Stock market driven acquisitions? *

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Abstract: We challenge the notion that acquirer equity valuation is an important driver of the choice of the method of payment in M&A deals. We argue that during the period in which pooling accounting was allowed in the U.S., these accounting regulations provided an incentive for highly-valued acquirers to use full stock swaps to buy their targets. We show that once those incentives are taken away (as they were in 2001) the link between acquirer valuation and the choice to conduct a full stock swap in an M&A deal is broken. Our interpretation of this result is confirmed by international evidence.

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1. Introduction

The importance of the mergers and acquisitions (M&A) market as a resource allocation mechanism in modern economics has been highlighted in many academic contributions (e.g., see Andrade et al., 2001), and the M&A market represents a fascinating laboratory of experiments for financial theories. Corporate governance (Manne, 1963), the boundary of the firm (Williamson, 1965), free-riding (Grossman and Hart, 1980), sources of synergies (Bradley et al., 1983), market power (Eckbo, 1983), and agency-related conflicts of interests (Jensen, 1986) is a (non-exhaustive) list of some of the key topics explored in the literature.

The method of payment in M&A transactions has also been closely examined in this literature. In an early contribution, Travlos (1987) reports empirical evidence on the negative association between the choice of (bidder) stock as the method of payment and bidder cumulative abnormal announcement returns (CAAR) surrounding deal announcement. Fuller et al. (2002) show that the payment mode interacts with the listing status of the target (public vs. private) to explain bidder CAAR, and many theoretical papers (e.g., Hansen, 1987; Fishman, 1989) have explored the choice between cash and stock as a method of payment in acquisitions from the perspectives of preemptive (i.e., competitive) bidding and information asymmetries between the parties.

Shleifer and Vishny (2003) (hereafter: SV), introduces a behavioral theory of equity misvaluation and its use as an acquisition currency. An acquirer might, hypothetically, choose to use its own stock to buy a target if acquirer management perceives that stock to be overvalued. Rhodes-Kropf and Vishwanathan (2004) (hereafter: RV) shows that we can in fact observe ex-post misvalued acquirers paying in stock in acquisitions in a model in which everyone is rational and has unbiased average expectations, but bidders and targets have (potentially correlated) valuation errors.¹ Rhodes-Kropf, Robinson, and Vishwanathan (2005) (hereafter: RRV) report empirical evidence supporting this misvaluation-based explanation. This later paper has had a considerable impact on the finance (and M&A) literature: part of this impact is due to the introduction by RRV of a procedure to isolate the so-called misvaluation component of firm value, but the results in RRV relating misvaluation and the mode of payment are now treated in the M&A literature as stylized facts.

¹ In the RV model, markets price securities correctly on average, but because there is a systematic component to the deviation from fundamental values (in addition to an idiosyncratic component), when one party mistakenly overstates their private value they will make stock-financed offers that the target will be more likely to accept because of this correlated misvaluation component. We thank David Robinson for helping us to understand the intricacies of the SV and RV models, and the subtle differences between them.

Recent contributions in the empirical M&A literature challenge the SV (behavioral) and RV (rational) theories of equity misvaluation and stock payment in M&A deals. In particular, Eckbo et al. (2017) strongly reject the notion of bidder opportunism. The authors argue that the more the target knows about the bidder, the lower should be its propensity to accept overvalued stock as compensation in an M&A deal. Their test of this simple and intuitive prediction generates results incompatible with the misvaluation-based explanation of stock as a method of payment: the better the target knows the acquirer (according to the proxies used by the authors), the higher the probability that equity is used as a medium of payment. The authors also report results of an instrumental variable-based approach, again rejecting the misvaluation-based argument. This raises an important question: if misvaluation *does not* drive RRV's empirical results, what alternative interpretation can those results be given? In this paper, we revisit RRV's empirical results, question their interpretation, and engage in a preliminary search for the modern determinants of the mode of payment in M&A deals.

It is important to note that during the entire RRV sample period (1977 – 2000), and ending very shortly thereafter, the *pooling of interests* (hereafter: pooling) method of accounting for stock-swap M&A transactions was allowed by the Accounting Principles Board under APB 16. APB 16 was released in 1970, and allowed two alternative methods of accounting for business combinations. Under the first, known as the "purchase" method, acquirers would account for an M&A deal by recording the difference between the acquisition price and the fair value of the target's net assets (assets minus liabilities) as goodwill on their balance sheet. Such goodwill would then be amortized by the acquiring corporation, reducing future earnings. This amortization of goodwill was not tax-deductible, as the goodwill was classified by the taxation authorities in the U.S. as a self-created intangible.² Under the second method, known as "pooling of interests," qualifying acquirers could simply fuse the accounting for acquisitions was disallowed by the Financial Accounting Standards Board (FASB) under FAS 141 in June 2001 (i.e., just after the end of the sample period considered in RRV).

The most important of the conditions to qualify for pooling accounting was paragraph 47-b in APB 16: *all of* the consideration paid to target shareholders had to be acquirer common

² See https://www.law.cornell.edu/uscode/text/26/197.

³ In APB 16 the FASB justified this method of acquisition accounting as a "fusion of equity interests," specifically rejecting the notion that the "acquisition price" (and hence goodwill) could be accurately measured in deals in which the target's shares were exchanged for 100% acquirer stock, i.e., full stock-swap M&A deals.

stock (with rights identical to those of the majority of the acquirer's outstanding voting common stock) and the acquirer had to purchase at least 90% of the target's voting stock. This created artificial regulatory incentives promoting the use of stock as the exclusive method of payment in M&A deals (i.e., full stock swaps), and we argue that these incentives cloud our ability to draw a causal connection between equity misvaluation and the method of payment using sample of M&A deals from a period during which pooling was allowed. As explained in Section 2 of this paper, there are compelling reasons to believe that these artificial regulatory incentives promoting the use of full stock-swaps as the method of payment in M&A deals specifically stimulated the use of stock as a method of payment by acquiring firms with highly- or overvalued equity (either firm-specific, or more generally when equity markets appear broadly overvalued).

The principal conclusion from our analyses is that the widely-accepted positive relation between equity overvaluation and the use of full stock-swaps as the method of payment in M&A deals (hereinafter referred as full stock payment) is an artifact of a regulatory regime in the U.S. (allowing the use of pooling accounting) that no longer exists. The most impactful result in this paper is that when we focus on M&A deals in the post-pooling period (i.e., July 2001 onwards), we do not observe *any* (positive or negative) statistically significant relation between acquirer equity misvaluation and full stock payment: the (behavioral) misvaluation-based explanation of the exclusive use of stock as a method of payment in M&A deals simply does not find empirical support in the modern (post-pooling) era.

We start our investigation by replicating as closely as possible the results in RRV, matching their sample selection criteria (which, importantly, lies entirely in the period during which pooling was an allowed accounting technique: we call this the pooling period). Critically, we focus on full stock payment (100% stock-swaps), as this allows us to draw unambiguous inferences about the relation between misvaluation and the choice of method of payment.⁴ If the acquirer chooses to pay in stock because they consider it to be overvalued, the transaction is profitable the more acquirer stock that gets used as compensation for target shareholders. Therefore, under the misvaluation-based method of payment hypothesis, full stock payment

⁴ See RRV Table 9, Panel C and p.590.

should be observed in M& deals. This argument explains why RRV focus on full stock payment in their empirical analysis.⁵

We are able to closely replicate the vast majority of RRV's descriptive statistics, and we then turn to the commonly-used RRV regression-based valuation decompositions. In those decompositions, we obtain similar R-squared and regression coefficients as RRV for the vast majority of industry-level and firm-level analyses. Most importantly, in our replication of RRV during the pooling period, our results confirm that both broad (i.e., market-to-book) and specific proxies for overvaluation have a positive and statistically significant correlation with the propensity of a firm to participate to the M&A market, the propensity to participate as an acquirer, and, crucially in the present case, the propensity of an acquirer to use full stock payment. Concerning the probability of full stock payment, our coefficient estimates are mostly of the same order of magnitude as the coefficients reported in RRV (in their Table 10, Panel B).

Next, we expand our analysis to focus on the post-pooling period: M&A deals after 2001, when the FASB had eliminated the possibility for acquirers to use the pooling method of accounting. Using again the same sample-selection criteria as in RRV, we find that the proportion of M&A transactions fully paid in stock during the post-pooling period is less than half of what it was during the earlier sample period that RRV used (21% vs. 49%), a fact already reported in de Bodt et al. (2017). The key insight that emerges from our analyses using data from the more recent sample period (2002 – 2016) is that, while we come to the same conclusion about the effect of overvaluation on a firm's participation in the M&A market and participation in the role of an acquirer, multivariate analyses of the full stock payment probability reveal fundamentally different results than those reported in RRV for the pooling period.

In the more recent sample period, high market-to-book firms are actually *less* likely to use full stock payment to buy their target (conditional on making an offer to begin with) and the RRV misvaluation components either lose significance (time-series sector error and firm-specific error) or flip sign (long-run value) in explaining the method of payment. The negative relation between the probability of full stock payment and the market-to-book ratio that we report for the post-pooling period is in fact consistent with the market-to-book ratio being a

⁵ Empirical evidence based on mixed payment mode usage (or the percent of stock in the method of payment, a continuous variable) are ambiguous and difficult to interpret because, under the misvaluation-based method of payment hypothesis, the use of a *combination* of stock and cash (or any other medium) implies the presence of some costs to the use of stock as a method of payment which are difficult to theoretically reconcile with the misvaluation hypothesis. For this reason, we (and RRV) focus on M&A deals with full stock payment.

proxy for future growth opportunities (Martin, 1996), as acquirers anticipating a period of high growth could be more reluctant to share the benefits of such growth with the target.

The contradictory results obtained for the determinants of the method of payment between the pooling (1980 - 2001) and post-pooling (2002 - 2016) periods is striking. The fact that (i) this change is observed around the pooling abolishment decision; and (ii) pooling required 100% stock payment strongly suggests that the positive correlation between full stock payment and valuation ratios observed during the pooling period was driven by the willingness of acquirers to structure their acquisitions in such way that they qualified under the pre-2001 regulations for pooling accounting. We develop two additional analyses to investigate whether this interpretation is plausible. In the first, during the pooling period we discriminate between paying in cash, paying fully in stock and recording the transaction under pooling accounting, and paying fully in stock and recording the transaction under purchase accounting. Our results show that the RRV misvaluation firm specific component is significant only in explaining the choice of full stock payment with pooling accounting, but does not explain the choice of full stock payment coupled with purchase accounting (which represents a little under half of the distribution of full-stock payments in that sample). This result again suggests that full stock payment was chosen in order to qualify for pooling accounting prior to the accounting rule change in 2001.

Second, we turn to international evidence. We focus on Europe and Australia, studying the entire 1990-2015 period. Pooling accounting was either not an option for firms in the selected countries during that period or not used in practice because the preconditions required for qualification were too restrictive. Therefore, evidence from these countries allows us to observe the role of RRV misvaluation components isolated from any incentives to qualify for pooling accounting. If anything, our results support a negative relation between full stock payment and the RRV misvaluation components (i.e., the opposite of RRV's original findings), especially in the European context. Once again, our results fail to support the misvaluation hypothesis.

The identification of pooling as a confounding factor polluting the RRV results is the key contribution of our work⁶. This finding also stresses the need to update empirical evidence about the determinants of the method of payment in M&A deals for the post-pooling period.

⁶ de Bodt et al. (2017) suggest that CEO incentives drive the preference of highly valuated acquirers to opt for pooling in place of purchase accounting, generating this spurious correlation between full-stock payment and acquirer valuation.

This is our second endeavor. We collect the necessary information to investigate the role of a long list of potential determinants suggested by the academic literature. Some are classics (information asymmetry (Hansen, 1987; Eckbo et al., 1990), competition (Fishman, 1989), merger waves (Harford, 2005)), while others more recent (the role of private bidders (Eckbo et al., 2017). We uncover two potentially interesting findings. First, only one variable from our long list of potential determinants exhibits stability in sign and statistical significance between the pooling and post-pooling periods: innovation-focused acquirers (with high R&D expenses) are significantly more likely to offer their targets a full stock swap. Second, many of the well-known determinants of full stock payment from the M&A literature (such as the relative size and listing status of the target) only find empirical support in the post-pooling period. Interestingly, during the post-pooling period the marginal tax rate of the acquirer also seems to play a role in the choice of method of payment to be paid to shareholders of the target: bidders with high marginal tax rates appear significantly less likely to pay for their acquisitions with their own stock.

This paper proceeds as follows. Section 2 describes our theory about the relation between pooling and overvaluation. Section 3 describes our data sources and provides descriptive statistics. Section 4 contains our main empirical results updating the RRV tests for the post-pooling period, and in Section 5 we conduct a preliminary analysis of the determinants of the choice of stock as the method of payment in the post-pooling era. Section 6 concludes.

2. Incentives for overvalued acquirers to qualify for pooling prior to 2001

The central theme of this paper is that the disappearance of the acquirer overvaluation / full stock payment relation after June 2001 can be explained by the fact that the existence of that relation up to June 2001 was driven by highly-valued acquirers choosing stock as their sole method of payment in M&A deals in order to qualify for pooling accounting.

However, most of the "costs" associated with the alternative to pooling (i.e., purchase accounting) were related to the valuation of the *target*. Under the purchase method of accounting, two effects potentially adversely affected the post-acquisition accounting statements of the acquirer: (i) As a result of a merger, the target's assets had to be revalued to their "fair value." In most settings, such a revaluation would result in an increase in the value of the target's total assets. These additional assets would bloat the acquirer's balance sheet, potentially adversely affecting asset-based ratios such as return on assets (ROA); and (ii) As a

result of a merger, the difference between the price paid to acquire the target and the "fair value" of the target's assets had to be accounted for as goodwill, and, under accounting regulations in effect prior to June 2001, that goodwill had to be amortized on a regular schedule.⁷ Such amortization of goodwill would depress the earnings of the newly merged firm, and weaken ratios such as EPS or P/E (which led to the term "dilutive" to describe some acquisitions). These costs associated with the purchase method of accounting gave acquirers a strong incentive to qualify for the pooling method of accounting.

An interesting example of this motivation is AT&T's acquisition of NCR in 1991. Lys and Vincent (1995) report that AT&T agreed to pay as much as US\$500 million over what would otherwise have been required by NCR's shareholders, simply in order to qualify for pooling accounting treatment. Furthermore, this choice boosted AT&T's EPS by 17%, but had absolutely no benefit to the fundamental future cash flows from the acquisition. In other words, AT&T appears to have paid a substantial amount of their shareholder's wealth in order to benefit from a cosmetic accounting treatment (pooling) that boosted EPS but had no tangible consequences for the cash flows accruing to their shareholders.

Given that most of the costs associated with the purchase accounting were related to the valuation of the *target*, the believability of our thesis in this paper depends, therefore, on the credibility of the idea that overvalued *acquirers* had stronger incentives (than fairly- or undervalued acquirers) to qualify for pooling. In the following, we provide several arguments to justify this relation:

i) Correlated valuations: One possible explanation for the relation between acquirer overvaluation and the desire to use the pooling method of accounting prior to June 2001 is that the acquirer's valuation ratio proxied for the general level of valuation ratios in the stock market. In other words, acquirer overvaluation in the RRV results proxies for generally high valuations of firms in the U.S. (note that most of the pooling transactions in our sample occurred in the mid-to-late 1990s: see Table 1). When market valuation ratios are generally high, the price paid to acquire a target would be high, exacerbating the problems described above.⁸ On the other hand, paying for the target completely with acquirer stock, and accounting for the transaction under pooling, avoided these negative impact on accounting ratios for the acquirer. Therefore, the effect of correlated

⁷ This amortization, originally mandated by APB 17 in 1970, was described as "arbitrary" by the FASB in 2001, and replaced in FAS 142 by an annual test for impairment.

⁸ Also see, for example, Fu, Lin, and Officer (2013), Table 5.

valuations implies a positive correlation between valuation ratios and full stock payment in M&A deals during the pooling period (1970 – June 2001), because when valuations were generally high, qualifying for pooling enabled the acquirer to avoid the creation of egregious amounts of goodwill and the associated earnings-reducing amortization. Given that the RRV regressions concerning the method of payment (which have had such an impact on the literature, and we are trying to replicate) do *not* contain targetfirm valuation ratios, it is entirely plausible that the acquirer-firm valuation metrics in those empirical models simply proxy for generally high valuation multiples.

EPS bootstrapping: If an overvalued acquiring firm uses a stock-swap to buy a target firm that has a lower valuation multiple, the acquiring firm is essentially exchanging higher-priced shares for lower-priced shares. As a result of the acquisition, the number of shares outstanding in the acquiring firm will increase but by less than the total number of shares outstanding in the target, assuming that the acquirer does not pay too high of a premium (because of the discrepancy in valuation multiples). When EPS is computed for the combined firm, therefore, the numerator (total earnings) will be the sum of the earnings of the acquirer and target (assuming no synergies), but the denominator (total shares outstanding) is less than the sum of the shares outstanding of the acquirer and target. The result, therefore, is a higher reported EPS ("bootstrapping"). Furthermore, this effect is exaggerated the more overvalued the acquiring firm is (relative to the target).

The relation with pooling comes about because the bootstrapping effect assumes that the earnings of the combined firm is the sum of the earnings of the acquirer and the target. This implies, in turn, that no accounting goodwill has been recorded and, therefore, there is no need for goodwill amortization associated with the acquisition. On the other hand, if the acquisition had been accounted for with the purchase method under accounting regulations in effect between 1970 and June 2001, goodwill would likely have been recorded on the acquirer's balance sheet and said goodwill would need to be amortized in future years, reducing accounting earnings and dampening the "bootstrapping" effect.

Simply put, EPS bootstrapping worked "best" in M&A deals prior to July 2001 if the acquirer could qualify for pooling accounting (as AT&T did in their acquisition of NCR). Therefore, the most highly valued (and possibly overvalued) acquirers had the incentive prior to June 2001 to structure their M&A deals as stock swaps in order to

qualify for pooling and enjoy the greatest EPS bootstrapping benefits. In fact, there were CEOs of highly-valued acquiring firms in the mid-to-late 1990s who publicly stated that qualifying for pooling was a precondition for them to even consider an acquisition. For example, Barry Diller stated in 1997 that "We will not do any deals without pooling of interests accounting."⁹

We do not claim that EPS bootstrapping is the reason *why* acquirers do deals in the first place. In the late 1990s, for example, it may have been that acquirers first decided to buy a target, then chose a method of payment such that the acquiring firm could qualify for pooling (and therefore get the maximum benefit from the EPS bootstrapping effect). This possibility doesn't, however, affect the main conclusion from this EPS bootstrapping argument: the availability of the pooling method of accounting drove a positive correlation between high acquirer valuation and full stockswaps in M&A deals prior to 2001, because the choice of a full stock-swap allowed the acquirer to enjoy the maximum EPS-accretive benefits from their high valuation ratio.

3. Data and descriptive statistics

RRV collect a sample of 4,325 bids for 4,025 target firms over the period 1978 to 2001 from the Securities Data Corporation (SDC) database of mergers and acquisitions. RRV use the following sample selection criteria:

- Acquirer and target are both public firms (according to SDC);
- SDC identifies the bid as a "Merger" transaction;
- Necessary information about the acquirer and target are available in both the Center for Research in Securities Prices (CRSP) and Compustat databases (see Appendix 1), and both firms are required to have non-zero total assets, book-to-market below 100, and market value of equity greater than US\$10 million.

Note that both successful and unsuccessful bids are included in RRV's sample. Applying these criteria (some 15 years later) to the same data sources over the same sample period, we obtain 3,691 announced M&A bids for 2,719 targets over the period 1978 to 2001. The difference between RRV's sample and ours (using exactly the same sampling criteria and data sources) is due to the lack of availability of necessary information for the target firm in

⁹ See Reda (1999). The firm that Mr. Diller ran at that time, USA Networks, had a P/E multiple well in excess of 400 at the close of the 1997 fiscal year.

some bids¹⁰. Table 1, Panel A documents the number of M&A deals and average deal size per year in the RRV sample and our sample. The well-known M&A waves are present in both cases. Despite our best efforts, however, there are some differences between the RRV sample and our replication sample. In particular, the average transaction size in our sample is larger (US\$960 million versus US\$839 million in the RRV sample) and 49% of bids (1,810 out of 3,691) have a method of payment that is completely in acquirer stock in our replication sample versus 28% (1,218 out of 4,325) in the RRV sample. In Table 1, Panel B we report the percentage of full-stock deals by year of announcement, and the proportion of these full-stock deals accounted for using the pooling and purchase methods. It is clearly apparent that pooling was the accounting method of choice during the late 1980s and early 2000s, when stock market valuation ratios were particularly high.¹¹

Insert Table 1 about here

We next use the matching procedure described in RRV to merge data from SDC, CRSP and Compustat, applying the following rules (which mimic RRV):

- To calculate the market-to-book ratio, we match fiscal year-end data from Compustat with CRSP market values measured three months afterward;
- We associate CRSP and Compustat data with an announced bid from SDC if the bid announcement occurs at least one month after the date on which the CRSP market value is observed;
- If an M&A bid announcement occurs between the fiscal year-end and one month after the date on which the CRSP market value is observed, we match the M&A transaction with data from the prior fiscal year.

Using this matching procedure, we collect financial data on acquirers to compute size, performance, and leverage ratios. Table 2 reports descriptive statistics on these acquirer

¹⁰ This difference in sample composition is not surprising. The SDC database is known to change over time due to back-filling of data (Bollaert and Delanghe, 2015).

¹¹ We note that from 1978 to 1986, no transactions are reported in the SDC database as being accounted for using pooling accounting, despite the fact that pooling had been allowed by the (precursor to the) FASB since 1970. This raises the question of the quality of the database coverage during that period early in our sample. Also, some transactions (three, to be specific) in 2002 are still coded by SDC as being accounted for using pooling, despite the fact that pooling was abolished in the middle of 2001.

characteristics, with a comparison between the RRV sample and our replication sample. Variable definitions are provided in Appendix 1: we follow RRV in computing the market-tobook ratio, and specifically use book equity as the denominator (as do RRV).¹² Our replication sample includes smaller acquirers (US\$12,158 million average market value of assets versus US\$18,487 million average in the RRV sample, with a similar conclusion using book value of assets, market value of equity, property, planta, and equipment (PP&E), long-term debt, capital expenditure, and net income), despite also having larger targets (as noted above). Our acquirers display also lower operating performance (return on assets of 3.4% versus 5.2% in the RRV sample and return on equity of 12.2% versus 15.2% in the RRV sample) but, importantly, a similar market-to-book ratio (3.52 versus 3.43 in the RRV sample). Finally, we observe that acquirers in our sample (vs. RRV's sample) are more levered, with an average book leverage ratio of 0.64 versus 0.59 and an average market leverage ratio of 0.49 versus 0.44, but display similar quick and current ratios.

In Table 2 we also provide a comparison of acquirer characteristics between the pooling and post-pooling periods. We use our RRV replication sample for the pooling period. For the post-pooling period, we collect a sample of acquisition bids in the July 2001 to 2015 window using the RRV sample selection criteria described above. This results in a sample of 1,774 acquisition bids announced between July 2001 and 2015.¹³ In the remainder of this paper we will refer to this sample as the post-pooling sample. Note that this sample overlaps with the RRV sample for only six months, between July 2001 and December 2001.

Insert Table 2 about here

It appears that during the post-pooling period, acquirers in the sample described above are significantly larger, with an average market value of assets of US\$31,155 million versus US\$12,158 million during the pooling period. We reach a similar conclusion using the other size measures. Acquirers in the post-pooling sample also display weaker operating performance

¹² This will be important when comparing our results to other references. For example, Faccio and Masulis (2005) and Martin (1996) both use total assets as the denominator and (a proxy for) the market value of asset as the numerator in their measure of Tobin's Q.

¹³ 69 of the 216 deals announced in 2001 occur in the six months after the abolishment of pooling at the end of June of that year. Therefore, the post-pooling sample size described here starting in July 2001 (1,774) is different than the deal count reported in Table 1 for the post-pooling period (1,705) because Table 1 reports annual observations and starts the post-pooling period with 2002.

(with a return of assets of 2.7% versus 3.4% during the pooling period and return on equity of 9.5% versus 12.2%) and lower valuation ratios (with a market-to-book of 3.2 versus 3.5 during the pooling period). The financial structure of acquirers during the pooling and post-pooling periods appears more similar, except for the quick ratio which increases by more than 10% (from around 2 during the pooling period to 2.3 during the post-pooling period).

As (economically¹⁴) significant differences exist between the original RRV sample and our replication sample, we will start our investigation by reproducing the RRV multivariate analyses using our replication sample to check whether these differences in sample composition prevent us from reaching the same conclusions as in RRV. We reproduce the market-to-book decomposition from RRV (see Section 4 of their paper), and present descriptive statistics for the decomposition (using RRV's Model III) in Appendix 3. These descriptive statistics are based on our RRV replication sample plus a control sample of non-merger firms, collected using the same criteria as in RRV. Specifically, as in RRV a firm-year from Compustat is labeled as an "M&A" observation if the firm was involved in an M&A deal as either the acquirer or target (according to SDC data) in the specific year; all other firm-year observations from Compustat are then categorized as "non M&A."

As in RRV, in our replication sample (from the pooling period), merger firms display higher market-to-book than non-merger firms and acquirers display higher market-to-book than target firms. These results (which are entirely from the pooling period) are almost completely consistent with the Model III results in Table 6 in RRV.

4. Firm valuation, merger participation, firm role, and full stock payment

4.1. Replication of the Rhodes-Kropf, Robinson, and Viswanathan (2005) results

In Table 3, we use our replication sample to reproduce the firm-level merger participation (Table 9, Panel A in RRV), role (Table 9, Panel B in RRV), and mode of payment choice (Table 9, Panel C in RRV) multivariate analyses. Specifically, in Panel A we use the joint sample of merger and non-merger firm-years (described above) to examine whether the decision to be involved in a deal is a function of the valuation components as decomposed by RRV. The

¹⁴ Note that since we do not have the original RRV sample at our disposal, we are not in position to test the statistical significance of differences highlighted in Table 2.

dependent variable in this regression is an indicator variable equal to one if a firm is involved in a merger either as acquirer or target, and zero otherwise. In Panels B and C, we focus on the sample of merging firms only, and examine whether valuation affects the decision to be an acquirer rather than a target (Panel B: the dependent variable is an indicator equal to one if the firm involved is an acquirer, and zero otherwise (i.e., if it is a target)) and the choice of method of payment (Panel C: the dependent variable is an indicator equal to one if the method of payment in the deal is a 100% stock swap, and zero otherwise). In Panel C the valuation metrics (i.e., the independent variables) are for the *acquirer*, as they are in RRV's Table 9.

We present results for the baseline specification, that includes only the natural logarithm of the market-to-book ratio as the sole independent variable, and the Model III specification from RRV (which includes their most developed definition of the firm-specific error, the timeseries sector error, and the long-run value-to-book as independent variables). Estimates are presented in our Table 3 for pooled and fixed-effect estimators, with our panels in that table matching the panels in Table 9 of RRV. Our results confirm those in RRV for a sample drawn from the pooling period. Specifically, in Panel A of Table 3 firms are more likely to participate in the M&A market when their market-to-book ratio is high, and firm-specific errors have a positive and statistically significant effect on the propensity to participate to the M&A market.

Insert Table 3 about here

In Panel B we find (as did RRV) that firms are much more likely to be an acquirer rather than a target when they display a high firm-specific valuation error, conditional on participating in the M&A market to begin with. Crucially in the present case, in Panel C we confirm that in our RRV replication sample highly valued firms (whether using the book-to-market or the three valuation components identified using RRV model) are significantly more likely to pay for an acquisition fully in stock than in cash. We note that our coefficient estimates in all panels of Table 3 are approximately equal to the coefficients reported in Table 9 in RRV. We conclude from these validity checks that, despite the differences in size and composition, our replication sample provides an adequate empirical basis to replicate RRV's results during the 1978 to 2001 period.¹⁵

4.2.Post-pooling period evidence

Does the relation between overvaluation and full stock payment persist in the postpooling period? There are good reasons to believe that the dynamics of the method-of-payment choice changed dramatically right after the RRV sample period ends: pooling accounting (qualification for which was a major motivation to use stock as the method of payment) was abolished by the FASB in June 2001. Section 2 above describes in detail some plausible explanations for why the overvaluation / stock-payment relation may be very different in the absence of the availability of pooling accounting.

In Table 4, we use our post-pooling sample (all acquisitions are announced from July 2001 to December 2015, and the sample construction otherwise follows that described in RRV) to reexamine the results from RRV in light of this dramatic change in regulation right after the end of the sample period in the original RRV paper. The structure of the panels in Table 4 is similar to that in Table 3 above (and also Table 9 in RRV): Panel A examines participation in the M&A market, Panel B looks at whether that participation is in the role of an acquirer or target, and Panel C presents results for regressions explaining the method of payment choice. As in Table 3, we present results for the baseline specification which includes only the natural logarithm of the market-to-book ratio as the sole independent variable and the Model III specification from RRV (which includes the firm-specific error, the time-series sector error, and the long-run value-to-book as independent variables).

In Panels A and B of Table 4, we report the results from multivariate analyses of the decision to participate to the M&A market (Panel A) and the decision to participate as an acquirer (Panel B). The results in Panels A and B are qualitatively very similar to those reported

¹⁵ One possibility, which we explore in Internet Appendix Table 1, is that acquirers chose the pooling method of accounting in the period before June, 2001, to mask "bad" deals on average. We examine ex-post accounting returns (ROA) in regressions similar to those in Table 7 in Harford, Humphery-Jenner, and Powell (2012). We find that for transactions in the period where pooling was allowed in the U.S., those accounted for using the pooling method of accounting exhibit abnormally high post-deal ROA while those accounted for with the purchase method do not. This is (at least) prima facie evidence that the acquirer's choice of accounting method (and, hence, method of payment) was not influenced by fundamental deal quality. Admittedly, however, we cannot observe the counterfactual: how acquirers during that period would have performed (in terms of post-deal ROA) had their deals been accounted for using purchase rather than pooling.

in RRV, and our coefficients are very close in magnitude (and statistical significance) to those in the original RRV analysis (Table 9 in that paper).¹⁶ Given these results, we reach the same conclusion as RRV using multivariate analyses about the effect of valuation components on the probability of a firm becoming involved in acquisitions and as an acquirer: higher firm valuations, especially the firm- and sector-specific components from the RRV decomposition, increase the probability with which a firm engages in an M&A and as an acquirer. Simply put, highly- (or over-) valued firms are more likely than other firms to attempt to buy another firm, as discussed in the original RRV paper.

Insert Table 4 about here

Where we diverge from RRV, however, is in the effect of valuation on the choice of method of payment. Panel C in Table 4 contains the results of regressions where the dependent variable is indicator equal to one if the method of payment in an announced M&A deal is a 100% stock swap of the acquirer's shares for the target's, and zero otherwise. As in Panel C in Table 3, the independent variables (measures of valuation) are for the acquirer. As can be seen in the table, in the post-pooling period the acquirer's raw (log) market-to-book ratio does *not* predict full stock payment in M&A deals as it did in RRV's analysis (based solely on the pooling period). In fact, the coefficient on this variable is significantly *negative*, implying that highly valued acquirers are *less* likely to use their own equity as the method of payment in an M&A deal. This result is also consistent with the market-to-book ratio being a proxy for future growth opportunities (as argued in Faccio and Masulis, 2005), as acquirers anticipating a period of high growth should be more reluctant to share benefits of this growth with the target shareholders

When we turn our attention to the components of the RRV decomposition in columns (3) and (4), we again find no support for the contention that highly- (or over-) valued acquirers are more likely to offer their target a full stock swap. Contrary to the strongly positive coefficient on the firm-specific error component of valuation (m f RRV) that RRV report for

¹⁶ There is one exception to this. In our analysis of whether a firm participates in the M&A market as an acquirer or as a target (Panel B), the long-run value-to-book component of the RRV decomposition (which we call m_b_RRV) is not statistically significant (whereas it is in Table 9 of RRV). In the original RRV paper the authors do not offer an interpretation of this significantly negative coefficient, and we are therefore unsure how to interpret its lack of significance in our sample.

the pooling period, in our analysis of M&A deals focused solely on the post-pooling period the coefficient on the firm-specific error component of valuation has a *negative* point estimate (but is statistically insignificant). Reflecting the fact that the negative coefficient on the market-to-book ratio in columns (1) and (2) must be driven by one of these components of valuation, the other two components (m_s_RRV and m_b_RRV) both have significantly *negative* coefficients in Panel C of Table 4 (as opposed to the large and significantly positive coefficients reported in the original pooling-period results reported by RRV).

What this implies is that the link between acquirer equity overvaluation and the use of full stock payment is broken by the change in regulation that prohibited the use of pooling accounting in acquisitions. This link, which is very strong in the RRV paper and has become widely accepted in the academic finance profession, simply doesn't exist in analyses using data solely from the post-pooling period.

In an effort to more clearly identify incentives to opt for full stock payment during the pooling period, in Table 5 we use our RRV replication sample and a multinomial logit regression to study the relation between the RRV misvaluation components and the decision to pay (i) fully in cash, (ii) fully in stock and record the transaction using pooling, and (iii) fully in stock and record the transaction using purchase accounting. The structure of Table 5 follows Table 3, Panel C with one difference: the left four columns report results for the choice between full cash payment versus full stock payment with pooling accounting, while the right four columns report results for the choice between full cash payment and full stock payment with purchase accounting. A striking result emerges: while the RRV firm-specific misvaluation component is significant in the former case (i.e., affecting the choice between full cash payment and full stock payment with pooling accounting), it is not significant in the latter case. More specifically, our results show that the RRV firm-specific misvaluation component is only able to significantly explain the choice of full stock payment and pooling, but is not able to explain the choice between cash and full stock payment coupled with purchase accounting. This again suggests that any observed link between acquirer equity overvaluation and the use of full stock payment is conditional on the availability of pooling as a choice for accounting in acquisitions.

Insert Table 5 about here

4.3. International evidence

Another empirical strategy to investigate whether pooling is the factor driving the apparent relation between the RRV misvaluation components and the decision to pay fully in stock is to replicate the RRV regressions but for a sample drawn from countries that either did not allow pooling at all or did so with such restrictive conditions that, in practice, accounting under pooling was not used (see Amel-Zadeh et al., 2016). We first select the same sample of European countries as in Faccio and Masulis (2005), composed of Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, and the UK. We next focus on Australia. Our data sources are the SDC database for M&A transactions and Worldscope for accounting and financial information. As pooling cannot play a role in the method of payment choice for acquirers from these countries, we estimate regressions using the whole 1990 – 2015 sample period.

Table 6 presents our results, again following the same organization as Panel C in Tables 3 or 4. Panel A contains results for the European sample: Columns (1) to (4) is for all countries noted above, (5) to (8) for the UK only, and (9) to (12) for the European sample without the UK. The results are again unambiguous. In all cases, the natural logarithm of the market-to-book ratio is *negatively* correlated with the choice of full stock payment in an acquisition. The coefficient on the RRV firm-specific misvaluation component is itself negative and significant for the European sample and the UK, but not significant for the European sample without UK (an indication of the importance of the UK in driving the results in the pan-Europe sample). Turning our focus to Australia in Table 6, Panel B, the coefficient on the natural logarithm of the market-to-book ratio is again negative (but only weakly significant without year fixed-effects) and the RRV firm-specific misvaluation component is not statistically significant. This international evidence confirms that, in absence of the opportunity to account for M&A transactions under pooling, the link between misvaluation proxies and the choice of full stock payment disappears.

Insert Table 6 about here

4.4. Robustness checks

As additional robustness checks, we investigate whether our results are affected by the internet bubble or the 2008 financial crisis (results reported in the Internet Appendix Tables 2 and 3). To check the robustness of our results to the inclusion of the internet bubble in our sample period, we replicate Table 3, Panel C for the pooling period (1978 to end of June 2001) and Table 4, Panel C for the post-pooling period (July 2001 to 2015) but excluding high tech firms from our sample. High tech firms are identified using the Kile and Phillips (2009) SIC-code based classification. As in Panel C of Tables 3 and 4, the coefficient on the RRV firm-specific misvaluation component is positive and highly significant during the pooling period but loses its significance in the post-pooling period (either with or without the inclusion of year fixed-effects). We note also that for the sample excluding high tech firms the coefficient on the natural logarithm of the market-to-book ratio is negative and significant during the post-pooling period, confirming the results in Table 4, Panel C.

Our second robustness check focuses on the 2008 financial crisis. We replicate our analyses using the post-pooling but pre-financial crisis period (July 2001 to 2007) and the post-pooling and post-financial crisis period (2009 to 2015).¹⁷ The coefficient on the RRV firm-specific misvaluation component is not statistically significance in either post-pooling subperiod excluding the financial crisis, while the coefficient on the natural logarithm of the market-to-book ratio is negative and statistically significant in both periods. These results again fail to support the misvaluation hypothesis for the choice of stock as the sole method of payment.

Taken together, our results suggest that the RRV conclusions about the method of payment in M&A deals were driven by the availability of pooling as an accounting choice. Highly-valued acquirers desired to use pooling accounting for their M&A deals, and because pooling accounting was only acceptable to the FASB if the deal was a full stock-swap, this prompted highly-valued acquirers to use their own equity as the sole method of payment. This link was misinterpreted in the literature to be a link between (over)valuation and the method of payment in mergers and acquisitions, a link that was severed when the FASB disallowed pooling in June 2001.

¹⁷ We exclude the 2008 year from this analysis because that year was the nadir of the financial crisis.

5. Updated evidence on the determinants of full stock payment

Because overvaluation does not appear to predict full stock payment in M&A deals in the postpooling period, at least in the way that we are used to interpreting traditional results in the literature, we next turn our attention to a search for the determinants of full stock payment. Specifically, our interest is in determinants that are consistent between the pooling and postpooling periods. In other words, determinants that are robust over time and whose impact does not appear to be influenced by changes in regulation.

5.1. Sample

We undertake this quest by developing a new sample which incorporate private targets, as the target's public status as been reported in the extant literature as a significant determinant of the method of payment (e.g., Fuller et al., 2002). We also develop this new sample to match the sample selection criteria used in more recent contributions to this literature (e.g., Eckbo et al., 2017). This new sample consists of 4,186 takeover bids for US targets by US public nonfinancial acquirers during 1990-2015 period. Bids are identified using the SDC database of mergers and acquisitions, and bidders must also be available on both CRSP and Compustat to obtain the RRV valuation components and other control variables used in our empirical specifications. Bidders must also have positive total assets and a book-to-market ratio below 100. The sample includes both successful and unsuccessful bids. Deal size must be a minimum of 1% of bidder total book assets (i.e., relative size is at least 1. In addition, bidders must hold less than 50% of the target shares at the announcement date and seek to hold 100% after (i.e., the sample contains only full-control deals).

Table 7 reports the annual distribution of these 4,186 takeover bids, the corresponding average bid size, target status, and payment method. The well-known M&A waves are, as usual, present in this new sample. As in Ekbo et al. (2017), the most active M&A market period is between 1995 and 2000, ending at the peak of the Internet bubble. The average deal size undergoes strong time variation, with peak years in 2000, 2009 and 2015 (and corresponding average deal size of US\$1,837; 3,166; and 2,810 million, respectively).¹⁸ The proportion of

¹⁸ We note the presence of a few mega transactions in 2000 (AOL / Time Warner for US\$165 billion), in 2009 (Pfizer / Wyeth for US\$68 billion, Merck / Schering-Plough for US\$41 billion, Exxon Mobile / XTO Energy for

public targets fluctuates around 50%, with a low of 25.7% in 1992 and a peak of 58.7% in 2001. The number of all-stock bids displays a dramatic decline after 2001, as already reported in Table 1 (and in de Bodt et al., 2017).

Insert Table 7 about here

5.2. The determinants of full-stock payment

Table 8 provides the mean, median, and number of observations for the set of potential determinants of the method of payment, taken from the recent Eckbo et al. (2017) paper. Variable definitions and data sources are listed in Appendix 1. Descriptive statistics are reported for the whole period under investigation (1990 to 2015), the pooling period (1990 to June 2001) only, and the post-pooling period (July 2001 to 2015) only. A test of difference of means between the pooling and post-pooling periods is displayed in column (10), with the corresponding t-statistics in column (11). These difference of means tests send us a clear message: many bidder and deal characteristics are substantially different comparing the pooling and post-pooling periods.

Insert Table 8 about here

For example, the percentage of transactions completely paid in stock drops by almost 40 percentage points (from 51.91% in the pooling period to around 13.84% in the post-pooling period), the average bidder market-to-book ratio declines by 2.32 (from 5.91 to 3.59), all three RRV valuation components ($m_f RRV$, $m_s RRV$ and $m_b RRV$) decline significantly, the average bidder size more than doubles (from US\$2,128 million to US\$6,826 million), and relative size consequently declines (from 64.69% to 42.48% on average). Furthermore, comparing the two periods highlighted in Table 8, bidder cash holdings increase by 2.42 percentage points, bidder asset tangibility decreases by 2.84 percentage points (from 42.32% to 39.19%), and there is a strong increase in the presence of cash-only sellers (from 8.58% to

US40 billion, etc), and in 2015 (Pfizer / Allergan for US146 billion, a deal which was not successfully completed).

13.35%; essentially financial sponsors or subsidiaries of other public firms) and of private buyers (from 53.13% to 60.25%). Table 8 also highlights an increase in the frequency of horizontal deals (from 34.66% to 40.61%) and decreases in bidder financial constraints (the Hadlock and Pierce (2010) size age index, SA_index in the table, goes from 3.3 to 3.59), in bidder marginal tax rates (from 0.28 to 0.25), in bidder run-up (from 1.33 to 1.16), in the presence of frequent bidders (from 13.82% to 9.52%), and in the frequency of negotiated deals (from 58.15% to 35.42% of the transactions).

The pooling and post-pooling periods are therefore characterized not only by a change in accounting regulation, but also by very different economic and financial environments. This is highlighted by the change in valuation levels, and the profound transformation of the M&A market with the increase in the activity (on both the buy and sell side) of financial sponsors (already reported in Eckbo et al., 2017). How do these transformations affect the importance of bidder and deals characteristics in explaining the choice of the mode of payment?

5.3. Results

We provide a preliminary investigation in Table 9. In each of the regressions reported in the table, the dependent variable is the full stock indicator and we use Probit specifications. All regressions contain the set of explanatory variables from Ekbo et al. (2017), as well as industry fixed-effects based on the 49-industry classification by Fama and French.¹⁹ The first three columns use only the logarithm of market-to-book ratio as valuation measure (one of our important independent variables), columns (4) to (6) use the firm specific valuation error $(m_f _RRV)$, and columns (7) to (9) the three RRV valuation components (m_f_RRV, m_s_RRV) and m_b_RRV . The sample size drops from 4,186 to 4,172 due to the inclusion of industry fixed-effects, as some industries witness only full-stock payment transactions. For each choice of valuation ratio, we report results for the whole period (1990 to 2015) in columns (1), (4) and (7), the pooling period (1990 to end of June 2001) in columns (2), (5) and (8), and the postpooling periods (from July 2001 to 2015) in columns (3), (6) and (9).

Turning first to the role of valuation ratios, the results in Table 9 are consistent with those reported in Tables 3 and 4. The logarithm of the market-to-book ratio is positively correlated to the probability of full-stock payment during the pooling period (the RRV result)

¹⁹ Available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

but the statistical significance of that coefficient disappears in the post-pooling period. Qualitatively similar conclusions are obtained using the RRV firm-specific valuation error and the three RRV valuation components. As discussed earlier in this paper, acquirer (over-) valuation was a strong predictor of full-stock payment in M&A deals when pooling accounting was allowed by the FASB (i.e., during the RRV sample period), but that predictability disappears thereafter.

Investigating next bidder and deal characteristics, and focusing on results obtained using the logarithm of the market-to-book ratio as valuation measure (i.e., columns (2) and (3) in Table 9), only one variable exhibits stability in sign and statistical significance between the pooling and the post-pooling periods: acquirer R&D expenses (relative to total assets). In the periods both before and after 2001, innovation-focused acquirers (with high R&D expenses) are significantly more likely to offer their targets a full stock-swap (as opposed to buying the target completely with cash). This conclusion (that the innovativeness of the acquirer is the only persistent determinant of full stock payment in acquisitions) is qualitatively true regardless of which columns one compares in Table 9.

The majority of the well-known determinants of full stock payment from the M&A literature only find empirical support in the post-pooling period regressions in Table 9. For example, regardless of the columns chosen in Table 9, we find that 100% stock swaps in the post-pooling period are more likely in deals involving relatively larger targets (Hansen, 1987; Martin, 1996) and targets that are publicly traded, and less likely in deals where competitive pressure implies the need for cash payment (because there is frequent private equity activity in the industry, for example). Interestingly, despite the ubiquity and intuitiveness of these propositions, none of those results are also true for the part of our sample that lies entirely within the pooling period.

Insert Table 9 about here

Table 9 leaves us with a few inferences. First, the determinants of full stock payment in mergers and acquisitions have changed substantially over time: in many cases, what we think we know about payment by acquirers varies dramatically depending on the timeliness of the sample we are examining. Second, one of those "stylized facts" that has gained acceptance in

the academic literature, but appears to not be true in the post-pooling era, is that acquirers are more likely to pay their targets entirely with their own stock if that stock is richly valued. While that appears to have been true (in both the RRV paper and our replication) at the time when pooling accounting was allowed by the FASB, in the modern era that is no longer the case (and is one of the more substantial and significant reversals of signs we see comparing the two periods in Table 9).

This emphasizes the need for updated empirical evidence on determinants of the choice of mode of payment, especially for the post-pooling period (which appears to have fundamentally altered the desire of acquirers to pay completely in stock). Economic interpretation of the "stylized facts" in Table 9 is difficult at this stage because endogeneity, whether in the form of reverse causality or the presence of latent factors, is a first order issue. Intensive empirical investigations of the determinants of full stock payment are clearly needed, not only to challenge what appear to be established facts despite being based on sample periods governed by obsolete accounting regimes, but also to provide clear evidence that will help test many different theories in finance.

One issue to which we are sensitive is that for most of the tests in this paper the dependent variable is an indicator variable equal to one for full stock-swaps (and zero otherwise). We also investigate the robustness of our results to the use of the fraction of stock payment as the dependent variable in a Tobit specification: this dependent variable is used somewhat frequently in the literature on the method of payment in acquisitions (e.g., Faccio and Masulis, 2005).²⁰ Table 10 presents the results from these specifications, and the results broadly mimic those reported earlier in the paper.²¹ Specifically concerning misvaluation, we continue to find that overvalued acquirers appeared to be likely to use *more* stock in their offers during the pooling period, but that this relation loses statistical significance outside the pooling period (see columns (3), (6), and (9) in Table 10). In other words, the relation between misvaluation and *any* stock payment is only significant for deals announced when accounting rules encouraged the use of acquirer stock to qualify for pooling accounting. The only other

²⁰ One reservation we have about these additional tests is that this paper focuses on differences in the relation between misvaluation and method of payment around a change in accounting rules, and those accounting rules only allowed the use of pooling if the method of payment in an acquisition was 100% acquirer stock. Therefore, the most natural dependent variable in our tests is an indicator for full stock-swaps, as is used in most of this paper. Nonetheless, we present the results in Table 10 because the fraction of stock is a commonly-used dependent variable in the M&A literature.

²¹ The results in Table 10 are also similar to those reported in the existing literature using a similar sample period. For example, for our full sample period (1990 – 2015; columns (1), (4), and (7)) the coefficient magnitudes are qualitatively similar to those reported in Table 3 of Eckbo et al. (2017), who use M&A data from 1980 – 2014.

result that is different from Table 9 (where the dependent variable indicates full stock-swaps) is the persistence of relative size as an explanation for the fraction of stock used in M&A deals. Acquirers appear, both inside and outside the pooling period, to be more likely to use more stock in their offers the larger the target is relative to the acquirer (as hypothesized in Martin, 1996).

Insert Table 10 about here

5.4. Robustness checks

The results in Table 9 are based on a sample consisting of 4,186 takeover bids for US targets by US public *nonfinancial* acquirers during the 1990 to 2015 period. We investigate the robustness of these results to the inclusion of financial acquirers in the sample and to restricting the sample to public targets (see Internet Appendix Table 4).

The inclusion of financial acquirers does not alter our baseline results: the logarithm of the market-to-book ratio is again positively correlated to the probability of full-stock payment during the pooling period but loses statistical significance in the post-pooling period, as does the RRV firm-specific valuation error. Concerning bidder and deal characteristics, acquirer R&D expenses is again the only variable that exhibits a stable and statistically significant coefficient between the pooling and the post-pooling periods, and relative size and target status only play a role in the post-pooling period. The negative and statistically significant coefficient of the acquirer marginal tax rate during the post-pooling period is also confirmed.

Restricting the sample to public targets has a dramatic impact on the sample size, as expected (the number of observation drops from 4,172 to 1,163 over the 1990 to 2015 period), but allows us to include in the regressions a larger set of target characteristics. The two most noticeable conclusions from this expanded set of potential determinants are that valuation ratios (the logarithm of the market-to-book ratio and the RRV firm-specific valuation error) once again lose significance in the post-pooling period as determinants of the method of payment, and that target characteristics matter. In particular, target size and target financial constraints (Hadlock and Pierce (2010) size-age index) are positively correlated with the probability of full stock payment over the whole 1990 to 2015 period and in each sub-period. Target leverage, on the other hand, is negatively correlated with full stock payment, again over the whole period

and for each sub-period. We finally note that the target R&D displays a negative coefficient in the post-pooling period, which corresponds to the post Internet bubble period.

6. Conclusions

The method of payment in M&A transactions has been closely examined in the finance literature. In this paper we challenge the notion, introduced in Shleifer and Vishny (2003) (behavioral) and Rhodes-Kropf and Viswanathan (2004) (rational) theories of the use of stock as an acquisition currency, that acquirer equity misvaluation is a key driver of the choice of the method of payment. We explain that during the period in which pooling accounting was allowed by the FASB in the U.S. (1970 – June 2001), these accounting regulations provided an artificial incentive for acquirers to use complete stock swaps to buy their targets, especially during periods of high general valuations or for individually overvalued acquirers. As we demonstrate using data from the post-pooling period, however, once those incentives are taken away (as they were starting in July 2001) the link between acquirer valuation and the choice to conduct a full stock swap in an M&A deal is broken. In this way, our paper comes to a similar conclusion as Eckbo et al. (2017), who also question the veracity of the hypothesis that opportunistic bidders can fool targets into accepting the acquirer's overvalued stock in an M&A deal.

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Figure 1 – Full stock deals during 2001

Figure 1 presents the number of full stock deals during the pooling abolishment year 2001. Pooling was abolished the 30 June 2001.



Table 1 – M&A Sample Descriptive Statistics

Table 1 presents descriptive statistics of RRV and Ours M&A sample. Panel A presents a comparison of yearly M&A frequencies and average deal size between RRV (Rhodes-Kropf et al., 2005) sample and the sample used to replicate RRV results (referred as *Ours*). M&A transactions are collected in the SDC database and are required to have the necessary information available in the CRSP and Compustat databases. Sample selection criteria are reported in Section 3. *Deal Size* is the average deal value in US\$ million as reported in the SDC database. *All Stock* and *All Cash* refer to transactions fully in stock or cash. Panel B presents, for our sample, the proportion of full stock deals by year, and the proportion of these full stock deals that use pooling or purchase accounting.

Panel A

	Acqu	uirers	Tar	gets	All S	stock	All	Cash	Deal	Size
Year	RRV	Ours	RRV	Ours	RRV	Ours	RRV	Ours	RRV	Ours
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1978	11	8	9	8	4	3	7	5	435	420
1979	11	8	11	6	1	1	4	7	88	475
1980	18	9	21	8	0	3	3	1	310	227
1981	61	67	44	45	1	24	4	9	857	596
1982	63	74	55	50	0	22	0	9	271	262
1983	95	60	94	40	2	30	9	4	308	406
1984	104	128	109	73	7	32	34	15	252	325
1985	113	139	110	107	17	51	55	65	406	536
1986	144	122	145	96	14	34	81	71	300	420
1987	164	124	168	95	25	37	95	52	274	308
1988	141	119	135	92	20	33	70	68	175	302
1989	141	119	123	95	28	58	66	45	363	536
1990	101	60	103	43	19	28	49	21	274	321
1991	108	93	90	63	31	51	32	18	234	247
1992	99	104	83	75	24	66	43	24	228	201
1993	170	143	147	98	51	74	69	27	460	523
1994	255	239	219	153	96	146	98	54	260	345
1995	315	254	284	184	100	154	124	65	569	653
1996	367	263	342	193	141	147	116	58	717	689
1997	413	344	411	261	157	203	116	70	713	954
1998	426	360	409	264	154	210	127	83	1,840	1,729
1999	451	359	410	289	160	179	160	99	1,421	2,075
2000	395	279	363	211	124	137	137	72	1,666	2,511
2001	159	216	140	170	42	87	43	63	994	978
2002	-	141	-	97	-	38	-	46	-	746
2003	-	154	-	123	-	38	-	47	-	645
2004	-	159	-	124	-	42	-	47	-	2,046
2005	-	155	-	110	-	33	-	58	-	2,216
2006	-	166	-	114	-	29	-	82	-	2,187
2007	-	176	-	131	-	28	-	71	-	1,153
2008	-	111	-	84	-	23	-	49	-	1,992
2009	-	83	-	65	-	21	-	30	-	2,875
2010	-	92	-	68	-	17	-	50	-	1,111
2011	-	66	-	44	-	15	-	27	-	2,396
2012	-	94	-	71	-	19	-	48	-	1,049
2013	-	83	-	61	-	14	-	37	-	1,402
2014	-	109	-	78	-	27	-	38	-	4,163
2015	-	116	-	77	-	18	-	36	-	4,933
Total 1978-2001	4,325	3,691	4,025	2,719	1,218	1,810	1,542	1,005	839	960
Total 2002-2015	-	1,705	-	1,247	-	362	-	666	-	2,237

Year	% All stock	% All stock w/ pooling	% All stock w/ purchase
	(1)	(2)	(3)
1978	37.5%	0.0%	100.0%
1979	12.5%	0.0%	100.0%
1980	33.3%	0.0%	100.0%
1981	35.8%	0.0%	100.0%
1982	29.7%	0.0%	100.0%
1983	50.0%	0.0%	100.0%
1984	25.0%	0.0%	100.0%
1985	36.7%	0.0%	100.0%
1986	27.9%	0.0%	100.0%
1987	29.8%	2.7%	97.3%
1988	27.7%	3.0%	97.0%
1989	48.7%	8.6%	91.4%
1990	46.7%	21.4%	78.6%
1991	54.8%	37.3%	62.7%
1992	63.5%	57.6%	42.4%
1993	51.7%	60.8%	39.2%
1994	61.1%	56.8%	43.2%
1995	60.6%	63.6%	36.4%
1996	55.9%	66.0%	34.0%
1997	59.0%	88.7%	11.3%
1998	58.3%	81.9%	18.1%
1999	49.9%	66.5%	33.5%
2000	49.1%	43.8%	56.2%
2001	40.3%	13.8%	86.2%
2002	27.0%	7.9%	92.1%
2003	24.7%	0.0%	100.0%
2004	26.4%	0.0%	100.0%
2005	21.3%	0.0%	100.0%
2006	17.5%	0.0%	100.0%
2007	15.9%	0.0%	100.0%
2008	20.7%	0.0%	100.0%
2009	25.3%	0.0%	100.0%
2010	18.5%	0.0%	100.0%
2011	22.7%	0.0%	100.0%
2012	20.2%	0.0%	100.0%
2013	16.9%	0.0%	100.0%
2014	24.8%	0.0%	100.0%
2015	15.5%	0.0%	100.0%
Total 1978-2001	49.0%	51.7%	48.3%
Total 2002-2015	21.2%	0.8%	99.2%

Table 2 - Characteristics of Acquirers: Descriptive Statistics

Table 2 reports a set of descriptive statistics on acquirer characteristics, with a comparison between RRV (Rhodes-Kropf et al., 2005) sample and the sample used to replicate RRV results (referred as *Ours*) and a test of difference of means between the pooling period (1978 to end of June 2001) and the post-pooling period (from July 2001 to 2015). Corresponding samples of M&As are introduced in Table 1. Size, performance and leverage indicators are computed using data collected in the Compustat database. Reported statistics are yearly averages. *t(diff)* is for the t-statistic for a difference of means test between the pooling and the post-pooling periods, with a correction for unequal variance across groups. All variables are defined in Appendix 1. Ratios are winsorized at 1% in each tail to control for outliers. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

	Pooling	Period	Post-Pooling Period			
	Acq	uirer	Acquirer	t(diff)		
Variable	RRV	Ours	Ours			
	(1)	(2)	(3)	(4)		
Sample size	4,325	3,691	1,774			
Size						
Market value (assets)	18,486.55	12,157.79	31,154.75	7.73 ***		
Book assets	11,516.44	8,205.55	21,863.83	6.46 ***		
Market equity	9,733.78	5,427.76	14,960.43	10.14 ***		
Book equity	2,518.64	1,362.81	5,062.64	11.78 ***		
PP&E	1,869.88	1,526.98	4,909.72	6.61 ***		
Long-term debt	1,596.73	873.18	3,350.83	8.61 ***		
Capital expenditure	466.12	169.37	448.39	6.74 ***		
Net income	401.63	204.80	821.76	10.20 ***		
Performance						
Return on assets	0.0520	0.0338	0.0266	-1.81 *		
Return on equity	0.1520	0.1224	0.0954	-2.54 ***		
Market-to-book	3.43	3.52	3.15	-3.26 ***		
Leverage						
Leverage (book)	0.59	0.64	0.63	-1.81 *		
Leverage (market)	0.44	0.49	0.47	-1.58		
Quick ratio	2.00	2.04	2.33	3.01 ***		
Current ratio	2.52	2.54	2.70	1.60		

Table 3 - Rhodes-Kropf et al. (2005) Results Replication

Table 3 replicates RRV's (Rhodes-Kropf et al., 2005) main empirical results. Panel A focuses on the probability of a firm participating in the M&A market, Panel B on the probability of the firm being an acquirer conditional on participation, and Panel C on the probability that the M&A deal involves full stock payment for the target. The *RRV* columns contains the results reported by RRV in their Table 9 and the *Ours* columns report results that we obtain using our replication sample. *Baseline* and *Model 3* present results using the log of the market to book (ln(mb)) and RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f RRV$, $m_s RRV$ and $m_b RRV$). The odd columns do not include year fixed-effects while the even columns do. The M&A sample is introduced in Table 1. All regressions are probit models where the dependent variables are indicator variables that equal one if the firm participates in the M&A market in that year (Panel A), if the firm participates as an acquirer (Panel B), and if the method of payment in the acquisition is completely acquirer equity (Panel C); and zero otherwise. *T-statistics* are reported in parentheses below corresponding coefficients. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

Valuation		R	RV		Ours					
Component	Baseli	ne	Mo	Model 3 Baselin		eline	Мо	odel 3		
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)		
ln(mb)	0.0880***	-0.0340			0.0832***	0.0420***				
	(15.95)	(-1.19)			(14.12)	(6.75)				
m_f_RRV			0.2090***	0.2060***			0.2011***	0.2007***		
			(24.13)	(4.02)			(20.30)	(20.46)		
m_s_RRV			0.7220***	-0.2330**			0.4261***	-0.0201		
			(28.38)	(-1.90)			(17.34)	(-0.61)		
m_b_RRV			-0.0830***	-0.1250***			-0.1013***	-0.0924***		
			(-10.59)	(-3.28)			(11.23)	(-10.09)		
Year FE	No	Yes	No	Yes	No	Yes	No	Yes		

Panel A - M&A Market Participation

Valuation	RRV O					irs		
Component	Basel	Baseline		el 3	3 Base		Moo	del 3
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ln(mb)	0.0970***	-			0.1736***	0.2095***		
	(6.86)	-			(8.09)	(9.03)		
m_f_RRV			0.3790***	-			0.5035***	0.5093***
			(18.00)	-			(13.61)	(13.73)
m_s_RRV			0.4910***	-			-0.0784	0.0996
			(8.39)	-			(1.14)	(1.08)
m_b_RRV			-0.0229***	-			-0.0810**	-0.0766**
			(-11.27)	-			(2.37)	(-2.23)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes

Panel B - Acquirer Status

Panel C - Full Stock Payment

Valuation		RI	RV			Ο	urs	
Component	Bas	seline	Mo	del 3	Base	eline	Moo	del 3
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ln(mb)	0.2320***	0.1790***			0.2341***	0.1945***		
	(14.35)	(10.11)			(8.79)	(6.85)		
m_f_RRV			0.1460***	0.1160***			0.2407***	0.2333***
			(6.33)	(5.02)			(5.82)	(5.57)
m_s_RRV			0.6430***	0.3730***			0.4554***	0.2447**
			(10.53)	(5.70)			(5.54)	(2.17)
m_b_RRV			0.2360***	0.2190***			0.1501***	0.1443***
			(10.87)	(9.92)			(3.59)	(3.40)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes

Table 4 - Post-Pooling Period Results

Table 4 displays results obtained estimating the same models as in Table 3, but using our sample from the postpooling period (July 2001 to 2015). Panel A focuses on the probability of a firm participating in the M&A market, Panel B on the probability of the firm being an acquirer conditional on participation, and Panel C on the probability that the M&A deal involves full stock payment for the target. *Baseline* and *Model 3* present results using the log of the market to book (ln(mb)) and RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f RRV$, $m_s RRV$ and $m_b RRV$). The odd columns do not include year fixedeffects while the even columns do. The M&A sample is introduced in Table 1, and all regressions are probit models. *T-statistics* are reported in parentheses below corresponding coefficients. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

Valuation	Post-Pooling							
Component	Base	eline	Model 3					
	(1)	(2)	(3)	(4)				
ln(mb)	0.0496***	0.0414***						
	(6.20)	(4.90)						
m_f_RRV			0.1253***	0.1274***				
			(10.53)	(10.56)				
m_s_RRV			0.2407***	0.2149***				
			(6.70)	(4.74)				
m_b_RRV			-0.0568***	-0.0653***				
			(4.66)	(-5.16)				
Year FE	No	Yes	No	Yes				

Panel A - M&A Market Participation

I unter B meg									
Valuation	Post-Pooling								
Component	Bas	eline	Moo	del 3					
	(1)	(2)	(3)	(4)					
ln(mb)	0.1611***	0.1632***							
	(5.14)	(5.04)							
m_f_RRV			0.3010***	0.2981***					
			(6.82)	(6.72)					
m_s_RRV			0.5834***	0.8219***					
			(5.39)	(6.10)					
m_b_RRV			-0.0546	-0.0431					
			(1.21)	(-0.94)					
Year FE	No	Yes	No	Yes					

Panel B - Acquirer Status

Panel C - Full Stock Payment

Valuation	Post-Pooling								
Component	Base	eline	Mod	Model 3					
	(1)	(2)	(3)	(4)					
ln(mb)	-0.1481***	-0.1453***							
	(3.04)	(-2.93)							
m_f_RRV			-0.0256	-0.0260					
			(0.40)	(-0.40)					
m_s_RRV			-0.5530***	-0.5627**					
			(3.13)	(-2.57)					
m_b_RRV			-0.2107***	-0.2265***					
			(3.18)	(-3.37)					
Year FE	No	Yes	No	Yes					

Table 5 – Multinomial model: Mixed payment versus All-Stock Pooling versus All-Stock Purchase

Table 5 displays results obtained estimating a multinomial logit regression for the choice of payment by using our sample from the pooling period (before July 2001). The outcomes are mixed method of payment (base outcome), full stock method of payment with pooling accounting, and full stock method of payment with purchase accounting. *Baseline* and *Model 3* present results using the log of the market to book (ln(mb)) and RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f RRV$, $m_s RRV$ and $m_b RRV$). The odd columns do not include year fixed-effects while the even columns do. The M&A sample is introduced in Table 1. *T-statistics* are reported in parentheses below corresponding coefficients. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

	Mixed p	ayment vs under	full stock	payment	Mixed p	payment		
Valuation	Pooling period Pooling period						g period	
Component	Bas	eline	Mo	del 3	Bas	eline	Moo	lel 3
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
ln(mb)	0.5858***	0.4421***			0.2009***	0.2319***		
	(11.60)	(7.76)			(3.74)	(4.22)		
m_f_RRV			0.7024***	0.7212***			0.1261	0.1339
			(8.70)	(8.25)			(1.51)	(1.60)
m_s_RRV			1.5153***	0.4537*			0.0857	0.4063*
			(9.92)	(1.89)			(0.48)	(1.94)
m_b_RRV			0.1728**	0.1598*			0.2930***	0.2771***
			(2.08)	(1.86)			(3.63)	(3.35)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes

Table 6 – International Evidence

Table 6 displays results obtained estimating the same models as in Table 3, Panel C but using a sample of international deals from the 1990-2015 period. Panel A using a European sample, Panel B an Australian sample, and both focus on the probability that the M&A deal involves full-stock payment for the target (as in Table 3, Panel C). *Baseline* and *Model 3* present results using the log of the market to book (ln(mb)) and RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f RRV$, $m_s RRV$ and $m_b RRV$). The odd columns do not include year fixed-effects while the even columns do. All regressions are probit models similar to those in Table 3, Panel C. *T-statistics* are reported in parentheses below corresponding coefficients. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

Valuation		All European	n countries		Only UK				European countries without UK			
Component	Bas	eline	Moo	del 3	Base	line	Moo	del 3	Base	eline	Mod	el 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ln(mb)	-0.1419***	-0.1359***			-0.1477***	-0.1285**			-0.1219*	-0.1413*		
	(3.32)	(-3.12)			(-2.72)	(-2.33)			(-1.70)	(-1.81)		
m_f_RRV			-0.1235**	-0.1383**			-0.2052***	-0.2374***			-0.0428	-0.0467
			(2.17)	(-2.41)			(-2.74)	(-3.07)			(-0.45)	(-0.46)
m_s_RRV			-0.0044	0.2093			-0.2056	0.1472			0.1823	0.2996
			(0.04)	(1.43)			(-1.22)	(0.75)			(1.04)	(1.28)
m_b_RRV			-0.1512**	-0.1338**			-0.0071	0.0285			-0.2395***	-0.2378**
			(2.56)	(-2.17)			(-0.08)	(0.33)			(-2.63)	(-2.43)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Ν	1,840	1,840	1,824	1,824	1,023	1,023	1,014	1,014	817	798	810	791

Panel A – European sample

Panel B – Australian sample

Valuation		Au	stralia					
Component	Base	line	Model	Model 3				
	(1)	(2)	(3)	(4)				
ln(mb)	-0.1162*	-0.0853						
	(1.67)	(-1.15)						
m_f_RRV			-0.0746	-0.0715				
			(0.87)	(-0.81)				
m_s_RRV			-0.3411***	-0.2076				
			(2.72)	(-1.60)				
m_b_RRV			-0.0922	-0.0514				
			(0.92)	(-0.47)				
Year FE	No	Yes	No	Yes				
Ν	611	601	594	584				

Table 7 – Extended M&A Sample: Descriptive Statistics

Table 7 introduces the extended M&A sample used to study the determinants of full-stock payment. M&A transactions are collected from the SDC database. Selection criteria are as follows: bidder status is public, bids are identified using "Merger" transaction form in SDC, necessary information must be available in both CRSP and Compustat databases, firms are required to have non-zero total assets and book-to-market below 100, and the relative deal size must be above one percent (of the bidder's total assets). The sample includes both successful and unsuccessful bids and financial industries are excluded (SIC codes 6000 to 6999). *Acquirer* is the number of acquirers by year, *Deal Size* is the average deal value in US\$ millions as reported in the SDC database, *Public Target* is the number of listed targets, and *All Stock* and *All Cash* are the number of transactions fully paid in stock or cash (respectively).

Year		Acquirer	Deal Size	Public Target	All Stock	All Cash
		(1)	(2)	(3)	(4)	(5)
	1990	53	222	29	25	14
	1991	86	106	30	35	17
	1992	113	106	29	60	24
	1993	150	259	48	66	26
	1994	212	257	79	110	43
	1995	276	276	101	162	49
	1996	285	465	124	164	44
	1997	304	376	133	159	59
	1998	354	946	173	177	74
	1999	340	1,398	164	179	64
	2000	299	1,837	119	157	60
	2001	160	895	94	59	45
	2002	136	752	66	34	47
	2003	146	421	71	30	57
	2004	168	761	64	28	85
	2005	174	1,676	76	19	87
	2006	152	1,420	65	25	79
	2007	164	881	71	14	92
	2008	100	748	38	10	52
	2009	75	3,166	37	14	36
	2010	95	1,027	45	7	67
	2011	73	1,871	26	6	48
	2012	98	788	39	7	62
	2013	74	838	30	5	51
	2014	43	1,546	19	4	27
	2015	56	2,810	25	1	38
Total		4,186	909	1,795	1,557	1,347

Table 8 - Extended M&A Sample: Acquirers' Descriptive Statistics

Table 8 reports a set of descriptive statistics for a list of potential determinants of full-stock payment for the M&A sample introduced in Table 7. Columns (1) to (3) contain descriptive statistics for the whole period (1990 to 2015), columns (4) to (6) for the pooling period (1990 to end of June 2001), and columns (7) to (9) for the post-pooling period (July 2001 to 2015). *Mean* is the arithmetic average, *Median* the corresponding median, and *N* is the number of observations. A test of difference of means between the pooling period (1990 to June 2001) and the post-pooling period (July 2001 to 2015) is provided in column (10), with corresponding *T-statistic* in column (11). All variables are defined in Appendix 1. Ratios are winsorized at 1% in each tail to control for outliers. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

		All		Ро	oling Period		Post-Pooling Period				
	Mean	Median	Ν	Mean	Median	Ν	Mean	Median	Ν	(4) - (7)	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
All Stock	0.3720	0.0000	4,186	0.5191	1.0000	2,568	0.1384	0.0000	1,618	0.3806	29.11 ***
Market/book	5.0174	3.0265	4,186	5.9147	3.4218	2,568	3.5933	2.5795	1,618	2.3213	13.48 ***
m_f_RRV	0.1990	0.1349	4,186	0.2648	0.2018	2,568	0.0945	0.0461	1,618	0.1703	7.72 ***
m_s_RRV	0.0665	0.0592	4,186	0.0792	0.0592	2,568	0.0465	0.0593	1,618	0.0327	4.68 ***
m_b_RRV	0.9311	0.9766	4,186	0.9893	1.0239	2,568	0.8388	0.8870	1,618	0.1506	8.83 ***
Bidder Size	3,944	431	4,186	2,128	274	2,568	6,826	809	1,618	-4,698	-8.79 ***
Relative Size	0.5611	0.2175	4,186	0.6469	0.2520	2,568	0.4248	0.1774	1,618	0.2221	7.87 ***
Leverage	0.1832	0.1473	4,186	0.1879	0.1513	2,568	0.1759	0.1451	1,618	0.0120	2.13 **
Cash Holding	0.1359	0.0854	4,186	0.1265	0.0720	2,568	0.1508	0.1027	1,618	-0.0242	-5.21 ***
Dividend	0.3662	0.0000	4,186	0.3723	0.0000	2,568	0.3566	0.0000	1,618	0.0157	1.03
R&D	0.0545	0.0105	4,186	0.0541	0.0037	2,568	0.0552	0.0193	1,618	-0.0010	-0.37
Tangibility	0.4111	0.2997	4,186	0.4232	0.3106	2,568	0.3919	0.2756	1,618	0.0313	2.84 ***
Opertional Efficiency	2.1842	1.5651	4,186	2.2501	1.5732	2,568	2.0797	1.5546	1,618	0.1704	0.72
Cash-only Seller	0.1049	0.0000	4,186	0.0868	0.0000	2,568	0.1335	0.0000	1,618	-0.0467	-4.61 ***
Public Target	0.4288	0.0000	4,186	0.4225	0.0000	2,568	0.4388	0.0000	1,618	-0.0163	-1.04
Private-buyer Competition	0.5615	0.5724	4,186	0.5357	0.5313	2,568	0.6025	0.6047	1,618	-0.0668	-15.27 ***
M&A Waves	0.2153	-0.1989	4,186	0.5094	0.1466	2,568	0.2516	-0.4596	1,618	0.2578	25.85 ***
Horizontal deal	0.3696	0.0000	4,186	0.3466	0.0000	2,568	0.4061	0.0000	1,618	-0.0595	-3.86 ***

Table 8 (continued)

	All			Pooling Period			Post-Pooling Period				
	Mean	Median	Ν	Mean	Median	Ν	Mean	Median	Ν	(4) - (7)	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
SA_index	3.4098	-3.3569	4,186	3.2950	-3.2369	2,568	3.5919	-3.5169	1,618	-0.2970	14.41 ***
Marginal tax rate	0.2710	0.3276	4,186	0.2825	0.3310	2,568	0.2529	0.3150	1,618	0.0297	8.60 ***
Bidder Run_up	1.2656	1.0558	4,186	1.3322	1.0764	2,568	1.1600	1.0342	1,618	0.1722	6.14 ***
Frequent Bidder	0.1216	0.0000	4,186	0.1382	0.0000	2,568	0.0952	0.0000	1,618	0.0431	4.31 ***
Negociation	0.4758	0.0000	1,032	0.5815	1.0000	552	0.3542	0.0000	480	0.2274	7.50 ***
Target initiation	0.3353	0.0000	1,032	0.3370	0.0000	552	0.3333	0.0000	480	0.0036	0.12

Table 9 – Extended M&A Sample: Probability of Full-Stock Payment Analysis

Table 9 displays the results of probit regressions explaining the probability of full-stock payment using the M&A sample introduced in Table 7. The dependent variable in all columns is an indicator variable equal to one if the deal is completely paid for using acquirer stock, and zero otherwise (all-cash and mixed deals). Columns (1), (4), and (7) are for the whole period (1990 to 2015), columns (2), (5), and (8) for the pooling period (1990 to end of June 2001), and columns (3), (6), and (9) for the post-pooling period (July 2001 to 2015). Columns (1) to (3) use the logarithm of market-to-book as valuation measure, columns (4) to (6) the RRV (Rhodes-Kropf et al., 2005) firm specific component of over-valuation ($m_f _ RRV$), and columns (7) to (9) the RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f _ RRV$, $m_s_ RRV$ and $m_b_ RRV$). *Pseudo-R²* corresponds to the pseudo R-squared of the probit model. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

			Post-			Post-			Post-
	All	Pooling	Pooling	All	Pooling	Pooling	All	Pooling	Pooling
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(mb)	0.2130***	0.2857***	-0.0523						
	(7.12)	(7.90)	(-0.88)						
m_f_RRV				0.2475***	0.2859***	0.0615	0.2677***	0.2917***	0.0763
				(6.55)	(6.27)	(0.83)	(6.86)	(6.17)	(1.03)
m_s_RR							0.4404***	0.2648	-0.1345
							(3.29)	(1.61)	(-0.48)
m_b_RRV							0.1063**	0.2760***	-0.2753***
							(2.03)	(4.30)	(-2.77)
Bidder Size	0.0000	0.0128	-0.0482	-0.0092	0.0055	-0.0508	-0.0136	0.0119	-0.0606
	(0.00)	(0.44)	(-1.10)	(0.40)	(0.19)	(-1.16)	(0.58)	(0.40)	(-1.35)
Relative Size	0.0466*	-0.0006	0.2655***	0.0583**	0.0137	0.2511***	0.0500*	-0.0005	0.2798***
	(1.77)	(-0.02)	(4.12)	(2.22)	(0.49)	(3.92)	(1.89)	(-0.02)	(4.32)
Leverage	-0.6115***	-0.8453***	0.2766	-0.8130***	-1.1126***	0.0945	-0.7369***	-0.8620***	-0.0450
	(3.95)	(-4.58)	(0.89)	(5.02)	(-5.80)	(0.29)	(4.47)	(-4.37)	(-0.14)
Cash Holding	-0.3255*	-0.2500	-0.3952	-0.2576	-0.1629	-0.4522	-0.3004	-0.2469	-0.3354
	(1.76)	(-1.06)	(-1.20)	(1.39)	(-0.69)	(-1.38)	(1.61)	(-1.04)	(-1.02)
Dividend	-0.1414**	-0.2025***	-0.0212	-0.1237**	-0.1822***	-0.0301	-0.1329**	-0.2021***	-0.0037
	(2.47)	(-3.00)	(-0.19)	(2.17)	(-2.70)	(-0.26)	(2.32)	(-2.98)	(-0.03)
R&D	2.0236***	1.9474***	2.1670***	2.1455***	2.1491***	2.0154***	2.0584***	1.9546***	2.2007***
	(5.90)	(4.47)	(3.61)	(6.28)	(4.89)	(3.43)	(5.97)	(4.47)	(3.72)

Table 9 (continued)

			Post-			Post-			Post-
	All	Pooling	Pooling	All	Pooling	Pooling	All	Pooling	Pooling
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Tangibility	-0.2523***	-0.2960***	-0.1186	-0.2274**	-0.2760**	-0.1301	-0.2362**	-0.2943***	-0.0795
	(2.65)	(-2.67)	(-0.65)	(2.40)	(-2.52)	(-0.72)	(2.48)	(-2.65)	(-0.44)
Operational Efficiency	-0.0015	0.0120*	-0.0083*	-0.0021	0.0111	-0.0086**	-0.0014	0.0119*	-0.0086*
	(0.40)	(1.66)	(-1.86)	(0.55)	(1.60)	(-1.98)	(0.38)	(1.64)	(-1.92)
Cash Only Seller	-0.3038***	-0.4302***	0.0437	-0.3137***	-0.4530***	0.0580	-0.3117***	-0.4300***	0.0456
	(3.47)	(-4.14)	(0.28)	(3.59)	(-4.39)	(0.37)	(3.56)	(-4.14)	(0.30)
Public Target	0.0915*	-0.0360	0.5121***	0.0776	-0.0576	0.5214***	0.0915*	-0.0360	0.4966***
	(1.69)	(-0.55)	(4.68)	(1.44)	(-0.88)	(4.76)	(1.69)	(-0.55)	(4.54)
Private-buyer Competition	-0.1313	-0.0521	1.0071*	-0.2018	-0.1288	1.0095*	-0.1068	-0.0590	0.9807*
	(0.62)	(-0.22)	(1.83)	(0.96)	(-0.53)	(1.84)	(0.50)	(-0.24)	(1.79)
M&A Waves	-0.0079	-0.0204	0.0651	-0.0060	-0.0167	0.0632	-0.0080	-0.0204	0.0730
	(0.31)	(-0.72)	(0.81)	(0.24)	(-0.59)	(0.78)	(0.32)	(-0.72)	(0.90)
Horizontal deal	-0.0964**	-0.0699	-0.0989	-0.1083**	-0.0865	-0.1034	-0.0979**	-0.0706	-0.1114
	(2.00)	(-1.20)	(-0.99)	(2.25)	(-1.49)	(-1.03)	(2.03)	(-1.21)	(-1.11)
Size-age index	0.0909	0.0156	0.2222*	0.1124*	0.0443	0.2274*	0.0976	0.0160	0.2586**
	(1.37)	(0.19)	(1.71)	(1.70)	(0.56)	(1.74)	(1.47)	(0.20)	(1.98)
Marginal tax rate	-0.4718*	0.1451	-1.9634***	-0.3832	0.1260	-2.0352***	-0.4528	0.1469	-1.8388***
	(1.66)	(0.39)	(-4.21)	(1.36)	(0.34)	(-4.41)	(1.59)	(0.39)	(-3.93)
Run-up bidder	0.0872***	0.0947***	0.0391	0.0908***	0.1062***	0.0330	0.0786***	0.0948***	0.0296
	(3.18)	(3.08)	(0.75)	(3.24)	(3.40)	(0.62)	(2.86)	(3.06)	(0.56)
Frequent bidder	0.1540**	0.1636*	0.1936	0.1757**	0.2018**	0.1832	0.1565**	0.1643*	0.2042
	(2.18)	(1.91)	(1.25)	(2.48)	(2.36)	(1.18)	(2.21)	(1.92)	(1.30)
Industry FE	Yes								
Year FE	Yes								
pseudo R ²	0.2260	0.1430	0.2000	0.2240	0.1360	0.2000	0.2270	0.1430	0.2060
Ν	4172	2556	1551	4172	2556	1551	4172	2556	1551

Table 10 - Extended M&A Sample: Tobit analysis of the fraction of stock payment

Table 10 displays the results of tobit regressions explaining the fraction of stock in the deal payment using the M&A sample introduced in Table 7. Columns (1), (4), and (7) are for the whole period (1990 to 2015), columns (2), (5), and (8) for the pooling period (1990 to end of June 2001), and columns (3), (6), and (9) for the post-pooling period (July 2001 to 2015). Columns (1) to (3) use the logarithm of market-to-book as valuation measure, columns (4) to (6) the RRV (Rhodes-Kropf et al., 2005) firm-specific misvaluation component ($m_f RRV$), and columns (7) to (9) use the RRV model 3 market-to-book decomposition (see Equation 15 and Appendix 1 in RRV for definitions of $m_f RRV$, $m_s RRV$ and $m_b RRV$). Pseudo- R^2 corresponds to the pseudo R-squared of the Tobit model. *,**, or *** indicates statistical significance at the 10%, 5%, or 1% confidence level (respectively).

	All	Pooling	Post-Pooling	All	Pooling	Post-Pooling	All	Pooling	Post-Pooling
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(mb)	0.2288***	0.3660***	-0.0483						
	(7.45)	(8.14)	(-1.27)						
m_f_RRV				0.3040***	0.3989***	0.0665	0.3390***	0.4217***	0.0684
				(7.72)	(6.79)	(1.40)	(8.37)	(6.98)	(1.42)
m_s_RR							0.6025***	0.5451***	-0.1678
							(4.34)	(2.64)	(-0.89)
m_b_RRV							0.0241	0.2599***	-0.2443***
							(0.46)	(3.42)	(-3.79)
Bidder Size	0.0159	0.0647*	-0.0487*	0.0024	0.0497	-0.0529**	-0.0096	0.0474	-0.0602**
	(0.70)	(1.85)	(-1.83)	(0.11)	(1.40)	(-1.97)	(0.41)	(1.29)	(-2.23)
Relative Size	0.1727***	0.0830**	0.4175***	0.1878***	0.1053***	0.4006***	0.1820***	0.0866**	0.4288***
	(5.36)	(2.38)	(6.75)	(5.82)	(2.98)	(6.56)	(5.60)	(2.48)	(6.95)
Leverage	-0.6045***	-1.0408***	0.2845	-0.8591***	-1.4210***	0.1116	-0.8686***	-1.1587***	0.0108
	(3.84)	(-4.61)	(1.40)	(5.23)	(-6.01)	(0.53)	(5.19)	(-4.83)	(0.05)
Cash Holding	-0.2196	-0.2599	-0.0189	-0.1522	-0.1349	-0.0820	-0.1794	-0.2419	0.0140
	(1.18)	(-0.90)	(-0.09)	(0.82)	(-0.46)	(-0.39)	(0.96)	(-0.83)	(0.07)
Dividend	-0.1338**	-0.2115**	0.0009	-0.1161**	-0.1910**	-0.0039	-0.1165**	-0.2030**	0.0205
	(2.31)	(-2.56)	(0.01)	(2.01)	(-2.29)	(-0.05)	(2.01)	(-2.45)	(0.28)
R&D	2.2123***	2.5879***	1.5048***	2.3318***	2.8683***	1.3332***	2.2653***	2.6262***	1.5094***
	(5.91)	(4.59)	(3.43)	(6.28)	(4.98)	(3.13)	(6.07)	(4.61)	(3.53)

Table 10 (continued)

	All	Pooling	Post-Pooling	All	Pooling	Post-Pooling	All	Pooling	Post-Pooling
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Tangibility	-0.1787*	-0.3212**	-0.0697	-0.1476	-0.2825**	-0.0751	-0.1483	-0.3038**	-0.0344
	(1.90)	(-2.41)	(-0.59)	(1.58)	(-2.11)	(-0.64)	(1.58)	(-2.26)	(-0.29)
Operational Efficiency	-0.0016	0.0112	-0.0034	-0.0022	0.0103	-0.0038	-0.0016	0.0113	-0.0038
	(0.53)	(1.40)	(-1.32)	(0.72)	(1.33)	(-1.46)	(0.52)	(1.40)	(-1.48)
Cash-only Seller	-0.4363***	-0.6418***	-0.1927**	-0.4398***	-0.6683***	-0.1810*	-0.4470***	-0.6473***	-0.1900**
	(5.36)	(-5.42)	(-2.04)	(5.40)	(-5.62)	(-1.91)	(5.50)	(-5.47)	(-2.02)
Public Target	0.0238	-0.1884**	0.3093***	0.0172	-0.2095**	0.3192***	0.0237	-0.1836**	0.3020***
	(0.42)	(-2.29)	(4.28)	(0.30)	(-2.55)	(4.41)	(0.42)	(-2.24)	(4.21)
Private-buyer Competition	-0.2383	-0.0666	0.3244	-0.3115	-0.1583	0.3209	-0.1935	-0.0544	0.2999
	(1.09)	(-0.23)	(0.94)	(1.42)	(-0.54)	(0.93)	(0.88)	(-0.18)	(0.87)
M&A Waves	0.0185	0.0003	0.0425	0.0214	0.0071	0.0430	0.0191	0.0013	0.0469
	(0.71)	(0.01)	(0.93)	(0.82)	(0.21)	(0.94)	(0.73)	(0.04)	(1.03)
Horizontal deal	0.0257	0.0459	0.0640	0.0124	0.0205	0.0624	0.0223	0.0416	0.0565
	(0.52)	(0.64)	(1.04)	(0.25)	(0.29)	(1.01)	(0.45)	(0.58)	(0.92)
Size-age index	0.1693**	0.1483	0.1570*	0.1909***	0.1807*	0.1596*	0.1840***	0.1473	0.1799**
	(2.55)	(1.53)	(1.93)	(2.89)	(1.86)	(1.95)	(2.79)	(1.52)	(2.21)
Marginal tax rate	-1.0571***	-0.2441	-1.9281***	-0.9099***	-0.1982	-1.9894***	-0.9883***	-0.2164	-1.7750***
	(3.82)	(-0.56)	(-5.95)	(3.32)	(-0.46)	(-6.21)	(3.57)	(-0.50)	(-5.50)
Run-up bidder	0.1340***	0.1623***	0.0495	0.1344***	0.1753***	0.0423	0.1177***	0.1535***	0.0410
	(4.10)	(4.04)	(1.48)	(4.00)	(4.27)	(1.28)	(3.62)	(3.84)	(1.16)
Frequent bidder	0.1306*	0.1758	0.0865	0.1476*	0.2221**	0.0766	0.1370*	0.1795*	0.0929
	(1.67)	(1.61)	(0.81)	(1.89)	(2.02)	(0.72)	(1.77)	(1.65)	(0.87)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
pseudo R ²	0.1720	0.1200	0.1710	0.1730	0.1160	0.1710	0.1750	0.1210	0.1770
Ν	4186	2568	1618	4186	2568	1618	4186	2568	1618

Variable	Definition	Source
All Stock	Indicator variable =1 in case of full stock payment, 0 otherwise	SDC
Bidder Size	Logarithm of Book value of total assets (Compustat item AT)	Compustat
Book Assets	Book value of total assets (Compustat item AT): US\$ million	Compustat
Book Equity	Book value of equity (Compustat item CEQ): US\$ million	Compustat
Capital Expenditure	Capital expenditure (Compustat item CAPX: US\$ million	Compustat
Cash Holding	Cash (Compustat item CH) / Book value of total assets (Compustat item AT)	Compustat
Cash-only Seller	Indicator variable =1 if the target is a financial sponsor or a subsidiary	SDC
Current Ratio	Current assets (Compustat item ACT) / Current Liabilities (Compustat item LCT)	Compustat
Dividend	Indicator variable=1 if total dividend (Compustat item DVT) greater than zero	Compustat
Frequent bidder	Indicator variable =1 in case of the bidder made five or more deals within the previous three year period, 0 otherwise	SDC
Horizontal deal	Indicator variable =1 in case of SIC 4 digits code of the acquirer and the target are equal, 0 otherwise	SDC
Leverage	Total debt (Computat item DLTT + Compustat item DLC) / Book value of total assets (Compustat item AT)	Compustat
Leverage (book)	1- (Book equity (Compustat item CEQ) / Book value of total assets (Compustat item AT))	Compustat
Leverage (market)	1- (Market equity / Market value (assets))	Compustat
Ln(mb)	Logarithm of Market-to-book	Compustat
Long-term Debt	Long-Term Debt (Compustat item DLTT): US\$ million	Compustat
Marginal tax rate	Bidder marginal tax rate computed with the method developed in Blouin et al. (2010)	Compustat & John Graham website
Market Equity	Price (Compustat item PRCC_F) * Shares outstanding (Compustat item CSHO): US\$ million	Compustat
Market Value (assets)	Market equity + Book value of total assets (Compustat item AT) - Book equity (Compustat item CEQ) - Deferred taxes (Compustat item TXDB): US\$ million	CRSP,Compustat
Market-to-book	Market equity / Book equity (Compustat item CEQ)	Compustat
M&A Waves	Aggregate value of mergers scaled by aggregate total assets in the bidder's FF49 industry and year	CRSP,SDC
m_b_RRV	Long-run value to book (RRV (2006) decomposition)	CRSP,SDC
m_f_{RRV}	Firm specific error (RRV(2006) decomposition)	CRSP,SDC
m_s_RRV	Time series sector error (RRV (2006) decomposition	CRSP,SDC
Net income	Net income (Compustat Item NI): US\$ million	Compustat
Operational efficiency	(Cost of goods sold (Compustat item COGS) + Selling, general, and administrative expenses (Compustat item XSGA)) / (Property, plant, and equipment (Compustat item PPEGT) + Current assets (Compustat item ACT) - Cash (Compustat item CSH) - Current liabilities (Compustat item LCT))	Compustat
PP&E	Property, plant, and equipment (Compustat item PPEGT): US\$ million	Compustat
Private-buyer Competition	Fraction of all deals in the target's FF49 industry and year in which the bidder is private	SDC
Public Target	Indicator variable=1 if target listing status is public, 0 otherwise	SDC
Quick Ratio	Current assets (Compustat item ACT) - Inventories (Compustat item INVT) / Current liabilities (Compustat item LCT)	Compustat
Run-up bidder	Buy-and-hold return (BHR) of bidder divided by the BHR of the value weighted index computed during the [-210,-10] days window relative to announcement date	CRSP
Relative Size	Deal value / Book value of total assets (Compustat item AT)	Compustat,SDC
R&D	R&D expense (Compustat item XRD) / Book value of total assets (Compustat item AT)	Compustat
Return On Assets	Net income (Compustat item NI) / Book value of total assets (Compustat item AT)	Compustat
Return On equity	Net income (Compustat item NI) / Book equity (Compustat item CEQ)	Compustat
Size-age index	Size/age based financial constraint measure (Hadlock and Pierce, 2010)	CRSP

Appendix 1 - Variables Definitions

Legend: SDC: Thomson SDC M&A database; CRSP: Center for Reseach in Security Prices database ; Compustat: Fundamental Annual database

Appendix 2	- Conditional	Regression	Multiples
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Sample		Fama a	nd Fren	ich indu	stry clas	ssificatio	on						
	Parameters	1	2	3	4	5	6	7	8	9	10	11	12
	Alpha0	2.39	2.56	2.20	2.35	2.38	2.55	2.91	2.15	2.44	2.68	2.21	2.60
		0.04	0.11	0.05	0.06	0.11	0.05	0.10	0.13	0.05	0.04	0.04	0.05
	Alpha1	0.64	0.56	0.64	0.66	0.64	0.59	0.60	0.85	0.62	0.61	0.58	0.60
		0.01	0.02	0.01	0.02	0.05	0.02	0.03	0.03	0.01	0.02	0.01	0.01
>	Alpha2	0.27	0.30	0.27	0.23	0.31	0.29	0.26	0.12	0.28	0.26	0.30	0.25
RRV		0.01	0.02	0.01	0.02	0.04	0.01	0.04	0.03	0.01	0.01	0.01	0.01
	Alpha3	0.08	0.05	0.10	0.00	0.13	-0.03	0.27	0.17	0.01	-0.09	-0.16	0.00
		0.03	0.06	0.03	0.04	0.06	0.04	0.05	0.04	0.04	0.05	0.05	0.04
	Alpha4	-2.59	-2.36	-2.09	-2.13	-2.43	-2.55	-2.27	-2.52	-2.11	-2.42	-1.06	-2.15
		0.05	0.09	0.07	0.15	0.19	0.11	0.18	0.23	0.06	0.10	0.05	0.09
	R-square	0.84	0.80	0.86	0.88	0.90	0.83	0.87	0.94	0.86	0.85	0.82	0.80
	Alpha0	2.03	1.97	2.05	2.10	2.30	2.46	2.85	1.75	2.39	2.70	2.02	2.39
		0.05	0.08	0.04	0.08	0.08	0.05	0.07	0.07	0.03	0.06	0.06	0.04
	Alpha1	0.64	0.63	0.64	0.65	0.59	0.57	0.56	0.87	0.59	0.54	0.62	0.61
		0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.02	0.02	0.01
s	Alpha2	0.35	0.33	0.30	0.29	0.36	0.35	0.32	0.11	0.33	0.37	0.33	0.31
Our		0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	Alpha3	-0.08	-0.04	-0.05	-0.08	-0.08	-0.13	0.02	0.03	-0.13	-0.17	-0.16	-0.10
		0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01
	Alpha4	-1.81	-1.49	-1.63	-1.38	-1.66	-2.07	-1.79	-1.90	-1.83	-1.93	-1.00	-1.73
		0.05	0.05	0.06	0.07	0.10	0.13	0.10	0.11	0.05	0.10	0.04	0.05
	R-square	0.90	0.91	0.89	0.90	0.92	0.85	0.89	0.97	0.88	0.86	0.89	0.84

Sample	Valuation	n All				M&A			All Cash			All Stock			
	Component	Non M&As	M&As	t(diff)	Target	Acquirer	t(diff)	Target	Acquirer	t(diff)		Target	Acquirer	t(diff)	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(10)	(11)	(12)	
	ln(mb)	0.59	0.76	-15.81 **	** 0.69	0.83	-6.95 ***	• 0.61	0.79	-5.13	***	0.87	1.12	-6.97	***
22	m_f_RRV	-0.01	0.18	-25.21 **	** 0.03	0.32	-20.21 ***	· -0.08	0.29	-15.01	***	0.05	0.44	-16.09	***
RI	m_s_RRV	0.03	0.10	-24.20 **	** 0.07	0.12	-8.73 ***	• 0.06	0.14	-8.40	***	0.12	0.17	-5.21	***
	m b RRV	0.57	0.48	10.69 **	** 0.58	0.39	12.52 ***	° 0.62	0.37	9.97	***	0.71	0.51	6.94	***
	ln(mb)	0.64	0.79	-13.41 **	** 0.68	0.87	-8.74 ***	• 0.53	0.78	-6.43	***	0.82	1.00	-5.30	***
urs	m_f_RRV	-0.01	0.14	-20.28 **	** -0.01	0.24	-16.51 ***	· -0.10	0.18	-10.45	***	0.03	0.29	-12.21	***
Ô	m_s_RRV	0.01	0.08	-20.01 **	** 0.07	0.09	-2.64 ***	• 0.06	0.09	-2.80	***	0.09	0.11	-1.67	*
	m_b_RRV	0.64	0.57	8.68 **	** 0.61	0.55	4.48 ***	° 0.57	0.51	2.16	**	0.70	0.60	4.62	***

Appendix 3 - I	Decomposing Market-to-be	ook at the Firm Level	in the Pooling Period