Financial Constraints, Ownership Dilution, and the Method of Payment in M&A Transactions

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Abstract

The method of payment choice in merger and acquisition (M&A) transactions has been the subject of much research in the finance literature. But significant changes in the economic environment of acquirers in the U.S. call into question whether known stylized facts are still valid and motivate us to undertake new empirical analyses. Using a large sample of M&A transactions spanning the last two decades, we investigate the financial constraints versus ownership dilution tradeoff that potentially drives negotiations about the method of payment (i.e., stock or cash), controlling for an extensive list of other potential determinants. The main takeaway from our analyses is that financial constraints are a dominant factor motivating acquirers to include stock (at least partially) in the method of payment package in M&A transactions in the recent period.

1. Introduction

Mergers and acquisitions (M&As) have played a major role in our modern economies as a resource allocation mechanism for many decades (Andrade et al., 2001; Betton et al., 2008; Alexandridis et al., 2017). One dimension of M&A deals that is particularly scrutinized by the academic community is the composition of the method of payment agreed to by acquirers and targets (Hansen, 1987; Travlos, 1987; Fishman, 1989; Amihud, Lev, and Travlos, 1990; Eckbo, Giammarino, and Heinkel, 1990; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Faccio and Masulis, 2005; and countless other studies[1]). Beyond the potentially significant financial implications of this choice for the merging parties, this issue is also very pertinent for academic research because of the very limited opportunities to develop real experimental research designs in corporate finance. Analysis of the method of payment in M&A transactions offers researchers a chance to test many theories in finance.

Since the beginning of this century, U.S. acquirers operate in a radically new landscape relative to market conditions prior to 2000. The abolishment of "pooling of interests" accounting (hereafter, pooling) in June 2001 by the Financial Accounting Standards Board (FASB) (via FAS 141) has removed one of the main incentives to pay for acquisitions completely in acquirer shares (de Bodt et al., 2018). Simultaneously, the sharp (and sustained) fall in interest rates in the U.S. in the wake of the September 11th, 2001, attacks and the 2008 financial crisis has significantly reduced the cost of raising cash. Finally, the rise in deal activity by private (especially private equity) acquirers has put considerable competitive pressure on acquirers to use cash as a payment medium (see Eckbo et al., 2018, Figure 2). Updating the empirical evidence on the method of payment determinants in M&A transactions is therefore needed, and in this paper we provide such evidence.

In particular, we focus on the tradeoff between acquirer financial constraints (which would favor the use of acquirer stock in acquisitions) versus ownership (or control) dilution, the latter of which would discourage potential acquirers from using their own stock in acquisitions. This tradeoff is likely important in the decision to use stock (at least partially) as the method of payment in acquisitions since other likely motivations are considerably less relevant in recent decades. As noted above, pooling accounting no longer provides a motivation to use acquirer shares in M&A deals and the effect of acquirer stock misvaluation (important in Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) as a

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[1] An extensive literature review of this field is beyond the scope of our work.

leading explanation for the use of stock in M&A transactions) has recently been refuted in Eckbo et al. (2018)[2] and de Bodt et al. (2021).

Faccio and Masulis (2005) provide a first exploration of the interaction between the use of stock in the method of payment and ownership or control dilution, as the use of stock in the method of payment dilutes existing acquirer shareholders. Using a sample of 3,667 M&A transactions from 13 European countries over the period 1997 to 2000, the authors show that control, defined as the ultimate voting stake held by the bidder's largest shareholder, and the percentage of cash in the method of payment are non-linearly related: the incentives to use cash are the strongest in the intermediate range of control in which issuing acquirer stock in an M&A deal could significantly influence the control rights of bidder shareholders. These results are, however, obtained in the European context, which features very specific ownership structures. To the best of our knowledge, those tests and results have not been replicated with U.S. data, especially data from recent decades.

The major alternative to issuing acquirer shares as compensation to target shareholders in an M&A deal is to use cash. But using cash is costly, especially for financial constrained firms. While the literature on financial constraints is abundant, empirical evidence on the effect of financial constraints on the choice of method of payment in M&A transactions remains limited, as noted in Gorbenko and Malenko (2018, p. 3940). Alshwer et al. (2011) report, in an unpublished working paper, that financially constrained bidders are more likely to use stock as a method of payment, likely because the raising of cash is much more expensive for constrained firms. This state of the extant literature motivates us to study whether ownership dilution matters to U.S. acquirers in the post 2001 economic landscape, to what extent financial constraints play a role in the method of payment choice, and whether these two mechanisms interact.

Our investigation starts with a sample of 6,225 control transactions undertaken by 2,335 non-financial publicly traded acquirers extracted from the Thomson SDC (SDC) database over the period 2002 to 2020.[3] We also collect ownership data extracted from the Securities and Exchange Commission's (SEC's) Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database[4] for listed acquirers and targets,

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[2] The main analysis in Eckbo et al., 2018 rests on a simple and intuitive argument: if stocks are used opportunistically by acquirers as a cheap currency to buy targets, the more the merging parties know each other, the less frequently (or intensively) stock should be used for payment in M&A deals, as targets are likely to recognize the opportunistic use of stock if they are very familiar with the acquirer. Their empirical results reject this proposition: acquirer stock is, in fact, *more* likely to be used as a method of payment as familiarity between the acquirer and target increases.

[3] We exclude financial acquirers because the regulatory regime imposed on financial institutions, in particular constraints on equity, generates specific motivations to select a given payment method when undertaking acquisitions (Grullon et al., 1997).

[4] https://www.sec.gov/edgar/searchedgar/webusers.htm

replicating the procedure introduced in Schwartz-Ziv and Volkova (2021).[5] Other data sources include the Compustat and Center for Research in Securities Prices (CRSP) databases, and the Hoberg-Maksimovic Financial Constraints Repository.[6]

The main dependent variable used in our tests is the percentage of stock used in the compensation package agreed to by the target (*%Stock*). We start by investigating whether acquirer financial constraints are significant determinants of the choice of mode of payment. We measure financial constraints using the four indicators examined in Farre-Mensa and Ljungqvist (2016) in addition to a composite indicator proposed by Bartram et al. (2021) and the text-based financial constraints indicator from Hoberg and Maksimovic (2015). We next investigate whether acquirer or target ownership dilution, estimated using hand-collected data from SEC filings 13D and 13G, is a meaningful determinant of the choice of mode of payment, and whether dilution interacts with financial constraints in this important financing choice.

In our tests we control for an extensive list of acquirer, target, transaction, and industry characteristics, identified in the extant academic literature on the method of payment in M&A deals (Travlos, 1987; Martin, 1996; Faccio and Masulis, 2005; Eckbo et al, 2018). Multivariate analyses rest on a linear specification and inferences are based on standard errors that are robust to heteroskedasticity. The principal source of endogeneity to which we are exposed is the omitted variable bias. We try to counteract that concern as much as possible with numerous control variables and industry and year fixed effects. We are also exposed to multi-collinearity issues and therefore report variance inflation factors (VIF) in addition to coefficient estimates and corresponding p-values from our multivariate analyses.

We start by confirming that after 2002 the percentage of stock used in M&A transactions is usually below 30%, in sharp contrast with the 1990s (see de Bodt et al., 2018, Figure 1). This evidence confirms the presence of a structural break around the year 2001, a direct consequence of the change in the economic environment (the abolishment of pooling accounting, low interest rates affecting the cost of borrowing cash, and rising competitive pressure from private equity buyers) and motivates our focus on the post-2001 period.

Our univariate analyses reveal that the use of stock as a method of payment is negatively correlated with all six of our measures of acquirer financial constraints, providing a clear indication that acquirer financial constraints matter when choosing to include stock as (part of) the method of payment in M&A deals. Regarding the importance of the ownership structure, univariate tests indicate that acquirers with a larger dominant shareholder are more willing to pay in stock. This result is consistent with acquirers

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[5] The data is at the blockholder-company-year level.
[6] http://faculty.marshall.usc.edu/Gerard-Hoberg/MaxDataSite/index.html

taking into account dilution when composing the method of payment in acquisitions, but while this result is statistically significant, the difference in acquirer block size between all-cash transactions and those involving the exchange of acquirer shares is economically small.

Analysis of the target's ownership structure tells a very different story. We observe a higher probability of including at least some acquirer shares in the method of payment when the potential size of the post-consummation target shareholders' block in the newly merged entity is larger. This result is highly statistically significance and economically sizeable: the average post-consummation target shareholders' block in the newly merged entity in mixed transactions is at least three times higher than in all-cash transactions. This univariate evidence strongly suggests that acquirer managers or shareholders are not primarily concerned about avoiding control dilution and loss of power in the merged firm when making decisions about the method of payment in an acquisition.

However, we observe that even in the worst case for the dilution of acquirer shareholders (all-stock payment for the target firm) the resulting block in the merged entity that is born from the target's pre-deal ownership structure is still only about one fourth the size of the block in the merged entity that is born from the acquirer's pre-deal ownership structure (at least on average). This result suggests that, on average, control dilution is simply unlikely to be important to blockholders in the pre-merger acquirer firm.

We collect twenty-six control variables in addition to measures of financial constraints and control dilution. These control variables capture characteristics of the acquirer, the target, the transaction, and the industry. Our univariate analyses reveal that eighteen out of these control variables differ significantly between all-cash and mixed-payment (i.e., including some acquirer stock) transactions. This provides a clear indication of the importance of using an extensive list of control variables in our multivariate investigation to combat omitted variables as a source of bias (Angrist and Pischke, 2009 and 2015). In our univariate tests, acquirers using some stock in the method of payment are smaller, hold more cash, pay less dividends, do more research and development (R&D), hold more tangible assets, have lower retained earnings, have higher stock price run-up before the transaction, and have undertaken fewer M&A transactions (but more seasoned equity offerings (SEOs)) in the prior eighteen months before the transaction. The targets in these transactions that involve some acquirer stock in the method of payment are less likely to be subsidiaries of other public firms or firms with a financial sponsor. In other words, the targets are less likely to be what Eckbo et al. (2018) label "cash-only sellers." The targets in this sample of mixed method of payment deals are also more often public firms, are less often in different countries than the acquiring firm (i.e., are less likely to be cross-border deals), but are more often in the same industry

as the acquirer and take place more frequently in high-tech and less concentrated industries. In these transactions that involve some acquirer stock in the method of payment, the average transaction size is larger, both in absolute value and relative to the size of the acquirer, and transactions are less likely to be tender offers.

We start our multivariate analyses by shedding the light on the role of acquirer financial constraints in the method of payment choice. All of our six measures (independently) have positive and highly statistically significant coefficients in method of payment regressions. Point estimates derived from these coefficients indicate that shifting from financially unconstrained to constrained increases the percentage of stock in the M&A method of payment by at least five percentage points. This corresponds to an increase of close to twenty-five percent with respect to the unconditional average percentage of stock in the M&A method of payment for the last two decades. Of the control variables, the role of the acquirer size (negatively related to the percent of stock), R&D (positively related), retained earnings (negatively related), recent SEO (positively related), and run-up (positively related) are confirmed. For the target, the role of cash-only sellers (negatively related to the percent of stock) and public status (positively related) are confirmed, as are the effect of transaction characteristics such as tender offers (negatively related), cross-border activity (negatively related), and transactions that take place in high-tech industries (positively related to the percent of stock). As indicated by the variance inflation factor (VIF), these results are not affected by multicollinearity.

We next turn to the trade-off for acquirers between financial constraints and ownership dilution. Payment using acquirer shares will preserve financial flexibility and liquidity but potentially result in dilution of existing acquirer shareholder control of the firm (and vice versa for cash payment). Our data collection effort using SEC filings enables us to obtain the necessary ownership / blockholder information for 4,643 transactions out of 6,225 (4,296 out of 5,740 and 3,383 out of 4,350 in some specifications), close to seventy-five percent of our initial sample. In contrast with results reported in Faccio and Masulis (2005) in the European context, in the U.S. in the last two decades, the potential for control dilution for acquirer shareholders does not appear to play a role in the method of payment choice in any of our empirical specifications. Furthermore, the inclusion of acquirer dilution measures does not alter our results on the important role that acquirer-firm financial constraints play in the decision to include acquirer stock in the M&A method of payment.

As we also collect information on the ownership structure of the target firm, we repeat our analyses focusing on the target. Control appears to matter more for target shareholders: the percentage of acquirer stock in the method of payment increases when target shareholders are in position to obtain

a significant stake in the merged entity. This result holds even controlling for both the acquirer and the target ownership structure in a sample limited to 531 transactions. In other words, the method of payment in an M&A deal appears to include more acquirer stock exactly when the issuance of those shares would create a larger post-deal blockholder in the merged firm born from the target's pre-deal ownership structure. This evidence indicates that acquirer managers or shareholders are apparently not primarily concerned about avoiding loss of power in the merged firm when making decisions about the method of payment in an acquisition.

Collecting data from SEC filings 13D and 13G is an error prone process (Holderness, 2009) and our results are therefore potentially affected by measurement errors. This source of noise leads, generally speaking, to an attenuation bias (i.e., a bias against finding significant results), thus we replicate our analyses with ownership data provided by Schwartz-Ziv and Volkova (2021) and reported in the Bureau van Dijk Orbis database. We obtain similar results, albeit somewhat statistically weaker, with this latter data source.

This paper primarily contributes to the M&A literature and, in particular, to the stream of papers focusing on the composition of the method of payment, either because of the importance of the topic in itself or due to the fertile environment it provides for testing theories in finance (Hansen, 1987; Travlos, 1987; Fishman, 1989; Eckbo et al., 1990; Martin, 1996; Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Faccio and Masulis, 2005; Boone et al., 2014; Eckbo et al., 2018; de Bodt et al., 2018; de Bodt et al., 2020). With respect to the extant literature, existing empirical analyses studying the determinants of the method of payment in M&A deals report evidence contaminated by data from the pre-2001 period. That period was characterized by a fundamentally different economic and regulatory environment; in particular, an environment in which the choice to pay for an acquisition completely with acquirer shares was biased by the possibility that such deals could be subject to pooling accounting (which had benefits for highly-valued acquirers).

2. Data and Empirical Methods

2.1. Data Sources

Mergers and acquisitions

We collect M&As from the SDC database. We select all completed or withdrawn non-financial transactions (neither the acquirer nor the target belong to a four-digit SIC industry between 6000 and 6999: see footnote 3) announced between 2002 and 2020 for which the form of the deal is "merger" or

"acquisition of assets" and the acquirer owns less 50% of the target firm before the transaction and seeks to own more than 50% after (in almost 99% of the completed deals in our sample the acquirer owns 100% of the target once the deal closes). The acquirer must be a U.S. listed firm while targets can be U.S. or foreign firms, listed, subsidiaries, or private. The SDC database must report the method of payment for a transaction to be kept in our sample: full-cash, full-stock, or a combination of the two with the corresponding percentages of cash and stock payment. This leads to a sample of 6,225 transactions by 2,335 non-financial acquirers. For additional analyses (in particular when focusing on acquirer and target ownership structures), the sample size is affected by the availability of data.

Table 1 displays the time series for all control transactions in our sample. As in much of the M&A literature (e.g., see Alexandridis et al., 2017, Figure 1), the M&A wave of mid-2000s is clearly observable, as are the effects the revival of the M&A market in the years 2010 to 2015 (after the 2008 financial crisis), both in number of transactions (Column 1) or in aggregate transaction value (Column 2). The frequency of all-stock payment transactions in the full sample is 11.76% by number and 17.23% by deal value. Compared to the averages for the 1990s reported in de Bodt et al. (2018), this represents a sharp drop. This evidence is consistent with pooling of interests being a major incentive to opt for full-stock payment during that time period (de Bodt et al., 2018). Furthermore, the rise of private buyers in the market for corporate control has put considerable pressure on listed acquirers to make cash offers during the post-2001 period (Eckbo et al., 2018) and interest rates were very low in that time period, incentivizing the use of cash as a method of payment.

The frequency of all-stock payment also undergoes significant variation through time. In number (Column 3), we observe a steady decline during the first decade of our sample period, with some reversal thereafter. By value (Column 4), this pattern appears to be less clear, likely due to the presence of very large deals completely paid in stock: for example, Allergan and Pfizer in 2015 (146 billion USD), Raytheon and United Technologies in 2019 (86 billion USD), and Xillix and AMD in 2020 (36 billion USD). The percentage of all-cash transactions in number and value, reported in Columns 5 and 6, confirm the dominant role played by cash in the M&A method of payment during the last two decades, with respective unconditional averages of 67.55% and 30.16%. These averages are consistent with the intuition that all-cash payment is more likely in smaller deals. The percentages of stock in the method of payment (Column 7), and the corresponding percentage of cash (Column 8) confirm these observations: cash payment amounts to close to 80% of M&A compensation during the last two decades, with a peak close to 90% in 2012.

Figure 1 highlights these time trends, which clearly illustrate the dramatic change in the composition of the method of payment in the new century when compared to Figure 1 in de Bodt et al. (2018). There has, however, been something of a resurgence in the use of acquirer stock in the method of payment near the end of our sample (as there was in the aftermath of the 2008 financial crisis).

Ownership

We collect ownership information from the SEC's EDGAR database. Because much of these data are hand-gathered, we describe this data collection exercise in some detail in Appendix B. Filing 13D is required of any investor who acquires beneficial ownership of more than 5% of a class of equity registered under Section 12 of the Securities Exchange Act of 1934. This acquisition must be reported within 10 calendar days of crossing the 5% threshold, with some possible exceptions for filers allowed to use a short-form Schedule 13G.[7] Filing 13D must be amended promptly (i.e., without unreasonable delay) to report any material change in the information provided, including the acquisition or sale of 1% or more of the class of equity concerned.

For our 2,335 acquirers and 6,162 targets included in our M&A sample, we download 125,314 SEC filings. Our processing code largely mimics the approach of Schwartz-Ziv and Volkova (2021), who freely distributes their R codes for querying the EDGAR database (see Appendix B).[8] As we start our analyses of ownership structure in the post-2001 sample period, we have a seven-year period (1994 to 2000) for the SEC to be notified of new and updated pre-1994 blocks.[9] This approach mitigates the concern that we are missing ownership-related filings before 1994 for blocks that do not undergo any material changes reportable in 13D or 13G filings with the SEC.

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[7] Three categories of investors are allowed to file a short-form 13G in place of 13D: exempt investors, qualified institutional investors, and passive investors. Exempt investors are persons who acquire all their securities prior to the issuer registering under the Security Exchange Act of 1934 and who did not, after such registration, acquire additional securities of the same class which exceed 2% of said class. Qualified institutional investors are investors that acquired or hold the securities in the ordinary course of business and without a purpose or effect of changing or influencing control of the issuer (typically brokers and dealers, banks, insurance companies, and the like). Passive investors are persons not seeking to acquire or influence the control of the issuer and who own less than 20% of the class of securities in focus. Neither a director nor an officer of an issuer can be considered a passive investor. Filing of a form 13G is required within 45 calendar days after the filing conditions are met for exempt investors and 10 calendar days after the filing conditions are met for qualified institutional and passive investors.
[8] https://github.com/volkovacodes
[9] The only blocks that will be missed by our data collection approach are those in place before 1994 and not updated between 1994 and 2000. We provide a robustness check based on the Bureau van Dijk Orbis database, which is free of this source of measurement error.

Other Data Sources

We collect financial information from the Compustat and CRSP databases, and Hoberg and Maksimovic data are from the Hoberg-Maksimovic Financial Constraints Repository.

2.2. Variables

Our dependent variable of interest is the percentage of the transaction price paid in acquirer stock (*%Stock*), a continuous variable that encompasses full-cash offers (*%Stock* equal to zero), full-stock offers (*%Stock* equal to 100), and mixed-payment deals (*%Stock* between zero and 100). Below, we first introduce our independent variables of interest (proxies for acquirer financial constraints and characterization of the acquirer and target ownership structure) and then we list our control variables grouped into four categories: acquirer, target, transaction, and industry characteristics. All variable definitions and specific data sources are provided in Appendix A. Note that all financial ratios are winsorized at 1st and 99th percentiles.

2.2.1. Independent variables

Acquirer financial constraints

It is likely that acquirer financial constraints (i.e., lack of liquidity or lack of ability to easily raise capital) are an important determinant of the propensity for acquirers to pay for acquisitions with something other than cash (i.e., at least some acquirer shares). We follow Farre-Mensa and Ljungqvist (2016) and use four measures of acquirer financial constraints: the Hadlock and Pierce (2010) age-size index (*HP Dummy*), the Lamont et al. (2001) version of the KZ index (*KZ Dummy*), the Whited and Wu (2006) index (*WW Dummy*), and a dummy variable identifying firms never paying dividends (*NonDividend Dummy*). In addition, we examine the effect of the Hoberg and Maksimovic (2015) delayed investment measure (*HM Index*) and the Bartram et al. (2021) composite measure (*BHK Dummy*). Table 2 Panel A provides descriptive statistics for these variables. By construction, close to one third of our acquirers are classified as financially constrained according to *HP Dummy*, *KZ Dummy* and *WW Dummy*.[10] Fifty-five percent never pay dividends. Finally, the *BHK Dummy* appears to provide a more restrictive classification of financial constraints as only ten percent or so of acquirers in our sample are characterized as

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[10] We do not have exactly one third of our acquirers classified as financially constrained because the terciles used to build the dummy variables are based on the entire Compustat universe of firms. In addition, because the measurement of the *HM Index* uses a standardized cosine distance, we do not attempt to interpret descriptive statistics about that *level* of that measure (as opposed to cross-sectional or time-series changes in the measure).

constrained using this measure. This is likely due to the fact that this measure uses a combination of criteria based on the Hadlock and Pierce (2010) age-size index, the Kaplan and Zingales (1997) index, the Whited and Wu (2006) index, firm size, and the payout ratio.

Tests of difference in means between all cash transactions and mixed-payment transactions are reported in Column 5 in Table 2, Panel A, with the corresponding p-values in Column 6. All-cash transactions appear to be undertaken by acquirers classified as less financially constrained on average using all of the aforementioned measures. One may question the usefulness of including six measures of acquirer financial constraints in our investigation, as these may be highly correlated (Farre-Mensa and Ljungqvist, 2016). To this end, in Figure 2 we report eigenvalues associated with the six factors obtained by running principal component analysis on the six measures of acquirer financial constraints. This results in a graphical representation known as the *Scree Plot*. Figure 2 demonstrates that the first component captures only thirty percent of the total sample variance and we need to go up to the fourth component to capture eighty percent of the variance. Therefore, our six measures clearly capture several distinct dimensions of firm financial constraints.

Acquirer and target ownership structures

Using information collected from SEC filings 13D and 13G (see Section 2.1), we characterize the acquirer and target ownership structure with two variables: the size of largest block in the ownership structure the year before the deal (*Max Block*) and the estimated potential size of the largest block in the ownership structure of the merged entity after the transaction is completed assuming full stock payment (*Full-Stock Block*).

The statistics reported in Table 2, Panel B reveal that, on average, the largest acquirer blockholder (*Acq Max Block*) in our sample holds 14.7% of the acquirer's shares. We obtain comparable statistics using the Schwartz-Ziv and Volkova (2021) database (*Acq Max Block SV)* but a significantly higher figure with the Burean van Dijk database (*Acq Max Block Orbis*). These statistics are consistent with the claim in Holderness (2009) that diffuse ownership in the US is a myth. For comparison, Faccio and Masulis (2005) have a sample of European acquirers over the period 1997 to 2000 and report an average ultimate voting stake held by the acquirer's largest shareholder of 22% (see their Table 2, Panel B). Moreover, obtaining consistent estimates using our hand-collected data and data provided by Schwartz-Ziv and Volkova (2021) is reassuring.[11]

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[11] Note that we checked (unreported) whether *Acq Max Block* displays a time trend due to missing block sales in our procedure to collect and analyze SEC filings 13D and 13G (see Appendix B), and this is not the case.

The Bureau van Dijk database reports total ownership figures (the sum of direct and indirect ownership stakes). A higher average maximum block is therefore to be expected. It is interesting to note that *Acq Max Block Orbis* (23.5%) is comparable to the ultimate voting stake reported in Faccio and Masulis (2005) in the European context. Overall, even if the procedure that we use to collect ownership data is noisy (see Section 2.1), the figures reported in Table 2 appear to be approximately of the order of magnitude that we could expect. The test of difference of means between all-cash and mixed transactions reveals that all-cash transactions are undertaken by acquirers with a smaller dominant shareholder. The difference is statistically significant (at least using our hand-collected data and Schwartz-Ziv and Volkova (2021) data) but not economically striking (in the order of 1.5 percentage point and less so using data from the Bureau van Dijk database).

For our subset of publicly listed targets, we collect the same ownership information as for our acquirers. The average stake held by the largest blockholder in targets in our sample is 15.14%, comparable to the figure obtained for acquirers and consistent with the average for targets in our sample in the Schwartz-Ziv and Volkova (2021) database. Using the Bureau van Dijk Orbis database, we again obtain a higher estimate (19.6%), most likely for the same reason as for acquirers. Statistical tests of difference in means between all-cash and mixed transactions are inconclusive (except in the case of Schwartz-Ziv and Volkova (2021) database, with a smaller dominant shareholder in case of all-cash transaction, as with acquirers).

Turning to the estimated potential size of the largest block in the ownership structure of the newly merged entity after completion in the case of full stock payment (the *Full-Stock Block* variables), we observe some dilution of stakes in the acquirer as a result of the acquisition. For example, according to *Acq Full-Stock Block* based on our own data, the average maximum acquirer block shrinks from 14.7% to 13.1%. However, except for these measures calculated using the Bureau van Dijk Orbis database, we do not observe significant difference between all-cash and mixed-payment transactions.

On the target side, *Targ Full-Stock Block* is considerably smaller: an average of 2.9% using our hand-collected data. This is a direct consequence of the size difference between acquirers and targets (the average of relative deal size is close to 20% in our sample). Estimates using the Schwartz-Ziv and Volkova (2021) data and the Bureau van Dijk Orbis database are of approximately the same size (around 3 – 4%).

Strikingly, with all these data sources transactions involving at least some stock in the method of payment (i.e., mixed-payment), blocks in the newly merged entity created from old target firm blocks assuming full stock payment are a significantly higher than they are in the case of all-cash deals. Not only

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is this difference statistically significant but it is economically sizeable: the *Targ Full-Stock Block* triples (or more) regardless of the source of data. Recall that this variable is the largest post-deal block that could be created in the merged firm from pre-deal target blockholders assuming full-stock payment. This variable captures how big of a concern there could be for acquirer managers and boards concerned about the creation of new blockholders in the merged entity out of pre-deal target blocks.[12] Our univariate results show that on average acquirers appear to use their own stock as at least part of the method of payment for a target firm exactly when the issuance of those shares would create a larger (not smaller) post-deal blockholder in the merged firm born from the target's pre-deal ownership structure.

This univariate evidence questions the interpretation of *Targ Full-Stock Block* as a measure of control loss (Faccio and Masulis, 2005), as it indicates that acquirer managers or shareholders are apparently not primarily concerned about avoiding dilution and loss of power in the merged firm when making decisions about the method of payment in an acquisition. This conclusion is also consistent with the fact that *Targ Full-Stock Block* (which averages 2.9% according to our data) is substantially smaller on average than *Acq Full-Stock Block* (which averages 13.2% in the full sample). In other words, even in the worst case for the dilution of acquirer shareholders, which would happen when there is all-stock payment for the target firm, the resulting block in the merged entity that is born from the target's pre-deal ownership structure is still only about one fourth the size of the block in the merged entity that is born from the acquirer's pre-deal ownership structure (at least on average). While much is made in the existing literature about control dilution being a primary factor affecting the method of payment decision (see, for example: Stultz, 1988; Amihud, Lev, and Travlos, 1990; Jung et al. 1996 and Martin, 1996), at least in our sample, control dilution does not appear to be a first-order consideration in the method-of-payment decision.

2.2.2. Control variables

Acquirer Characteristics

We control for *Size* (market value of equity), *Leverage* (book value of debt divided by the sum of the market value equity and the book value of debt), *Cash Holding* (cash to total assets), *M/B* (market value of equity divided by the book value of equity), *Dividend* (an indicator variable equal to one if the firm pays dividends), *R&D* (R&D expenses divided by total assets), *Asset Tangibility* (property, plant, and equipment divided by total assets), *Ret Earnings* (the ratio of retained earnings divided by total assets,

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[12] This variable is labeled *Control Loss* in Faccio and Masulis (2005).

following DeAngelo et al., 2006), and acquirer run-up (the market-adjusted buy-and-hold return from 300 days to 46 days before the acquisition announcement date). We also include in our regressions two measures of information asymmetry introduced in Eckbo et al. (2018): *Recent M&A* (an indicator variable equal to one if the acquirer has undertaken a deal in the last eighteen months) and *Recent SEO* (an indicator variable equal to one if the acquirer has completed a seasoned equity offering (SEO) the last eighteen months).

Descriptive statistics for these variables are contained in Table 2, Panel C. The average market value of our acquirers is 11.8 billion USD. Their average leverage is 15.1%, with cash holdings averaging 22.0% of total assets, and an average market-to-book equal to 3.5. 36.0% of the acquirers are dividend payers, and R&D expenses amount to 5.1% of total assets on average. The average asset tangibility is 18.8%, with a corresponding average retained earnings of -35%[13] and run-up of 15.5%. 38.7% of our acquirers undertook an M&A deal recently and 11.3% conducted a recent SEO. Compared to the characteristics of the sample used in Eckbo et al. (2018), which is the most similar sample to ours (6,200 mergers for US targets by US non-financial public acquirers from 1980 to 2014[14]), our acquirers are larger (3.08 billion USD total assets on average in Eckbo et al. while in our sample acquirer average total assets amount to 5.12 billion USD – unreported), have less leverage (20.5% on average in Eckbo et al., but we use the market value of equity while Eckbo et al. use the book value), hold more cash (14.1% on average in Eckbo et al.), have a smaller market-to-book (4.62 on average in Eckbo et al.), and spend about the same level on R&D (4.9% of total assets on average in Eckbo et al.). Our acquirers have undertaken more frequently M&A deals in their recent past (38.7% have undertaken at least one M&A in the past 18 months against 25.1% in Eckbo et al., a important difference due to presence of acquisitions of assets, which are classified as control transactions, in our sample while Eckbo et al. include only mergers) but less frequently SEOs (11.3% in our sample versus 26.5% in Eckbo et al.)**.**

Table 2, Panel C, also reveals that most of these control variables are statistically significantly different between transactions paid at least partially with stock (i.e., mixed-payment transactions) and transactions fully paid in cash. Mixed-payment transactions are undertaken by smaller acquirers that hold more cash (a result consistent with cash being held for precautionary motives, as argued in Bates et al.,

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[13] The average retained earnings ratio in our sample is surprisingly negative. Since we winsorize all ratios at the 1st and 99th percentiles, this result is unlikely to be driven by the presence of outliers. The arithmetic average of retained earnings ratio is regularly reported as being negative in the literature (eg., DeAngelo et al., 2006), retained earnings being a cumulated sum including the pre-IPO period. The distribution of this ratio is moreover significantly skewed to the left: the median is 25%.

[14] Note that Eckbo et al. (2018) in their Table 1 compare all-cash to all stock transactions, while we focus on a comparison between all-cash and mixed-payment transactions.

2009), have higher M/B ratios, are less likely to pay dividends, and do more R&D. Similar differences are also found in Eckbo et al. (2018) between acquirers paying fully in cash and fully in stock, and are reflective of the fact that acquirers in all-cash deals are, at least on average, more mature firms. Fitting that maturity profile, mixed-payment acquirers appear to have fewer retained earnings, a higher pre-deal stock price run-up, and are less informationally transparent according to the *Recent M&A* indicator (more so according *Recent SEO*, but this result is potentially also due to less mature firms being less likely to obtain funding directly from equity markets).

Target Characteristics

Our sample includes private targets and, therefore, we collect only a limited number of target characteristics from the SDC database. We control for *Cash-Only Seller* (an indicator variable equal to one if the target is owned by a financial sponsor or is a subsidiary of a publicly traded firm according to SDC) and *Poison pill* (an indicator variable equal to one if the target has this antitakeover device). Panel D in Table 2 contains descriptive statistics for these variables. 29.9% of the targets included in our sample are sold by an owner who is likely to only accept cash in the transaction (Eckbo et al., 2018, report 10.4% in their sample, a difference indicating that the acquisitions of assets included in our sample are more frequently sold by cash-only sellers than mergers) and only 0.3% of our targets have a poison pill according to SDC.[15] As expected, cash-only sellers are matched more frequently to all-cash acquirers.

Transaction Characteristics

We collect from SDC *Deal Value* (in millions of USD), *Relative Deal Size* (deal value divided by acquirer market value), *Tender Offer* (an indicator variable equal to one in tender offers), *Public Target* (an indicator variable equal to one if the target's listing status is public), *Cross-border Deal* (an indicator variable equal to one if the acquirer and target are located in different countries), *Horizontal Deal* (an indicator variable equal to one if the acquirer and the target share the same 2-digit Standard Industrial Classification (SIC) code), *Toehold* (an indicator variable equal to one if the acquirer holds some stock in the target before announcement), *Hostile* (an indicator variable equal to one if SDC classifies the transaction as hostile or unsolicited), and *Multiple bidder* (an indicator variable equal to one if SDC reports more than one bidder for the target).

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[15] SDC reports the presence of poison pill only if it affects the transaction. Also, over 70% of our transactions are for non-public targets, for which a poison pill would be virtually meaningless. These factors explain the very low percentage of poison pills that we obtain from SDC data.

All ratios are winsorized at the 1st and 99th percentiles in the Compustat universe (we perform the winsorization by year in order to preserve trends, if any). Descriptive statistics for these variables are in Panel E of Table 2. The average deal value is 637 million USD (not reported in Eckbo et al., 2018, but comparable to Alexandridis et al., 2017, in their sample of 26,078 transactions between 1990 and 2015 by US listed firms (see their Table 1)). The average relative deal size is 0.19. Eckbo et al. (2018) report a median of 0.28 for relative deal size using total assets as the denominator, consistent with the fact that mergers (the focus of their paper) are larger transactions than assets sales (which are included in our sample). Our sample includes 4.9% of deals employing a tender offer and 23.6% of our sample deals involve public targets (Eckbo et al., 2018, report 45.5%, but their sample does not include asset sales). 19.3% of the deals in our sample are cross-border transactions (similar to the magnitudes reported by Alexandridis et al., 2017), 64.1% are horizontal transactions (again comparable to Alexandridis et al., 2017), 0.9% of transactions involve a pre-announcement toehold held by the acquirer (Betton et al., 2009, report a significantly higher frequency of toeholds (7.2%) during the period 1990 to 2002 using a sample of 531 transactions), 0.4% of transactions are classified as hostile by SDC (smaller than in Alexandridis et al., 2017, who report 3.4% of hostile deals in their sample of public transactions from 1990 to 2009), and 2.5% have multiple bidders (comparable to Alexandridis et al., 2017).

Table 2, Panel C, highlights that these transaction characteristics are very different between mixed-payment and all-cash transactions. Mixed-payment deals are larger both in absolute (consistent with Martin, 1996) and relative (to the size of the acquirer) terms, are less likely to involve a tender offer (unsurprisingly, because the preferred mode of payment in tender offer is cash[16]), and more often target listed firms (again consistent with the significantly larger deal size in mixed deals. The use of stock in the method of payment is less frequent in cross-border or diversifying acquisitions (consistent with Faccio and Masulis, 2005, in the European context), and are more likely to involve multiple bidders (which is consistent with cash offers deterring competition in M&A contests as argued in Fishman, 1989).

Industry Characteristics

M&A transactions happen in waves, at the aggregate level (Andrade et al., 2001) and at the industry level (Harford, 2005). Therefore, beyond the inclusion of industry fixed effects in our multivariate analyses, we include a time-varying industry control variable labeled *Wave* (defined as in Maksimovic et al., 2013). We also control for *High Tech* (defined as in Kile and Phillips, 2009, for the acquirer's industry),

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[16] In our sample, 86.1% of tender offers are fully paid in cash.

HHI (asset-based Herfindahl-Hirschman Index for the acquirer industry), and *Private Buyers Comp* (defined as in Eckbo et al., 2018, as the fraction of all transactions in the industry that are undertaken by private acquirers in the announcement year).

As indicated in Table 2, Panel F, almost half of our transactions (46.9%) take place in high-technology industries (Eckbo et al., 2018, report 43.3%, using a comparable definition also based on acquirer two digits SIC codes). On average, the industry asset-based HHI is 995, marginally higher than in Eckbo et al. (2018) who report an average HHI of 720. Slightly more than one fourth (26.3%) of our M&A transactions in the target industry are undertaken by private buyers, a figure close to that in Eckbo et al. (2018) who report 21.6%.

As with many of the other variables in this study, mixed-payment transactions appear significantly different than all-cash deals in the context of some of these industry characteristics: mixed-payment transactions are more frequent in high-technology industries, and more frequent in less concentrated industries. In contrast with Eckbo et al. (2018) however, the M&A mode of payment appears not to be (statistically significantly at least) related to M&A waves and the competitive pressure applied by private buyers.

2.3. Econometric Specification

While our dependent variable is a percentage (the percentage of the transaction price paid with acquirer stock, *%Stock*) which would suggest the use of a censored non-linear specification such as a Tobit model, we use the following linear specification for our multivariable analyses:

$$\%Stock_i = FF_i + Year_t + \beta X_{i,t-1} + \boldsymbol{Control'}_{i,t-1}\, \boldsymbol{\gamma} + \epsilon_i \qquad (1)$$

with i indexing acquisitions, FF_i being industry fixed effects based on the Fama-French 49 industries (FF49 henceforth), $Year_t$ indicating year fixed effects, $X_{i,t-1}$ being our independent variables of interest (lagged by one year relative to the M&A transaction announcement year) with β the corresponding coefficients. $\boldsymbol{Control}_{i,t-1}$ is the vector of covariates (similarly lagged by one year) with $\boldsymbol{\gamma}$ the corresponding vector of coefficients, and ϵ_i is the error term. The choice of this linear specification is motivated by Angrist and Pischke (2009) (theorem 3.1.6) that establishes such a specification as the best linear approximation of

non-linear conditional expectation functions.[17] We base our inferences on standard errors robust to heteroskedasticity.

The question of possible causal interpretation of our results is, as in most corporate finance studies, a central issue. The three main threats are, as always, the omitted variable bias, the selection bias, and the reverse causality (or simultaneity) bias. We attempt to fight the omitted variable bias by including as many control variables as possible, collected based on an extensive analysis of the prior literature, as well as industry and year fixed effects. Despite these efforts, however, as in all cross-sectional studies, we remain exposed to this bias and therefore, we must remain cautious concerning any causal interpretation of our results. Concerning the selection bias, it must be noted that our analyses are conducted in the intensive margin: we study, at the M&A transaction level, payment choices by acquirers and targets. Therefore, as long as we are aware that our results are conditional on being involved in a M&A transaction, this second source of endogeneity is unlikely to threaten a causal interpretation. Finally, reverse causality seems unlikely. For example, it can hardly be argued that lagged financial constraints for the acquirer is affected by the method of payment package chosen in a future acquisition. Using one-year lagged covariates is an elegant but powerful fix to the reverse causality source of endogeneity (at least assuming that acquirers do not anticipate future acquisitions and adjust their current capital structure, which is unlikely).

Another econometric issue which we are confronted with is collinearity. We use a long list of covariates that are known to be interdependent. For example, capital structure decisions (leverage) are not made in isolation of investment decisions (R&D) or the nature of the firm's assets (asset tangibility). This interdependence potentially generates collinearity, a known source of inflation for regression standard errors. We therefore report variance inflation factors (VIF) associated with each covariate as a check on multicollinearity in our baseline specification. The generally accepted threshold that should not be crossed is greater than 10 (Belsley et al, 1980).

3. Multivariate Analyses

As argued in Section 2.3, adopting a multivariate approach is required to combat the omitted variable bias but, while analyzing the results, two pitfalls must be kept in mind. Multivariate analyses bring

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[17] Angrist and Pischke (2009) provide evidence that, as long we are interested in the coefficient estimates, inferences drawn from a linear specification are mostly similar to inferences obtained using a non-linear specification. The use of a linear specification provides many benefits such as better handling of numerous fixed-effects and covariates (that raise numerical convergence issues in non-linear specifications), direct interpretation of coefficients as marginal effects, and easier interpretation of interaction terms to compare results across periods and sub-samples.

with them potential "bad control" issues (Angrist and Pischke, 2015): these can lead to underestimate of the total effect of some variables on our dependent variable (%$Stock$) because some channels through which the variable of interest acts on the outcome variable are not incremental to the effect of other variables. Controlling for a long list of covariates, in addition to industry and year fixed effects, can also reduce the precision of our estimates to the extent that we include variables that appear not to contribute enough to the decrease of the residuals standard error. One primary effect is a loss of degrees of freedom, but there is also a trade-off between the effect on the standard error of the residuals and on the coefficient on a variable of interest (Angrist and Pischke, 2009):

$$SE(\beta_k) = \frac{SE_e}{\sqrt{n}} \times \frac{1}{SE_{\tilde{X}_k}} \qquad (2)$$

where $SE(\beta_k)$ is the standard error of the coefficient β_k, SE_e is the standard error of the residuals, n is the number of observations, $\tilde{X}_k$ is the residuals of a regression of X_k of all other covariates and $SE_{\tilde{X}_k}$ is the corresponding standard error. Adding covariates leads to a decrease in the standard error of the residuals, which improves the precision of the estimate of β_k, but at the cost of decreasing the standard error of $\tilde{X}_k$, a countervailing effect that is often ignored (or underestimated). Which of these effects dominates is an empirical question. Therefore, we report results without and with of our long list control variables in addition to the independent variables of interest.

We present our multivariate results in three successive steps: we first focus on the role of acquirer financial constraints, next we account for acquirer ownership structure, and finally for target ownership structure. This choice is dictated by the sample size restrictions generated by the inclusion of ownership structure variables in our regression specifications.

3.1. Acquirer Financial Constraints

We start by exploring the impact of acquirer financial constraints on the choice of the composition of the method of payment in M&A deals, an issue that is not sufficiently explored in the empirical academic literature (Gorbenko and Malenko, 2018).

Table 3 Panel A presents our results without control variables (except industry and year fixed effects) and Table 3 Panel B with our list of control variables. In each case, columns 1 to 6 correspond to the use of one measure of acquirer financial constraints as independent variable (respectively, *HP Dummy*, *KZ Dummy*, *WW Dummy*, *NonDividend Dummy*, *BHK Dummy* and *HM Index*). Using the *HP Dummy*, *KZ*

Dummy, *WW Dummy* and *NonDividend Dummy*, results are obtained for our full sample of 6,225 M&A transactions. The use of *BHK Dummy* and *HM Index* restrict samples sizes to respectively 5,740 and 4,350 observations.

The results are unambiguous: without and with controls variables, in all specifications the coefficients on the variables proxying for financial constraints are positive and highly statistically significant. As expected, introducing control variables reduces the estimated coefficients, but even in Panel B of Table 3 the effect of being identified as financially constrained is economically sizeable. Being identified as financially constrained generates an increase in the stock component in the M&A method of payment by at least 4.6 percentage points (Column 4, *NonDividend* Dummy) and potentially up to 7.2 percentage points (Column 1, *HP Index*), depending on the measure of financial constraints. Taking into account the unconditional average percentage of stock included in the method of payment of transactions in our sample (18.69%, see Table 1 Column 7), this represents an increase from close to 25% up to more than 38%.

Turning to the coefficients on the control variables, we first note that the reported VIF stay well below 3 in all specifications, an indication that multicollinearity is unlikely to be a great concern here. Next, the following univariates test of mean differences between mixed-payment and all-cash transactions are confirmed in this multivariate setting: market value (smaller acquirers pay more in stock), R&D (more R&D intensive acquirers pay more in stock), retaining earnings (acquirers retaining less earnings pay more in stock), recent SEO (acquirers having issued equity recently pay more in stock, a result consistent with Eckbo et al., 2018, who introduce this variable as a proxy for information asymmetry).

On the target side, the role of cash-only sellers is confirmed: as expected, acquisitions of targets owned by cash-only sellers involve more cash in the method of payment. Concerning acquisition characteristics, tender offers include more cash (as one could infer from the existing literature), public targets are correlated with greater stock payment, while cross-border deals are less likely to involve acquirer stock payment (confirming the results in Huang et al., 2016). Finally, transactions in high-tech industries are associated with more stock payment. On the other hand, eleven statistically significant variables in our univariate analyses lose their significance in this multivariate setting: acquirer cash holding, market-to-book ratio (only marginally so), dividend payment, asset tangibility, bidder run-up, recent M&A, transaction deal value and relative size, as well as horizontal deal and multiple bidder indicator variables, and industry concentration. These numerous losses of statistical significance highlight the potentially strong effects of the omitted variable bias in the analysis of the determinants of the method of payment in M&A deals. Especially noteworthy is the case of the market-to-book ratio: acquirer

valuation multiples no longer appear to drive acquirers to use stock as a method of payment (see Eckbo et al., 2018, and de Bodt et al., 2020). As in that existing literature, this calls into question whether acquirers use their own stock opportunistically when those shares appear to be overvalued.

3.2. Acquirer Financial Constraints and Acquirer Ownership Structure

The importance of ownership-related incentives as a determinant of the method of payment in M&A deals has been discussed in Faccio and Masulis (2005) in the European context. To the best of our knowledge, this issue has not been addressed in the US context. We investigate this issue using our sample of US acquisitions, employing block holding data collected from SEC Filings 13D and 13G (see Section 2.1).

The specific variables of interest in this analysis are *Acq Full-Stock Block* (the estimated potential size of the largest block in the ownership structure of the newly merged entity being born out of acquirer pre-deal blockholdings, taking into account potential dilution in case of full stock payment) and *Acq Full-Stock Block²,* the square of that variable. *Acq Full-Stock Block* is inspired by the "control" variable in Faccio and Masulis (2005), defined as the "ultimate voting stake held by the bidder's largest shareholder."[18] We include *Acq Full-Stock Block²* because Faccio and Masulis (2005) report that the relation between the method of payment and ownership control is non-linear in the European context.

The necessity to collect target market values to estimate the dilutive effect of the acquisition, in addition to the gathering of SEC Filings 13D and 13G in EDGAR (see Section 2.1), leads to a significant sample size reduction: specifications using *HP Dummy*, *KZ Dummy*, *WW Dummy* and *NonDividend Dummy* as measures of financial constraints are estimated on a sample of 4,643 transactions and those using *BHK Dummy* and *HM Index* on sample of 4,296 and 3,383 transactions, respectively. This represents a loss of close to twenty-five percent of the sample. Like Table 3, Table 4 Panel A presents our results without control variables (except industry and year fixed effects) and Table 4 Panel B presents our results with our list of control variables. In each case, columns 1 to 6 correspond to the use of one measure of acquirer financial constraints as independent variable (*HP Dummy*, *KZ Dummy*, *WW Dummy*, *NonDividend Dummy*, *BHK Dummy* and *HM Index*). In Table 4 Panel C, we report results obtained adding interaction terms between our measures of financial constraints and *Acq Full-Stock Block* and its square to test explicitly for the presence of a tradeoff effect. In the case of *HP Dummy* measure of financial constraints (Column 1), this leads to the following regression specification:

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[18] Faccio and Masulis, Appendix A, p. 1380.

$$\%Stock_i = FF_i + Year_t + \beta_0\,Acq\,FullStock\,Block_i + \beta_1\,Acq\,FullStock\,Block_i^2 + \gamma\,HP\,dummy_i$$
$$+ \delta_1\left(Acq\,FullStock\,Block_i \times HP\,dummy_i\right) + \delta_2\left(Acq\,FullStock\,Block_i^2 \times HP\,dummy_i\right) +$$
$$\boldsymbol{X'_{i,t-1}\,\beta} + \epsilon_i \qquad\qquad (3)$$

where we adopt the same notations as in Equation 1, δ_1 and δ_2 are the coefficients of the interaction terms and $\boldsymbol{X_{i,t-1}}$ is the vector of one-year lagged control variables.

The results are again clear. First, we observe in Table 4 Panels A to C that coefficients on the six financial constraints measures remain positive and highly statistically significant (except in one column in Panel B and two in Panel C[19]). Moreover, point estimates of these coefficients remain on the order of magnitude of those reported in Table 3. The addition of *Acq Full-Stock Block* and its square do not weaken the role of acquirer financial constraints in determining the method of payment.

Turning to the role of acquirer ownership structure, the coefficients on *Acq Full-Stock Block* and its square are almost never significant in any of the panels in Table 4. When they are significant, as in Table 4 Panel A Column 1, it is typically only weakly so. These results do not support the notion that control incentives from the acquirer's side affect the choice of the method of payment. Moreover, this conclusion is supported by the results obtained for Equation 3 and reported in Table 4 Panel C that explicitly test the acquirer financial constraints versus acquirer dilution tradeoff: the coefficients on the interaction terms (δ_1 and δ_2) remain indistinguishable from zero whatever measure of acquirer financial constraints we use.

Collecting blockholder information from SEC filings 13D and 3G is an error-prone process. Even if errors in variables generate an attenuation bias, working against finding statistically significant results (Angrist and Pischke, 2009), we check the robustness of our results by rerunning the regressions in Table 4 but using the Schwartz-Ziv and Volkova (2021) ownership data as well as ownership data from the Bureau van Dijk Orbis database. The results are reported in Appendix C Panel A (Schwartz-Ziv and Volkova (2021) data) and Panel B (Bureau van Dijk data). Using Schwartz-Ziv and Volkova, 2021, dataset, the results are almost exactly the same as in Table 4: despite marginally bigger sample sizes, the coefficients on *Acq Full-Stock Block* are not statistically significantly different from zero in any specification while the coefficients on all six financial constraints measures are positive and statistically significant. With ownership data collected in the Bureau van Dijk database, the sample sizes are much smaller, with a loss of fifteen to twenty five percent of the observations depending on the specification. *Acq Full-Stock Block* coefficients are again never statistically significant. All six measures of acquirer financial constraints

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[19] This doesn't come as a complete surprise, however, as the addition of interaction terms likely generate significant multicollinearity between the regressors.

coefficients remain positive but statistical significance is weaker, perhaps because of the sample size decrease or due to change in the composition of the sample.

3.3. Acquirer Financial Constraints and Target Ownership Structure

Faccio and Masulis (2005) also analyze the role of potential loss of control due to the largest block in the target ownership structure, using a variable computed as "the product of a target's controlling share block and the deal's relative size."[20] We parallel this analysis using the *Targ Full-Stock Block*, which is the estimated potential size of the largest block in the ownership structure of the newly merged entity being born out of target pre-deal blockholdings, taking into account potential dilution in case of full stock payment (the worst case scenario from the perspective of an acquirer concerned about loss of control in the merged entity).

Collecting SEC filings 13D and 13G for the target limits our sample to transactions targeting publicly listed firms. We are able to assemble a sample of 651 transactions with the required data (620 or 439 when using the *BHK Dummy* or *HM Index* measures of acquirer financial constraints, respectively), which amounts to a drastic loss of close ninety percent of our original sample of M&A transactions. Moreover, in specifications combining both acquirer and target *Full-Stock Block* variables, the sample shrinks to 531 M&A transactions (507 and 361 using *BHK Dummy* and *HM Index*, respectively). Having collected blockholdings for acquirers and targets, we are also in position to add an indicator variable identifying cases in which the holder of the largest block in the acquirer also holds a block in the target the year before the transaction (i.e., cross-ownership). We replicate the analyses in Table 4, initially including only *Targ Full-Stock Block* (and its square) in Table 5, and then we include both *Acq Full-Stock Block* and *Targ Full-Stock Block* (and their squares) in Table 6, without (Panel A) and with (Panel B) control variables. Tables 5 and 6 follow the same organization as Table 4.

Despite of the dramatic loss of sample size, in Table 5 we continue to find that without control variables (Panel A) the role of the acquirer financial constraints is again robust: the coefficients of our six measures are all positive and statistically significant. With the addition of control variables in Panel B, however, all coefficients remain positive but statistical significance is maintained only for *WW Dummy*. - The cross-ownership variable is highly significant: the proportion of stock payment increases by more than 9 percentage points in case of cross-ownership. This makes sense as cross-ownership contributes to reduce target-side information asymmetry (Officer et al., 2009). Finally, in Panel C, we add interaction terms between acquirer financial constraints and target ownership structure variables like in Table 4 Panel

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[20] Faccio and Masulis (2005), p.1350.

C (for acquirer ownership structure) and obtain similar results (the interaction terms are not statistically significant). With one tenth of our original sample size, such a loss of statistical power is perhaps not surprising. Strikingly, the coefficients on the *Targ Full-Stock Block* and *Targ Full-Stock Block* squared variables are statistically significant in all specification (except in Panels B and C Column 6), depicting a concave relation. This result essentially indicates that the percentage of stock payment is increasing in *Targ Full – Stock Block* but at a decreasing rate: for target shareholders, the larger their potential position in the newly merged entity, the more they are willing to accept acquirer stock as payment in an M&A deal to fully capture potential synergies.

Alternatively, the method of payment in an M&A deal appears to include *more* acquirer stock exactly when the issuance of those shares would create a *larger* post-deal blockholder in the merged firm born from the target's pre-deal ownership structure. This evidence is consistent with the conclusion that acquirer managers or shareholders are apparently not primarily concerned about avoiding loss of power in the merged firm when making decisions about the method of payment in an acquisition. While much is made in the existing literature about control dilution being a primary factor affecting the method of payment decision (see, for example: Stultz, 1988; Amihud et al., 1990; Jung et al., 1996 and Martin, 1996), at least in our sample acquirer control dilution does not appear to be a first-order consideration.

The addition of acquirer side ownership variables (*Acq Full-Stock Block* and its square; Table 6) does not affect these conclusions (see Table 6 Panel A for specifications without control variables and Panel B for specifications with control variables), despite the even smaller sample sizes. We also report results obtained using the Schwartz-Ziv and Volkova (2021) data and the Bureau van Dijk data in appendices D and D, corresponding to Tables 5 and 6, respectively. The reported results are robust to these changes of data sources, except in the case of simultaneous inclusion of *Acq Full-Stock Block* and *Targ Full-Stock Block* and the use of the Bureau van Dijk Orbis data (Appendix E Panel B), even if coefficient signs are mostly maintained.

4. Conclusion

Our investigations focus on the role of acquirer financial constraints and control dilution as drivers of the method of payment in M&A transactions, topics for which the current empirical academic literature report only limited evidence (especially in the US). We focus on M&A transactions from the last two decades, as the economic environment for acquirers has undergone profound changes since 2001 due the combination of the abolishment of the pooling of interests accounting method, persistently low interest rates, and the increase of private buyers activities in the M&A market.

Our empirical results rest on six alternative measures of acquirer financial constraints (the Hadlock and Pierce (2010) age-size index, the Lamont et al. (2001) version of the Kaplan and Zingales (1997) index, the Whited and Wu (2006) index, a dummy variable identifying firms never paying dividends, the Hoberg and Maksimovic (2015) delayed investment measure, and the Bartram et al. (2021) composite measure) and measures of control dilution paralleling Faccio and Masulis (2005). Ownership data are directly collected from SEC filings 13D and 13G, with a procedure replicating Schwartz-Ziv and Volkova (2021). Furthermore, we investigate whether our results are robust to alternative data sources (the Schwartz-Ziv and Volkova (2021) data and the Bureau van Dijk data).

Our two main takeaways are that acquirer financial constraints matter (the more acquirer is financially constrained, the more stock is used as a method of payment) and that acquirer control dilution does not, in sharp contrast with evidence reported in Faccio and Masulis (2005) in the European context. In addition, we discover that the larger the potential ownership stake in the newly merged entity born out of the target's pre-deal ownership structure, the more stock is used in the method of payment, signaling that large target shareholders appear to be willing to participate in the newly merge entity. Our results are mostly remarkably robust to the different measures of financial constraints and different data sources discussed above.

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Appendix A – Variable Definitions

Variable	Definition	Source
Acquirer Financial Constraints		
HP Dummy	Age/size based financial constraint measure (Hadlock and Pierce, 2010). Firms are sorted into terciles based on their index values in the previous year. Firms in the top tercile are coded as constrained (variable equal to one) and those in the others tercile are coded as unconstrained (variable equal to zero).	Compustat
KZ Dummy	Financial constraint measure constructed following Lamont et al. (2001). Firms are sorted into terciles based on their index values in the previous year. Firms in the top tercile are coded as constrained (variable equal to one) and those in the other tercile are coded as unconstrained (variable equal to zero).	Compustat
WW Dummy	Financial constraint measure constructed following Whited and Wu (2006). Firms are sorted into terciles based on their index values in the previous year. Firms in the top tercile are coded as constrained (variable equal to one) and those in the others tercile are coded as unconstrained (variable equal to zero).	Compustat
NonDIvidend Dummy	Indicator variable equal to one if the firm have a history of zero dividends on common stock (DVC), going as far back as 1970	Compustat
BHK Dummy	Composite indicator constructed following Bartram et al. (2021). Firms are categorized as financially constrained (variable equal to one) if they are above the median for the KZ Index, HP Index and WW index, and if they are below the median for firm size (AT) and payout ratio ((PRSTKC+DVT)/IB)	Compustat
HM Index	Hoberg and Maksimovic (2015) text based financial constraint measure. Firms with higher values are more similar to a set of firms known to be at risk of delaying their investments due to issues with liquidity	Hoberg-Maksimovic Financial Constraints Repository website

Acquirer and Target Ownership Structure

Acq Max Block, Acq Max Block SV, Acq Max Block Orbis	Size of the largest block in the acquirer ownership structure the year before the deal	Edgar, SV: Schwartz-Ziv et al. (2021) Database, Orbis database
Acq Full-Stock Block, Acq Full-Stock Block SV, Acq Full-Stock Block Orbis	Estimated potential size of the greatest block in the acquirer ownership structure in the new entity after the deal in case of full stock payment, computed as the product of the greatest block in the acquirer ownership structure (Acq Max Block) and the potential bidder's relative size in the new entity. The potential bidder's relative size in the new entity is the ratio of the bidder market value 42 days before deal announcement and the potential target market value plus this bidder market value. The potential target market value is approximate by Deal Value.	Edgar, SDC, CRSP SV: Schwartz-Ziv et al. (2021) Database, Orbis database
Targ Max Block, Targ Max Block SV, Targ Max Block Orbis	Size of the largest block in the target ownership structure the year before the deal	Edgar, SV: Schwartz-Ziv et al. (2021) Database, Orbis database
Targ Full-Stock Block, Targ Full-Stock Block SV, Targ Full-Stock Block Orbis	Estimated potential size of the greatest block in the target ownership structure in the new entity after the deal in case of full stock payment, computed as the product of the greatest block in the target ownership structure (Targ Max Block) and the potential target's relative size in the new entity. The potential target's relative size in the new entity is the ratio of the potential target market value and the sum of the bidder market value 42 days before deal announcement and this potential target market value. The potential target market value is approximate by Deal Value.	Edgar, SDC, CRSP SV: Schwartz-Ziv et al. (2021) Database, Orbis database
Cross-ownership	Indicator variable equal to one if the holder of the largest block in the acquirer firm is holding a block in target firm the year before the transaction.	

Acquirer Control Variables

- Financial ratios

Market Value	Market value (PRC*SHROUT) of the acquirer 42 days before the deal announcement	CRSP
Leverage	Long term debt plus current liabilities divided by the sum of the market value of equities, long term debt and current liabilities ((DLTT + DLC) / ((PRCC_C* CSHO)+ DLTT+ DLC))	Compustat
Cash Holding	Cash holding divided by total assets (CHE / AT)	Compustat
M/B	Market to book ratio of equities ((PRCC_C*CSHO)/ (AT-LT))	Compustat
Dividend	Indicator variable equal to one if total dividend (DVT) is greater than zero	Compustat
R&D	Research and development expense divided by total assets (XRD / AT)	Compustat
Asset Tangibility	Property plant and equipment divided by total assets (PPGT / AT)	Compustat
Ret Earnings	Mix of earned and contributed capital, defined as the ratio of retained earnings to total asset (DeAngelo et al., 2006) (RE / AT)	Compustat
Bidder Run_up	Market-adjusted buy-and-hold return of the bidding firm's stock over the period beginning 300 days and ending 46 days before deal announcement.	CRSP

- Information asymmetry

Recent M&A	Indicator variable equal to one if the bidder announced at least one another deal within 18 months prior to the deal under focus	SDC
Recent SEO	Indicator variable equal to one if the bidder issued stocks within 18 months prior to the deal under focus	SDC

Target Control Variables

- Governance

Cash-Only Seller	Indicator variable equal to one if the target is a financial sponsor or a subsidiary as reported in SDC.	SDC
Poison pill	Indicator variable equal to one if the target has a poison pill in place according to SDC	SDC

Transaction Control Variables

Deal Value	Transaction value (in US million $)	SDC
Relative Deal Size	Relative size of the deal, defined as transaction value divided by market value (Deal value / Market value)	SDC, Compustat
Tender Offer	Indicator variable equal to one if the deal is a tender offer according to SDC	SDC
Public Target	Indicator variable equal to one if the target is a listed firm	SDC
Cross-border Deal	Indicator variable equal to one if the target is a foreign firm	SDC
Horizontal Deal	Indicator variable equal to one when the bidder and the target share the same 2-digit SIC code as reported in SDC	SDC
Toehold	Indicator variable equal to one if the percentage of target shares own by the acquirer at the deal announcement is greater than zero according to SDC	SDC
Hostile	Indicator variable equal to one if the deal is hostile or unsolicited according to SDC	SDC
Multiple bidder	Indicator variable equal to one if the number of bidders is greater than one according to SDC	SDC

Industry Control Variables

Wave	Maksimovic et al. (2013) Z-score M&A wave variable, computed as the normalized aggregate volume of M&A transactions in the bidder Fama and French 49 industry divided by the aggregate total assets of all firms in the corresponding industry.	SDC, Compustat
High Tech	Indicator variable equal to one if the acquirer SIC code is classified as High tech according to Kile and Phillips (2009)	SDC
HHI	Assets based Herfindahl-Hirschman Index in the bidder's Fama and French 49 industry	Compustat
Private Buyers Comp	Fraction of all deals in the target's Fama and French industry undertaken by private bidders (Eckbo et al. , 2018)	SDC

Appendix B – Ownership Information Extraction from SEC Filings 13D and 13G

Our processing code mimics largely the approach introduced in Schwartz-Ziv and Volkova (2021), who distribute on GitHub freely her R codes (https://github.com/volkovacodes). The filings are either in plain text format or in html format. The first processing step is to convert html files into plain text format, removing all html tags. We use to this end the free HtmlAsText.exe utility, available at http://www.nirsoft.net/utils/htmlastext.html. The next processing step is to extract from the filings header the subject CIK (the Central Index Key, attributed by the SEC to individuals, compagnies or foreign governments – found next to the "SUBJECT COMPANY - CENTRAL INDEX KEY" entry), the subject company name (found next to the "SUBJECT COMPANY - COMPANY CONFORMED NAME" entry), the filer CIK (found next to the "FILED BY – CENTRAL INDEX KEY" entry) and the filer company name (found next to the "FILED BY - COMPANY CONFORMED NAME" entry). The filing date is extracted from the file name. The last and more challenging step is to extract from the filing the block percentage. While the extraction code deals with numerous particular cases, we implement the following general approach:

- Starting from the beginning of the filing, find the document block (identified by "<DOCUMENT>");
- While in a document block, find the Item 9, 10 or 11 sections (identified by "Percent of Class Represented by Amount in Row" sentence and variations of it);
- Once an Item 9, 10 or 11 section start is found, loop inside the next 5 lines of text and extract the block percentage.

Our code deals with inserted figures and graphics in JPEG format, included pdf files, multiple document blocks, badly formatted document block, Item 5 cases (that is used to indicate sales of blocks), the presence (or absence) of the character "%" or the word "PERCENT" after indication of the block size, the presence of multiple numbers on a given line, numbers above 100, the presence of several percentage indications for a given block, all tricky issues that are potentially source of errors. We are able to identify the block size in more than 95% of the cases. Manual examination of a sample of remaining cases reveals that errors are due to a mixture between incomplete filings, filings without block indication, complex filings in which block percentages are indicated in the form of an html table, etc.

Once the Filings 13D and 13G have been downloaded and processed, we undertake to construct the block ownership structure of our 2,335 acquirers and 6,162 targets year by year. One of the main challenges at this step of the procedure is to identify block sales so as to avoid taking into account blocks that disappeared in the past (obsolete blocks). Sales of blocks should be systematically reported under SEC regulation because they amount to a material change of the information previously provided. But this is apparently not always the case. We implement therefore the following procedure: sales of block

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themselves are identified either using information reported in Filings 13D and 13G Item 5, or by reported block percentage below 5 percent. However, not all blockholders follow this practice, and thus, if a blockholder does not file for three consecutive years a 13G or a 13D filing, we assume as Schwartz-Ziv et al. (2021), that the last year the blockholder did file a 13G, 13D filing was the last year he was indeed a blockholder.

Another source of errors in the process of building the firm-year panel data set is due to multiple filings occurring the same day by various filers for the same block, a case that corresponds to multiple beneficial owners in trust entities. We simply keep one unique filing in these cases. Several other rules of thumb are used to improve as much as possible the accuracy of the procedure. For example, if a Schedule 13D/A or 14D/A filing appears (a filing that amends a previous Filing 13D or 13G) but the previous filing has not been classified (because, for example, the block percentage has not been found), the corresponding unclassified filing is considered as the initial filing.

Appendix C – Table 4 Results Replication using Ownership Data from Schwartz-Ziv and Volkova (2021) and Bureau van Dijk Orbis Databases

Panel A: Schwartz-Ziv and Volkova (2021) Database

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Acquirer Ownership Structure						
Acq Full-Stock Block SV	-0.0360	-0.0171	-0.0133	-0.0470	-0.0252	-0.1066
	(-0.37)	(-0.18)	(-0.14)	(-0.48)	(-0.25)	(-0.93)
Acq Full-Stock Block SV²	0.0003	0.0002	0.0001	0.0005	0.0002	0.0014
	(0.27)	(0.15)	(0.11)	(0.43)	(0.13)	(0.89)
- Acquirer Financial Constraints						
HP Dummy	6.5649***					
	(5.15)					
KZ Dummy		4.6066***				
		(3.18)				
WW Dummy			5.0153***			
			(3.84)			
NonDividend Dummy				4.8017***		
				(4.13)		
BHK Dummy					4.0412**	
					(2.24)	
HM Index						12.0294**
						(2.17)
Control variables	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.2650	0.2620	0.2630	0.2630	0.2510	0.2640
N	4,879	4,879	4,879	4,879	4,498	3,889

Panel B: Bureau van Dijk Orbis Database

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Acquirer Ownership Structure						
Acq Full-Stock Block Orbis	0.0810	0.0774	0.0782	0.0791	0.0580	0.0291
	(1.09)	(1.04)	(1.05)	(1.06)	(0.77)	(0.31)
Acq Full-Stock Block Orbis²	-0.0012	-0.0012	-0.0012	-0.0012	-0.0009	-0.0006
	(-1.61)	(-1.58)	(-1.59)	(-1.59)	(-1.26)	(-0.69)
- Acquirer Financial Constraints						
HP Dummy	5.0027***					
	(3.56)					
KZ Dummy		2.1154				
		(1.41)				
WW Dummy			3.0308**			
			(2.17)			
NonDividend Dummy				1.9245		
				(1.45)		
BHK Dummy					3.1409	
					(1.60)	
HM Index						10.9131
						(1.63)
Control variables	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.2590	0.2570	0.2580	0.2570	0.2580	0.2590
N	3,959	3,959	3,959	3,959	3,740	2,540

Appendix D– Table 5 Results Replication using Ownership Data from Schwartz-Ziv and Volkova (2021) and Bureau van Dijk Orbis Databases

Panel A: Schwartz-Ziv and Volkova (2021) Database

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Target Ownership Structure						
Targ Full-Stock Block SV	2.9537***	2.9780***	2.9969***	2.9649***	3.2777***	1.9980*
	(3.14)	(3.19)	(3.30)	(3.16)	(3.48)	(1.73)
Targ Full-Stock Block SV²	-0.0871**	-0.0884**	-0.0881***	-0.0891**	-0.1020***	-0.0548
	(-2.43)	(-2.53)	(-2.61)	(-2.54)	(-3.02)	(-1.11)
- Acquirer Financial Constraints						
HP Dummy	13.6244***					
	(2.61)					
KZ Dummy		5.1652				
		(1.09)				
WW Dummy			11.0072**			
			(2.51)			
NonDividend Dummy				10.7710**		
				(2.42)		
BHK Dummy					7.3206	
					(1.09)	
HM Index						29.8339
						(1.56)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3710	0.3640	0.3700	0.3710	0.3600	0.3870
N	730	730	730	730	686	539

Panel B: Bureau van Dijk Orbis Database

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Target Ownership Structure						
Targ Full-Stock Block Orbis	1.4390***	1.4549***	1.4838***	1.4545***	1.5037***	1.0921
	(3.58)	(3.62)	(3.71)	(3.64)	(3.72)	(1.29)
Targ Full-Stock Block Orbis²	-0.0229***	-0.0236***	-0.0241***	-0.0236***	-0.0252***	-0.0234
	(-3.37)	(-3.50)	(-3.57)	(-3.51)	(-3.68)	(-1.47)
- Acquirer Financial Constraints						
HP Dummy	8.2727					
	(1.40)					
KZ Dummy		9.0214*				
		(1.82)				
WW Dummy			5.9043			
			(1.21)			
NonDividend Dummy				3.8234		
				(0.82)		
BHK Dummy					3.7719	
					(0.52)	
HM Index						-3.0137
						(-0.13)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3840	0.3860	0.3840	0.3830	0.3880	0.3920
N	645	645	645	645	618	380

Appendix E– Table 6 Results Replication using Ownership Data from Schwartz-Ziv and Volkova (2021) and Bureau van Dijk Orbis Databases

Panel A: Schwartz-Ziv and Volkova (2021) Database

Variable	perc_stock (1)	perc_stock (2)	perc_stock (3)	perc_stock (4)	perc_stock (5)	perc_stock (6)
- Ownership Structure						
Acq Full-Stock Block SV	0.9453*	0.8901*	0.9832*	0.9015*	1.0598*	1.2483**
	(1.80)	(1.67)	(1.92)	(1.72)	(1.86)	(2.16)
Acq Full-Stock Block SV²	-0.0136	-0.0130	-0.0142	-0.0128	-0.0155	-0.0192*
	(-1.44)	(-1.36)	(-1.53)	(-1.36)	(-1.52)	(-1.88)
Targ Full-Stock Block SV	2.8521**	2.7586**	2.7954**	2.8151**	3.4421**	2.1243
	(2.23)	(2.20)	(2.31)	(2.21)	(2.56)	(1.61)
Targ Full-Stock Block SV²	-0.0850	-0.0822	-0.0840*	-0.0843	-0.1190**	-0.0604
	(-1.61)	(-1.64)	(-1.74)	(-1.63)	(-2.14)	(-1.17)
Cross-ownership	10.5760**	10.2854**	10.4660**	10.8986**	10.4394**	12.5970**
	(2.51)	(2.47)	(2.50)	(2.56)	(2.43)	(2.37)
- Acquirer Financial Constraints						
HP Dummy	6.2284					
	(0.89)					
KZ Dummy		8.4716				
		(1.46)				
WW Dummy			14.0735***			
			(2.61)			
NonDividend Dummy				6.2961		
				(1.12)		
BHK Dummy					15.5011**	
					(1.98)	
HM Index						21.4504
						(0.94)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3550	0.3570	0.3630	0.3560	0.3490	0.3750
N	542	542	542	542	513	414

Panel B: Bureau van Dijk Orbis Database

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Ownership Structure						
Acq Full-Stock Block Orbis	0.0866	0.1110	0.0164	0.0777	0.1673	0.4320
	(0.26)	(0.34)	(0.05)	(0.24)	(0.51)	(0.98)
Acq Full-Stock Block Orbis²	-0.0011	-0.0012	-0.0002	-0.0010	-0.0020	-0.0054
	(-0.30)	(-0.36)	(-0.06)	(-0.29)	(-0.56)	(-1.18)
Targ Full-Stock Block Orbis	0.0376	-0.0035	-0.0237	0.0686	0.0922	-0.7077
	(0.05)	(0.00)	(-0.03)	(0.09)	(0.13)	(-0.69)
Targ Full-Stock Block Orbis²	0.0032	0.0042	0.0037	0.0029	0.0015	0.0108
	(0.23)	(0.31)	(0.27)	(0.21)	(0.11)	(0.57)
Cross-ownership	6.0552	6.7984	5.2407	6.1589	5.7695	11.4777*
	(1.35)	(1.53)	(1.18)	(1.37)	(1.26)	(1.71)
- Acquirer Financial Constraints						
HP Dummy	0.4889					
	(0.05)					
KZ Dummy		14.6083**				
		(2.19)				
WW Dummy			14.4820**			
			(2.06)			
NonDividend Dummy				-8.4178		
				(-1.40)		
BHK Dummy					9.5674	
					(0.84)	
HM Index						-2.2561
						(-0.07)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3450	0.3560	0.3540	0.3490	0.3560	0.4190
N	410	410	410	410	395	251

Figure 1: M&A Activity and Payment Consideration – Control Transactions

Figure 1 displays the volume of M&A transactions in million USD and the corresponding percentages of stock and cash used as consideration. The sample contains 6,225 acquisitions of assets and mergers control transactions undertaken by 2,335 non financials acquirers over the period 2002 to 2020 collected in the Thomson SDC database.
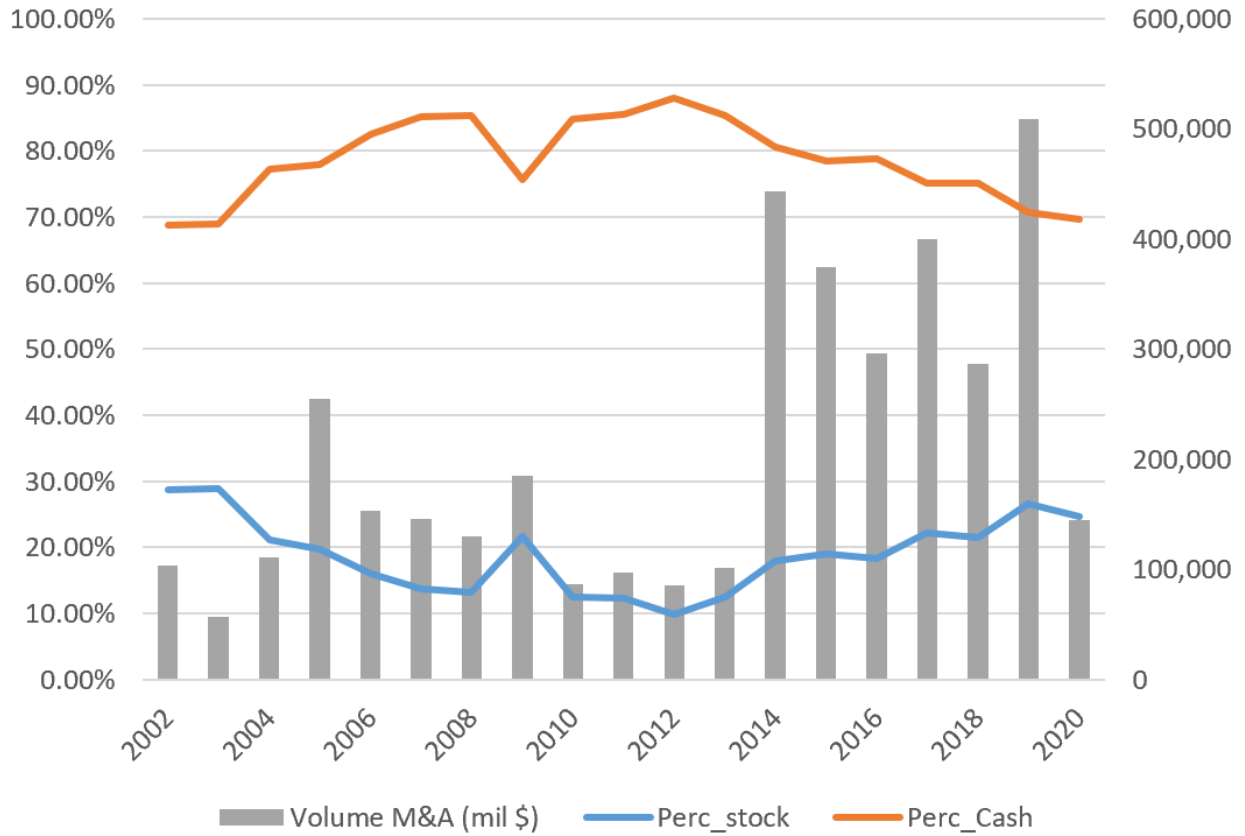
Figure 2: Scree Plot Obtained After a Principal Component Analysis on Financial Constraints Measures

Figure 2 displays eigenvalues of factors obtained running a principal component analysis on the six measures of acquirer financial constraints investigated in our analysis (the Hadlock and Pierce (2010) age-size index, the Lamont, Polk and Saa-Requejo (2001) version of the Kaplan Zingales (1997) index, the Whited and Wu (2006) index, a dummy variable identifying firms never paying dividends, the Hoberg and Maksimovic (2015) delayed investment measure and the Bartram, Hou and Kim (2021) composite measure). The sample contains 6,225 acquisitions of assets and mergers control transactions undertaken by 2,335 non financials acquirers over the period 2002 to 2020 collected in the Thomson SDC database.
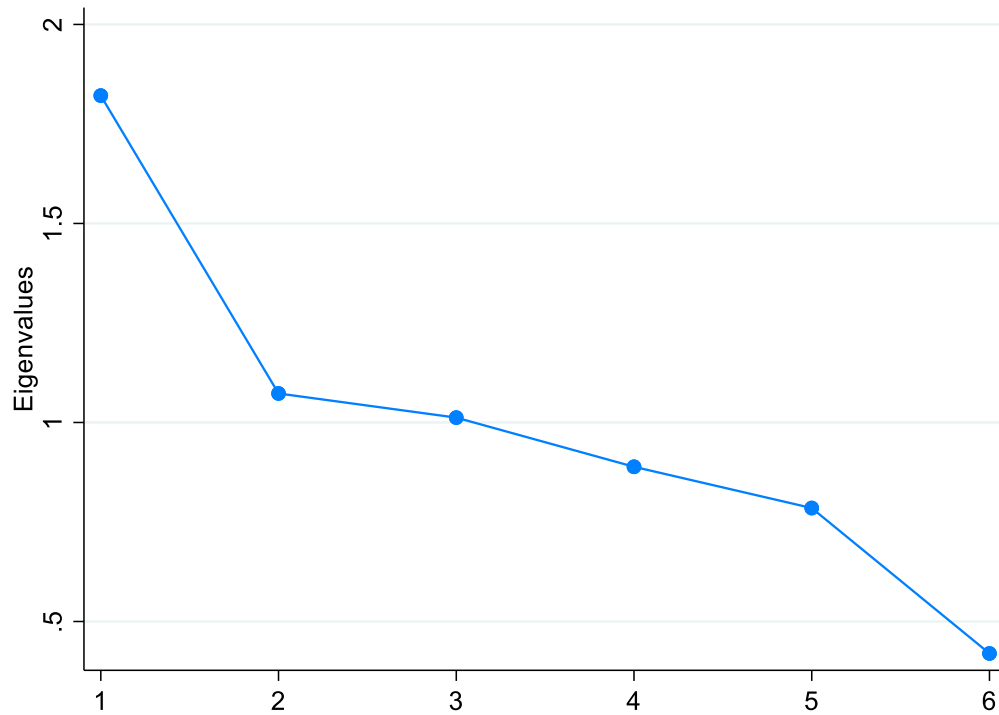
Table 1: Sample statistics

Table 1 reports descriptive statistics on our sample of mergers and acquisitions of assets. The sample contains 6,225 acquisitions of assets and mergers control transactions, as classified in the Thomson SDC database, undertaken by 2,335 non financials acquirers over the period 2002 to 2020. Column 1 reports the number of transactions by year and column 2, the corresponding volume in Million USD. Columns 3 and 4 provide the corresponding percentages of all-stock transactions, respectively based on the number (Column 3) and volume (Column 4) of transactions. Columns 5 and 6 display the corresponding percentages for all-cash transactions. Finally, Column 7 shows the average percentage of stock used in the compensation package of these transactions and Column 8, the corresponding average percentage of cash.

Year	All deals		% All-stock transactions		% All-cash transactions		% Stock	% Cash
	Number	Volume	Number	Volume	Number	Volume		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2002	462	103,185	18.61%	70.16%	57.58%	19.03%	28.76%	68.75%
2003	425	57,376	18.82%	34.92%	58.59%	34.93%	28.99%	68.94%
2004	528	110,461	11.55%	27.05%	67.05%	28.18%	21.13%	77.25%
2005	538	255,266	10.22%	11.20%	66.54%	22.52%	19.74%	78.04%
2006	509	153,526	7.47%	7.53%	72.10%	40.07%	16.07%	82.46%
2007	518	145,554	6.18%	4.70%	75.87%	68.00%	13.67%	85.16%
2008	338	130,400	7.69%	3.88%	76.63%	46.86%	13.23%	85.39%
2009	253	185,336	12.25%	5.25%	65.22%	17.12%	21.63%	75.74%
2010	319	86,426	5.64%	5.76%	76.18%	72.07%	12.45%	84.88%
2011	293	96,892	4.44%	4.46%	75.43%	70.50%	12.27%	85.53%
2012	335	85,927	4.18%	5.02%	76.42%	68.74%	9.84%	87.96%
2013	295	100,983	4.75%	2.26%	76.27%	46.95%	12.47%	85.32%
2014	333	443,494	9.01%	8.96%	68.47%	13.31%	17.96%	80.69%
2015	265	374,994	6.79%	44.44%	61.13%	19.04%	18.95%	78.46%
2016	177	296,327	5.65%	8.49%	61.02%	35.11%	18.28%	78.86%
2017	170	400,168	8.24%	3.40%	54.71%	13.15%	22.13%	75.07%
2018	186	287,062	9.14%	7.78%	57.53%	65.73%	21.55%	75.05%
2019	139	508,637	13.67%	30.18%	53.24%	10.12%	26.64%	70.73%
2020	142	144,431	11.97%	43.17%	54.23%	34.81%	24.69%	69.61%
Total	6,225	3,966,443	11.76%	17.23%	67.55%	30.16%	18.69%	79.16%

Table 2: Descriptive statistics

Table 2 reports descriptive statistics on acquirer characteristics (Panel A), target characteristics (Panel B), transaction characteristics (Panel C) and industry characteristics (Panel D) obtained for a sample of 6,225 acquisitions of assets and mergers control transactions as classified in the Thomson SDC database, undertaken over the period 2002 to 2020. Acquirers characteristics include *Market Value* (in USD thousands), *Leverage*, *Cash Holding*, *M/B* (for market to book), *Dividend payment*, *R&D* (for research and development), *Asset Tangibility*, *Ret Earnings* (for retained earnings), stock price bidder run-up, six measures of financial constraints (*HP Dummy, KZ Dummy, WW Dummy, NonDividend Dummy, BHK Dummy, HM Index*), *Recent M&A*, *Recent SEO*, *Acq Max Block* (for the largest block in the acquirer ownership structure) and *Acq Full-Stock Block* (for the potential size of the largest block in the acquirer ownership structure in the new entity in case of full stock payment) and the corresponding variables obtained using Schwartz-Ziv and Volkova (2021) dataset (*Acq Max Block SV* and *Acq Full-Stock Block SV*) and the Bureau van Dijk Orbis Database (*Acq Max Block Orbis* and *Acq Full-Stock Block Orbis*). Collected target characteristics are *Cash-Only Seller*, *Poison pill* and the same list of ownership structure characteristics as for acquirers. Transaction characteristics are *Deal Value*, *Relative Deal Size*, *Tender offer*, *Public Target*, *Cross-border Deal*, *Horizontal Deal, Toehold*, *Hostile* and *Multiple bidder*. Industry characteristics are *Wave*, *High Tech* (for industries classified as high-technology in Kile and Phillips, 2009), *HHI* (for the assets based Herfindahl-Hirschman concentration index) and *Private Buyers Comp* (for competition from private buyers). All variable definitions are provided in Appendix A, with their data sources. All financial ratios are winsorized at 1st and 99th percentiles. Arithmetic averages are reported for the full sample (columns 1 and 2), all-cash transactions (column 3), mixed-payment transactions (column). Column 5 a test of difference of means between mixed-payment and all-cash transactions with the associated p-values are in column 6 adjusted for heterosckedasticity. *N* is the number of observations for which the corresponding variable is available.

Variable	Full sample		All-cash	Mixed	Difference	
	N	Mean	Mean	Mean	Mean	P-val
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A - Acquirer Financial Constraints						
HP Dummy	6,225	0.2654	0.1831	0.4366	-0.2535	0.000
KZ Dummy	6,225	0.2638	0.2421	0.3089	-0.0668	0.000
WW Dummy	6,225	0.2978	0.2176	0.4649	-0.2473	0.000
NonDividend Dummy	6,225	0.5547	0.4892	0.6911	-0.2019	0.000
BHK Dummy	5,740	0.0962	0.0652	0.1632	-0.0980	0.000
HM index	4,350	-0.0164	-0.0216	-0.0051	-0.0165	0.000
Panel B - Acquirer and Target Ownership Structure						
Acq Max Block	4,643	14.7020	14.2577	15.7208	-1.4631	0.001
Acq Full-Stock Block	4,643	13.1780	13.2928	12.9149	0.3779	0.319
Acq Max Block SV	4,879	15.8760	15.4037	16.9596	-1.5558	0.001
Acq Full-Stock Block SV	4,879	14.2073	14.3253	13.9365	0.3887	0.352
Acq Max Block Orbis	3,959	23.5077	23.4283	23.6988	-0.2705	0.797
Acq Full-Stock Block Orbis	3,959	21.1086	22.0354	18.8805	3.1550	0.001
Targ Max Block	651	15.1419	14.5617	15.8336	-1.2719	0.183
Targ Full-Stock Block	651	2.8791	1.4689	4.5599	-3.0910	0.000
Targ Max Block SV	730	16.5663	15.3357	18.0093	-2.6736	0.019
Targ Full-Stock Block SV	730	3.0134	1.4838	4.8071	-3.3233	0.000
Targ Max Block Orbis	645	19.6150	18.4619	20.9412	-2.4793	0.205
Targ Full-Stock Block Orbis	645	3.7712	1.6962	6.1576	-4.4615	0.000
Cross-ownership	708	0.1568	0.1296	0.1879	-0.0582	0.035
Panel C - Acquirer Control Variables						
- Financial ratios						
Market Value (mil)	6,225	11,800,000	14,400,000	6,555,842	7,844,158	0.000
Leverage	6,225	0.1506	0.1501	0.1516	-0.0015	0.750
Cash Holding	6,225	0.2198	0.2017	0.2575	-0.0558	0.000
M/B	6,225	3.5340	3.4668	3.6739	-0.2071	0.105
Dividend	6,225	0.3602	0.4043	0.2683	0.1360	0.000
R&D	6,225	0.0509	0.0410	0.0715	-0.0305	0.000
Asset Tangibility	6,225	0.1883	0.1839	0.1974	-0.0135	0.022
Ret Earnings	6,225	-0.3504	-0.0482	-0.9796	0.9314	0.000
Bidder Run_up	6,225	0.1545	0.1113	0.2444	-0.1332	0.000
- Information asymetry						
Recent M&A	6,225	0.3873	0.4197	0.3198	0.0999	0.000
Recent SEO	6,225	0.1134	0.0918	0.1584	-0.0666	0.000

Variable	Full sample		All-cash	Mixed	Difference	
	N	Mean	Mean	Mean	Mean	P-val
	(1)	(2)	(3)	(4)	(5)	(6)
Panel D - Target Control Variables						
- Governance						
Cash-Only Seller	6,225	0.2991	0.3593	0.1738	0.1856	0.000
Poison pill	6,225	0.0029	0.0031	0.0025	0.0006	0.659
Panel E - Transaction Control Variables						
Deal Value	6,225	637	284	1,371	-1,087	0.000
Relative Deal Size	6,225	0.1949	0.0914	0.4106	-0.3192	0.000
Tender offer	6,225	0.0487	0.0621	0.0208	0.0413	0.000
Public Target	6,225	0.2257	0.1836	0.3134	-0.1298	0.000
Cross-border Deal	6,225	0.1933	0.2124	0.1535	0.0589	0.000
Horizontal Deal	6,225	0.6408	0.6190	0.6861	-0.0671	0.000
Toehold	6,225	0.0085	0.0078	0.0099	-0.0021	0.428
Hostile	6,225	0.0040	0.0040	0.0040	0.0001	0.961
Multiple bidder	6,225	0.0246	0.0207	0.0327	-0.0120	0.008
Panel F - Industry Control Variables						
Wave	6,225	-0.1230	-0.1183	-0.1329	0.0145	0.429
High Tech	6,225	0.4691	0.4573	0.4936	-0.0363	0.007
HHI	6,225	0.0995	0.1013	0.0956	0.0057	0.053
Private Buyers Comp	6,225	0.2631	0.2615	0.2664	-0.0050	0.210

Table 3: The Role of the Acquirer Financial Constraints

Table 3 reports multivariate analyses of the mode of payment determinants without (Panel A) and with (Panel B) control variables focusing on the role of acquirer financial constraints. Our M&A sample contains 6,225 acquisitions of assets and mergers control transactions, as classified in the Thomson SDC database, undertaken by 2,335 non financials acquirers over the period 2002 to 2020. The estimation sample is however restricted to 5,740 and 4,350 transactions in columns 5 and 6 respectively because of data availability limitations. In all specifications, the dependent variable is the percentage of stocks in the payment package. The independent variable of interest is the measure of acquirer financial constraints (*HP Dummy, KZ Dummy, WW Dummy, NonDividend Dummy, BHK Dummy, HM Index* in columns 1 to 6 respectively). Control variables include acquirer, target, transaction and industry characteristics listed in Table 2 (at the exclusion of *deal value* because colinear with *Ln(Market Value)* and *Relative Deal Size*). Appendix A provides variable definitions and their data sources. Descriptive statistics are reported in Table 2. All specifications are estimated by ordinary least squares and includes year and industry fixed effects. Standard errors are robust to heteroskedasticity and reported between parentheses below coefficient estimates. *adj. R^2* is for adjusted r-squared, *N* for the number of observations. * indicates statistical significance at the ten percent confidence level, ** at the five percent confidence level and *** at the one percent confidence level.

Panel A: Without Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Acquirer Financial Constraints						
HP Dummy	17.7966***					
	(16.30)					
KZ Dummy		7.5270***				
		(6.58)				
WW Dummy			15.9698***			
			(15.03)			
NonDividend Dummy				10.3255***		
				(12.03)		
BHK Dummy					18.0369***	
					(10.15)	
HM Index						28.2806***
						(4.84)
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.1010	0.0580	0.0910	0.0700	0.0760	0.0480
N	6,225	6,225	6,225	6,225	5,740	4,350

Panel B: With Control Variables

Variable	(1)	VIF	(2)	VIF	(3)	VIF	(4)	VIF	(5)	VIF	(6)	VIF
- Acquirer Financial Constraints												
HP Dummy	7.1939***	1.75										
	(6.16)											
KZ Dummy			5.4919***	2.01								
			(4.21)									
WW Dummy					4.7667***	1.75						
					(4.13)							
NonDividend Dummy							4.6023***	1.96				
							(4.28)					
BHK Dummy									7.0826***	1.26		
									(4.31)			
HM Index											14.2421***	1.08
											(2.71)	
- Acquirer Characteristics												
Ln(Market Value)	-1.9606***	2.10	-2.6884***	1.56	-2.2228***	2.08	-2.6138***	1.59	-2.5168***	1.68	-2.7427***	1.53
	(-6.59)		(-9.64)		(-7.27)		(-9.34)		(-8.77)		(-8.85)	
Leverage	1.4124	1.49	-4.8075	1.61	0.4315	1.48	-0.6259	1.46	-0.7205	1.46	-1.0641	1.50
	(0.47)		(-1.54)		(0.14)		(-0.21)		(-0.24)		(-0.30)	
Cash Holding	0.2658	1.81	4.6314*	1.90	1.6401	1.79	1.2277	1.79	2.8219	1.82	0.0596	1.83
	(0.10)		(1.70)		(0.61)		(0.46)		(1.00)		(0.02)	
M/B	0.1175	1.22	0.1476*	1.22	0.1357	1.22	0.1535*	1.22	0.1405	1.20	0.2616**	1.26
	(1.32)		(1.68)		(1.54)		(1.74)		(1.53)		(2.00)	
Dividend dummy	-0.6031	1.28	1.0440	1.43	0.0014	1.30	2.1737**	1.86	0.1336	1.30	-0.3756	1.27
	(-0.69)		(1.11)		(0.00)		(1.98)		(0.15)		(-0.36)	
R&D	53.0917***	1.66	53.9473***	1.67	55.2513***	1.66	55.5527***	1.65	48.2937***	1.65	54.2709***	1.66
	(6.66)		(6.72)		(6.93)		(6.91)		(5.61)		(5.19)	
Asset Tangiblility	6.8732**	1.34	1.4698	1.69	7.0712**	1.34	6.6865**	1.34	3.5836	1.35	3.9842	1.38
	(2.33)		(0.45)		(2.40)		(2.27)		(1.18)		(1.07)	
Ret Earnings	-2.6319***	1.21	-2.6304***	1.22	-2.6673***	1.21	-2.7029***	1.21	-2.4080***	1.20	-2.9239***	1.25
	(-8.45)		(-8.38)		(-8.48)		(-8.58)		(-7.40)		(-7.54)	
Recent M&A	-0.7031	1.13	-0.6048	1.13	-0.5543	1.13	-0.6956	1.13	-0.7825	1.12	-0.4121	1.12
	(-0.91)		(-0.78)		(-0.71)		(-0.90)		(-0.98)		(-0.45)	
Recent SEO	3.2360**	1.06	3.7702***	1.05	4.0090***	1.05	3.6159***	1.05	4.8794***	1.05	5.1366***	1.04
	(2.49)		(2.94)		(3.11)		(2.82)		(3.49)		(3.29)	
Bidder Run_up	2.4269***	1.06	2.6323***	1.05	2.4827***	1.06	2.6285***	1.05	2.6234***	1.05	3.0213***	1.05
	(4.63)		(4.88)		(4.70)		(4.81)		(4.54)		(4.30)	

Variable	(1)		(2)		(3)		(4)		(5)		(6)	
- Target Characteristics												
Cash-Only-Seller	-5.2719***	1.22	-5.4220***	1.22	-5.3150***	1.22	-5.1771***	1.22	-4.8330***	1.22	-6.1999***	1.20
	(-6.62)		(-6.79)		(-6.65)		(-6.49)		(-6.00)		(-6.36)	
Poison piills	-8.6331	1.08	-8.3033	1.08	-8.4866	1.08	-8.5752	1.08	-4.7892	1.10	-5.6660	1.11
	(-1.20)		(-1.13)		(-1.15)		(-1.18)		(-0.54)		(-0.61)	
- Transaction Characteristics												
Relative Deal Size	3.0037	1.08	3.0034	1.08	2.9983	1.08	3.0025	1.08	2.7041	1.08	7.3139***	1.16
	(1.52)		(1.51)		(1.50)		(1.52)		(1.45)		(3.73)	
Public Target	25.3295***	1.56	25.1665***	1.56	25.2548***	1.56	25.3430***	1.56	25.7298***	1.56	24.0318***	1.59
	(17.26)		(17.09)		(17.16)		(17.23)		(17.23)		(13.48)	
Tender offer	-27.186***	1.27	-27.093***	1.27	-27.090***	1.27	-26.965***	1.27	-27.000***	1.28	-26.393***	1.30
	(-14.77)		(-14.67)		(-14.64)		(-14.63)		(-14.27)		(-11.68)	
Cross-border Deal	-1.9397**	1.03	-2.1438**	1.03	-2.0536**	1.03	-1.9268**	1.03	-1.9195**	1.03	-1.6786	1.03
	(-2.16)		(-2.38)		(-2.28)		(-2.14)		(-2.08)		(-1.51)	
Horizontal Deal	-0.6515	1.06	-0.6554	1.06	-0.5760	1.06	-0.6740	1.06	-0.5857	1.06	0.1422	1.06
	(-0.80)		(-0.81)		(-0.71)		(-0.83)		(-0.70)		(0.14)	
Toehold	9.0565*	1.03	8.4199	1.03	8.2503	1.03	8.2614	1.03	7.5261	1.03	11.6837*	1.04
	(1.72)		(1.60)		(1.57)		(1.57)		(1.40)		(1.74)	
Hostile	-2.0652	1.10	-3.3179	1.10	-2.8400	1.10	-2.4315	1.10	-3.2649	1.12	-4.1170	1.09
	(-0.31)		(-0.51)		(-0.43)		(-0.37)		(-0.48)		(-0.45)	
Multiple Bidder	-4.1529	1.12	-4.3828	1.12	-4.3959	1.12	-4.0121	1.12	-3.5331	1.12	-6.5043*	1.12
	(-1.45)		(-1.52)		(-1.54)		(-1.40)		(-1.20)		(-1.83)	
- Industry Characteristics												
Wave	0.4984	1.15	0.5085	1.15	0.4867	1.15	0.5047	1.15	0.0565	1.15	-0.0067	1.14
	(0.86)		(0.89)		(0.85)		(0.69)		(0.10)		(-0.01)	
High Tech	4.1248**	1.60	4.7607**	1.61	3.8209**	1.63	4.3494***	1.62	5.3372***	1.61	6.0422***	1.66
	(2.24)		(2.57)		(2.05)		(4.63)		(2.81)		(2.67)	
HHI	4.3014	1.06	3.9819	1.05	4.2318	1.05	3.2963	1.05	3.0369	1.05	7.5490	1.06
	(0.83)		(0.76)		(0.81)		(0.44)		(0.56)		(1.23)	
Private Buyers Comp	0.6378	1.24	0.4762	1.23	0.1186	1.23	0.1733	1.23	0.6768	1.23	-4.4477	1.25
	(0.16)		(0.12)		(0.03)		(0.04)		(0.16)		(-0.83)	
Year FE	yes		yes		yes		yes		yes		yes	
Industry FE	yes		yes		yes		yes		yes		yes	
adj. R²	0.2740		0.2710		0.2710		0.2710		0.2650		0.2700	
N	6,225		6,225		6,225		6,225		5,740		4,350	

Table 4: Acquirer Financial Constraints versus Acquirer Ownership Structure

Table 4 reports multivariate analyses of the mode of payment determinants without (Panel A), with (Panel B) control variables and with interaction terms (Panel C) focusing on the tradeoff between acquirer financial constraints and dilution due to acquirer ownership structure. Our M&A sample contains 6,225 acquisitions of assets and mergers control transactions, as classified in the Thomson SDC database, undertaken by 2,335 non financials acquirers over the period 2002 to 2020. The estimation sample is however varying depending on data availability limitations. In all specifications, the dependent variable is the percentage of stocks in the payment package. The independent variable of interest are characterization of the acquirer ownership structure (*Acq Full-Stock Block* and its squared value) and the measure of acquirer financial constraints (*HP Dummy, KZ Dummy, WW Dummy, NonDividend Dummy, BHK Dummy, HM Index* in columns 1 to 6 respectively). Control variables include acquirer, target, transaction and industry characteristics listed in Table 2 (at the exclusion of *deal value* because colinear with *Ln(Market Value)* and *Relative Deal Size*) but are not reported. Appendix A provides variable definitions and their data sources. Descriptive statistics are reported in Table 2. All specifications are estimated by ordinary least squares and includes year and industry fixed effects. Standard errors are robust to heteroskedasticity and reported between parentheses below coefficient estimates. *adj. R^2* is for adjusted r-squared, *N* for the number of observations. * indicates statistical significance at the ten percent confidence level, ** at the five percent confidence level and *** at the one percent confidence level.

Panel A: Without Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Acquirer Ownership Structure						
Acq Full-Stock Block	-0.2576**	-0.0968	-0.1830*	-0.2038*	-0.2423**	-0.1351
	(-2.30)	(-0.85)	(-1.65)	(-1.78)	(-2.11)	(-0.96)
Acq Full-Stock Block²	0.0027*	0.0013	0.0022	0.0026	0.0027*	0.0016
	(1.69)	(0.84)	(1.38)	(1.63)	(1.67)	(0.74)
- Acquirer Financial Constraints						
HP Dummy	17.3737***					
	(13.49)					
KZ Dummy		6.9557***				
		(5.32)				
WW Dummy			16.7806***			
			(13.39)			
NonDividend Dummy				10.2487***		
				(10.62)		
BHK Dummy					12.2471***	
					(5.41)	
HM Index						21.4690***
						(3.18)
Control variables	no	no	no	no	no	no
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.0960	0.0550	0.0930	0.0690	0.1010	0.0440
N	4,643	4,643	4,643	4,643	4,296	3,383

Panel B: With Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Acquirer Ownership Structure						
Acq Full-Stock Block	-0.1160	-0.0985	-0.0908	-0.1287	-0.0744	-0.0624
	(-1.09)	(-0.93)	(-0.86)	(-1.21)	(-0.69)	(-0.48)
Acq Full-Stock Block²	0.0013	0.0012	0.0011	0.0015	0.0007	0.0008
	(0.87)	(0.81)	(0.75)	(1.07)	(0.47)	(0.42)
- Acquirer Financial Constraints						
HP Dummy	7.3686***					
	(5.40)					
KZ Dummy		4.9349***				
		(3.27)				
WW Dummy			6.1918***			
			(4.48)			
NonDividend Dummy				4.6663***		
				(3.92)		
BHK Dummy					7.4513***	
					(3.63)	
HM Index						11.5156*
						(1.90)
Control variables	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.2550	0.2520	0.2540	0.2530	0.2480	0.2600
N	4,643	4,643	4,643	4,643	4,296	3,383

Panel C: With Control Variables and Interaction Terms

Variable	(1)	VIF	(2)	VIF	(3)	VIF	(4)	VIF	(5)	VIF	(6)	VIF
- Acquirer Ownership Structure												
Acq Full-Stock Block	-0.1238	11.49	-0.0348	10.70	0.0246	10.96	-0.2428*	18.37	-0.0195	9.06	-0.0661	8.34
	(-1.06)		(-0.30)		(0.22)		(-1.78)		(-0.18)		(-0.50)	
Acq Full-Stock Block²	0.0018	11.05	0.0010	10.77	-0.0003	10.03	0.0031*	17.33	0.0000	8.86	0.0010	8.11
	(1.13)		(0.61)		(-0.19)		(1.79)		(-0.03)		(0.52)	
- Acquirer Financial Constraints												
Constraint Measures	7.0992**	6.47	7.5834***	6.69	10.5420***	6.77	2.6277	6.77	13.8692***	5.79	1.0602	7.06
	(2.52)		(2.78)		(3.69)		(1.18)		(2.85)		(0.07)	
- Interaction between Financial Constraints & Ownership Structure												
Acq Full-Stock Block X Constraint	0.0887	23.64	-0.2241	24.72	-0.4608	23.75	0.2411	29.91	-0.6992	23.16	1.4433	21.25
	(0.36)		(-0.88)		(-1.64)		(1.19)		(-1.45)		(0.86)	
Acq Full-Stock Block² X Constraint	-0.0026	13.54	0.0008	15.18	0.0062	12.88	-0.0036	19.17	0.0096	13.34	-0.0293	10.08
	(-0.74)		(0.24)		(1.36)		(-1.25)		(1.23)		(-0.96)	
Control variables	yes		yes		yes		yes		yes		yes	
Year FE	yes		yes		yes		yes		yes		yes	
Industry FE	yes		yes		yes		yes		yes		yes	
adj. R²	0.2550		0.2530		0.2540		0.2530		0.2480		0.2600	
N	4,643		4,643		4,643		4,643		4,296		3,383	

Table 5: Acquirer Financial Constraints versus Target Ownership Structure

Table 5 reports multivariate analyses of the mode of payment determinants without (Panel A), with (Panel B) control variables and with interaction terms (Panel C) focusing on the tradeoff between acquirer financial constraints and dilution due to target ownership structure. Our M&A sample contains 6,225 acquisitions of assets and mergers control transactions, as classified in the Thomson SDC database, undertaken by 2,335 non financials acquirers over the period 2002 to 2020. The estimation sample is however varying depending on data availability limitations. In all specifications, the dependent variable is the percentage of stocks in the payment package. The independent variable of interest are characterization of the target ownership structure (*Targ Full-Stock Block* and its squared value) and the measure of acquirer financial constraints (*HP Dummy, KZ Dummy, WW Dummy, NonDividend Dummy, BHK Dummy, HM Index* in columns 1 to 6 respectively). Control variables include acquirer, target, transaction and industry characteristics listed in Table 2 (at the exclusion of *deal value* because colinear with *Ln(Market Value)* and *Relative Deal Size*) but are not reported. Appendix A provides variable definitions and their data sources. Descriptive statistics are reported in Table 2. All specifications are estimated by ordinary least squares and includes year and industry fixed effects. Standard errors are robust to heteroskedasticity and reported between parentheses below coefficient estimates. *adj. R²* is for adjusted r-squared, *N* for the number of observations. * indicates statistical significance at the ten percent confidence level, ** at the five percent confidence level and *** at the one percent confidence level.

Panel A: Without Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Target Ownership Structure						
Targ Full-Stock Block	3.3612***	3.9703***	3.4064***	3.7014***	3.5960***	7.4724***
	(6.59)	(7.80)	(6.97)	(7.24)	(6.97)	(5.21)
Targ Full-Stock Block²	-0.0397***	-0.0472***	-0.0395***	-0.0437***	-0.0429***	-0.2606***
	(-4.94)	(-5.73)	(-4.98)	(-5.25)	(-5.12)	(-2.90)
- Acquirer Financial Constraints						
HP Dummy	27.8532***					
	(5.79)					
KZ Dummy		11.0197**				
		(2.50)				
WW Dummy			28.9935***			
			(6.55)			
NonDividend Dummy				12.2926***		
				(3.70)		
BHK Dummy					30.4457***	
					(4.48)	
HM Index						62.5825***
						(2.88)
Controls	no	no	no	no	no	no
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.2680	0.2310	0.2810	0.2390	0.2410	0.2410
N	651	651	651	651	620	439

Panel B: With Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Target Ownership Structure						
Targ Full-Stock Block	1.7683***	1.8054***	1.8317***	1.7762***	1.7364***	1.2928
	(3.17)	(3.25)	(3.37)	(3.29)	(3.05)	(0.90)
Targ Full-Stock Block²	-0.0301***	-0.0311***	-0.0306***	-0.0302***	-0.0301***	-0.0208
	(-3.74)	(-3.84)	(-3.80)	(-3.75)	(-3.60)	(-0.25)
- Acquirer Financial Constraints						
HP Dummy	8.5035					
	(1.51)					
KZ Dummy		7.2921				
		(1.44)				
WW Dummy			13.7536***			
			(2.63)			
NonDividend Dummy				7.4124		
				(1.61)		
BHK Dummy					7.6718	
					(0.98)	
HM Index						24.6422
						(1.17)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3780	0.3780	0.3840	0.3790	0.3700	0.4400
N	651	651	651	651	620	439

Panel C: With Control Variables and Interaction Terms

Variable	(1)	VIF	(2)	VIF	(3)	VIF	(4)	VIF	(5)	VIF	(6)	VIF
- Target Ownership Structure												
Targ Full-Stock Block	2.1737***	11.92	2.2969***	14.47	1.8992***	11.68	1.3785*	16.98	1.8384***	10.35	1.6323	10.10
	(3.38)		(3.59)		(3.13)		(1.92)		(2.99)		(1.08)	
Targ Full-Stock Block²	-0.0347***	11.26	-0.0370***	11.16	-0.0304***	9.84	-0.0268***	12.73	-0.0310***	8.07	-0.0396	7.84
	(-4.03)		(-4.04)		(-3.63)		(-2.84)		(-3.57)		(-0.47)	
- Acquirer Financial Constraints												
Constraint Measures	16.2593*	5.10	11.8361*	4.16	12.0640*	4.24	6.5300	4.67	11.4225	4.40	19.4541	2.99
	(1.94)		(1.91)		(1.69)		(1.19)		(0.99)		(0.59)	
- Interaction between Financial Constraints & Ownership Structure												
Targ Full-Stock Block X Constraint	-2.1018	26.57	-1.5914	14.82	0.9261	21.46	0.0392	18.44	-1.0686	24.11	9.6280	12.49
	(-0.97)		(-0.97)		(0.45)		(0.03)		(-0.30)		(0.62)	
Targ Full-Stock Block² X Constraint	0.0409	19.47	0.0163	9.36	-0.0590	15.19	0.0275	12.65	0.0160	16.60	-1.1741	8.36
	(0.48)		(0.26)		(-0.72)		(0.47)		(0.13)		(-1.06)	
Control variables	yes		yes		yes		yes		yes		yes	
Year FE	yes		yes		yes		yes		yes		yes	
Industry FE	yes		yes		yes		yes		yes		yes	
adj. R²	0.3790		0.3790		0.3820		0.3770		0.3680		0.4400	
N	651		651		651		651		620		439	

Table 6: Acquirer Financial Constraints versus Acquirer and Target Ownership Structure

Table 6 reports multivariate analyses of the mode of payment determinants without (Panel A) and with (Panel B) control variables taking into account dilution due to both the acquirer and the target ownership structures. Our M&A sample contains 6,225 acquisitions of assets and mergers control transactions, as classified in the Thomson SDC database, undertaken by 2,335 non financials acquirers over the period 2002 to 2020. The estimation sample is however varying depending on data availability limitations. In all specifications, the dependent variable is the percentage of stocks in the payment package. The independent variable of interest are characterization of the acquirer and target ownership structure (*Acq Full-Stock Block*, *Targ Full-Stock Block* and their squared values) and the measure of acquirer financial constraints (*HP Dummy, KZ Dummy, WW Dummy, NonDividend Dummy, BHK Dummy, HM Index* in columns 1 to 6 respectively). Control variables include acquirer, target, transaction and industry characteristics listed in Table 2 (at the exclusion of *deal value* because colinear with *Ln(Market Value)* and *Relative Deal Size*) but are not reported. Appendix A provides variable definitions and their data sources. Descriptive statistics are reported in Table 2. All specifications are estimated by ordinary least squares and includes year and industry fixed effects. Standard errors are robust to heteroskedasticity and reported between parentheses below coefficient estimates. *adj. R^2* is for adjusted r-squared, *N* for the number of observations. * indicates statistical significance at the ten percent confidence level, ** at the five percent confidence level and *** at the one percent confidence level.

Panel A: Without Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Ownership Structure						
Acq Full-Stock Block	0.0762	0.3330	0.3102	0.2027	0.4970	1.4049*
	(0.12)	(0.50)	(0.50)	(0.31)	(0.74)	(1.71)
Acq Full-Stock Block²	0.0017	-0.0008	-0.0036	0.0027	-0.0041	-0.0219
	(0.14)	(-0.06)	(-0.31)	(0.21)	(-0.32)	(-1.31)
Targ Full-Stock Block	3.2257***	3.6633***	3.1888***	3.3993***	3.4297***	8.2968***
	(4.95)	(5.68)	(5.20)	(5.29)	(5.42)	(4.80)
Targ Full-Stock Block²	-0.0411***	-0.0463***	-0.0389***	-0.0425***	-0.0434***	-0.3003***
	(-4.22)	(-4.80)	(-4.18)	(-4.39)	(-4.52)	(-2.91)
Cross-ownership	8.4044*	7.1122*	8.5943**	7.8513*	8.7120**	12.6688**
	(1.96)	(1.65)	(2.02)	(1.78)	(2.01)	(2.15)
- Acquirer Financial Constraints						
HP Dummy	27.6385***					
	(4.61)					
KZ Dummy		16.9615***				
		(3.27)				
WW Dummy			30.6616***			
			(5.74)			
NonDividend Dummy				13.0960***		
				(3.31)		
BHK Dummy					33.1218***	
					(4.22)	
HM Index						50.1731**
						(2.02)
Controls	no	no	no	no	no	no
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.2330	0.2130	0.2540	0.2100	0.2270	0.2220
N	531	531	531	531	507	361

Panel B: With Control Variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
- Ownership Structure						
Acq Full-Stock Block	0.3513	0.3606	0.4219	0.3092	0.5650	1.0701
	(0.62)	(0.64)	(0.76)	(0.54)	(0.95)	(1.61)
Acq Full-Stock Block²	-0.0053	-0.0055	-0.0070	-0.0040	-0.0094	-0.0207
	(-0.47)	(-0.48)	(-0.63)	(-0.35)	(-0.80)	(-1.52)
Targ Full-Stock Block	1.5746**	1.5553**	1.5663**	1.5470**	1.4665**	1.4836
	(2.28)	(2.25)	(2.35)	(2.28)	(2.07)	(0.87)
Targ Full-Stock Block²	-0.0341***	-0.0348***	-0.0334***	-0.0334***	-0.0334***	-0.0318
	(-3.46)	(-3.54)	(-3.43)	(-3.41)	(-3.34)	(-0.32)
Cross-ownership	9.8396**	9.8431**	9.8652**	9.9844**	9.8812**	11.8929**
	(2.50)	(2.53)	(2.52)	(2.53)	(2.48)	(2.26)
- Acquirer Financial Constraints						
HP Dummy	2.0228					
	(0.29)					
KZ Dummy		13.6986**				
		(2.40)				
WW Dummy			14.0498**			
			(2.36)			
NonDividend Dummy				4.7020		
				(0.84)		
BHK Dummy					11.2980	
					(1.26)	
HM Index						17.0198
						(0.70)
Controls	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes
adj. R²	0.3690	0.3790	0.3780	0.3700	0.3660	0.4290
N	531	531	531	531	507	361