linear specification, they are. Adopting LPM specifications therefore facilitates the interpretation of our results.[12] The Equation 2 specification is a classic difference-in-differences test implementation in a multivariate context. We also report the results

[12] Appendix 2 contains the results obtained with a probit specification, as a robustness check.

obtained with the Equation 3 specification, because including year fixed effects controls for time-varying common factors that are not explicitly included in the vector of control variables (e.g., macro-economic variables). The $Post_{pool_i}$ dummy cannot be included in this second specification though, because it is a linear combination of the set of year fixed effects.

In Table 5, we report the results from estimating Equations 2 and 3 in the first two columns. The M&A sample is the one we introduced in Section 1, though restricted to transactions for which all the required data fields are available. We stacked the U.S. and Canadian M&A transactions to support the difference-in-differences tests. All control variables are as defined in Appendix 1.

The test of the pooling abolishment hypothesis relied on the interaction term $US_i \times Post_{pool_i}$ with coefficient δ for Equations 2 and 3. In Table 5, Column 1, the coefficient value is -.3134 (p = .00), and in Column 2, it is -.2099 (p = .00). These estimates strongly support the pooling abolishment hypothesis: In contrast with the Canadian experience, full stock payments declined in the U.S. in the wake of the pooling abolishment. The result is robust to our introduction of a large set of determinants of the M&A mode of payment, industry-level latent factors that were constant over time, and annual common latent factors. The properties of the difference-in-differences specification also make it robust to any latent factors common to the U.S. and Canada. Moreover, the sizable coefficient values indicated a decline of 20 to 30 pp in the probability of a full stock payment during the post period.[13] Finally, among the control variables, in comparison with the results obtained for the U.S. during 1990–2014 (Table 4), the coefficients of acquirer leverage, market-to-book ratio, tangibility, dividend, R&D, domestic transaction, public target, and 10-year interest rate kept their signs and statistical significance.

5. Additional Evidence

5.1. CEO Incentives and Full Stock Payment Probability

Pooling and purchase methods of accounting have significantly different consequences for the new merged entity, in terms of its displayed financial ratios (Reda 1999). Executives whose compensation packages depended on financial performance indicators such as EPS or ROA had clear incentives to opt for full stock payments during the pooling period. Consistently, Aboody et al. (2000) report that pooling was more likely in large target Step-Up transactions when managers received earnings-based compensation. These CEO incentives therefore might provide a channel to explain the interaction between pooling and the choice of payment methods in M&A transactions.

To study their role, we computed the percentage of variable compensation the CEO received, with data from the Execucomp database. We next reproduced the LPM of the full stock payment in the U.S. (Table 4) but added the percentage of variable CEO compensation and its interaction with the

[13] These results are confirmed in Appendix 2, using a probit specification. The interpretation of the interaction term coefficients must be handled with care in this nonlinear context (Greene 2010), but we note that the coefficients are negative and highly significant in both specifications (Column 1, -1.0183, p = .00; Column 2 -.6918, p = .00).

$Post_{pool}$ dummy variable.[14] The sample size decreased drastically (from 5,337 observations to 1,146), due to the limited data availability in the Execucomp database.

Table 6 displays the estimation results. We report four specifications, depending on whether the independent variables of interest and the year and sector fixed effects were included. The two independent variables of interest are "% Variable Compensation" and its interaction with the $Post_{pool}$ dummy variable. The former was positive but not significant in all specifications (Column 2, .1012, p = .20; Column 3, .0839, p = .31; Column 4, .0943, p = .23). In these same columns, the latter coefficient was negative and highly significant (-.2863, p = .01; -.2625, p = .02; -.2748, p = .01). Including both coefficients to obtain the net effect of % Variable Compensation during the post period led to a negative value that was significantly different from 0 (Fisher statistics: 5.78, p = .02; 4.74, p = .03; 5.83, p = .02). When the CEOs of acquirers earn a high proportion of variable compensation, they avoid full stock payments in the years since the pooling abolishment.

These results suggest that CEO incentives help explain the interaction between pooling abolishment and the marginalization of full stock payments in the U.S. When we compare the Column 1 results with those in Columns 2 and 3, we find that half of the post–pooling abolishment effect was due to CEO incentives. That is, in Column 1, the $Post_{pool}$ coefficient is -.4358, and in Columns 2 and 3, it shrinks to -.2382 and -.259 respectively, or roughly half.

5.2. Classic Determinants of M&A Mode of Payment

Can the marginalization of full stock payments in the U.S. be explained by the determinants of the M&A mode of payment classically used in M&A literature? To investigate this question, we study the predictive power of the determinants during the post period, using an empirical strategy similar to Boone et al.'s (2014): we model the probability of full stock payments using an LPM specification and the set of determinants in Table 3. The estimates of the LPM model coefficients rely on the subsample of transactions that took place during the pooling period. We then use those estimated coefficients to obtain the fitted probability of full stock payments, during both the pooling and post periods. Finally, we average the deal level fitted probabilities, year by year.[15] Table 7 displays the results, with the U.S. estimations in Panel A and the Canadian estimations in Panel B. In each panel, the left-hand column contains the estimation results for the pooling period, as used in this analysis. The average fitted probabilities are depicted in Figure 3. As is clearly apparent in Panel A, the LPM model captures the average probability of full stock payment during the pooling period (in-sample) reasonably well for the U.S., but it cannot explain the sharp decline during the post period. The comparison with the Canadian results (Panel B) is again striking. With the exception of the first few years (1990–1992), for which our

[14] We cannot replicate the Table 5 difference-in-differences specification, because CEO compensation packages are not available for Canadian acquirers.

[15] However, in contrast with Boone et al. (2014), our sample includes private target acquisitions, and fitted probabilities are strictly based on out-of-sample predictions for the post period.

sample is very limited (Section 1), the LPM captures the average probability of full stock payments correctly, but in this case, it can do so for both the pooling and post periods. The post result is remarkable: In Canada, despite the pooling abolishment, stock payment drivers remained stable over the analyzed 25 years. These observations lead us to conclude that the known determinants of stock payments do not drive the full stock payment marginalization in the U.S. after 2001, in confirmation of Boone et al.'s (2014) results. Because participation in the M&A market is a voluntary decision, endogenous self-selection may affect these results. We therefore replicated the exercise using a two-stage Heckman procedure, but the results were similar (available on request).

5.3. Classic Determinants of M&A Mode of Payment: Pooling versus Post-Pooling Periods

The results in Table 7 also offer an opportunity to compare the classic determinants' coefficients across the pooling and post periods. In each panel of Table 7, we report estimates for the pooling (left) and post (right) periods, as well as the test of coefficient differences. In the U.S. (Table 7, Panel A), the acquirer size, leverage, tangibility, and dividend coefficients change signs between periods, and the changes are statistically significant. The domestic and public target dummies keep their signs, but the changes in their coefficient values are significant. The pooling abolishment changed the profile of acquirers active in the M&A market, as well as the type transactions undertaken. This result corroborates the prediction that a change in accounting regulations has material impacts on the M&A market. The situation in Canada is different. We observe significant evolutions in only two variable coefficients: acquirer cash (which becomes negative and significant in the post period) and the public target dummy (which is positive but only significant during the post period). The stability of the multivariate results for Canada reinforces its validity as a counterfactual for the U.S. case.

5.4. Probability of Full Stock Payment and Pooling

If pooling was a main motivation to pay in stock during 1990–2001 in the U.S., acquirers who would have chosen pooling should not pay more frequently in stock than other acquirers do after the pooling abolishment. We test this prediction using a two-stage approach. In the first stage, we estimate the probability of pooling during the pooling period. In the second stage, using fitted probabilities of pooling obtained from the first-stage estimates, we study whether the probability of pooling still explains full stock payments during the post period. The first-stage estimated equation is

$$pooling_i = \Phi\left(\alpha + \boldsymbol{\varphi}'(\boldsymbol{Controls}_i)\right), \quad (4)$$

where $pooling_i$ is a dummy variable equal to 1 if the transaction was recognized under pooling, $\Phi(.)$ indicates a probit specification, and $\boldsymbol{Controls}_i$ is a set of control variables that explains the choice to structure an acquisition to make it eligible for pooling. Ayers (2002) highlights the role of the target's

Step-Up, ROA, and leverage. In turn, we selected a probit specification, because there is no interaction term in Equation 4.

In the second stage, similar to the analyses reported in Table 5, we tested two LPM specifications, one without year fixed effects and one with them:

$$stock_i = \alpha + \beta\ Post_{pool_i} + \gamma\ pooling\ hat_i + \ \delta\ \left(Post_{pool_i} \times pooling\ hat_i\right) + \boldsymbol{\theta}'(\boldsymbol{Sector\ FE}_i) + \ \boldsymbol{\varphi}'(\boldsymbol{Controls}_i) + \varepsilon_i, \text{ and} \quad (5)$$

$$stock_i = \alpha + \gamma\ pooling\ hat_i + \ \delta\ \left(Post_{pool_i} \times pooling\ hat_i\right) + \boldsymbol{\gamma}\ (\boldsymbol{Year\ FE}_i) + \boldsymbol{\theta}'(\boldsymbol{Sector\ FE}_i) + \ \boldsymbol{\varphi}'(\boldsymbol{Controls}_i) + \varepsilon_i\ . \quad (6)$$

The variable $pooling\ hat$ refers to the fitted probabilities of pooling, obtained using Equation 4. Finally, δ, the coefficient of the interaction terms $Post_{pool_i} \times pooling\ hat_i$, is the coefficient of interest.

Table 8, Panel A, displays the results of the estimation of Equation 4, obtained using M&A transactions from 1990 to 2001 in the U.S..[16] As suggested by Ayers (2002), the target's Step-Up, ROA, and leverage have significant roles. The greater its Step-Up and ROA, the higher the probability of pooling; the higher the target's leverage, the lower the probability of pooling, reflecting the acquirer's desire to avoid degrading its financial ratios. Other control variables also are significant, including the target's size (positive coefficient) and the acquirer's dividend (negative coefficient), run up (positive coefficient), and membership in manufacturing industries (negative coefficient).

Table 8, Panel B, contains the results of the estimations of Equations 5 and 6, which we obtained using the sample of U.S. M&A transactions for which we could access all necessary information. The two key coefficients are those for $pooling\ hat_i$ and the interaction term, $Post_{pool_i} \times pooling\ hat_i$. The former is positive and highly significant in both specifications (Column 1, .9336, p = .00; Column 2, .8419, p = .00). Acquirers interested in pooling selected full stock payments more often. This finding must be the case, because full stock payment was a necessary condition for pooling (Section 3). The coefficient of $Post_{pool_i} \times pooling\ hat_i$ also was negative and highly significant (Column 1, -1.1326, p = .00; Column 2, -.9740, p = .00). When we add the coefficients of $pooling\ hat_i$ and $Post_{pool_i} \times pooling\ hat_i$ to obtain the net effect of $pooling\ hat_i$ during the post period, we obtain a value close to 0 (not significantly different from 0 at p = .29; unreported result). We would expect such a result if pooling was a main reason to select full stock payment. That is, acquirers wishing to opt for pooling

[16] The significant sample size reduction is due to the need for data for computing target firm variables, such as the Step-Up and ROA, which thus restricts the sample to U.S. public targets.

had no more opportunity to do so during the post period, so they stopped paying in stock more frequently than other acquirers.

5.5. Value Effects

Fuller et al. (2002) and Officer et al. (2009) show that the mode of payment interacts with the target status to determine acquirer value creation in M&A transactions. The most value-creating transactions for acquirers are those of private targets paid in stock. Private target acquisitions are more value creating for acquirers than are public ones, possibly because of the presence of an illiquidity premium captured by acquirers. Moreover, relative to cash payments, the use of stock payments enables acquirer and target shareholders to share the valuation uncertainty that exists due to the absence of an active secondary market. The acquisition of public targets paid in stock instead is the most value-destroying combination, because it combines a size effect with a share exchange offer, both of which generate negative investor reactions (Golubov et al. 2015b; Moeller et al. 2004).

Our results show that the abolishment of pooling in 2001 (SFAS 141) represents the main explanation for why full stock payments were marginalized in the U.S. after 2001. In Section 5.3 we detailed how the stock-paid transaction characteristics and corresponding acquirer profiles changed after the pooling abolishment. Here, we investigate whether these changes affected investors' perceptions of the value creation surrounding the transactions.

We start by computing the acquirer CAR for our U.S. sample (see Section 1). We use the standard market model as a return-generating process, estimated on a window from day -300 to day -90, with respect to the announcement date. The acquirer CAR are for a three-day event window, centered on the announcement date. We then regressed acquirer CAR on the set of classical determinants (Golubov et al. 2015a) and dummy variables that capture the post-pooling period ($Post_{pool}$), the target's status (public target), and full stock payment (stock).

Table 9 contains the results. Column 1 includes only the classic acquirer CAR determinants, for comparison with existing results. Similar to Fuller et al. (2002) and Officer et al. (2009), we observe that acquiring public targets is negatively perceived by investors, and the effect gets reinforced by full stock payments. We add the dummy variables—post, public target, and stock—and their interactions in Column 2. The $Post_{pool} \times \text{Stock} \times \text{Public Target}$ interaction coefficient is negative and highly significant (-.0463, p = .01), indicating that investors react far more negatively to acquisition announcements for public targets with full payment in stock in the period since the pooling abolishment. Noting that fully stock-paid transactions display significant changes in acquirer profiles and deal characteristics in the post period (Section 5.3), we determine that the pooling abolishment has transformed this segment of M&A activity. Only less value-creating or more value-destroying transactions of public targets continue to be fully paid in stock, and full stock payment conveys more negative private information about acquirers.

6. Robustness Checks

We investigate the robustness of the Table 5 results, reflecting our baseline difference-in-differences test of the pooling abolishment hypothesis, to various issues that could lead to misleading conclusions. To start, 2001 was the year SFAS 141 and 142 were adopted, but also the year the Internet bubble burst. Did this contemporaneous event drive our results? In Table 10, Panel A, we present a replication of the Table 5 tests after we excluded high-tech firms, which we identified using Kile and Phillips's (2009) method. These authors provide a detailed list of four-digit SIC industries that can be considered high-tech. After excluding them, our sample size dropped from 6,123 observations in Table 5 to 3,273 observations in Table 10. The coefficients of the U.S. dummy × $Post_{pool}$ dummy interaction term remained negative and highly significant (Column 1, -.2410, p = .00; Column 2, -.1777, p = .00). The bursting of the Internet bubble thus is not a confounding factor. This result also indicates that pooling relevance during the 1990s was not restricted to high-tech industries, as was frequently suggested by the financial press at the time.

If cross-border transactions are asymmetrically distributed between the U.S. and Canada and also underwent specific time trends after 2001, they also could act as confounding factors. We replicated our preceding analysis, but this time we excluded cross-border transactions. The results in Table 10, Panel B, stem from a sample size of 5,174 transactions. The coefficients of the U.S. dummy × $Post_{pool}$ dummy interaction term became even more negative and highly significant (Column 1, -.3693, p = .00; Column 2, -.2214, p = .00).

The pooling and post-pooling subsamples of acquirers each incorporate a reduced number of identical firms. As we reported in Section 5.3, in the U.S., the determinants of full stock payment underwent significant changes between the two periods. Might this variation in the composition of the acquirer samples affect the estimation results? To check, we selected a subsample of U.S. acquirers that undertook at least one transaction in the five years before the pooling abolishment and another transaction in the five years following it. We refer to this subsample as the constant acquirer sample, and we present the pertinent results in Table 10, Panel C. The sample size dropped drastically to 971 observations. The coefficients of the U.S. dummy × $Post_{pool}$ dummy interaction term remained negative and highly significant again (Column 1, -.3431, p = .00; Column 2, -.2079, p = .00).

Many Canadian companies are listed on U.S. capital markets, as well as Canadian markets, which defines them as cross-listed firms. If the cross-listing decision was motivated by the search for easier conditions for pooling in the U.S., the presence of these cross-listed firms could affect our results.[17] We check the robustness of our Table 5 results to this issue by adding a dummy variable, *Canadian Cross-listed*, equal to 1 if a firm was cross-listed. According to Table 10, Panel D, the

[17] Canadian cross-listed firms did not use pooling more often than single-listed Canadian firms before the abolishment, an observation inconsistent with the idea that pooling might have motivated the cross-listing.

coefficients of the U.S. dummy × $Post_{pool}$ dummy interaction effect remained negative and highly significant (Column 1, -.3231, p = .00; Column 2, -.2147, p = .00). An alternative robustness test would drop Canadian cross-listed firms from the sample; in doing so, we obtained comparable results (available on request) but a drastically reduced sample size.

The use of pooling was very limited in European countries, whether because it was forbidden by country-specific regulations or because of their restrictive conditions, similar to those in Canada.[18] Europe therefore qualifies as another valid counterfactual for our difference-in-differences test. We extracted, from Thomson SDC, M&A transactions completed by European acquirers, using the same criteria we described in Section 1. The resulting sample of 6,285 transactions involved companies in 41 European countries, though U.K. firms account for more than 58%. In Figure 4, we present the yearly average percentages of fully stock-paid transactions, in count values, for European and U.K. samples compared with the U.S. one. No pattern was similar to that U.S. pattern. For example, the yearly average stock-paid transaction percentages for Europe (UK) were 20.76% (17.44%) during 1990–2001 and then 17.59% (13.77%) during 2002–2014. The parallel trends assumption underlying a valid difference-in-differences test implementation is respected here; the European and U.K. samples displayed behaviors similar to the U.S. sample both before and after the pooling abolishment. The U.S. post–pooling abolishment fully paid stock transaction frequency also rejoined the long-term averages for Europe; this observation should prompt further investigation. Table 10, Panel E, provides the results for Europe (including the United Kingdom); Panel F describes U.K. acquirers only. In Panel E, Column 1, the coefficient value is -.2221 (p = .00), and in Column 2, it is -.2241 (p = .00). These estimates strongly support the pooling abolishment hypothesis, because in contrast with the European experience, full stock payments declined significantly in the U.S. after the pooling abolishment. The result also is robust to the introduction of the control variables,[19] industry-level latent factors constant through time, and annual common latent factors.

A main contribution of our analyses is the demonstrated use of difference-in-differences tests with valid counterfactuals. In Section 3, we detailed the U.S. and Canadian accounting regulations to explain why Canada was so well suited to serve as a counterfactual; in this section, we describe how Europe is qualified as well. In turn, we apply a classic treatment effect test for the pooling abolishment hypothesis, avoiding non–U.S. transactions as the counterfactual. Specifically,

- For a given M&A transaction, we define the treatment as the announcement date, taking place during the post period.

[18]Thomson SDC reports only 32 deals recognized under pooling in Europe since 1978, among 25,088 transactions with deal sizes greater than USD1 million completed by public acquirers.

[19] We used a restricted set of control variables for this robustness check, due to the limited data availability for European firms.

- We use propensity score-matching estimators to impute the missing counterfactual for each transaction as the outcome of the most similar transaction that also took place during the pooling period. The outcome of this transaction is the potential outcome.
- We compute the treatment effect by taking the average of the difference between the observed and potential outcomes for each subject.

A detailed presentation of this procedure is available from Roberts and Whited (2013). We used acquirer and transaction characteristics to estimate the treatment model. Table 10, Panel G, displays the treatment effect test results: The average treatment effect is negative and strongly significant (-.3320, *p* = .00), consistent with our results in Table 5.

Rule 10b-18 under the Securities Exchange Act of 1934 creates a safe harbor from claims of market manipulation in the case of share repurchases (see Simpson Thacher report[20] for limitations and restrictions that apply to Rule 10b-18). In November 2003, the SEC drastically restricted the applicability of this share repurchases safe harbor for most non-cash M&A. The 2003 ruling did not prohibit share repurchases while M&A transactions were pending, but it significantly increased the risk of in-depth regulatory scrutiny in such cases. The November 2003 amendment applied only to non-cash transactions, such that it created new incentives for acquirers to pay in cash and thereby benefit from Rule 10b-18's safe harbor. Accordingly, we test whether our results are robust to this regulatory change by including a $Post_{PURCH}$ dummy variable (=1 for transactions announced after November 2003) and an additional *US x* $Post_{PURCH}$ interaction term in our difference-in-differences specification. As the results in Table 10, Panel H, reveal, the US × $Post_{POOL}$ coefficient remains negative and strongly significant in both difference-in-differences specifications, whereas the *US x* $Post_{PURCH}$ interaction coefficient is significant only in the specification with year fixed effects (*p* = .09). The previous results thus are robust to the SEC Rule 10b-18 share repurchases safe harbor amendments of 2003.

7. Conclusion

This analysis of the evolution of full stock payments in M&A transactions in the U.S. in recent decades shines a light on the striking, sharp declines in the percentage of transactions fully paid in stock after 2001. The consistency of about 10% of stock-paid transactions since 2010 suggests that we are not exaggerating when we note the marginalization of this payment mode. Because 2001 is the year that pooling and goodwill amortization were abolished in the U.S. (SFAS 141 and 142), we test whether that this accounting rule change have had far-reaching implications. The question is particularly relevant, because the choice of a mode of payment for M&As constitutes a sort of laboratory of experience, to test various theoretical predictions from corporate finance.

[20] See http://www.stblaw.com/docs/default-source/cold-fusion-existing-content/publications/pub392.pdf?sfvrsn=2

We test a pooling abolishment hypothesis, in which we argue that pooling helped avoid degradation in the displayed financial performance ratios of the newly merged entity, such as its EPS, ROA, or ROE. Its abolishment was a one-time experience though. Convincing empirical evidence that this change in the regulatory environment caused full stock payment marginalization therefore is challenging to obtain.

We used a difference-in-differences test of the pooling abolishment hypothesis, with Canada as a counterfactual for the U.S. experience. The Canadian economy is closely tied the U.S. economy, and they share many common latent factors. The evolution of Canada's pooling regulations also offers a particularly interesting way to test the pooling hypothesis. Pooling was also abolished in 2001 in Canada, but it had rarely been used previously there, unlike the U.S. case. Using Canada as a sort of placebo, we test whether the U.S. pooling abolishment was an effective medication. With large samples of M&A transactions between 1990 and 2014, our results clearly support the pooling abolishment hypothesis. Although some other factors may have played some role, our numerous analyses and robustness checks affirm our assertion that pooling abolishment was a key determinant.

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Figure 1. Percentage of fully stock-paid M&A transactions in the U.S. during 1990–2014
Figure 1 displays the percentage of fully stock-paid M&A transactions in the U.S. from 1990 to 2014 (count and value based). The sample was collected from the Thomson SDC database, using the selection criteria listed in Section 1, which produced a set of 6,955 M&A transactions.

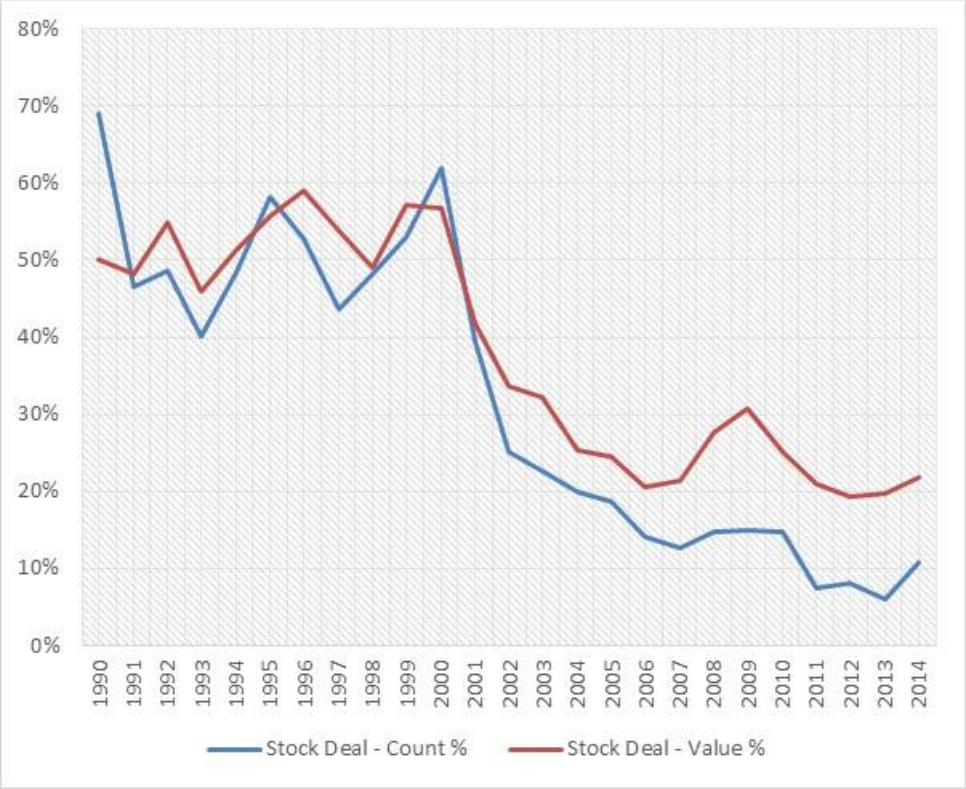
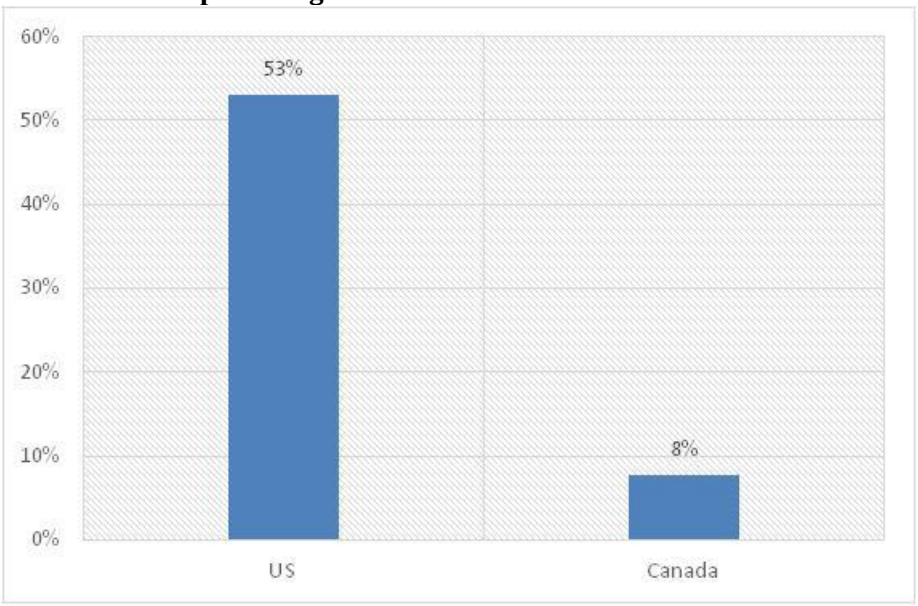


Figure 2. Pooling versus purchase in the U.S. and Canada during 1990–2001
Figure 2 displays the average percentage of M&A transactions in our sample (Table 1) that used pooling and had a deal size greater than USD100 million that were fully paid by stock during 1990–2001 (source: Thomson SDC Database). Panel A is the count percentage, and Panel B is the value percentage.

A. Count-based percentages



B. Value-based percentages

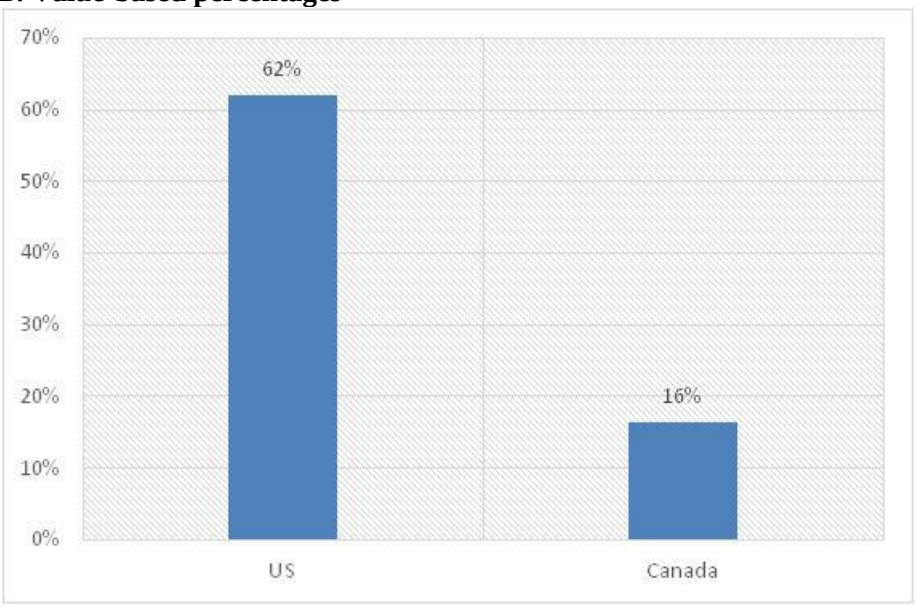
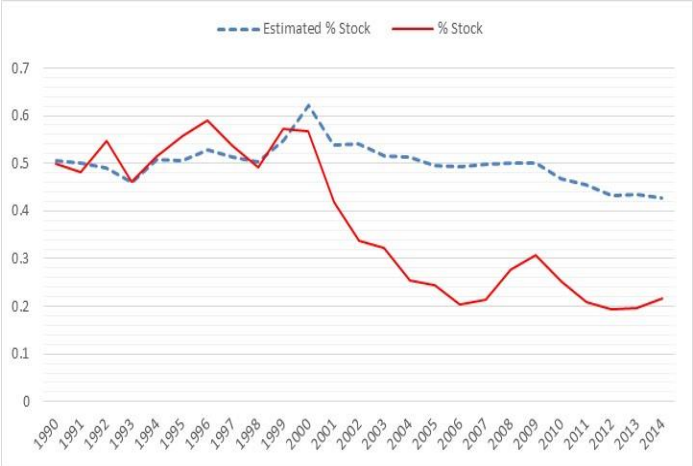


Figure 3. Forecasted frequency of full stock payments in the U.S. and Canada
Figure 3 represents the evolution of the percentage of M&A transactions fully paid in stock from 1990 to 2014 (Panel A for the U.S., Panel B for Canada). The corresponding M&A samples are in Table 1. % Stock refers to the observed percentage. Estimated % Stock is obtained using the fitted probabilities from the linear probability models in Table 7, column 1990/2001.

A. U.S.



B. Canada

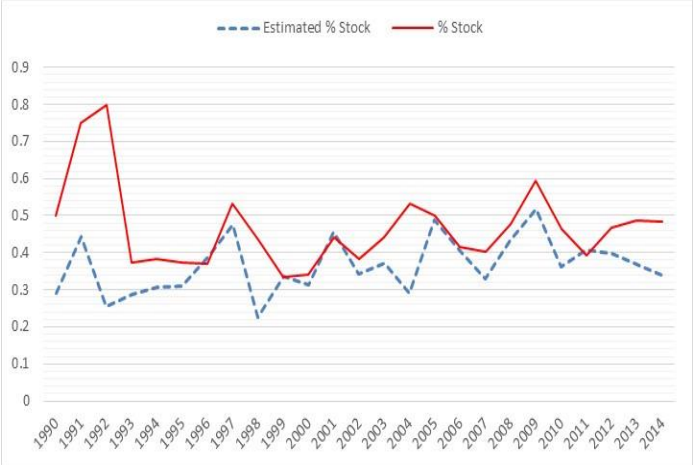


Figure 4. Percentage of stock-paid M&A transactions in the U.S., Europe, and United Kingdom during 1990–2014

Figure 4 displays the percentage of fully stock-paid M&A transactions in the U.S., Europe, and United Kingdom from 1990 to 2014 (count-based). The sample was collected from the Thomson SDC database, using the selection criteria listed in Section 1, which lead to sample sizes of 6,955 U.S. transactions and 6,285 European (41 countries) transactions, of which 3,679 are U.K. transactions.

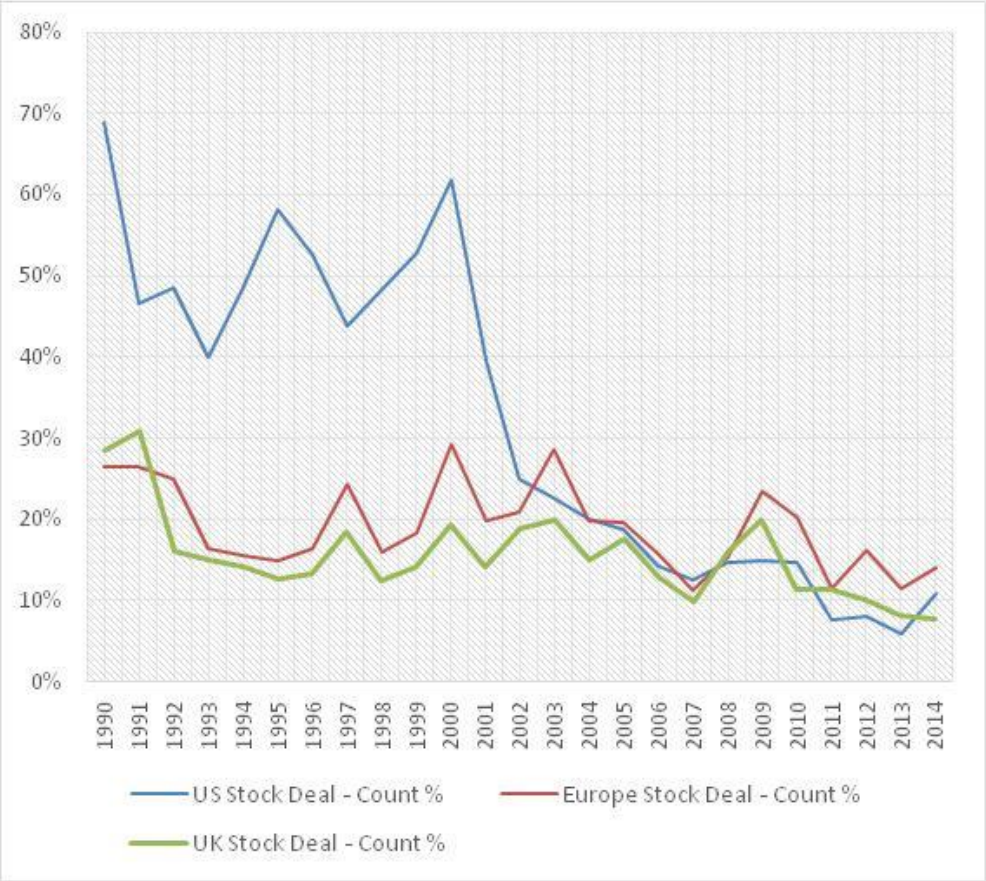


Table 1. M&A sample

Table 1 presents the M&A samples for the U.S. and Canada. The Thomson SDC database is the data source. The sample selection criteria were: deal size above USD1 million, public acquirers (no restriction on target status), deal value to acquirer size of at least 1%, exchange offers, acquisition of assets, acquisition of certain assets, buybacks, recaps and acquisition (of stock) excluded, percentage of shares acquired between 50% and 100%, 100% of shares hold after transaction, consideration offered reported by the Thomson SDC database, and financial acquirers (SIC codes 6000 to 6999) excluded. Value are reported in 2010 constant million USD for comparability through time and between the U.S. and Canada.

	U.S.		Canada	
Year	Number of Deals	Value of Deals	Number of Deals	Value of Deals
1990	86	10,679	4	93
1991	141	17,044	4	135
1992	188	22,208	5	863
1993	226	23,133	8	801
1994	296	43,621	13	1,052
1995	396	54,256	24	3,223
1996	431	69,443	35	4,195
1997	511	105,110	30	2,913
1998	536	90,868	23	3,123
1999	476	104,495	36	2,918
2000	482	94,601	41	4,266
2001	258	40,704	43	6,570
2002	237	35,501	55	5,155
2003	236	34,623	70	4,971
2004	284	40,858	94	8,890
2005	322	45,540	122	6,876
2006	273	45,345	149	13,100
2007	276	46,672	169	15,249
2008	203	27,656	138	11,434
2009	175	23,034	143	7,848
2010	195	34,473	123	10,666
2011	191	28,627	122	10,731
2012	165	26,713	92	7,549
2013	178	29,197	74	5,269
2014	193	28,273	95	8,917
Total	6,955	1,122,675	1,712	146,807

Table 2. Fully stock-paid transaction percentages by year and structural break test
Panel A presents the time series of fully stock-paid M&A transaction percentages in the U.S. and Canada, from 1990 to 2014, in value (2010 USD constant) and count. The grand average is the average across the sample of M&A transactions. Panel B displays a Chow test of the structural break with a known change of structure date (estimated for 1990–2014 for the U.S. and 1993–2014 for Canada). Trend is a linear time trend variable, and *post* is a dummy variable that is equal to 1 for the post–pooling abolishment period. The *Coeff*, *p-val*, R^2, and Number are the coefficient, p-value, R-square, and number of observations, respectively. The Chow test is the Fisher statistics of a joint test of significance on the $Post_{pool}$ dummy variable coefficient and its interaction with the linear time trend coefficient.

A. Stock-paid transaction percentages by year

	U.S.		Canada	
Year	% Stock Paid (Value)	% Stock Paid (Count)	% Stock Paid (Value)	% Stock Paid (Count)
1990	68.98%	50.00%	58.07%	50.00%
1991	46.51%	48.23%	95.07%	75.00%
1992	48.54%	54.79%	11.91%	80.00%
1993	40.02%	46.02%	72.43%	37.50%
1994	48.47%	51.35%	26.46%	38.46%
1995	58.10%	55.81%	7.44%	37.50%
1996	52.71%	58.93%	30.96%	37.14%
1997	43.74%	53.82%	32.13%	53.33%
1998	48.23%	49.07%	18.98%	43.48%
1999	52.92%	57.14%	28.23%	33.33%
2000	61.90%	56.85%	22.85%	34.15%
2001	39.45%	41.86%	42.15%	44.19%
2002	25.06%	33.76%	38.16%	38.18%
2003	22.66%	32.20%	35.02%	44.29%
2004	19.99%	25.35%	36.41%	53.19%
2005	18.69%	24.53%	64.06%	50.00%
2006	14.23%	20.51%	49.70%	41.61%
2007	12.64%	21.38%	35.17%	40.24%
2008	14.81%	27.59%	58.48%	47.83%
2009	14.97%	30.86%	38.94%	59.44%
2010	14.78%	25.13%	22.62%	46.34%
2011	7.55%	20.94%	26.74%	39.34%
2012	8.17%	19.39%	16.08%	46.74%
2013	5.97%	19.66%	28.46%	48.65%
2014	10.91%	21.76%	33.94%	48.42%
Grand average	35.80%	41.22%	37.18%	45.79%

B. Structural break test

	US		Canada	
	Coeff	*p-val*	*Coeff*	*p-val*
$Post_{pool}$ x Trend	-0.0093	(0.12)	0.0010	(0.88)
$Post_{pool}$	-0.1073	(0.07)	0.0251	(0.77)
Trend	0.0011	(0.84)	0.0020	(0.72)
Constant	0.5130	(0.00)	0.3832	(0.00)
R^2	91.24%		25.87%	
Number	25		22	
Chow test	12.44	(0.00)	0.27	(0.76)

Table 3. Descriptive statistics

Table 3 reports the descriptive statistics for the set of payment mode determinants classically used in M&A literature (see Eckbo et al. 2014). The M&A samples for the U.S. and Canada are presented in Table 1. 1990/2001 is the pre-pooling abolishment period, and 2002/2014 is the post period. Stdev stands for standard deviation. Statistics are computed on yearly averages. Diff Avg is a standard test of difference of means. All variables are defined in Appendix 1.

A. U.S.

	1990/2014			1990/2001	2002/2014	Diff Avg
	Mean	Median	Stdev	Mean	Mean	*p-val*
Deal Size (Million USD)	130	128	33	111	147	(0.01)
Acquirer Size (Million USD)	1,624	1,504	749	1,236	1,983	(0.01)
Acquirer Cash	16.36%	16.66%	2.30%	15.19%	17.45%	(0.01)
Acquirer Market to Book	2.59	2.38	1.02	3.05	2.16	(0.03)
Acquirer Assets Tangibility	38.95%	38.63%	4.60%	41.12%	36.94%	(0.02)
Acquirer Research and Development	6.15%	5.63%	1.59%	5.83%	6.44%	(0.34)
Acquirer Dividend Payment	24.34%	23.31%	6.83%	24.41%	24.28%	(0.96)
Acquirer Leverage	15.08%	14.97%	1.40%	14.75%	15.40%	(0.25)
Public Target	30.45%	29.71%	8.19%	35.29%	25.99%	(0.00)
Private Target	54.92%	55.58%	6.37%	52.69%	56.98%	(0.10)
Relative Size	0.55	0.53	0.16	0.46	0.64	(0.00)
Horizontal Deal	35.76%	35.15%	3.33%	33.82%	37.55%	(0.00)
Domestic Deal	85.49%	85.07%	5.59%	90.19%	81.14%	(0.00)
10 Year Interest Rate	6.33%	6.51%	1.49%	7.63%	5.13%	(0.00)

B. Canada

	1990/2014			1990/2001	2002/2014	Diff Avg
	Mean	Median	Stdev	Mean	Mean	*p-val*
Deal Size (Million USD)	76	82	25	74	78	(0.71)
Acquirer Size (Million USD)	483	400	313	310	643	(0.00)
Acquirer Cash	11.11%	10.91%	5.85%	6.59%	15.29%	(0.00)
Acquirer Market to Book	1.88	1.64	0.80	1.66	2.09	(0.18)
Acquirer Assets Tangibility	77.16%	68.72%	21.93%	87.13%	67.97%	(0.03)
Acquirer Research and Development	1.75%	1.36%	1.71%	1.07%	2.38%	(0.05)
Acquirer Dividend Payment	21.56%	21.21%	11.80%	21.14%	21.95%	(0.87)
Acquirer Leverage	14.45%	13.36%	7.36%	19.81%	9.51%	(0.00)
Public Target	49.30%	47.30%	14.31%	59.34%	40.03%	(0.00)
Private Target	38.15%	40.00%	13.64%	30.48%	45.23%	(0.01)
Relative Size	1.29	1.13	0.76	1.65	0.95	(0.02)
Horizontal Deal	55.65%	55.80%	11.02%	59.00%	52.56%	(0.16)
Domestic Deal	76.42%	72.73%	12.59%	82.39%	70.91%	(0.02)
10 Year Interest Rate	5.36%	5.33%	2.33%	7.28%	3.60%	(0.00)

Table 4. Determinants of the probability of full stock payment

Table 4 displays the results of a linear probability model of full stock payments using the set of mode of payment choice determinants classically used in prior literature (Eckbo et al. 2014). All variables are defined in Appendix 1. Sector FE indicates whether industry fixed effects are included. R^2 stands for R-square, Number indicates the number of observations, *Coeff* is the variable coefficient, and *p-val* refers to the p-value.

	U.S.		Canada	
	Coeff	*p-val*	*Coeff*	*p-val*
Acquirer Size	-0.0057	(0.18)	-0.0259	(0.02)
Relative Size	0.0066	(0.48)	-0.0016	(0.90)
Acquirer Leverage	-0.2032	(0.00)	-0.2649	(0.03)
Acquirer Market to Book	0.0197	(0.00)	0.0226	(0.00)
Acquirer Tangibility	-0.0594	(0.01)	0.0105	(0.84)
Acquirer Dividend	-0.0605	(0.00)	-0.1340	(0.00)
Acquirer Research and Development	0.4451	(0.00)	0.6816	(0.00)
Acquirer Cash	-0.0393	(0.37)	-0.1023	(0.32)
Domestic	0.0787	(0.00)	0.1446	(0.00)
Horizontal	-0.0163	(0.21)	0.0551	(0.10)
Public Target	0.0670	(0.00)	0.2434	(0.00)
10 Year Interest Rate	11.4812	(0.00)	0.0870	(0.93)
Sector FE	yes		yes	
R^2	20.83%		30.46%	
Number	5,337		786	

Table 5. Method of payment and pooling abolishment: difference-in-differences test

Table 5 reports the results of two difference-in-differences test specifications. The dependent variable is the full stock payment dummy variable (=1 if the transaction is fully paid in stock). The M&A sample for the U.S. and Canada is introduced in Table 1. Variables are defined in Appendix 1. Both specifications rely on a linear probability model. In Column 1, the *post* dummy variable (=1 for the post–pooling abolishment period) is explicitly introduced. In Column 2, we introduce year fixed effects (Year FE). US x $Post_{pool}$ is the interaction term between the U.S. and $Post_{pool}$ dummy variables. The set of control variables is the same as in Table 4. Sector FE indicates whether industry fixed effects are included. R^2 stands for R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value. Standard errors are robust to heteroskedascity.

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.1568	(0.00)	0.1183	(0.00)
$Post_{pool}$ Dummy	0.0198	(0.66)		
US x $Post_{pool}$	-0.3134	(0.00)	-0.2099	(0.00)
Acquirer Size	0.0048	(0.51)	0.0049	(0.51)
Relative Size	-0.0053	(0.17)	-0.0037	(0.35)
Acquirer Leverage	-0.2182	(0.00)	-0.2161	(0.00)
Acquirer Market to Book	0.0173	(0.00)	0.0191	(0.00)
Acquirer Tangibility	-0.0469	(0.03)	-0.0485	(0.03)
Acquirer Dividend	-0.0826	(0.00)	-0.0827	(0.00)
Acquirer Research and Development	0.4507	(0.00)	0.4369	(0.00)
Acquirer Cash	-0.0157	(0.69)	-0.0146	(0.71)
Domestic	0.1013	(0.00)	0.0993	(0.00)
Horizontal	-0.0046	(0.70)	-0.0065	(0.58)
Public Target	0.0853	(0.00)	0.0820	(0.00)
10 Year Interest Rate	2.2224	(0.00)	-1.0835	(0.49)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	23.46%		24.19%	
Number	6,123		6123	

Table 6. CEO incentives and the probability of full stock payment

Table 6 displays the results of a linear probability model of full stock payment determinants. The variables of interest are the proportion of CEO variable compensation (% Variable Compensation) and its interaction with $Post_{pool}$ dummy (dummy variable = 1 for the post–pooling abolishment period). All variables are defined in Appendix 1. Sector FE (Year FE) indicates whether industry (year) fixed effects are included. R^2 stands for R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value. Standard errors are robust to heteroskedascity. The F-test is the Fisher statistics of a test of significance for the sum of the coefficients %Variable Compensation and %Variable compensation x $Post_{pool}$.

	(1)		(2)		(3)		(4)	
	Coeff	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*
$Post_{pool}$ Dummy	-0.4358	(0.00)	-0.2382	(0.01)	-0.2598	(0.00)		
% Variable Compensation			0.1012	(0.20)	0.0839	(0.31)	0.0943	(0.23)
%Variable Compensation x $Post_{pool}$			-0.2863	(0.01)	-0.2625	(0.02)	-0.2748	(0.01)
Acquirer Size	-0.0004	(0.96)	-0.0327	(0.00)	-0.0401	(0.00)	-0.0335	(0.01)
Relative Size	-0.0337	(0.00)	0.0043	(0.67)	-0.0001	(0.99)	0.0083	(0.42)
Acquirer Leverage	-0.1680	(0.01)	-0.1575	(0.02)	-0.1534	(0.05)	-0.1247	(0.11)
Acquirer Market to Book	0.0250	(0.00)	0.0252	(0.00)	0.0255	(0.00)	0.0257	(0.00)
Acquirer Tangibility	-0.0049	(0.89)	-0.0012	(0.97)	-0.0156	(0.73)	-0.0047	(0.92)
Acquirer Dividend	-0.0597	(0.01)	-0.0619	(0.01)	-0.0362	(0.14)	-0.0541	(0.03)
Acquirer Research and Development	0.6010	(0.00)	0.5654	(0.00)	0.5013	(0.01)	0.4483	(0.02)
Acquirer Cash	-0.0536	(0.55)	-0.0336	(0.71)	-0.0815	(0.38)	-0.0467	(0.61)
Domestic	0.0673	(0.00)	0.0618	(0.01)	0.0709	(0.00)	0.0679	(0.01)
Horizontal	0.0170	(0.44)	0.0135	(0.53)	0.0022	(0.92)	0.0070	(0.76)
Public Target	0.0019	(0.93)	0.0020	(0.93)	0.0055	(0.81)	0.0003	(0.99)
10 Year Interest Rate	1.3119	(0.33)	1.0624	(0.43)	0.8766	(0.54)	-8.1663	(0.08)
Credit Spread	1.4140	(0.01)	1.4986	(0.01)	1.5976	(0.01)	5.0953	(0.08)
Year FE	no		no		no		yes	
Sector FE	no		no		yes		yes	
R^2	36.62%		36.84%		39.63%		42.19%	
Number	1,146		1,146		1,146		1,146	
F-test	-	-	5.78	(0.02)	4.74	(0.03)	5.82	(0.02)

Table 7. Determinants of the probability of full stock payment

Table 7 displays the results of a linear probability model of full stock payment using the set of mode of payment choice determinants classically used in prior literature (Eckbo et al. 2014) by sub-period (pooling and post–pooling abolishment periods). Panel A reports the U.S. results, and Panel B reports the results for Canada. All variables are defined in Appendix 1. Sector FE indicates whether industry fixed effects are included. Diff Coeff is a test of coefficient differences between the pooling and post–pooling abolishment periods, obtained by estimating a pooled specification with interactions terms. R^2 stands for R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value.

A. U.S., pooling and post–pooling abolishment periods

	1990/2001		2002/2014		Diff Coeff
	Coeff	*p-val*	*Coeff*	*p-val*	*p-val*
Acquirer Size	0.0263	(0.00)	-0.0484	(0.00)	(0.00)
Relative Size	0.0083	(0.42)	0.0366	(0.08)	(0.22)
Acquirer Leverage	-0.3784	(0.00)	0.0223	(0.67)	(0.00)
Acquirer Market to Book	0.0103	(0.00)	0.0056	(0.37)	(0.49)
Acquirer Tangibility	-0.1046	(0.00)	0.0427	(0.19)	(0.00)
Acquirer Dividend	-0.1115	(0.00)	-0.0406	(0.02)	(0.01)
Acquirer Research and Development	0.4103	(0.00)	0.4722	(0.00)	(0.95)
Acquirer Cash	-0.0090	(0.88)	-0.0040	(0.94)	(0.59)
Domestic	0.1128	(0.00)	0.0342	(0.06)	(0.01)
Horizontal	-0.0167	(0.35)	-0.0023	(0.88)	(0.55)
Public Target	0.0170	(0.36)	0.1471	(0.00)	(0.00)
10 Year Interest Rate	1.5629	(0.22)	3.8250	(0.00)	(0.15)
Sector FE	yes		yes		
R^2	15.93%		19.10%		
Number	3,231		2,106		

B. Canada, pooling and post–pooling abolishment periods

	1990/2001		2002/2014		Diff Coeff
	Coeff	*p-val*	*Coeff*	*p-val*	*p-val*
Acquirer Size	-0.0077	(0.83)	-0.0359	(0.00)	(0.41)
Relative Size	0.0147	(0.66)	-0.0039	(0.82)	(0.60)
Acquirer Leverage	-0.1382	(0.73)	-0.3044	(0.03)	(0.67)
Acquirer Market to Book	-0.0056	(0.88)	0.0239	(0.00)	(0.40)
Acquirer Tangibility	0.0063	(0.97)	0.0405	(0.47)	(0.83)
Acquirer Dividend	-0.2132	(0.11)	-0.1253	(0.01)	(0.51)
Acquirer Research and Development	2.3846	(0.02)	0.6039	(0.01)	(0.31)
Acquirer Cash	0.1973	(0.60)	-0.1634	(0.12)	(0.05)
Domestic	0.0226	(0.86)	0.1589	(0.00)	(0.26)
Horizontal	0.1804	(0.11)	0.0220	(0.55)	(0.15)
Public Target	0.1155	(0.28)	0.2975	(0.00)	(0.09)
10 Year Interest Rate	1.4213	(0.70)	0.7102	(0.68)	(0.85)
Sector FE	yes		yes		
R^2	26.65%		35.70%		
Number	165		621		

Table 8. Probabilities of full stock payments and of pooling: U.S. case

Table 8 reports the results of a two-stage analysis of the relation between the probability of full stock payment and the probability of pooling. The M&A sample for the U.S. is introduced in Table 1; the variables are defined in Appendix 1. Panel A presents the first-stage probability of pooling analysis. The dependent variable is the pooling dummy variable (=1 in the case of pooling). We adopt a classic probit specification. Control variables are selected in accordance with existing literature about pooling accounting (Ayers et al. 2002). The estimation is performed on the pooling period (1990–2001). Panel B is dedicated to the second-stage probability of full stock payment analysis. The dependent variable is the full stock payment dummy variable. Both specifications rely on a linear probability model. In Column 1, the $Post_{pool}$ Dummy variable is explicitly introduced. In Column 2, we introduce year fixed effects (Year FE). Pooling Hat is the fitted probability of pooling accounting, obtained using the first-stage probability of pooling analysis. $Post_{pool}$ x Pooling Hat is the interaction term between the $Post_{pool}$ dummy variable and Pooling Hat. The set of control variables is the same as in Table 4. Sector FE indicates whether industry fixed effects are included. R^2 stands for R-square, Pseudo R^2 for Pseudo R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value. Standard errors are robust to heteroskedascity.

A. First-stage probability of pooling

	Coeff	*p-val*
Step-Up	0.0215	(0.05)
Target Return On Assets	0.8622	(0.01)
Target Leverage	-0.9644	(0.00)
Target Size	0.1653	(0.00)
Relative Size	-0.0478	(0.48)
Acquirer Size	0.0346	(0.50)
Acquirer Leverage	-0.3756	(0.27)
Acquirer Cash	0.2968	(0.51)
Acquirer Market to Book	0.0473	(0.27)
Acquirer Tangibility	-0.0412	(0.80)
Acquirer Dividend	-0.2254	(0.08)
Run Up	0.2123	(0.03)
High Tech	-0.0333	(0.80)
Manufacturing	-0.6501	(0.00)
Pseudo R^2	13.22%	
Number	729	

B. Second-stage probability of full stock payment, linear probability model

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
$Post_{pool}$ Dummy	0.1922	(0.01)		
Pooling Hat	0.9336	(0.00)	0.8419	(0.00)
$Post_{pool}$ x Pooling Hat	-1.1326	(0.00)	-0.9740	(0.00)
Acquirer Size	-0.0688	(0.00)	-0.0640	(0.00)
Relative Size	-0.0474	(0.00)	-0.0490	(0.00)
Acquirer Leverage	-0.1396	(0.15)	-0.1154	(0.23)
Acquirer Market to Book	0.0185	(0.10)	0.0200	(0.07)
Acquirer Tangibility	-0.0312	(0.56)	-0.0244	(0.66)
Acquirer Dividend	-0.0538	(0.13)	-0.0530	(0.14)
Acquirer Research and Development	0.3939	(0.01)	0.4337	(0.01)
Acquirer Cash	0.0791	(0.48)	0.1065	(0.33)
Domestic	0.1091	(0.14)	0.1456	(0.05)
Horizontal	-0.0465	(0.10)	-0.0433	(0.12)
Public Target	0.0023	(0.98)	0.0247	(0.85)
10 Year Interest Rate	1.5632	(0.38)	-7.2418	(0.14)
Credit Spread	1.1686	(0.26)	9.7964	(0.01)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	27.85%		29.66%	
Number	1,157		1,157	

Table 9. Method of payment, pooling abolishment, and value effects: U.S. case

Table 9 reports the results of cross-sectional regressions of acquirer CAR on a large set of determinants classically used in prior literature (Golubov et al. 2015a), dummy variables identifying the post–pooling abolishment period ($Post_{pool}$), fully stock paid acquisitions (Stock), public targets (Public Target), and their interactions. The M&A sample for the U.S. is introduced in Table 1, and the variables are defined in Appendix 1. The CAR are obtained using the market model as a return-generating process (estimation window from day -300 to day -90 relative to the announcement date) and a three-day event window centered on the announcement date. Column 1 displays the results for the baseline specification. Column 2 adds the dummy variables of interest and their interactions. Sector FE (Year FE) indicates whether industry (year) fixed effects are included. R^2 stands for R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value. Standard errors are robust to heteroskedascity.

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
$Post_{pool}$ *Dummy*			-0.0033	(0.50)
$Post_{pool}$ x Stock			0.0116	(0.39)
$Post_{pool}$ x Public Target			0.0132	(0.07)
$Post_{pool}$ x Stock x Public Target			-0.0463	(0.01)
Stock	0.0087	(0.10)	0.0081	(0.18)
Public Target	-0.0190	(0.00)	-0.0272	(0.00)
Stock x Public Target	-0.0365	(0.00)	-0.0242	(0.01)
Relative Size	0.0187	(0.00)	0.0192	(0.00)
Acquirer Size	-0.0022	(0.18)	-0.0033	(0.02)
Acquirer Market to Book	-0.0002	(0.75)	-0.0005	(0.48)
Acquirer Free Cash Flow	-0.0016	(0.90)	-0.0013	(0.92)
Domestic	-0.0007	(0.87)	-0.0004	(0.94)
Horizontal	-0.0025	(0.47)	-0.0023	(0.52)
Sigma	0.5220	(0.02)	0.3543	(0.08)
Run Up	-0.0013	(0.68)	-0.0007	(0.82)
Hostile	-0.0033	(0.83)	-0.0046	(0.78)
Tender Offer	0.0123	(0.02)	0.0135	(0.01)
Sector FE	yes		yes	
Year FE	yes		no	
R^2	8.58%		7.63%	
Number	5,148		5,148	

Table 10. Robustness checks

Table 10 summarizes the robustness checks of the results in Table 5, our baseline difference-in-differences test of the pooling abolishment hypothesis. In Panel A, we excluded high-technology firms (Kile and Phillips 2009). In Panel B, we restrict the sample to domestic deals. In Panel C, we restrict the sample to U.S. acquirers that undertook at least one transaction in the five years before and another transaction in the five years after the pooling abolishment. In Panel D, we control for Canadian cross-listed firms. Panel E (F) reports the results of our difference-in-differences test specifications using Europe (UK) as a counterfactual. Panel G reports the results of a treatment effect test with propensity score matching to avoid the use of non-U.S. transactions as counterfactual. Panel H reports an additional difference-in-differences test controlling for the 2003 SEC amendments to the share repurchases safe harbor.

A. Internet bubble

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.1484	(0.00)	0.1441	(0.00)
$Post_{pool}$ Dummy	0.0426	(0.41)		
US x $Post_{pool}$	-0.2410	(0.00)	-0.1777	(0.00)
Acquirer Size	-0.0083	(0.30)	-0.0074	(0.36)
Relative Size	-0.0120	(0.03)	-0.0092	(0.10)
Acquirer Leverage	-0.2888	(0.00)	-0.2877	(0.00)
Acquirer Market to Book	0.0237	(0.01)	0.0247	(0.00)
Acquirer Tangibility	-0.0246	(0.37)	-0.0289	(0.29)
Acquirer Dividend	-0.0684	(0.00)	-0.0702	(0.00)
Acquirer Research and Development	0.8465	(0.00)	0.8396	(0.00)
Acquirer Cash	-0.0673	(0.31)	-0.0746	(0.26)
Domestic	0.1236	(0.00)	0.1202	(0.00)
Horizontal	-0.0107	(0.52)	-0.0129	(0.44)
Public Target	0.1021	(0.00)	0.1017	(0.00)
10 Year Interest Rate	1.7386	(0.05)	-1.8921	(0.35)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	0.2046		0.2116	
Number	3,273		3,273	

B. Domestic deals

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.1937	(0.00)	0.1291	(0.00)
$Post_{pool}$ Dummy	0.0804	(0.13)		
US x $Post_{pool}$	-0.3693	(0.00)	-0.2214	(0.00)
Acquirer Size	0.0077	(0.38)	0.0091	(0.30)
Relative Size	-0.0023	(0.59)	-0.0009	(0.83)
Acquirer Leverage	-0.2232	(0.00)	-0.2203	(0.00)
Acquirer Market to Book	0.0167	(0.00)	0.0189	(0.00)
Acquirer Tangibility	-0.0366	(0.12)	-0.0392	(0.10)
Acquirer Dividend	-0.0838	(0.00)	-0.0825	(0.00)
Acquirer Research and Development	0.4474	(0.00)	0.4346	(0.00)
Acquirer Cash	-0.0058	(0.89)	-0.0071	(0.87)
Horizontal	-0.0054	(0.68)	-0.0075	(0.57)
Public Target	0.0784	(0.00)	0.0766	(0.00)
10 Year Interest Rate	2.8727	(0.00)	-0.6842	(0.70)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	23.19%		23.96%	
Number	5,174		5,174	

C. Constant acquirer sample, between [-5,0] and [0,+5] year ranges

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.2464	(0.00)	0.1412	(0.00)
$Post_{pool}$ Dummy	0.0090	(0.91)		
US x $Post_{pool}$	-0.3431	(0.00)	-0.2079	(0.00)
Acquirer Size	-0.0009	(0.96)	-0.0035	(0.84)
Relative Size	-0.0140	(0.23)	-0.0147	(0.21)
Acquirer Leverage	-0.3213	(0.00)	-0.3137	(0.01)
Acquirer Market to Book	0.0103	(0.00)	0.0139	(0.00)
Acquirer Tangibility	-0.1070	(0.11)	-0.1040	(0.12)
Acquirer Dividend	-0.0302	(0.47)	-0.0319	(0.43)
Acquirer Research and Development	0.6285	(0.00)	0.5594	(0.00)
Acquirer Cash	-0.1349	(0.20)	-0.1155	(0.25)
Domestic	0.0994	(0.01)	0.1051	(0.01)
Horizontal	-0.0085	(0.78)	-0.0111	(0.72)
Public Target	0.0645	(0.04)	0.0649	(0.04)
10 Year Interest Rate	3.2220	(0.23)	4.5415	(0.36)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	0.2783		0.3022	
N	971		971	

D. Controlling for cross-listed Canadian firms

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.1879	(0.00)	0.1442	(0.00)
$Post_{pool}$ Dummy	0.0283	(0.53)		
US x $Post_{pool}$	-0.3231	(0.00)	-0.2147	(0.00)
Canadian Cross-listed	0.0707	(0.05)	0.0625	(0.08)
Acquirer Size	0.0046	(0.53)	0.0047	(0.53)
Relative Size	-0.0064	(0.11)	-0.0046	(0.24)
Acquirer Leverage	-0.2186	(0.00)	-0.2166	(0.00)
Acquirer Market to Book	0.0175	(0.00)	0.0193	(0.00)
Acquirer Tangibility	-0.0480	(0.03)	-0.0494	(0.02)
Acquirer Dividend	-0.0815	(0.00)	-0.0817	(0.00)
Acquirer Research and Development	0.4479	(0.00)	0.4345	(0.00)
Acquirer Cash	-0.0164	(0.68)	-0.0153	(0.70)
Domestic	0.1035	(0.00)	0.1013	(0.00)
Horizontal	-0.0046	(0.70)	-0.0066	(0.58)
Public Target	0.0846	(0.00)	0.0814	(0.00)
10 Year Interest Rate	2.1051	(0.00)	-1.2655	(0.42)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	23.51%		24.23%	
Number	6,123		6,123	

E. European countries as counterfactual

	(1)		(2)		(3)		(4)	
	Coeff	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*
US Dummy	0.3001	(0.00)	0.2986	(0.00)	0.2782	(0.00)	0.2781	(0.00)
$Post_{Pool}$ Dummy	-0.0679	(0.00)			-0.0560	(0.00)		
US x $Post_{pool}$	-0.2221	(0.00)	-0.2241	(0.00)	-0.2214	(0.00)	-0.2238	(0.00)
Deal Size					-0.0065	(0.01)	-0.0063	(0.01)
Domestic					0.0739	(0.00)	0.0724	(0.00)
Horizontal					-0.0081	(0.33)	-0.0074	(0.37)
Public Target					0.0765	(0.00)	0.0729	(0.00)
Sector FE	yes		yes		yes		yes	
Year FE	no		yes		no		yes	
R^2	14.12%		14.87%		15.03%		15.70%	
Number	13,235		13,235		13,235		13,235	

F. United Kingdom as counterfactual

	(1)		(2)		(3)		(4)	
	Coeff	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*	*Coeff*	*p-val*
US Dummy	0.3472	(0.00)	0.3402	(0.00)	0.3419	(0.00)	0.3359	(0.00)
$Post_{Pool}$ Dummy	-0.0653	(0.00)			-0.0534	(0.00)		
US x $Post_{pool}$	-0.2278	(0.00)	-0.2166	(0.00)	-0.2258	(0.00)	-0.2150	(0.00)
Deal Size					-0.0167	(0.00)	-0.0161	(0.00)
Domestic					0.0538	(0.00)	0.0503	(0.00)
Horizontal					-0.0190	(0.04)	-0.0187	(0.04)
Public Target					0.0827	(0.00)	0.0791	(0.00)
Sector FE	yes		yes		yes		yes	
Year FE	no		yes		no		yes	
R^2	16.78%		17.41%		17.63%		18.17%	
Number	10,629		10,629		10,629		10,629	

G. Treatment effect test with propensity score matching

Treatment Effect Test

	Num Obs	Mean	p-value
Average Treatment Effect (ATE)			
$Post_{pool}$ (1 vs. 0)	3,817	-0.3320	(0.00)

H. Difference-in-differences test, controlling for SEC Rule 10b-18

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.1652	(0.00)	0.1258	(0.00)
$Post_{pool}$ Dummy	0.0257	(0.70)		
$Post_{purch}$ *Dummy*	-0.0405	(0.50)		
US x $Post_{pool}$	-0.2752	(0.00)	-0.1673	(0.00)
US x $Post_{purch}$	-0.0403	(0.52)	-0.0727	(0.09)
Acquirer Size	0.0048	(0.52)	0.0050	(0.50)
Relative Size	-0.0050	(0.20)	-0.0036	(0.37)
Acquirer Leverage	-0.2189	(0.00)	-0.2154	(0.00)
Acquirer Market to Book	0.0173	(0.00)	0.0190	(0.00)
Acquirer Tangibility	-0.0467	(0.03)	-0.0467	(0.03)
Acquirer Dividend	-0.0811	(0.00)	-0.0829	(0.00)
Acquirer Research and Development	0.4449	(0.00)	0.4352	(0.00)
Acquirer Cash	-0.0139	(0.72)	-0.0143	(0.71)
Domestic	0.1008	(0.00)	0.0978	(0.00)
Horizontal	-0.0046	(0.70)	-0.0065	(0.58)
Public Target	0.0820	(0.00)	0.0816	(0.00)
10 Year Interest Rate	1.2432	(0.11)	-0.5847	(0.72)
Sector FE	yes		yes	
Year FE	no		yes	
R^2	23.59%		24.23%	
Number	6,123		6,123	

Appendix 1. Variable definitions

Variable	Definition	Source
% Variable Compensation	Variable component of the acquirer CEO's compensation : (item TDC1-item SALARY)/item TDC1	Execucomp
10 Year Interest Rate	10-year government bond (US & Canada) interest rate	FRED
Acquirer Cash	Cash on total asset (item CH/item AT)	Compustat
Acquirer Dividend	Dummy equal to 1 if bidder paid dividend previous year, 0 otherwise	Compustat
Acquirer Free Cash Flow	Income before extraordinary items (item IBC) divided by total assets (item AT)	Compustat
Acquirer Leverage	Acquirer long term debt (item DLTT) divided by total assets (item AT)	Compustat
Acquirer Market to Book	Total assets minus common equity (item CEQ) plus the market value of equity (item CSHO x item PRCC_F) divided by total assets (item AT)	Compustat
Acquirer Research and Development	In process Research and Development Expense (item RDIP) on total assets (item AT)	Compustat
Acquirer Size	Market value of bidder 42 days before announcement (logarithm is used in multivariate analyses)	Compustat, SDC, DS
Acquirer Tangibility	Property, plant and equipment total (item PPEGT) on total asset (item AT)	Compustat
Canadian Cross-listed	Dummy variable equal to 1 if the Canadian is also listed in US	Compustat
Credit Spread	Spread Moody corporate aaa	FRED
Deal Size	Deal value in millions USD	SDC
Domestic	Dummy equal to 1 if the acquirer and the target country are the same, 0 otherwise	SDC
High Tech	Dummy variable equal to 1 if the acquirer is in high-technology sector (Kile and Philips 2009), 0 otherwise	SDC
Horizontal	Dummy variable equal to 1 if the acquirer and the target belong to the same SIC code 4-digit, 0 otherwise	SDC
Hostile	Dummy variable equal to 1 if the deal is classified as hostile by SDC 0 otherwise	SDC
Manufacturing	Dummy variable equal to 1 if the acquirer is in manufacturing sector (SIC code between 2000 and 3999, high-technology sectors excluded)	SDC
Pooling Hat	Estimated probabilities of pooling (See Equation (6))	SDC
$Post_{pool}$ *Dummy*	Dummy equal to 1 if announcement date of the deal is after 2001 (after 30/06/2001 for daily data), 0 otherwise	SDC
$Post_{purch}$ *Dummy*	Dummy equal to 1 if announcement date of the deal is after October 2003, 0 otherwise	

Private Target	Dummy variable equal to 1 if the target is a private firm, 0 otherwise	SDC
Public Target	Dummy variable equal to 1 if the target is a public firm, 0 otherwise	SDC
Relative Size	Ratio of deal value on acquirer market value computed in day minus 42	SDC Compustat, CRSP Datastream
Run Up	Market-adjusted buy and hold return of the acquirer's stock over a 200 day window (-210,-11)	CRSP
Sector FE	Sector Fixed Effect (2 digit SIC codes)	SDC
Sigma	Standard deviation of the market adjusted daily returns of the acquirer stock over a 200 day window (from day minus two-hundreds and ten to day minus eleven relative to the announcement date)	CRSP
Step Up	Step-up in target book value, equals to deal value minus target Book Equity (Compustat item CEQ) divided by target Book Equity	SDC, Compustat
Stock	Dummy variable equal to one if the consideration is stock only and 0 otherwise	SDC
Target Leverage	Target long term debt (item DLTT) divided by total assets (item AT)	Compustat
Target Return On Assets	Target Earnings Before Interests and Taxes (item EBIT) on total assets (item AT)	Compustat
Target Size	Market value of target forty-two days before announcement (logarithm is used in multivariate analyses)	SDC, CRSP, Datastream
Tender Offer	Dummy variable equal to 1 if the deal is classified as a tender offer by SDC 0 otherwise	SDC
Trend	Linear time trend variable (increase of one unit each year)	
US Dummy	Dummy equal to 1 if acquirer country is US, 0 otherwise	SDC
Year FE	Year Fixed Effect build on the year of deal announcement	SDC

Legend:

- SDC: Thomson SDC M&A database

- CRSP: Center for Research in Security Prices database

- Compustat: Compustat Fundamental Annual database & Compustat North America

- DS: Datastream database

- Execucomp: Compustat Execucomp database

- FRED: Federal Reserve Economic Data - FRED

Appendix 2. Method of payment and pooling abolishment, probit-based results

Appendix 2 reproduces Table 5, using a probit specification. The dependent variable is the full stock payment dummy variable (=1 if the transaction is fully paid in stock). The M&A sample for the U.S. and Canada is introduced in Table 1, and the variables are defined in Appendix 1. In Column 1, the $Post_{pool}$ Dummy variable (=1 for the post–pooling abolishment period) is explicitly introduced. In Column 2, we introduce year fixed effects (Year FE). The set of control variables is the same as in Table 4. Sector FE indicates whether industry fixed effects are included. R^2 stands for R-square, Number for the number of observations, *Coeff* for the variable coefficient, and *p-val* for p-value.

	(1)		(2)	
	Coeff	*p-val*	*Coeff*	*p-val*
US Dummy	0.4350	(0.00)	0.3449	(0.00)
$Post_{pool}$ Dummy	0.0940	(0.51)		
US x $Post_{pool}$	-1.0183	(0.00)	-0.6918	(0.00)
Acquirer Size	0.0127	(0.55)	0.0141	(0.51)
Relative Size	-0.0272	(0.03)	-0.0210	(0.11)
Acquirer Leverage	-0.6620	(0.00)	-0.6595	(0.00)
Acquirer Market to Book	0.0627	(0.00)	0.0684	(0.00)
Acquirer Tangibility	-0.1210	(0.09)	-0.1316	(0.07)
Acquirer Dividend	-0.3022	(0.00)	-0.3057	(0.00)
Acquirer Research and Development	1.7142	(0.00)	1.6388	(0.00)
Acquirer Cash	-0.0712	(0.57)	-0.0583	(0.64)
Domestic	0.3525	(0.00)	0.3501	(0.00)
Horizontal	-0.0097	(0.80)	-0.0157	(0.69)
Public Target	0.3161	(0.00)	0.3051	(0.00)
10 Year Interest Rate	8.5784	(0.00)	-4.4859	(0.37)
Sector FE	yes		yes	
Year FE	no		yes	
Pseudo R^2	20.19%		20.97%	
Number	6,100		6100	