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Abstract

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JEL Classification: G12, G3, G32

Keywords: M&As, bargaining power, value of control, Business Groups

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M&As and the Value of Control

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Abstract

We study how value affects the bargaining game in the market for corporate control. We focus on business groups and propose a novel approach in which we can directly quantify the difference in value between what the buyer gets and what the seller gives. If a firm helps to retain control of a group through a network of cross-ownership, another firm buying such firm does not necessarily acquire control of the group. This implies that if another firm buys such firm, the seller loses control of the group but the buyer does not necessarily acquire it. Therefore, the value of the firm for the buyer is lower than it is for the seller. In these conditions it is not likely that the deal will ever go though. We argue and show that the difference in the value for the buyer and that for the seller is always strongly negatively related to the target market and offer premia as well as to the probability of completion of the deal. The relative bargaining power of bidder and target also affects the probability of the deal being initiated: a greater bargaining power makes it more likely to bid for another one and less likely to be the target itself of a deal. Our results provide a new way of thinking about the value of control in the M&A bargaining game and more in general about the value of firms, showing a dimension that is not directly related to cash flows and that is linked to the pure value of control within groups.

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Introduction

What is the value of control? How does it affect corporate actions – e.g., M&As? Does the market understand the value of control? To answer these questions requires the solution of one of the most difficult things in finance: to quantify the value of control. While it is a folk theorem that the owners of firms that sell the control of the firm enjoy a control premium, the value of such premium has been traditionally very difficult to quantify.

In this paper, we propose a novel approach in which we can directly quantify the value of control in business groups exploiting the inherent asymmetry between the value the buyer gets and the one the seller gives away. The intuition is as follows. In a merger, the control premium is related to the future "synergies" the buyer will derive from owning the firm, revenue synergies – e.g., cross-selling – or cost synergies – e.g., cost cutting, bargaining with suppliers and customers – or asset synergies – e.g., rationalization and improvement in value of assets – or financial synergies – e.g., financial benefits of different cost of capital or leverage. In this context, the control premium quantifies the present value of the future additional cash flows that accrue to the buyer thanks to its ability to have control of the target and to integrate it with his own assets. The underlying assumption is that what the buyer can get in terms of purely turnaround value of the target and synergies of integration with the buyer is higher than what the seller would be able to get.

However, this is not the case in business groups. Indeed, in business groups, firms are valuable not only because of their intrinsic values due to the cash flows they entitle the owners to, but also in terms of their ability to retain control of the group. Given that often the central firm retains control of a group through a network of cross-ownership, another firm buying such firm does not necessarily acquire control of the group. This implies that if another firm buys the central firm, the seller loses control of the group but the buyer does not necessarily acquire it. In other words, the value of the central firm for the buyer is lower than it is for the seller. The asymmetry between the benefits and alternative reservations values between buyer and seller affects their relative bargaining power and the very same probability the deal will go though. This implies that a firm that is a key node of power for the ultimate owner's ability to control the group but that, by itself, may not hand over control of the group to the buyer will be differentially valuable to the buyer and to the seller. We will exploit this feature to study the value of control in the M&A market.

We consider two alternative hypotheses. The first posits that the difference in value between the buyer and the seller ("GAP") increases the value for the seller as it increases its bargaining power. The more the buyer values it, the more it will be willing to pay for it. This raises the bargaining power for the seller that translates into a higher price. We will call this *the seller-power hypothesis*.

In contrast, the alternative hypothesis posits that the GAP between the buyer and the seller proxies for the benefits of controls which accrue to the buyer and are not shared by the seller. Given that these benefits do not depend on the seller – and indeed the seller does not benefit from them by owning the firm – the bargaining power of the seller is weaker compared to the buyer. This implies that the higher the GAP, the less the seller will benefit from being the target. Therefore the GAP reduces the value for the seller. That is, when the seller values the firm more than then buyer, the value it will receive for the sale is lower. We will call this *the buyer-power hypothesis.*

We exploit a new dataset of worldwide ownership of private (non-listed) and publicly listed firms for the 2000-2010 period for which we have, for the first time, information not only on firms characteristics and full ownership structure, but also on the financial market characteristics of the listed firms including detailed accounting data of private (not listed) firms.

We focus on the business groups. Business groups are the predominant form of corporate ownership and governance in most of the developing world and in many developed countries (Claessens et al., 2000; Faccio and Lang, 2002; Morck, 2005). The fraction of firms classified as "group affiliated" ranges from one fifth in Chile to two-thirds in Indonesia (Khanna and Yafeh, 2007). In a business group, a single shareholder (or a family), called the "ultimate owner", controls several independently traded firms while usually owning significant cash flow rights in only a few of them (Betrand, Mehta and Mullainathan, 2002). This is achieved by a complicated cross-ownership structure that allows the control of the firms of the group with a minimum of direct investment and to have more voting power that its direct equity stake – i.e., proportion of cash flows – he is entitled to would allow him to have. The important feature is that the firms used to control the group often (60% of the cases in our sample) do not coincide with the firm that sitting at the top of the pyramidal structure of the group extracts the cash flows from the firms of the group on behalf of the ultimate owner ("apex" or "top" firm). This implies that each firm in the group will provide the ultimate owner with two sources of value: the first are the cash flows accruing from the firm itself and from the others in which the firm has a stake. The second source of value is the ability to use the stakes the firm directly or indirectly controls to retain control of the group itself.

Our sample includes 8,875 unique affiliated listed firms from 104 countries. For each affiliated firm, we identify its ties to the business group which it is a part of as well as its positioning within the group. In order to obtain accurate business group structures from the network of ownership, we use a unique and novel method for identifying control relations in complex ownership structures.

We identify the value of control for the group and we construct a proxy for the difference in value between buyer and seller ("GAP"). This captures the difference between what the buyer gets (in terms of assets/cash flows of the group) and what the seller loses.

We start by testing whether, unconditionally, there is evidence that firms that are more useful to retain control are more valuable to the seller and therefore are less likely to be sold out. For each firm in the group, we define the degree of importance of the firm that we call centrality. We argue that a "central firm" in a group is a firm whose loss of control triggers for the ultimate owner the loss of a sizable fraction of his own stake in the entire group. We document that central firms are indeed special as they are less likely to be sold. For a one standard deviation increase in centrality, the odds of exiting the group (versus not exiting) decrease by a considerable factor of 0.06 (or a drop in the predicted probability of the firm exiting the group from 0.66% to 0.04%). Even more importantly, the market is aware of it as we can see from the reaction to M&As in the same industry.

The market internalizes the fact that central firms are less likely to be sold. This is reflected in pushing down the price of central firms relative to non-central firms in the case of M&As of other firms in the same industry (lower reaction). Indeed, the market perceives central firms as less "contestable". One standard deviation higher centrality is related to 32 basis points lower increase in price in reaction to an M&A of other firms in the same industry.

Then, we test the price implications of the relative bargaining power of bidder and target. We start by looking at the premia. We consider both target and bidder premia as well as the offer premia. We document that GAP is always strongly negatively related to the takeover premium across all the different specifications. This holds both for the case of runup and for the case of the return around the deal. This is not only statistically significant but also very economically relevant. One standard deviation higher GAP is related to 80 (140) bp lower runup in the case of CAR[-20,-2] (CAR[-40,-2]) and to 83 (111) bp lower return around the event in the case of CAR[-1,+1] (CAR[-5,+5]). In contrast, there is no effect for the mark-up, suggesting that the market already prices all the bargaining game before and at the beginning of the game itself.

Similar results are found when we focus on the transaction price – i.e., the Offer Premium. GAP is strongly negatively related to the Offer Premium. This holds across all the different specifications. One standard deviation higher GAP is related to 178 (364) bp lower Offer Premium if defined with respect to the price 1 week (4 weeks) before the deal announcement.

In contrast, we find no evidence of a link between GAP and bidder value. This is consistent with the intuition that GAP proxies for the bargaining power of the buyer and that the higher is this power, the lower the benefit for the target. While the market only assesses this around the deal for the target, it has already accounted it for the buyer, suggesting that the market has already discounted the fact that the buyer will start a deal in which it will have a sizable bargaining power while has not yet discounted the fact that the specific target is on the other side of such deal.

Overall, these results support the *buyer-power hypothesis*. The next step is to see whether gap (as proxy of the relative bargaining power of bidder and target) also affects the probability of the deal being

initiated and the probability of it being completed. We expect that a firm with greater bargaining power will more likely bid for another one and less likely be the target itself of a deal. Once the deal has been announced, we expect the relatively higher bargaining power of the bidder to reduce the probability of the deal being completed. Indeed, a weaker target may have no other choice than to withdraw from the deal altogether if it has no way of imposing its conditions.

And indeed, we find that, as expected, centrality reduces the probability that the firm becomes a target and increases the probability that it becomes a buyer. One standard deviation higher centrality is related to a 0.7% higher probability of being a bidder and a 0.38% lower probability of being a target.

We also document a strong negative correlation between GAP and the probability of the deal being completed. This holds across all the different specifications and it is both economically and statistically relevant. One standard deviation higher GAP is related to a 2.46%lower probability of the deal being completed. Again, this supports the *buyer-power hypothesis* that GAP is a proxy of the bargaining power of the buyer. This may help the buyer at the bargaining but also reduces the willingness of the seller to sell given that non-selling is his only option given his weak bargaining power.

The fact that centrality affects the probability of the deal may have implications in terms of the pricing as well and may cause the previous results to be just due to a spurious relationship between the probability of the deal and its pricing. We test this using a Heckman (1979) model. The results confirm the previous findings showing a negative relation between premia (both runup and event return) and GAP. This allays our concerns of selection bias.

We also consider another potential bias. It may be that centrality and therefore GAP is spuriously related to some features of the firm. To overcome such problems of simultaneity, we need a source of exogenous variation in the degree of centrality of firms in business groups. Exogeneity in this setting means that the change in centrality changes GAP in a way that is unrelated to the characteristics of the firm itself so that GAP affects negotiation only through the importance of the firm for the ultimate owner to control other group firms, independently of all other underlying characteristics of the firm.

We contribute to several strands of literature. First, we contribute to the literature on M&A and the value of control. Traditionally, the literature has tried to quantify the control premium by focusing on the value that a buyer can create by exercising effective control is a function of the value of potential prospective synergies, the quality of incumbent management team, how easy it is to implement new value-enhancing plans and whether the old owner will keep on having a say in the way the firm is run.

However, how much of these synergies – already uncertain by themselves – are in fact captured by the buyer and how much of them is retained by the seller is an open question. Anecdotal evidence suggests that the biggest chunk of them are appropriated by the seller, hence the definition that the market for corporate control is a seller market. The key determinant in the allocation of the synergies is the relative bargaining power of the buyer and seller.

To quantify it, some studies have looked at premiums implicit in block trades – transactions of 5% of the firm or more. For example, Barclay and Holderness (1989, 1991), using US data, find the premiums on large negotiated transactions to be greater than 10%. Nicodano and Sembenelli (2000), suing Italian data, find the premium to be equal to 31% in the case of blocks greater than 10% and 24% for blocks less than 10%. Nenova (2000) has estimated the premium paid for shares with voting rights attached and found it to vary from 1% in Sweden to 9.5% in Germany and 28% in France. Dyck and Zingales (2003) have quantified the premium paid to acquire a controlling block of equity and found it to vary from 1% in the United States, to 20% in Portugal and 38% in Italy and 57% in the Czech Republic. However, we miss a direct test of how to quantify such premium as the quantification of the synergies is very debatable.[1]

Alternatively, the value of control has been addressed by focusing on proxies such as the value of different classes of shares and at the position within the "pyramidal structure" of a business group. However, these analyses intermingle control and cash flows rights. For example, if we consider the shares of the firms at the top of a pyramidal business group, their value is affected by both the fact that the ultimate owner uses them to control the group as well as by the fact that such stocks give the highest amount of cash flow rights to the ultimate owner. Indeed, any potential subsidization within the group is aimed at increasing the cash flows of such firm.

We contribute by providing a novel way of testing the value of control in the M&A bargaining game. Hartzell Ofek and Yermack (2004) directly focus on the M&A bargaining. They document that it relates not only to price but who will run the company, the name of the new entity, HQ location, executive compensation. When the likelihood of takeover disciplining is low, the target management has considerable bargaining power. Fuller et al. (2002) focus on deals made by serial acquirers as a way to "fix" bidder characteristics. Boone and Mulherin (2007, 2008) directly zoom on the negotiating process. They use competition measure derived from private stage of takeover bidding (sourced from SEC filings) and look at whether there was an auction process, how many parties were contacted and how many participated in the first round. We contribute by studying the bargaining game providing a simple observable proxy of the relative difference in bargaining power between bidder and target based on the differences in value that accrues to either of them as a function of the deal and the position of the firm within the group.

Third, we contribute to the literature on business groups and pyramids (e.g., Almeida and Wolfenzon, 2006). Traditionally, the literature has focused on the separation between ownership and control (e.g., Claessens et al. 2000, Franks and Mayer, 2001, Lefort and Walker, 1999, Attig, et al.,

[1] For example Devos et al. (RFS 2009) try to estimate the actual synergies directly using Value Line forecasts for the two firms before merger to combined entity after the merger. They use 264 mergers with majority non-financial public targets and bidders followed by Value Line and argue and show that the Value Line forecasts correlate highly with realized cash-flows.

2003) and on the implications of group affiliation for the performance of the affiliated firms (e.g., Claessens et al, 2000, Joh, 2003). The focus is on tunneling (Johnson, et al., 2000) and diversion of resources from low – to high- cash flow right firms (Bertrand, et al., 2002, Bae, Kang, and Kim, 2002, Baek, et al., 2006, Johnson et al. 2000, Glaeser, et al., 2001, Jiang, et al., 2010, La Porta, et al., 2003). We focus on a scarcely explored issue: the role played by group affiliation in the market for corporate control and the effects that the positioning of the firm within the group has in terms of the bargaining game at the deal.

The remainder of the paper is organized as follows. In Section II, we describe the data. In Section III, we provide a preliminary analysis. In Sections IV, and V, we provide the main findings. In Section VI, we test for endogeneity. A brief conclusion follows.

II. Data and Variable Construction

We first describe the data sources and the main variables. Then, we lay out how we construct our identifiers of business groups and our measures of centrality and the other control variables.

A. Data Sources

The ownership data are from the ORBIS database of Bureau van Dijk, which contains data on worldwide private and publicly listed firms over the period of 2000-2010.

Bureau van Dijk describes its collection of ownership data as follows: "For US listed companies, ownership information is systematically collected from the Free Edgar File which includes all companies filing proxy statements. These links cover all known shareholders (corporations or individuals) with an ownership percentage of 5% or more, as well as the ownership of directors and executive officers (with no lower ownership percentage limitation). Data is gathered tracking lower levels percentages owned by corporations. This is done by querying the NASDAQ web-site under the entry "Beneficial Owner" which is associated to the display of a company. (This covers all companies listed in the US stock exchanges, not only those listed on the NASDAQ)."

For the non-US firms and the US private firms Bureau van Dijk collects data from annual reports, stock exchanges, information providers, company web-sites, press news, and private correspondence (with a 25% response rate). This implies that the data are collected in a similar manner as in other related studies.[2] We use the Bureau van Dijk's databases to determine whether firms are linked to other firms via control relations. We restrict the data to firms that are affiliated to business groups. The sample covers the period between 2000 and 2013. Appendix A provides a detailed description of our ownership data construction.

[2] The summary statistics based on the use of the Bureau Van Dijk data are comparable to those in Dlugosz et al. (2006), Villalonga and Amit (2006) and other studies on block ownership in US public firms.

Data on accounting variables come from Bureau van Dijk (especially for the private firms), from Datastream/Worldscope and from Compustat. Appendix B provides a description of the main variables. We match Bureau van Dijk data with Datastream/Worldscope and Compustat. We start with all the publicly listed companies for which we have accounting information from Bureau van Dijk, Datastream/Worldscope or Compustat, as well as stock market information from Datastream/WorldScope. While Orbis contains 52,099 unique publicly listed firms in 128 countries, after the match with Bureau van Dijk's accounting data, with Datastream/WorldScope and with Compustat, the sample is reduced to 40,963 unique publicly listed firms in 120 countries and includes 33,451 non-U.S. firms and 7,512 U.S. firms.

In our sample, there are 150,343 unique firms, out of which 48,461 are unique publicly listed firms from 134 countries, and 101,882 are unique private firms from 190 countries. These firms are held by 535,088 unique shareholders whose general type is distributed as follows: 4,612 insurance companies; 9,223 banks; 180,648 industrial firms (all companies that are neither banks nor financial companies nor insurance companies); 58,566 mutual or pension funds, nominees, trusts or trustees; 40,117 financial companies; 212,337 single private individuals or families; 3,275 foundations or research institutes; 2,465 employees, managers or directors; 1,058 private equity firms; 4,181 public authorities, states and governments; 884 venture capital firms; 30 hedge funds; and 17,692 with an unidentified type. We identify business groups by reconstructing the ownership structure for all the firms involved, both private and public. We provide a detailed description in Appendix A. The final sample includes 8,760 unique publicly listed group affiliated firms from 91 countries (41,865 firm-year observations).

Next, we restrict our sample to controlled firms that are affiliated to business groups. To identify affiliated firms and their ultimate owners we exploit the entire set of ownership tructure, including both private and public firms. Appendix A provides a description of the method. We apply this method to the Bureau van Dijk data. In addition, we manually completed missing ultimate ownership data for about 10,000 private firms (that directly/indirectly control public firms), we matched about 100,000 different family members together by using strict name matching algorithms and then having them manually checked, we matched about 3,000 different government agencies and authorities to their correct central authority and to the firms that they control (e.g. regional governments or agencies in China), and we manually completed missing types (banks, individuals, insurance etc.) or missing countries for about 6,000 entities. The output of the control identification process contains information on each controlled firm such as the identity of its ultimate owner, the ultimate owner's direct and indirect ownership stake, the number of control links between the firm and the ultimate owner (the level in a business group structure), the identity and stake of the controlling block and the minimal stake required for control given the ownership stakes of all the other non-controlling shareholders. Using this output, we define a business group as an entity with at least two public firms that are controlled by the same ultimate owner.

The final sample includes 8,875 unique publicly listed group affiliated firms from 104 countries (39,839 firm-year observations). Descriptive statistics are reported in Table 1. They are similar to the ones reported in the literature. For example, the international averages of leverage, CAPEX (scaled by assets) and idiosyncratic variance are 0.25, 0.049 and 0.167, respectively, in Ferreira and Matos (2008), compared to 0.22, 0.05, and 0.29 in our sample. In Lau, et al., (2010) the market-to-book ratio averages around 1.7 across stocks in different countries, compared to the mean of 2.1 and median of 1.45 in our sample. In Levin and Schmukler (2006) the average Amihud illiquidity ratio for stocks in the global market over the period from 1989-2000 is 0.79, and from Karolyi et al. (2011) the simple average across reported countries for the period 1995-2009 is about 0.09. These compare to a mean of 0.52 and median of 0.16 in our sample.

Our merger sample is taken from Security Data Corporation's (SDC) Mergers and Corporate Transactions database and includes deals announced between 2000 and 2010. We exclude LBOs, spin-offs, recapitalizations, self-tender offers, exchange offers, repurchases. This yields 391,161 deals. We further omit deals in which the target or acquirer is non-listed to facilitate the analysis of market reaction. After excluding these deals, we end up with a sample of 19,230 mergers. Further we require that the firms have gap that's well defined. This yields 8,145 deals. After we merge with Datastream items, we get 6,836 deals in our whole sample. But depending on the specification of the regression, we have 2,000-3,000 observations with all the available controls in the baseline regression.

We collect accounting variables from Worldscope. We acquire monthly firm-level, industry-level, and country-level stock returns both in local currency and in U.S. dollars from Datastream. Following (Ince and Porter, 2006), we clean the individual equity return data carefully and rule out extreme outliers. We collect a number of data items from SDC, including the announcement and completion dates, the target's name, public status (DS_CODE), primary industry measured by the four-digit Standard Industrial Classification code, country of domicile, as well as the acquirer's name, ultimate parents, public status, primary industry, and country of domicile. We collect the deal value in dollar terms when available, the fraction of the target firms owned by the acquirer after the acquisition, as well as other deal characteristics such as the method of payment made by the acquirer.

B. Main Variables

Centrality

We rely on the measure of contribution to group control in Kim et al. (2004) and in Kim and Sung (2006), as well as on the measure of centrality in Almeida et al. (2011) to introduce our own measure of the importance of a firm to control the group, which we also call centrality. Our proxy for the centrality of a firm is based on the structure of the business group and the value of equity of the affiliated firms.

We define the *centrality* measure of a firm affiliated to a business group by the fraction over which the ultimate owner loses control out of its entire group's (book) value as a result of losing control over that particular firm. Since the ultimate owner can control firms indirectly – via other firms – losing control over one affiliated firm may trigger the loss of control over other group firms. Even without changing the controlling shareholder's voting rights control may be lost because another coalition of owners increases its cumulative votes in the board to create an effective voting opposition to the controlling shareholder or in some cases even to seize control from it (as long the controlling shareholder holds less than 50%). We use book value of equity instead of the market value of equity in order avoid the possibility that the stock price already reflects centrality. Formally, if by losing control over firm F the ultimate owner of group G loses control over the set of firms G_{-F} (which includes F) then:

$$Centrality_F = \frac{1}{Book_{UO}} \sum_{i \in G_{-F}} Book_i$$

where $Book_i$ is the book value of equity of firm i, and $Book_{UO} = \sum_{i \in Group\ G} Book_i$ as the sum over the book values of all the firms in group G.

By construction, the $Centrality$ measure of a firm is a number between 0 and 1. Higher firm centrality means that the ultimate owner would lose a greater portion of the group if control over that firm is lost, To make the interpretation of the results simpler, we use this information to construct a dummy variable, called *central*, which equals one if an affiliated firm has the highest centrality measure compared to all the other firms affiliated to the same business group, and zero otherwise.

GAP

We define GAP as follows. Let F be a firm ultimately controlled by shareholder S. We define the Seller's Gap of firm F as the aggregate value of the book value of equity (Sales/Assets/MV) of the additional firms over which shareholder S would lose control if S lost control over firm F (e.g. if it sold it to another shareholder, or because of a hostile takeover) while excluding the value of firm F. (this number is positive if F is critical in bringing bring other firms under the control of S. For example, S controls F and F controls another firm G).

Let B be another shareholder. We define the Buyer's Gap of firm F as the aggregate value of the book value of equity (Sales/Assets/MV) of the additional firms over which shareholder B would gain control if B gained control over firm F, and only as a result of gaining control over F (e.g. via an acquisition) while excluding the value of firm F. (this number is positive if F is bringing bring other firms under the control of B, over which B would not control without controlling F. For example B holds directly 21% of firm G and F holds 30% of firm G, by buying control over firm F, shareholder B

now directly and through F holds 51% of firm G, and in fact gains control over G as a result its acquisition of F).

We define the Seller-minus-Buyer Gap, gap_dif (or in the following "GAP") of firm F as the difference between the Seller's Gap of firm F and the Buyer's Gap of firm F (i.e. Seller's Gap of firm F minus Buyer's Gap of firm F).

[Insert Table 1 here]

C. Control variables

We control for firm size – measured as the natural log of total assets; growth opportunities – proxied by the book-to-market ratio (i.e., book value of common equity divided by the market value of common equity); stock market affiliation – a dummy variable that equals one when a stock is listed on NYSE and zero otherwise.

Finally, we include dummy variables for each group to control for group effects, dummy variables for each country to capture country effects, dummy variables for each industry (which correspond to the 2-digit sic code of the primary industry of each firm) to account for industry effects, dummy variables to capture time effects, and in some specification we also control for firm fixed effects. Table 1 provides a description of the variables used in our analysis.

D. Descriptive Statistics

Table 2, Panels A (ownership variables) and B (financial and accounting variables) provide annual summary statistics for the 8,760 sample firms from 2000 through 2010, providing 41,685 firm-year observations, out of which 13,335 are central firm-year observations and 28,530 are non-central firm-year observations. Panel C provide annual summary statistics for the 3,341 business groups in our sample from 2000 through 2010, providing 10,866 observations.

[Insert Table 2 here]

Panel A concentrates on ownership structure variables and indicates that our measure of centrality has a mean of 0.33 and a median of 0.11. Intuitively, this indicates that if an ultimate owner loses control over an affiliated firm, it will consequently lose control over 33% of the value of its group on average. Also, this indicates that losing control over a firm with median centrality in our sample will trigger the loss of control over 11% of the value of the group to which it is affiliated. Controlling shareholders hold on average 59% of the voting rights, and the median voting rights controlling shareholders are 51%. About 37% of the firms in our sample are controlled by a minority stake (which makes them relatively more vulnerable to hostile takeover bids e.g. in case of a stock price drop) and the rest of the 63% of the firms in our sample are controlled by a majority stake (which makes them relatively more resilient to hostile takeover bids).

The last three columns in Panel A of Table 1 display the results of difference of mean tests between central and non-central firms in the entire sample (pooled from different groups and not within a specific group). The results of the difference of mean tests indicate that central firms control about 79% of the value of their group, compared to 11% controlled by non-central firms. Central firms are controlled with a slightly higher ownership stake (7% higher), but the control over them is not significantly more stable relative to non-central firms. Only 48% of the central firms are simultaneously the firm in which the ultimate owner has the highest cash flow rights (E1), and only 47% of the central firms are simultaneously the firm that holds the highest value in the group (E2).

The average raw GAP is 289.68 for the seller and 395.55 for the buyer. But this raw value reflects the size of the company, so we subtract log(1+size) from log(1+GAP), and get a size controlled GAP for the buyer (GAP_buyer) and seller (GAP_seller) respectively, and the final gap_dif equals GAP_seller-GAP_buyer.

Table 1, Panel B, provides summary statistics of the accounting and financial variables.[3] The basic statistics are similar to those reported in the literature. In our sample, the seller have on average 28% leverage, 4% ROA, 0.89 B/M.

The characteristics of the business groups in our sample are presented in Table 1 Panel C. On average a business group controls about 19 affiliated firms (public and private), the median group controls about 7 affiliated firms. On average, the central firm within a group controls about 60% more value than the least central firm, which is about $5 Billion in terms of book value of equity (in the median group the difference is 99% more value controlled by the central which is about $470 Million in term of book value of equity).

III. Preliminary Results: Value to the Owner and Viability of the Market for Corporate Control

One way to check whether centrality does indeed proxy for the fact that the firm is very valuable to the ultimate owner is to check whether central firms are less likely to be sold. We have two ways to assess it. The first is to directly look at whether central firms are less likely to be sold out. And indeed, we find that the answer is positive: the centrality of firms that exit the group (centrality measure around 0.02) is much smaller than the average centrality in the data (about 0.34). A Logit model estimating the probability that central firms exit the group vs. non-central firms show a significant strong negative relationship between exit and centrality: for a one standard deviation increase in centrality, the odds of

[3] For example, mean Total assets ($ billions) is 11.5 in our sample, compared to 7.33 in Anderson et al. (2012). The international averages of leverage, is 0.25 in Ferreira and Matos (2008), compared to 0.22 in our sample. In Lau, et al. (2010) the market-to-book ratio averages around 1.7 across stocks in different countries, compared to the mean of 2.3 in our sample.

exiting the group (versus not exiting) decrease by a factor of 0.06 (or a drop in the predicted probability of the firm exiting the group from 0.66% to 0.04%).

The second way is to assess whether centrality affects the way a stock reacts to M&As of other firms in the same industry. We know that firms in concentrated industries positively react to the takeover-bids within the same industry (of other firms). The intuition is that mergers increase consolidation and each firm has to rush to do the same, otherwise, it will be left behind. Given that each firm may be a potential takeover target, this implies that the stock prices of firms in an industry experiencing M&A waves should go up (Ahren and Harford, 2014). However, if centrality really means that the central firms are less likely to be sold out, the impact should be lower. Indeed, the market would perceive central firms as less "contestable".

We test if the daily stock return of a central firm is less sensitive than non-central firms to M&A shocks affecting firms in the same industry. We focus only on concentrated industries only (having a Herfindahl index higher than the median for each year). We estimate:

$$r_t = \alpha + \beta_1 Centrality_{i,t} + \beta_2 Same\ Industry\ M\&A_{i,t} + \beta_3$$

$$\beta_3 Centrality_{i,t} \times Same\ Industry\ M\&A_{i,t} + x_{i,t} + \epsilon_{i,t},\ (1),$$

where $Same\ Industry\ M\&A$ is a dummy variable that equals 1 if a merger or an acquisition of another firm (different from i) has occurred on day t in the same industry as that of firm i, and zero otherwise. The main explanatory variable is the interaction term $Centrality_{i,t} \times Same\ Industry\ M\&A_{i,t}$ that measures the differential sensitivity of the centrality of firms to same industry M&A shocks.

The results (unreported) find a strong a negative impact of centrality on the effect of a merger on the price of the other firms in the same industry. The effect is robust across the different econometric specifications and ranges from 12 to 32 basis point lower daily increase in price for one standard deviation higher degree of centrality.

These results confirm our intuition that central firms do indeed play a very special role and that not only the groups are less likely to sell them, but also the market is fully aware of this. In other words, the higher the value for the ultimate owner, the less "viable" the market for corporate control is.

IV. Main Findings

We now provide the main findings. We first focus on the premia and then zoom on the probability the deal is announced and, conditional on it, the probability the deal is completed.

A. Short-term premia

We start by looking at the premia. We consider both target and bidder premia as well as the offer premia.

A.1 Target premia

We start by looking at the link between GAP and short-term takeover premia. In Figure 1, we provide preliminary evidence on the link between premia and GAP. First, we rank each target firm in terms of its GAP at the end of quarter immediately before the run-up period. We then classify targets as a function of whether GAP is 'High Gap' (i.e. belonging to the top tercile of the distribution) or 'Low Gap' (i.e. belonging to the bottom tercile).

We see that, in line with the M&A literature, target firms exhibit on average significant premia, both in terms of run up and in terms of mark-up. When we decompose the run-up premia according to GAP, we see that High Gap targets significantly underperform Low Gap targets. In contrast, there is no effect on the mark-up. This provides preliminary evidence of our main finding: GAP affects the target premia. The market is aware of it and the effect is concentrated before the event.

[Insert Table 3 here]

Next, we control for other alternative factors, we estimate the following OLS cross-sectional regression for target returns:

$$\text{Premium}_i = GAP_i\,\beta + \mathbf{X}_{Control,i}\,\gamma + \upsilon_i\,, \qquad (2)$$

where the dependent variable is the cumulative abnormal return (CAR) before ("run-up"), during ("event return") and after ("mark-up") the announcement date for targets. We define three sets of premia for the target firm: run-up, event and mark-up. In terms of run-up, we use Runup20, defined as the CAR from before 20 days to -2 days before the event (i.e., CAR[-20,-2]), and Runup40, defined as the CAR from before 40 days to -2 days before the event (i.e., CAR[-40,-2]). In terms of the return around the event, we use the return from the day before the event (-1) to the day after the event (+1) (i.e., CAR[-1,+1]) and well as the return from 5 days before the event (-5) to 5 days after the event (+5) (CAR[-5,+5]). In terms of markup, we use Markup20, defined as the CAR from +2 days to after 20 days after the event (i.e., CAR[+2,+20]), and Markup60, defined as the CAR from +2 days to after 60 days after the event (i.e., CAR[+2,+60]).

We exclude extreme outliers and transactions whose value represents less than 1% of the target's market value. Whenever there are several bids for the same target (occurring within one year of the first bid), we keep only the first bid following (Gaspar, et al., 2005). We do so because revised or competing bids are likely to be associated with low abnormal stock returns, as the target's price already incorporates the news that the company is in play. If targets with higher GAP tend to receive multiple bids, a spurious negative correlation between GAP and abnormal return premiums could be generated. The final number of events in our base sample is 3, 198.

We use either the raw returns, or the abnormal stock returns adjusted by using the two-factor international market model (the factors are the local market return and the world market return) or the

returns adjusted using the Fama and French 3 domestic factor model Griffin (2002). The control variables are deal and targets and acquirers characteristics. An acquisition is considered hostile if the "attitude" field in SDC was marked "unsolicited" or "hostile". The "consideration offered" field in SDC refers to the list of all components of consideration (i.e., means of payment) offered by the acquirer/bidder. An acquisition is considered all-cash if the field "consideration offered" in SDC had only "cash" as keyword. An acquisition is considered all-equity if the field "consideration offered" in SDC did not include "cash" as keyword. Other definitions are provided in Table 2. We also include acquirer country/industry, target country/industry, and year fixed effects (not shown). Model (1) & (4) are without clustering. The specifications are estimated using heteroskedasticity-robust t-statistics.

We report the results in Table 4 for the runup, in Table 5 for the return around the event and in Table 6 for the mark-up. In Panel A, we report the raw returns, in Panel B the market-adjusted returns and in Panel C, the Fama and French 3 factor adjusted returns. To make the results comparable with the previous literature, in columns (1) and (4), we only include the deal-level variables, while in the other specifications we also include the accounting variables of both the target and the acquirer. Columns (2) and (4) cluster the standard errors by targets and acquirers. Columns (3) and (6) cluster the standard errors by target country for target CAR.

[Insert Table 4 here]

[Insert Table 5 here]

[Insert Table 6 here]

As our main result, GAP is always strongly negatively related to the takeover premium across all the different specifications. This holds both for the case of runup and for the case of the return around the deal. This is not only statistically significant but also very economically relevant. One standard deviation higher GAP is related to 80 (140) bp lower runup in the case of CAR[-20,-2] (CAR[-40,-2]) and to 83 (111) bp lower return around the event in the case of CAR[-1,+1] (CAR[-5,+5]). In contrast, there is no effect for the mark-up, suggesting that the market already prices all the bargaining game before and at the beginning of the game itself.

Among the other variables, premia are negatively related to toehold, to whether the deal is financial and positively related to whether it is a significant acquisition. Also, previous stock returns of the buyer (ret12_b) and its leverage are strongly negatively related to the premia.

These results use the market to assess the bargaining game. An alternative way is to use the transaction price – i.e., the Offer Premium. This is defined as the difference between the offer price and the price in the market 4 weeks (1 week) before the deal announcement. We therefore reestimate equation 1, replacing the dependent variable with the Offer Premium. The results are reported in Table 7 and 8. They confirm the previous results, displaying a strong negative relation between GAP and

Offer Premium. This holds across all the different specifications. One standard deviation higher GAP is related to 178 (364) bp lower offer premium if defined with respect to the price 1 week (4 weeks) before the deal announcement. We use the offer premium directly from SDC above, but we also compute long horizon offer premium using the stock price from Datastream 20 days and 3 month before the M&A and the deal value from SDC and rerun the regression. All the main results are unchanged. Table 7 use the premium SDC platinum provides and Table 8 is based on longer-term self calculated premium using stock price.

[Insert Table 7 here]

[Insert Table 8 here]

A.2 Bidder premium

In order to understand the effect of shareholder behavior on both sides of the transaction, we repeat the same analysis for the bidder firm. That is, we estimate equation (2) with the same set of variables, as before, with the exception that they now refer to the bidder firm rather than to the target. The (unreported) results document no evidence of a link between GAP and bidder value. This is consistent with the intuition that GAP proxies for the bargaining power of the buyer and that the higher is this power, the lower the benefit for the target. While the market only assesses this around the deal for the target, it has already accounted it for the buyer. In other words, the market has already discounted the fact that the buyer will launch a deal in which it will have a sizable bargaining power while has not yet discounted the fact that the specific target is on the other side of such deal.

Overall, these results confirm *the buyer-power hypothesis* and suggest that the relative bargaining power of buyer and seller play a major role in the market for corporate control.

B. Probability of Take-over

As we argued, the degree of centrality of the firm will affect the probability it will enter an M&A deal. In particular, we expect that it will reduce the probability of the firm being taken-over and increase the probability of the starting a deal. We therefore estimate whether the likelihood of a firm entering a takeover contest (either as a bidder or as a target) is related to its degree of centrality. We therefore estimate a probit model:

$$h_i^* = \mathbf{X}_{Behavior,i}\,\beta_2 + \mathbf{X}_{Control,i}\,\gamma_2 + \varepsilon_i \qquad (1)(3)$$

where h_i^* is a latent unobservable variable. In practice we observe h_i, a dummy that takes the value of 1 if the company is involved in a takeover: $h_i=1$ if $h_i^*>0$ or $h_i=0$ if $h_i^*<0$. A normal c.d.f. (.) is used to model the probability Prob(h_i=1). All the other variables are defined as before.

To estimate equation (3), we expand our premia sample by merging it with the SDC platinum M&A data, Datastream and Worldscope Dataset. For analysis of the decision to take part in M&As as an acquirer or as an acquired company, we assemble 123954 firm-quarters from the previous centrality sample. The dependent variable is a dummy variable that equals 1 if listed company becomes a target (acquirer) (in SDC platinum M&A data) in that quarter, and 0 otherwise. The main explanatory variable is centrality. The other control variables are defined as in the previous tables and defined in the Table 1. Following (Harford 2005; Maksimovic, et al., 2013) we include supply and demand factors that may affect acquisition decisions over time. To capture the supply of capital, we use the spread between the rate on Commercial & Industrial (C&I) loans and the Fed Funds rate as a measure of aggregate liquidity following Harford (2005).[4] When the credit spread is low, acquisitions become easier to finance and are more likely to be carried out. When investment opportunities and demand increase and the supply of new capital is inelastic, highly efficient firms may choose to buy other firms instead of building new capacity. We use the aggregate return for each country/market as proxies for aggregate investment opportunities and examine their impact on merger activities.

We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses.

We report the results in Table 9 for the probability that a listed company becomes a seller(target) and in Table 10 for the probability that a listed company becomes a buyer(acquiror). As expected, centrality reduces the probability that the firm becomes a target and increases the probability that it becomes a buyer. One standard deviation higher centrality is related to a 0.7% higher probability of being a bidder and a 0.38% lower probability of being a target.

[Insert Table 9 here]

[Insert Table 10 here]

These results show that the same variables that determine the premia also affect the likelihood of a firm participating in a takeover event. The fact that centrality affects the probability of the deal may have implications in terms of the pricing as well. Indeed, it may be the case that the results we have just shown are due to a spurious relationship between the probability of the deal and its pricing. We therefore now endeavor to test for whether this is the case by controlling for this selection bias will change the previous results. We re-estimate specification (2) using a Heckman (1979) model:

[4] We want to compare public firms M&A decisions only. And in each quarter, we only retain the first M&A deal. We can also keep all the M&A deals, but we have to do the 2 stages with caution, since

$$y_i^* = x_{1i}'\beta_1 + \varepsilon_{1i} \qquad (4)$$

$$h_i^* = x_{2i}'\beta_2 + \varepsilon_{2i} \qquad (5)$$

$$y = y_i^*, h_i = 1 \qquad \text{if } h_i^* > 0 \qquad (6)$$

$$y_i \text{ not observed}, \ h_i = 0 \qquad \text{if } h_i^* \le 0 \qquad (7)$$

where equation (4) is the focus equation and y_i refers to the premium and (5) is the selection equation that defines the probability of the target being a target (bidder being a bidder). x_{1i} and x_{2i} are the explanatory variables. They are the same as in model (2). We assume the following correlation structure:

$$\begin{pmatrix} \varepsilon_{1i} \\ \varepsilon_{2i} \end{pmatrix} \approx NID\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{matrix} \sigma_1^2 & \sigma_{12} \\ \sigma_{12} & \sigma_2^2 \end{matrix} \right).$$

We first estimate (错误!未定义书签。) using a standard probit choice model and then estimate:

$$y_i = x_{1i}'\beta_1 + \sigma_{12}\lambda_i + \eta_i \quad (8)$$

where $\lambda_i = \dfrac{\phi(x_{2i}'\beta_2)}{\Phi(x_{2i}'\beta_2)}$ is the Mill's Ratio estimated from the first stage. The identifying restrictions in the first stage are lagged local stock market return(rm_qtr) and credit spread(spread) as in Harford (2005). We expect (and see) that these variables do not affect the second stage because individual stock abnormal return should not correlate with lagged country return or the ease of financing on dollar terms. We correct the standard errors in the second stage for heteroscedasticity and for the fact that Lambda is an estimated regressor (Greene (1981)).

[Insert Table 11 here]

[Insert Table 12 here]

We report the results for the second stage in Table 11 and 12. They confirm the previous findings showing a negative relation between premia (both runup and event return) and GAP. Although due to smaller 2nd stage sample, heckman model using the bidder likelihood is less significant than the one using seller, but the pattern is still there. We also notice that self-selection is important as the Mill's Ratio is significant. This suggests that centrality does have an impact on the bidder and seller likelihood.

V. Probability of Completion

Finally, we focus on the probability of completion of the deal. We condition on the sample of announced deals and we estimate a probit specification of the probability that the deal is completed. The dependent variable *complete* is a dummy variable that equals 1 if the deal is finally completed, and 0 otherwise.

An acquisition is considered completed if the "status" field in SDC has "completed" as keyword. The main explanatory variable (GAP) as well as the control variables are defined as before. We report the results in Table 13. We include acquirer country/industry, target country/industry, and year fixed effects (not shown). Model (1) & (3) are without firm characteristics. Model (2) & (4) are with firm characteristics and cluster standard errors by target country.

[Insert Table 13 here]

We find a strong negative correlation between GAP and the probability of the deal being completed. This holds across all the different specifications and it is both economically and statistically relevant. One standard deviation higher GAP is related to a 2.46% lower probability of the deal being completed. This is consistent with *the buyer-power hypothesis* that GAP is a proxy of the bargaining power of the buyer. This may help the buyer at the bargaining but also reduces the willingness of the seller to sell given that non-selling is his only option given his weak bargaining power.

Conclusion

We study how value affects the bargaining game in the market for corporate control. We focus on business groups and propose a novel approach in which we can directly quantify the difference in value between what the buyer gets and what the seller gives. We rely on the stylized fact that firms are valuable not only because of their intrinsic values due to the cash flows they entitle the owners to, but also in terms of their ability to retain control of the group. If a firm helps to retain control of a group through a network of cross-ownership, another firm buying such firm does not necessarily acquire control of the group. This implies that if another firm buys such firm, the seller loses control of the group but the buyer does not necessarily acquire it. Therefore, the value of the firm for the buyer is lower than it is for the seller. In these conditions it is not likely that the deal will ever go though.

We compare the hypotheses. The first (*the seller-power hypothesis*) posits that the difference in value between the buyer and the seller ("GAP") increases the value for the seller as it increases its bargaining power. The more the buyer values it, the more it will be willing to pay for it. This raises the bargaining power for the seller that translates into a higher price. The second (*the buyer-power hypothesis*) posits that the GAP between the buyer and the seller proxies for the benefits of controls which accrue to the buyer and are not shared by the seller. Given that these benefits do not depend on the seller – and indeed the seller does not benefit from them by owning the firm – the bargaining power of the seller is weaker compared to the buyer. This implies that the higher the GAP, the less the seller will benefit from being the target. That is, when the seller values the firm more than then buyer, the value it will receive for the sale is lower.

We test these hypotheses using a new dataset of worldwide ownership of private (non-listed) and publicly listed firms for the 2000-2010 period. We identify the value of control for the group and we

construct a proxy for the difference in value between buyer and seller ("GAP"). This captures the difference between what the buyer gets (in terms of assets/cash flows of the group) and what the seller loses.

We first provide evidence that firms that are more useful to retain control ("central firms") are more valuable to the seller and therefore are less likely to be sold out. Also, the market is aware of it as we can see from the reaction to M&As in the same industry.

Next, we test the price implications of the relative bargaining power of bidder and target. We document that GAP is always strongly negatively related to the takeover premium across all the different specifications. This holds both for the case of runup and for the case of the return around the deal. Similar results are found when we focus on the transaction price – i.e., the Offer Premium. GAP is strongly negatively related to the Offer Premium. Overall, these results support the *buyer-power hypothesis*.

Then, we test whether the relative bargaining power of bidder and target also affects the probability of the deal being initiated and the probability of it being completed. We expect and find that firms with greater bargaining power will be more likely to bid for another one and less likely to be the target itself of a deal. Once the deal has been announced, the relatively higher bargaining power of the bidder lowers the probability of the deal being completed as weaker target may have no other choice than to withdraw from the deal altogether if it has no way of imposing its conditions.

Using a Heckman (1979) model, we assess the robustness of our results to the potential selection bias due to the probability of the deal being itself affected by the bargaining power. The results confirm the previous findings showing a negative relation between premia (both runup and event return) and GAP. We also exploit a natural experiment that affect centrality through its effect on the control structure of the group to address the potential issue of spurious correlation. Also in this case, the results hold.

Our results provide a new way of thinking about the value of control in the M&A bargaining game and more in general about the value of firms, showing a dimension that is not directly related to cash flows and that is linked to the pure value of control within groups. This suggests a new way of thinking about firm value within a broader perspective.

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Table 1 Variables Definitions

VARIABLES	Definition
Core explanatory variable	
gap_size_s	ln(gap_s+1)-ln(size_s)
gap_size_b	ln(gap_b+1)-ln(size_b)
gap_dif	ln(gap_b+1)-ln(size_b)-[ln(gap_s+1)-ln(size_s)]
Core dependent variable	
CARt_x	x means CAR[-t, t,], _0 means raw return, _1 means market model, _2 means FF-3 factor model

runupt_x	x means CAR[-t, -2], _0 means raw return, _1 means market model, _2 means FF-3 factor model
markupt_x	x means CAR[2, t], _0 means raw return, _1 means market model, _2 means FF-3 factor model
prem_1day	SDC Premium, 1 day before announcement
prem_1week	SDC Premium, 1 week before announcement
prem_4week	SDC Premium, 4 weeks before announcement
prem_20day	SDC Premium, 20 day before announcement
prem_3month	SDC Premium, 3 month before announcement
Deal Control variables	
cash0	Dummy variable equal to 1 if A deal is paid in 100% cash. When the payment is unknown, it is set to missing.
toehold	Dummy variable equal to 1 if acquirer owns non-zero percentage shares in the target firm before the announcement of transaction, and 0 otherwise
dealsize	The announced value of merger, in billions of dollars.
financial	Dummy variable equal to 1 if acquirer is a financial firm, and 0 otherwise.
same_ind	Same industry,Target firms are in the same industries as acquirers if any line of business the target firm is in (TSIC2) overlaps with that of acquirer (ASIC2).
friendly	Dummy variable equal to 1 if deal attitude is classified as "Friendly" by SDC, and 0 otherwise.
significant	0=stake purchase, 1 otherwise
Buyer/seller Control variables(_b denotes buyer, and _s denotes seller)	
ret12	recent 12 month cumulative return
bm	B/M defined as market value of equity (WorldScope 08001) divided by book value of equity (WorldScope item 03501).
roa	ROA
inv	ratio of the sum of capital expenditure (WC04601) and R&D expenses (WC01201) to total assets
leverage	Ratio of total debt (WorldScope item 03255) to total assets (WorldScope item 02999).
size	(log) Market capitalization in US dollars (WorldScope item 08001).
turnover	value of shares traded/shares outstanding (Datastream)

Table 2 Summary statistics

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	mean	sd	min	median	max	N
Core explanatory variable						
gap_size_s	-4.93	2.19	-12.58	-4.87	3.22	6830
gap_s	289.68	14461.62	0	0	1186502	6836
gap_b	395.55	4697.12	0	0	184948	6836
gap_size_b	-6.95	2.63	-13.22	-7.09	4.64	6356

gap_dif	-2.00	2.78	-14.44	-1.94	14.29	6352
Core dependent variable						
car1_1_s	0.06	0.12	-0.18	0.03	0.54	4385
car1_2_s	0.06	0.12	-0.18	0.03	0.54	4375
car1_3_s	0.06	0.12	-0.17	0.03	0.54	4348
car1_0_s	0.06	0.12	-0.18	0.03	0.55	5103
car5_1_s	0.07	0.14	-0.23	0.04	0.59	4453
car5_2_s	0.07	0.14	-0.23	0.04	0.58	4441
car5_3_s	0.07	0.14	-0.22	0.04	0.58	4423
car5_0_s	0.07	0.15	-0.26	0.05	0.62	5297
runup20_1_s	0.02	0.12	-0.30	0.01	0.41	4588
runup20_2_s	0.02	0.12	-0.31	0.01	0.42	4575
runup20_3_s	0.02	0.12	-0.30	0.01	0.42	4562
runup20_0_s	0.04	0.13	-0.34	0.03	0.46	5513
runup40_1_s	0.03	0.17	-0.44	0.02	0.62	4595
runup40_2_s	0.03	0.17	-0.44	0.02	0.62	4581
runup40_3_s	0.03	0.17	-0.43	0.02	0.58	4570
runup40_0_s	0.05	0.19	-0.49	0.04	0.62	5453
markup20_1_s	-0.01	0.11	-0.34	-0.01	0.36	4400
markup20_2_s	-0.01	0.11	-0.33	-0.01	0.36	4389
markup20_3_s	-0.01	0.11	-0.33	-0.01	0.35	4372
markup20_0_s	0.01	0.13	-0.37	0.00	0.44	5355
markup40_1_s	-0.01	0.17	-0.52	-0.02	0.56	4280
markup40_2_s	-0.01	0.17	-0.51	-0.01	0.57	4269
markup40_3_s	-0.01	0.16	-0.52	-0.01	0.56	4254
markup40_0_s	0.02	0.18	-0.52	0.01	0.59	5167
markup60_1_s	-0.02	0.21	-0.63	-0.02	0.69	3994
markup60_2_s	-0.02	0.21	-0.62	-0.02	0.66	3985
markup60_3_s	-0.01	0.20	-0.59	-0.02	0.68	3971
markup60_0_s	0.03	0.22	-0.63	0.02	0.73	4781
prem_1day	9.65	28.87	-72.84	4.03	140.50	3073
prem_1week	14.28	34.57	-81.70	8.89	159.60	3102
prem_4week	16.44	36.20	-79.84	11.11	157.80	3100
prem_20day	0.28	0.74	-0.95	0.17	4.77	2400
prem_3month	0.39	1.13	-0.95	0.18	7.99	2779
Control variables						
Deal Control variables						
cash0	0.42	0.49	0.00	0.00	1.00	6175
toehold	0.27	0.44	0.00	0.00	1.00	6175
dealsize	4.03	2.39	-1.36	3.95	9.62	4196
financial	0.09	0.28	0.00	0.00	1.00	6175
same_ind	0.62	0.48	0.00	1.00	1.00	6175
friendly	0.73	0.44	0.00	1.00	1.00	6175
significant	0.45	0.50	0.00	0.00	1.00	6175

Buyer/seller Control variables						
ret12_s	0.38	3.50	-1.00	0.08	216.60	6490
bm_s	0.89	4.80	-188.98	0.65	230.56	5406
roa_s	0.04	23.50	-653.72	0.02	1,578.25	5388
inv_s	0.06	0.49	0.00	0.03	31.92	5201
leverage_s	0.28	1.60	0.00	0.21	110.50	5384
ret12_b	0.45	3.41	-0.98	0.17	229.36	6146
bm_b	1.07	17.50	-22.95	0.58	1,178.70	5936
roa_b	-0.01	1.17	-75.99	0.03	1.08	5912
inv_b	0.05	0.41	0.00	0.03	30.37	5804
leverage_b	0.25	0.20	0.00	0.23	3.25	5929

Table 3 GAP and short-term takeover premia.

We provide preliminary evidence on the link between premia and GAP. First, we rank each target firm in terms of its GAP at the end of quarter immediately before the run-up period. We then classify targets as a function of whether GAP is 'High Gap' (i.e. belonging to the top tercile of the distribution) or 'Low Gap' (i.e. belonging to the bottom tercile).

Cumulative raw return of target around M&A				
gap_tercile	runup20	runup40	markup20	markup60
1	4.17%	6.31%	0.66%	2.27%
2	3.56%	5.58%	0.55%	2.65%
3	2.52%	3.96%	0.45%	2.51%
t-stat(1-3)	3.48***	3.54***	0.47	-0.28
Total	3.4%	5.3%	0.6%	2.5%

Table 4

Panel A Target Runup: Raw return

The table shows estimates from OLS regressions of market reaction to M&A deals with both listed targets and acquirers. The dependent variable is cumulative abnormal returns (CAR) 20 (40) days before (around) the announcement date for targets using raw return (Panel A), adjusted by benchmark of market model (Panel B), where we use the local stock market index to proxy for the market return, and by benchmark of Fama-French 3 factor model (Panel C), where we use the local FF3 factor (all returns in USD). Runup20 is CAR[-20,-2], and runup40 is CAR[-40,-2]. Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

Panel A						
	(1)	(2)	(3)	(4)	(5)	(6)
	runup20	runup20	runup20	runup40	runup40	runup40
gap_dif	-0.0029***	-0.0035***	-0.0035***	-0.0048***	-0.0050***	-0.0050**
	(-3.23)	(-3.23)	(-2.91)	(-3.86)	(-3.35)	(-2.51)
cash0	-0.0042	-0.0059	-0.0059	0.0053	0.026**	0.026*
	(-0.80)	(-0.65)	(-0.85)	(0.74)	(2.20)	(1.82)
toehold	-0.0058	-0.011	-0.011	-0.012*	-0.015	-0.015**
	(-1.13)	(-1.50)	(-1.64)	(-1.68)	(-1.48)	(-2.19)
same_ind	0.0050	0.013*	0.013***	0.0086	0.014	0.014
	(0.99)	(1.91)	(3.45)	(1.24)	(1.46)	(1.57)
friendly	-0.0075	-0.0011	-0.0011	-0.011	-0.013	-0.013
	(-1.22)	(-0.13)	(-0.15)	(-1.28)	(-1.14)	(-1.04)
financial	-0.0093	-0.0096	-0.0096	-0.0011	0.0036	0.0036
	(-0.97)	(-0.70)	(-0.80)	(-0.08)	(0.20)	(0.23)
significant	-0.0064	-0.0066	-0.0066	-0.0075	0.0022	0.0022
	(-1.10)	(-0.73)	(-0.73)	(-0.92)	(0.18)	(0.16)
dealsize	0.0018	0.0027	0.0027*	0.0040**	0.0031	0.0031
	(1.50)	(1.39)	(1.68)	(2.41)	(1.22)	(1.24)
ret12_s		-0.00091	-0.00091		-0.0018	-0.0018
		(-0.91)	(-0.94)		(-1.45)	(-1.50)
bm_s		0.00024	0.00024		0.0020	0.0020
		(0.27)	(0.38)		(1.29)	(1.53)
inv_s		0.00040	0.00040		-0.034	-0.034
		(0.01)	(0.01)		(-0.60)	(-0.79)
leverage_s		-0.013	-0.013		-0.020**	-0.020**
		(-1.49)	(-1.60)		(-2.15)	(-2.38)
roa_s		-0.0012	-0.0012		-0.0039	-0.0039
		(-0.25)	(-0.29)		(-0.68)	(-0.66)
ret12_b		0.00099***	0.00099***		0.00092***	0.00092***
		(4.07)	(3.25)		(3.26)	(3.12)
bm_b		-0.000049	-0.000049		0.00029***	0.00029**
		(-0.33)	(-0.42)		(3.31)	(2.54)
inv_b		-0.020	-0.020		-0.017	-0.017
		(-0.60)	(-0.98)		(-0.36)	(-0.48)
leverage_b		0.00044	0.00044		0.021	0.021
		(0.02)	(0.03)		(0.82)	(1.20)
roa_b		-0.053	-0.053*		-0.019	-0.019
		(-1.27)	(-1.73)		(-0.35)	(-0.33)
R2	0.0053	0.10	0.10	0.0084	0.11	0.11
F	2.13	2.50	9.29	3.36	3.05	19.9
No. of obs	3198	2016	2016	3170	1992	1992

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B Target Runup: Market Model

Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)
	runup20	runup20	runup20	runup40	runup40	runup40
gap_dif	-0.0034***	-0.0029***	-0.0029***	-0.0051***	-0.0040***	-0.0040***
	(-3.88)	(-2.94)	(-2.81)	(-4.12)	(-2.75)	(-2.77)
cash0	-0.0030	-0.0032	-0.0032	0.0028	0.017	0.017
	(-0.58)	(-0.39)	(-0.44)	(0.38)	(1.50)	(1.36)
toehold	-0.0067	-0.0019	-0.0019	-0.013*	-0.0047	-0.0047
	(-1.33)	(-0.27)	(-0.30)	(-1.78)	(-0.49)	(-0.86)
same_ind	0.0067	0.0091	0.0091**	0.0080	0.0069	0.0069
	(1.37)	(1.39)	(2.03)	(1.14)	(0.73)	(1.40)
friendly	-0.010*	-0.0012	-0.0012	-0.015*	-0.011	-0.011
	(-1.69)	(-0.15)	(-0.15)	(-1.72)	(-1.10)	(-1.01)
financial	0.00065	0.0047	0.0047	0.0041	0.0086	0.0086
	(0.07)	(0.35)	(0.41)	(0.29)	(0.46)	(0.42)
significant	0.0041	-0.0010	-0.0010	0.013	0.0087	0.0087
	(0.70)	(-0.12)	(-0.10)	(1.51)	(0.74)	(0.51)
dealsize	-0.00015	0.0024	0.0024*	-0.00047	0.0031	0.0031
	(-0.13)	(1.30)	(1.78)	(-0.27)	(1.22)	(1.48)
ret12_s		-0.025***	-0.025***		-0.043***	-0.043***
		(-6.01)	(-5.19)		(-7.19)	(-8.77)
bm_s		0.00080	0.00080		0.0036**	0.0036*
		(0.85)	(0.87)		(2.07)	(1.93)
inv_s		-0.0053	-0.0053		-0.051	-0.051
		(-0.17)	(-0.20)		(-1.03)	(-0.92)
leverage_s		-0.010	-0.010*		-0.015	-0.015*
		(-1.30)	(-1.76)		(-1.57)	(-1.97)
roa_s		-0.059***	-0.059***		-0.11***	-0.11***
		(-3.55)	(-3.64)		(-4.48)	(-4.44)
ret12_b		0.0017***	0.0017***		0.0015***	0.0015***
		(8.35)	(7.58)		(5.69)	(7.13)
bm_b		-0.0068**	-0.0068**		-0.0060*	-0.0060**
		(-2.09)	(-2.20)		(-1.69)	(-2.26)
inv_b		0.00088	0.00088		0.012	0.012
		(0.03)	(0.03)		(0.25)	(0.32)
leverage_b		0.0062	0.0062		0.025	0.025
		(0.36)	(0.49)		(0.97)	(1.19)
roa_b		-0.024	-0.024		-0.030	-0.030
		(-0.55)	(-0.79)		(-0.51)	(-0.53)
R2	0.0077	0.14	0.14	0.0093	0.15	0.15
F	2.63	9.01	70.1	3.20	9.01	177.7
No. of obs	2729	1740	1740	2734	1742	1742

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel C Target Runup: FF3 Model

Panel C						
	(1)	(2)	(3)	(4)	(5)	(6)
	runup20	runup20	runup20	runup40	runup40	runup40
gap_dif	-0.0028***	-0.0021**	-0.0021**	-0.0044***	-0.0031**	-0.0031**
	(-3.26)	(-2.07)	(-2.19)	(-3.72)	(-2.18)	(-2.38)
cash0	-0.0041	-0.0076	-0.0076	0.00031	0.0079	0.0079
	(-0.82)	(-0.94)	(-1.00)	(0.04)	(0.71)	(0.68)
toehold	-0.0035	0.0029	0.0029	-0.0089	0.00048	0.00048
	(-0.71)	(0.43)	(0.49)	(-1.29)	(0.05)	(0.09)
same_ind	0.0058	0.0070	0.0070	0.0039	0.0013	0.0013
	(1.20)	(1.05)	(1.46)	(0.58)	(0.14)	(0.33)
friendly	-0.0095	-0.00068	-0.00068	-0.016*	-0.011	-0.011
	(-1.58)	(-0.09)	(-0.09)	(-1.91)	(-1.10)	(-0.94)
financial	-0.0024	0.0035	0.0035	0.00054	0.0042	0.0042
	(-0.25)	(0.26)	(0.33)	(0.04)	(0.25)	(0.25)
significant	0.0052	0.0010	0.0010	0.016*	0.010	0.010
	(0.90)	(0.13)	(0.11)	(1.93)	(0.91)	(0.69)
dealsize	-0.00072	0.00085	0.00085	-0.0013	0.0013	0.0013
	(-0.60)	(0.45)	(0.64)	(-0.80)	(0.52)	(0.53)
ret12_s		-0.022***	-0.022***		-0.038***	-0.038***
		(-5.69)	(-4.45)		(-7.75)	(-9.95)
bm_s		0.00062	0.00062		0.0029*	0.0029*
		(0.70)	(0.81)		(1.90)	(1.92)
inv_s		-0.034	-0.034		-0.089*	-0.089
		(-1.11)	(-1.22)		(-1.91)	(-1.62)
leverage_s		-0.013	-0.013**		-0.017**	-0.017**
		(-1.65)	(-2.29)		(-2.00)	(-2.57)
roa_s		-0.049***	-0.049***		-0.094***	-0.094***
		(-2.83)	(-2.91)		(-3.92)	(-3.67)
ret12_b		0.0016***	0.0016***		0.0015***	0.0015***
		(8.35)	(7.90)		(5.66)	(8.75)
bm_b		-0.0054*	-0.0054**		-0.0045	-0.0045*
		(-1.81)	(-2.04)		(-1.34)	(-1.98)
inv_b		-0.011	-0.011		-0.0070	-0.0070
		(-0.37)	(-0.52)		(-0.15)	(-0.24)
leverage_b		0.0041	0.0041		0.017	0.017
		(0.24)	(0.32)		(0.64)	(0.92)
roa_b		0.016	0.016		0.020	0.020
		(0.38)	(0.54)		(0.36)	(0.35)
R2	0.0058	0.12	0.12	0.0079	0.14	0.14
F	1.98	8.38	55.1	2.70	8.94	318.9
No. of obs	2714	1731	1731	2719	1734	1734

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5

Panel A Target Event CAR: Raw return

The table shows estimates from OLS regressions of market reaction to M&A deals with both listed targets and acquirers. The dependent variable is cumulative abnormal returns 3 (11) days around the announcement date for targets using raw return (Panel A), adjusted by benchmark of market model (Panel B), where we use the local stock market index to proxy for the market return, and by benchmark of Fama-French 3 factor model (Panel C), where we use the local FF3 factor (all returns in USD). CAR1 is CAR[-1,+1], and CAR5 is CAR[-5,+5]. Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

Panel A						
	(1)	(2)	(3)	(4)	(5)	(6)
	car1	car1	car1	car5	car5	car5
gap_dif	-0.0061***	-0.0029***	-0.0029**	-0.0080***	-0.0042***	-0.0042**
	(-6.81)	(-2.97)	(-2.48)	(-7.47)	(-3.50)	(-2.14)
cash0	0.0079	0.021**	0.021***	0.0077	0.032***	0.032***
	(1.52)	(2.48)	(3.15)	(1.24)	(3.17)	(4.37)
toehold	-0.041***	-0.018***	-0.018**	-0.047***	-0.023***	-0.023***
	(-8.00)	(-3.20)	(-2.65)	(-7.80)	(-2.90)	(-3.32)
same_ind	-0.00075	-0.014**	-0.014***	0.00041	-0.0079	-0.0079
	(-0.15)	(-2.36)	(-3.14)	(0.07)	(-1.04)	(-1.14)
friendly	0.0033	-0.00073	-0.00073	-0.0039	-0.0050	-0.0050
	(0.55)	(-0.11)	(-0.11)	(-0.54)	(-0.59)	(-0.75)
financial	-0.016*	-0.024**	-0.024**	-0.019*	-0.026*	-0.026**
	(-1.72)	(-2.29)	(-2.54)	(-1.70)	(-1.76)	(-2.47)
significant	0.069***	0.045***	0.045***	0.066***	0.051***	0.051***
	(11.75)	(5.85)	(3.58)	(9.52)	(5.43)	(5.40)
dealsize	0.0027**	0.00026	0.00026	0.0026*	-0.00055	-0.00055
	(2.21)	(0.17)	(0.12)	(1.82)	(-0.29)	(-0.24)
ret12_s		-0.0015*	-0.0015*		-0.0023	-0.0023
		(-1.66)	(-1.90)		(-1.43)	(-1.38)
bm_s		0.00026	0.00026		-0.00026	-0.00026
		(0.37)	(0.39)		(-0.33)	(-0.50)
inv_s		-0.024	-0.024		-0.028	-0.028
		(-0.92)	(-0.84)		(-0.68)	(-0.72)
leverage_s		0.0017	0.0017		-0.0066	-0.0066
		(0.30)	(0.47)		(-0.88)	(-0.93)
roa_s		-0.00024	-0.00024		-0.0030	-0.0030
		(-0.08)	(-0.08)		(-0.27)	(-0.23)
ret12_b		-0.00076***	-0.00076***		-0.0013***	-0.0013***
		(-4.20)	(-3.51)		(-5.65)	(-5.56)
bm_b		0.000063	0.000063		0.000016	0.000016
		(0.80)	(0.81)		(0.18)	(0.31)
inv_b		0.027	0.027		0.038	0.038
		(0.96)	(1.13)		(1.06)	(1.22)
leverage_b		-0.036**	-0.036***		-0.037*	-0.037**
		(-2.40)	(-3.33)		(-1.95)	(-2.18)
roa_b		0.030	0.030*		0.015	0.015
		(1.01)	(1.97)		(0.39)	(0.38)
R2	0.12	0.22	0.22	0.089	0.18	0.18
F	51.2	5.17	36.7	37.7	6.12	27.6
No. of obs	3005	1906	1906	3095	1964	1964

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B Target Event CAR: Market Model

	(1) car1	(2) car1	(3) car1	(4) car5	(5) car5	(6) car5
gap_dif	-0.0061***	-0.0027***	-0.0027**	-0.0076***	-0.0032***	-0.0032*
	(-6.53)	(-2.60)	(-2.25)	(-6.95)	(-2.60)	(-1.75)
cash0	0.016***	0.020**	0.020***	0.014**	0.031***	0.031***
	(2.82)	(2.26)	(3.00)	(2.13)	(2.97)	(4.08)
toehold	-0.041***	-0.012*	-0.012*	-0.048***	-0.015*	-0.015**
	(-7.54)	(-1.95)	(-1.82)	(-7.61)	(-1.83)	(-2.42)
same_ind	0.0025	-0.011*	-0.011**	0.0020	-0.0062	-0.0062
	(0.47)	(-1.71)	(-2.04)	(0.32)	(-0.80)	(-0.71)
friendly	0.0012	-0.0041	-0.0041	-0.0038	-0.0044	-0.0044
	(0.18)	(-0.61)	(-0.62)	(-0.49)	(-0.52)	(-0.79)
financial	-0.020*	-0.032***	-0.032***	-0.018	-0.028**	-0.028**
	(-1.89)	(-2.98)	(-2.86)	(-1.50)	(-2.04)	(-2.42)
significant	0.077***	0.043***	0.043***	0.079***	0.049***	0.049***
	(11.92)	(5.08)	(2.81)	(10.54)	(4.93)	(3.64)
dealsize	0.0025*	0.0013	0.0013	0.00065	0.00049	0.00049
	(1.85)	(0.76)	(0.57)	(0.42)	(0.24)	(0.27)
ret12_s		-0.0071***	-0.0071***		-0.022***	-0.022***
		(-2.63)	(-4.55)		(-5.94)	(-7.49)
bm_s		0.0000073	0.0000073		0.00042	0.00042
		(0.01)	(0.01)		(0.38)	(0.42)
inv_s		-0.020	-0.020		-0.0099	-0.0099
		(-0.76)	(-0.75)		(-0.27)	(-0.36)
leverage_s		0.0016	0.0016		-0.0099*	-0.0099
		(0.31)	(0.51)		(-1.66)	(-1.66)
roa_s		-0.025*	-0.025**		-0.078***	-0.078***
		(-1.71)	(-2.12)		(-3.65)	(-3.14)
ret12_b		-0.00070***	-0.00070***		-0.0012***	-0.0012***
		(-3.97)	(-3.83)		(-5.66)	(-7.23)
bm_b		0.00029	0.00029		0.00078	0.00078
		(0.12)	(0.12)		(0.18)	(0.25)
inv_b		0.012	0.012		0.027	0.027
		(0.45)	(0.34)		(0.78)	(0.76)
leverage_b		-0.024	-0.024*		-0.020	-0.020
		(-1.52)	(-2.02)		(-1.02)	(-1.04)
roa_b		0.041	0.041		0.058	0.058
		(1.17)	(1.63)		(1.36)	(1.23)
R2	0.13	0.23	0.23	0.10	0.22	0.22
F	49.5	4.68	122.5	38.6	7.46	90.3
No. of obs	2630	1676	1676	2666	1699	1699

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel C Target Event CAR: FF3 Model

	(1) car1	(2) car1	(3) car1	(4) car5	(5) car5	(6) car5
gap_dif	-0.0060***	-0.0026**	-0.0026**	-0.0072***	-0.0028**	-0.0028
	(-6.44)	(-2.57)	(-2.21)	(-6.60)	(-2.31)	(-1.61)
cash0	0.016***	0.021**	0.021***	0.013*	0.030***	0.030***
	(2.79)	(2.31)	(2.90)	(1.94)	(2.81)	(3.52)
toehold	-0.040***	-0.0097	-0.0097	-0.045***	-0.0093	-0.0093
	(-7.34)	(-1.62)	(-1.48)	(-7.06)	(-1.19)	(-1.53)
same_ind	0.0027	-0.010*	-0.010*	0.0027	-0.0058	-0.0058
	(0.49)	(-1.65)	(-1.91)	(0.44)	(-0.75)	(-0.63)
friendly	0.0014	-0.0031	-0.0031	-0.0013	-0.0017	-0.0017
	(0.21)	(-0.46)	(-0.45)	(-0.17)	(-0.20)	(-0.27)
financial	-0.018*	-0.030***	-0.030***	-0.019	-0.026*	-0.026**
	(-1.75)	(-2.79)	(-2.75)	(-1.52)	(-1.93)	(-2.33)
significant	0.076***	0.042***	0.042***	0.077***	0.047***	0.047***
	(11.80)	(5.02)	(2.74)	(10.38)	(4.64)	(3.19)
dealsize	0.0024*	0.00093	0.00093	0.00045	-0.00011	-0.00011
	(1.84)	(0.56)	(0.44)	(0.29)	(-0.06)	(-0.06)
ret12_s		-0.0071***	-0.0071***		-0.020***	-0.020***
		(-2.62)	(-4.17)		(-5.51)	(-7.29)
bm_s		-0.000018	-0.000018		0.00049	0.00049
		(-0.02)	(-0.03)		(0.48)	(0.52)
inv_s		-0.022	-0.022		-0.017	-0.017
		(-0.81)	(-0.80)		(-0.48)	(-0.72)
leverage_s		0.00013	0.00013		-0.014**	-0.014**
		(0.03)	(0.04)		(-2.25)	(-2.37)
roa_s		-0.023	-0.023*		-0.077***	-0.077***
		(-1.59)	(-2.00)		(-3.71)	(-3.18)
ret12_b		-0.00071***	-0.00071***		-0.0013***	-0.0013***
		(-4.02)	(-3.83)		(-5.89)	(-7.92)
bm_b		0.00026	0.00026		0.0019	0.0019
		(0.11)	(0.11)		(0.46)	(0.67)
inv_b		0.013	0.013		0.016	0.016
		(0.49)	(0.36)		(0.48)	(0.44)
leverage_b		-0.021	-0.021*		-0.023	-0.023
		(-1.36)	(-1.86)		(-1.18)	(-1.41)
roa_b		0.050	0.050**		0.075*	0.075
		(1.45)	(2.03)		(1.69)	(1.61)
R2	0.13	0.23	0.23	0.099	0.22	0.22
F	48.2	4.51	115.6	36.4	6.84	77.4
No. of obs	2609	1660	1660	2648	1687	1687

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6

Panel A Target markup: Raw return

The table shows estimates from OLS regressions of market reaction to M&A deals with both listed targets and acquirers. The dependent variable is cumulative raw returns (CAR) 20 (60) days after the announcement date for targets using raw return (Panel A), adjusted by benchmark of market model (Panel B), where we use the local stock market index to proxy for the market return, and by benchmark of Fama-French 3 factor model (Panel C), where we use the local FF3 factor (all returns in USD). Markup20 is CAR[2,20], and markup60 is CAR[2,60]. Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

Panel A

	(1) markup20	(2) markup20	(3) markup20	(4) markup60	(5) markup60	(6) markup60
gap_dif	-0.0014*	0.00046	0.00046	-0.0031**	-0.00022	-0.00022
	(-1.69)	(0.46)	(0.53)	(-1.99)	(-0.13)	(-0.19)
cash0	-0.0064	0.0058	0.0058	-0.0051	0.016	0.016
	(-1.33)	(0.67)	(0.80)	(-0.55)	(1.04)	(0.98)
toehold	0.0012	-0.00090	-0.00090	0.0059	-0.0021	-0.0021
	(0.25)	(-0.13)	(-0.23)	(0.67)	(-0.18)	(-0.24)
same_ind	0.0062	0.0028	0.0028	0.00050	-0.0044	-0.0044
	(1.34)	(0.40)	(0.44)	(0.06)	(-0.38)	(-0.41)
friendly	-0.012**	-0.0062	-0.0062	-0.023**	-0.0094	-0.0094
	(-2.06)	(-0.84)	(-0.94)	(-2.21)	(-0.73)	(-1.31)
financial	0.0085	0.015	0.015*	0.0045	-0.015	-0.015
	(0.95)	(1.07)	(1.72)	(0.27)	(-0.67)	(-0.79)
significant	0.021***	0.020**	0.020***	0.037***	0.042***	0.042***
	(3.74)	(2.34)	(3.17)	(3.49)	(2.89)	(3.28)
dealsize	-0.0048***	-0.0059***	-0.0059***	-0.010***	-0.011***	-0.011***
	(-4.31)	(-3.25)	(-3.58)	(-4.88)	(-3.68)	(-3.33)
ret12_s		-0.0027	-0.0027		-0.0030	-0.0030
		(-1.59)	(-1.56)		(-1.23)	(-1.21)
bm_s		0.0012	0.0012		0.0022	0.0022
		(0.82)	(0.77)		(0.76)	(0.69)
inv_s		-0.0098	-0.0098		-0.0084	-0.0084
		(-0.38)	(-0.38)		(-0.20)	(-0.19)
leverage_s		0.012	0.012		-0.016	-0.016
		(0.78)	(0.59)		(-0.56)	(-0.54)
roa_s		0.0062*	0.0062*		-0.0025	-0.0025
		(1.69)	(1.81)		(-0.27)	(-0.30)
ret12_b		0.00022	0.00022		-0.017***	-0.017***
		(0.06)	(0.06)		(-2.67)	(-3.01)
bm_b		-0.00040***	-0.00040***		0.00032**	0.00032**
		(-6.19)	(-9.54)		(2.30)	(2.27)
inv_b		-0.031	-0.031		-0.078	-0.078
		(-0.81)	(-0.74)		(-1.17)	(-1.31)
leverage_b		0.014	0.014		-0.012	-0.012
		(0.74)	(0.53)		(-0.35)	(-0.35)
roa_b		-0.034	-0.034		0.16**	0.16*
		(-0.78)	(-0.69)		(2.35)	(1.92)
R2	0.011	0.094	0.094	0.014	0.11	0.11
F	4.32	3.67	17.9	4.63	2.60	18.8
No. of obs	3128	1992	1992	2698	1846	1846

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B Target markup: Market Model

Panel B	(1) markup20	(2) markup20	(3) markup20	(4) markup60	(5) markup60	(6) markup60
gap_dif	-0.0016**	0.00033	0.00033	-0.0027*	0.00011	0.00011
	(-2.00)	(0.33)	(0.44)	(-1.68)	(0.06)	(0.07)
cash0	-0.0038	0.0063	0.0063	-0.010	0.011	0.011
	(-0.80)	(0.75)	(0.78)	(-1.03)	(0.68)	(0.94)
toehold	0.0015	0.0055	0.0055	0.0073	0.0063	0.0063
	(0.31)	(0.79)	(1.48)	(0.79)	(0.51)	(0.57)
same_ind	0.0060	0.0050	0.0050	-0.0019	-0.0067	-0.0067
	(1.30)	(0.73)	(1.04)	(-0.21)	(-0.55)	(-0.64)
friendly	-0.010*	-0.0071	-0.0071	-0.027**	-0.019	-0.019***
	(-1.83)	(-1.01)	(-1.38)	(-2.51)	(-1.47)	(-2.85)
financial	-0.00077	0.0058	0.0058	-0.014	-0.027	-0.027
	(-0.09)	(0.40)	(0.44)	(-0.81)	(-1.24)	(-1.57)
significant	0.018***	0.0068	0.0068	0.039***	0.026	0.026*
	(3.30)	(0.80)	(0.82)	(3.41)	(1.62)	(1.95)
dealsize	-0.0028**	-0.0014	-0.0014	-0.0072***	-0.0043	-0.0043
	(-2.44)	(-0.80)	(-0.86)	(-3.18)	(-1.35)	(-1.67)
ret12_s		-0.032***	-0.032***		-0.070***	-0.070***
		(-6.97)	(-7.51)		(-7.74)	(-9.97)
bm_s		0.0016	0.0016		0.0033*	0.0033
		(1.33)	(1.27)		(1.66)	(1.46)
inv_s		-0.0070	-0.0070		-0.088	-0.088
		(-0.23)	(-0.23)		(-1.35)	(-1.32)
leverage_s		0.014	0.014		0.019	0.019
		(0.85)	(0.90)		(0.61)	(0.75)
roa_s		-0.023	-0.023		-0.023	-0.023
		(-1.14)	(-1.02)		(-0.62)	(-0.49)
ret12_b		0.0074*	0.0074**		0.0049	0.0049
		(1.84)	(2.05)		(0.60)	(0.91)
bm_b		-0.00047	-0.00047		-0.0095	-0.0095*
		(-0.18)	(-0.23)		(-1.44)	(-1.97)
inv_b		-0.027	-0.027		-0.0073	-0.0073
		(-0.79)	(-0.77)		(-0.11)	(-0.15)
leverage_b		-0.0064	-0.0064		-0.032	-0.032
		(-0.35)	(-0.31)		(-0.97)	(-1.01)
roa_b		0.0032	0.0032		0.073	0.073
		(0.07)	(0.06)		(0.87)	(0.76)
R2	0.0088	0.13	0.13	0.012	0.16	0.16
F	2.93	3.25	29.0	3.37	4.75	29.6
No. of obs	2631	1685	1685	2293	1590	1590

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel C Target markup: FF3 Model

Panel C	(1) markup20	(2) markup20	(3) markup20	(4) markup60	(5) markup60	(6) markup60
gap_dif	-0.0016*	0.00013	0.00013	-0.0024	0.00042	0.00042
	(-1.94)	(0.13)	(0.16)	(-1.51)	(0.23)	(0.21)
cash0	-0.0073	-0.00055	-0.00055	-0.014	0.0036	0.0036
	(-1.54)	(-0.07)	(-0.07)	(-1.48)	(0.23)	(0.27)
toehold	0.0030	0.0066	0.0066	0.0093	0.0082	0.0082
	(0.64)	(0.96)	(1.68)	(1.01)	(0.67)	(0.64)
same_ind	0.0033	0.0020	0.0020	-0.0093	-0.010	-0.010
	(0.71)	(0.30)	(0.33)	(-1.02)	(-0.83)	(-0.93)
friendly	-0.0087	-0.0057	-0.0057	-0.021**	-0.019	-0.019***
	(-1.54)	(-0.78)	(-1.03)	(-1.97)	(-1.46)	(-3.04)
financial	-0.0064	0.0023	0.0023	-0.012	-0.021	-0.021
	(-0.71)	(0.17)	(0.18)	(-0.68)	(-0.93)	(-1.04)
significant	0.017***	0.00061	0.00061	0.041***	0.025	0.025
	(3.06)	(0.07)	(0.07)	(3.71)	(1.53)	(1.60)
dealsize	-0.0029**	-0.0013	-0.0013	-0.0081***	-0.0050	-0.0050*
	(-2.53)	(-0.72)	(-0.88)	(-3.63)	(-1.58)	(-1.94)
ret12_s		-0.028***	-0.028***		-0.061***	-0.061***
		(-5.65)	(-6.00)		(-6.61)	(-7.78)
bm_s		0.0013	0.0013		0.0023	0.0023
		(1.31)	(1.22)		(1.39)	(1.28)
inv_s		-0.012	-0.012		-0.094	-0.094
		(-0.37)	(-0.41)		(-1.35)	(-1.31)
leverage_s		0.0076	0.0076		0.011	0.011
		(0.48)	(0.64)		(0.36)	(0.43)
roa_s		-0.025	-0.025		-0.021	-0.021
		(-1.33)	(-1.29)		(-0.64)	(-0.49)
ret12_b		0.0063*	0.0063		0.0063	0.0063
		(1.66)	(1.63)		(0.87)	(1.20)
bm_b		0.00094	0.00094		-0.0033	-0.0033
		(0.37)	(0.39)		(-0.63)	(-1.19)
inv_b		-0.042	-0.042		-0.0031	-0.0031
		(-1.04)	(-0.96)		(-0.05)	(-0.06)
leverage_b		-0.0098	-0.0098		-0.033	-0.033
		(-0.54)	(-0.55)		(-0.99)	(-1.24)
roa_b		0.0096	0.0096		0.11	0.11
		(0.20)	(0.20)		(1.34)	(1.25)
R2	0.0093	0.12	0.12	0.014	0.14	0.14
F	3.06	2.39	9.31	4.01	3.71	23.0
No. of obs	2613	1674	1674	2278	1580	1580

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7 SDC premium in 1 month

The table shows estimates from OLS regressions of premium to M&A deals with both listed targets and acquirers. The dependent variable is price premium according to target stock price 1 week and 4 weeks prior to the announcement date (from SDC). Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) prem_1week	(2) prem_1week	(3) prem_1week	(4) prem_4week	(5) prem_4week	(6) prem_4week
gap_dif	-1.18***	-0.64*	-0.64**	-2.02***	-1.31***	-1.31***
	(-3.64)	(-1.82)	(-2.44)	(-5.84)	(-3.57)	(-3.98)
cash0	2.97*	-0.93	-0.93	3.00*	0.60	0.60
	(1.66)	(-0.41)	(-0.29)	(1.68)	(0.25)	(0.18)
toehold	-3.88**	-6.47***	-6.47**	-5.94***	-8.04***	-8.04**
	(-2.27)	(-3.21)	(-2.46)	(-3.50)	(-4.00)	(-2.42)
same_ind	0.17	0.38	0.38	-0.083	1.17	1.17
	(0.12)	(0.21)	(0.24)	(-0.05)	(0.62)	(0.51)
friendly	-4.71**	-6.30***	-6.30***	-4.52**	-5.92**	-5.92**
	(-2.51)	(-2.70)	(-2.90)	(-2.35)	(-2.51)	(-2.66)
financial	-2.24	-3.51	-3.51	-2.87	-4.52	-4.52
	(-0.63)	(-0.79)	(-1.04)	(-0.76)	(-1.00)	(-1.44)
significant	8.66***	3.04	3.04	8.77***	4.37*	4.37
	(4.23)	(1.27)	(0.84)	(4.15)	(1.79)	(1.07)
dealsize	1.67***	1.84***	1.84***	2.06***	2.07***	2.07***
	(4.32)	(4.01)	(3.33)	(5.29)	(4.40)	(3.53)
ret12_s		-2.00**	-2.00**		-1.71*	-1.71*
		(-2.47)	(-2.37)		(-1.91)	(-1.99)
bm_s		-0.14	-0.14		-0.078	-0.078
		(-0.40)	(-0.35)		(-0.24)	(-0.21)
inv_s		-3.32	-3.32		1.04	1.04
		(-0.61)	(-0.65)		(0.17)	(0.18)
leverage_s		-1.05	-1.05		-2.92*	-2.92
		(-0.55)	(-0.47)		(-1.74)	(-1.60)
roa_s		2.55***	2.55***		2.87***	2.87***
		(3.38)	(3.55)		(4.49)	(6.28)
ret12_b		-0.032	-0.032		0.18***	0.18***
		(-0.64)	(-0.91)		(3.50)	(4.21)
bm_b		-0.018	-0.018		-0.019	-0.019
		(-1.38)	(-1.42)		(-1.52)	(-1.39)
inv_b		8.18	8.18		4.88	4.88
		(0.90)	(1.46)		(0.60)	(1.03)
leverage_b		2.18	2.18		5.17	5.17
		(0.46)	(0.65)		(1.05)	(1.30)
roa_b		-2.56	-2.56		1.37	1.37
		(-0.51)	(-0.70)		(0.20)	(0.27)
R2	0.20	0.24	0.24	0.20	0.23	0.23
F	9.53	4.82	13.9	13.3	7.70	31.8
No. of obs	2551	1547	1547	2547	1545	1545

Table 8 Long horizon self-calculated premium

The table shows estimates from OLS regressions of premium to M&A deals with both listed targets and acquirers. The dependent variable is price premium according to target stock price 20/3 month trading days prior to the announcement date. Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown) and cluster standard errors by targets and acquirers (model (2) & (5)) and by target country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) prem_20day	(2) prem_20day	(3) prem_20day	(4) prem_3month	(5) prem_3month	(6) prem_3month
gap_dif	-0.022**	-0.023**	-0.023*	-0.046***	-0.050***	-0.050***
	(-2.57)	(-2.12)	(-1.87)	(-4.16)	(-3.70)	(-2.75)
cash0	0.080**	0.092	0.092	0.077	0.13	0.13
	(2.27)	(1.51)	(1.66)	(1.54)	(1.44)	(1.13)
toehold	-0.063	-0.100*	-0.100	-0.046	-0.062	-0.062
	(-1.48)	(-1.73)	(-0.99)	(-0.77)	(-0.76)	(-0.62)
same_ind	-0.0085	-0.053	-0.053	0.013	-0.037	-0.037
	(-0.22)	(-0.94)	(-0.80)	(0.24)	(-0.46)	(-0.50)
friendly	-0.094*	-0.044	-0.044	-0.16**	-0.10	-0.10
	(-1.66)	(-0.63)	(-0.71)	(-2.13)	(-1.10)	(-1.06)
financial	-0.098	-0.096	-0.096	-0.061	-0.15	-0.15
	(-1.19)	(-0.91)	(-1.17)	(-0.47)	(-0.83)	(-1.59)
significant	0.024	0.046	0.046	-0.028	0.034	0.034
	(0.48)	(0.61)	(0.54)	(-0.43)	(0.35)	(0.28)
dealsize	0.039***	0.045***	0.045*	0.047***	0.055***	0.055**
	(3.72)	(2.88)	(1.96)	(3.64)	(2.84)	(2.23)
ret12_s		0.012	0.012		0.021	0.021
		(0.49)	(0.45)		(0.64)	(0.71)
bm_s		0.011	0.011		0.014	0.014
		(1.42)	(1.20)		(0.89)	(0.81)
inv_s		-0.31	-0.31		0.087	0.087
		(-1.08)	(-0.98)		(0.43)	(0.49)
leverage_s		-0.057**	-0.057**		-0.051	-0.051
		(-2.00)	(-2.34)		(-0.97)	(-1.16)
roa_s		0.045***	0.045***		0.012	0.012
		(3.22)	(3.49)		(1.56)	(1.60)
ret12_b		0.0037***	0.0037***		0.0027	0.0027*
		(3.11)	(2.74)		(1.35)	(1.82)
bm_b		-0.00028	-0.00028		-0.00021	-0.00021
		(-0.66)	(-0.81)		(-0.78)	(-0.52)
inv_b		-0.18	-0.18		0.12	0.12
		(-0.71)	(-0.62)		(0.25)	(0.22)
leverage_b		0.012	0.012		-0.083	-0.083
		(0.09)	(0.09)		(-0.38)	(-0.41)
roa_b		-0.023	-0.023		0.34*	0.34
		(-0.11)	(-0.11)		(1.70)	(1.61)
R2	0.14	0.20	0.20	0.14	0.19	0.19
F	4.72	4.26	14.0	5.37	3.43	11.4
No. of obs	2251	1333	1333	2601	1575	1575

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9 Probability that a listed company becomes a target

The table shows estimates from 1st stage of Heckman model of how centrality affects the likelihood of the firm being taken over. The dependent variable is a dummy that takes the value of 1 if acquired Main explanatory variable is centrality and identifying restrictions are local stock market return(rm_qtr) and credit spread(spread) as in Harford(2005). Definitions of all variables are found in Table 1. We include target mkt/industry(sic2), and year fixed effects (not shown) and cluster standard errors by firm (model (2)) and by market/country (model (3)) and by industry (model (4)). Model (1) are without clustering and fixed effects. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) Prob(ma=1)	(2) Prob(ma=1)	(3) Prob(ma=1)	(4) Prob(ma=1)
centrality	-0.18***	-0.16***	-0.16***	-0.16***
	(-9.09)	(-6.46)	(-3.57)	(-5.91)
spread	-0.022	-0.027	-0.027	-0.027
	(-1.52)	(-0.67)	(-0.57)	(-0.76)
rm_qtr	-0.012	-0.049	-0.049	-0.049
	(-0.23)	(-0.80)	(-0.61)	(-0.73)
inv	0.17	-0.27	-0.27	-0.27*
	(1.37)	(-1.62)	(-1.48)	(-1.79)
bm	-0.031***	-0.068***	-0.068***	-0.068***
	(-3.58)	(-5.43)	(-4.07)	(-3.77)
leverage	0.31***	0.19***	0.19***	0.19***
	(8.42)	(3.98)	(3.39)	(3.33)
roa	-0.68***	-0.66***	-0.66***	-0.66***
	(-10.57)	(-8.77)	(-5.69)	(-5.38)
turnover	0.060*	0.18***	0.18**	0.18***
	(1.69)	(4.14)	(2.53)	(4.42)
size	0.037***	-0.016	-0.016	-0.016
	(7.90)	(-1.25)	(-0.76)	(-1.13)
lna	0.0093***	0.052***	0.052***	0.052***
	(3.29)	(4.18)	(2.86)	(3.81)
Constant	-2.23***	-3.23***	-3.23***	-3.23***
	(-42.94)	(-11.40)	(-12.59)	(-16.11)
Log Likelihood	-16420.9	-15816.2	-15816.2	-15816.2
Chi2	417.6	1245.7	.	.
No. of obs	128808	127963	127963	127963

t statistics in parentheses
* p < 0.10, ** p < 0.05, *** p < 0.01

Table 10 Probability that a listed company becomes an acquirer

The table shows estimates from 1st stage of Heckman model of how centrality affects the likelihood of the firm starting a deal. The dependent variable is a dummy that takes the value of 1 if the firm launches a bid in that quarter. Main explanatory variable is centrality and identifying restrictions are local stock market return(rm_qtr) and credit spread(spread) as in Harford(2005). Definitions of all variables are found in Table 1. We include target mkt/industry(sic2), and year fixed effects (not shown) and cluster standard errors by firm (model (2)) and by mkt (model (3)) and by industry (model (4)). Model (1) are without clustering and fixed effects. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) ma	(2) ma	(3) ma	(4) ma
centrality	0.21***	0.20***	0.20***	0.20***
	(12.91)	(7.88)	(4.94)	(5.93)
spread	-0.44***	-0.14***	-0.14***	-0.14***
	(-30.22)	(-3.71)	(-3.07)	(-4.12)
rm_qtr	-0.0096	0.17***	0.17**	0.17***
	(-0.20)	(2.91)	(2.46)	(2.69)
inv	-0.30**	-0.45**	-0.45*	-0.45*
	(-2.32)	(-2.11)	(-1.96)	(-1.87)
bm	0.063***	0.0042	0.0042	0.0042
	(7.81)	(0.31)	(0.25)	(0.15)
leverage	0.31***	0.19***	0.19**	0.19**
	(8.60)	(3.09)	(2.10)	(2.03)
roa	-0.52***	-0.11	-0.11	-0.11
	(-6.45)	(-1.02)	(-1.11)	(-0.73)
turnover	0.072**	0.11*	0.11	0.11*
	(2.23)	(1.82)	(1.37)	(1.67)
size	0.20***	0.12***	0.12***	0.12***
	(45.52)	(7.94)	(5.57)	(5.27)
lna	0.025***	0.11***	0.11***	0.11***
	(9.38)	(7.87)	(5.43)	(4.24)
Constant	-2.57***	-4.11***	-4.11***	-4.11***
	(-50.85)	(-11.05)	(-16.24)	(-7.59)
Log Likelihood	-21415.7	-20021.3	-20021.3	-20021.3
Chi2	6765.2	.	.	.
No. of obs	124459	107795	107795	107795

Table 11 Heckman model of target

The table shows estimates from 2 stages of Heckman model of how centrality affects the likelihood of the firm being taken over. The dependent variable is a dummy that takes the value of 1 if acquired Main explanatory variable is centrality and identifying restrictions are local stock market return(rm_qtr) and credit spread(spread) as in Harford(2005). Definitions of all variables are found in Table 1. We include acquirer country/industry, target country/industry, and year fixed effects (not shown). Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) car1	(2) car5	(3) runup20	(4) runup40
2nd stage				
gap_dif	-0.0038***	-0.0063***	-0.0029**	-0.0051***
	(-3.51)	(-4.61)	(-2.33)	(-3.05)
cash0	-0.0056	0.00020	-0.0026	0.017
	(-0.75)	(0.02)	(-0.30)	(1.50)
toehold	-0.035***	-0.042***	-0.0097	-0.022**
	(-5.71)	(-5.53)	(-1.40)	(-2.37)
same_ind	-0.0070	-0.0030	0.0097	0.012
	(-1.14)	(-0.39)	(1.38)	(1.30)
friendly	0.0045	-0.0080	-0.0073	-0.020*
	(0.65)	(-0.92)	(-0.92)	(-1.92)
financial	-0.021*	-0.018	-0.029**	-0.015
	(-1.79)	(-1.20)	(-2.09)	(-0.81)
significant	0.045***	0.050***	-0.0100	-0.0013
	(5.84)	(5.12)	(-1.12)	(-0.11)
dealsize	0.0015	-0.00051	0.00083	0.00029
	(1.00)	(-0.27)	(0.47)	(0.12)
ret12_s	-0.0085**	-0.010**	0.0014	0.0047
	(-2.56)	(-2.46)	(0.35)	(0.90)
bm_s	-0.0015	-0.0014	0.00063	0.0023
	(-1.45)	(-1.06)	(0.52)	(1.42)
inv_s	0.017	0.048	0.052	0.019
	(0.55)	(1.26)	(1.47)	(0.39)
leverage_s	-0.0090	-0.017*	-0.0068	-0.015
	(-1.26)	(-1.93)	(-0.86)	(-1.41)
roa_s	-0.024	-0.088***	-0.0054	-0.026
	(-1.57)	(-4.69)	(-0.32)	(-1.18)
ret12_b	0.0055	0.0046	-0.0018	0.00064
	(1.43)	(0.95)	(-0.41)	(0.10)
bm_b	-0.0067	-0.0048	-0.010*	-0.0026
	(-1.36)	(-0.78)	(-1.80)	(-0.35)
inv_b	0.011	0.016	0.026	0.017
	(0.29)	(0.34)	(0.60)	(0.30)
leverage_b	-0.044***	-0.042**	0.012	0.028
	(-2.77)	(-2.13)	(0.67)	(1.13)
roa_b	0.031	0.034	-0.021	0.035
	(1.27)	(1.10)	(-0.73)	(0.91)
1st stage				
centrality	-0.68***	-0.69***	-0.68***	-0.69***
	(-18.97)	(-19.21)	(-19.34)	(-19.33)
spread	-0.36***	-0.35***	-0.36***	-0.36***
	(-15.24)	(-15.36)	(-15.91)	(-15.85)
rm_qtr	0.14**	0.12*	0.11	0.093
	(2.00)	(1.66)	(1.50)	(1.32)
inv	0.30**	0.25**	0.24**	0.20
	(2.47)	(2.03)	(2.04)	(1.62)

bm	-0.0011	-0.0012	-0.0013	-0.0013
	(-0.98)	(-1.06)	(-1.12)	(-1.11)
leverage	-0.0036	-0.0023	-0.00074	-0.00079
	(-0.31)	(-0.21)	(-0.08)	(-0.08)
roa	-0.00064	-0.00044	-0.00019	-0.00020
	(-0.35)	(-0.24)	(-0.11)	(-0.12)
turnover	0.00042	0.00033	0.00016	0.00016
	(0.23)	(0.17)	(0.08)	(0.08)
size	-0.021***	-0.027***	-0.030***	-0.029***
	(-3.52)	(-4.48)	(-5.00)	(-4.91)
lna	-0.0069*	-0.0064*	-0.0060	-0.0060
	(-1.81)	(-1.69)	(-1.62)	(-1.61)
mills				
lambda	0.0051	0.0087	-0.014	0.00075
	(0.41)	(0.55)	(-0.97)	(0.04)
R2				
F				
No. of obs	127038	126972	126919	126938

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12 Heckman model of acquiror

The table shows estimates from 2 stage of Heckman model of how centrality affects the likelihood of the firm starting a deal. The dependent variable is a dummy that takes the value of 1 if acquired Main explanatory variable is centrality and identifying restrictions are credit spread as in Harford(2005). Definitions of all variables are found in Table 1. We include acquirer country/industry, acqget country/industry, and year fixed effects (not shown) and cluster standard errors by acqgets and acquirers (model (2) & (5)) and by acqget country (model (3) & (6)). Model (1) & (4) are without clustering. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) car1	(2) car5	(3) runup20	(4) runup40
2nd stage				
gap_dif	-0.0024	-0.0033*	-0.0031*	-0.0034
	(-1.61)	(-1.79)	(-1.82)	(-1.51)
cash0	-0.0074	-0.0044	0.00063	0.0023
	(-0.78)	(-0.38)	(0.06)	(0.16)
toehold	-0.037***	-0.048***	-0.032***	-0.038***
	(-4.58)	(-4.93)	(-3.44)	(-3.19)
same_ind	-0.0099	-0.011	0.015	0.0091
	(-1.20)	(-1.13)	(1.59)	(0.73)
friendly	0.014	0.011	-0.0065	-0.023
	(1.40)	(0.89)	(-0.57)	(-1.57)
financial	-0.025	-0.015	-0.016	-0.012
	(-1.60)	(-0.80)	(-0.87)	(-0.51)
significant	0.037***	0.047***	0.0044	0.0039
	(3.79)	(3.93)	(0.39)	(0.27)
dealsize	0.0017	0.0018	0.0033	0.0023
	(0.71)	(0.61)	(1.22)	(0.64)
ret12_s	-0.0021	0.00019	0.0057	0.0063
	(-0.48)	(0.03)	(1.09)	(0.92)
bm_s	-0.0022	0.0081	0.010**	0.017***
	(-0.51)	(1.56)	(2.02)	(2.60)
inv_s	0.034	0.018	0.013	-0.046
	(0.65)	(0.28)	(0.22)	(-0.56)
leverage_s	-0.0062	-0.0080	-0.0028	-0.0058
	(-0.82)	(-0.86)	(-0.31)	(-0.50)
roa_s	-0.028	-0.068**	-0.067**	-0.0038
	(-1.19)	(-2.37)	(-2.53)	(-0.11)
ret12_b	0.0021	-0.0027	-0.013*	-0.013
	(0.35)	(-0.37)	(-1.84)	(-1.48)
bm_b	-0.0078	-0.018*	-0.025***	-0.019
	(-1.03)	(-1.86)	(-2.82)	(-1.56)
inv_b	0.098	0.096	-0.025	-0.0019
	(1.41)	(1.11)	(-0.30)	(-0.02)
leverage_b	-0.062***	-0.044	0.026	0.052
	(-2.68)	(-1.56)	(1.00)	(1.52)
roa_b	0.030	0.12*	0.10*	0.13
	(0.56)	(1.80)	(1.67)	(1.62)
1st stage				
centrality	0.57***	0.56***	0.56***	0.57***
	(17.05)	(17.03)	(17.18)	(17.34)
spread	-0.32***	-0.32***	-0.32***	-0.33***
	(-10.58)	(-10.66)	(-10.82)	(-10.87)
rm_qtr	0.30***	0.29***	0.30***	0.30***
	(2.86)	(2.89)	(2.96)	(2.94)
inv	-0.052	-0.11	-0.18	-0.14
	(-0.23)	(-0.48)	(-0.79)	(-0.61)
bm	0.00060**	0.00059**	0.00058**	0.00059**
	(2.17)	(2.13)	(2.08)	(2.09)
leverage	0.098***	0.098***	0.097***	0.100***
	(3.11)	(3.15)	(3.09)	(3.23)

roa	0.091	0.094	0.089	0.095
	(1.37)	(1.44)	(1.36)	(1.51)
turnover	-0.00049	-0.00055	-0.00058	-0.00058
	(-0.27)	(-0.31)	(-0.32)	(-0.32)
size	0.100***	0.099***	0.097***	0.096***
	(13.04)	(13.16)	(13.04)	(12.87)
lna	0.036***	0.036***	0.036***	0.037***
	(7.14)	(7.20)	(7.14)	(7.32)
mills				
lambda	-0.025*	-0.011	0.036**	0.050***
	(-1.95)	(-0.70)	(2.45)	(2.60)
R2				
F				
No. of obs	124155	124106	124069	124070

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13 Probability that a deal is finally complete and gap

The table shows estimates from probit regressions on probability that a deal is finally completed. The dependent variable *complete* is a dummy variable that equals 1 if the deal is finally completed, and 0 otherwise. Main explanatory variable is Gap_dif is [ln(gap_b+1)-ln(size_b)]-[ln(gap_s+1)-ln(size_s)]. Definitions of all variables are found in Table 1. Model (1) & (3) are without firm characteristics. Model (2) & (4) are with firm characteristics and cluster standard errors by target country. Heteroskedasticity-robust t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The sample period is from 2000 to 2010.

	(1) complete	(2) complete	(3) complete	(4) complete
gap_dif	-0.042***	-0.042***	-0.042***	-0.042***
	(-4.68)	(-3.90)	(-3.28)	(-2.84)
cash0	-0.043	-0.081	-0.043	-0.081
	(-0.84)	(-1.19)	(-0.61)	(-1.18)
toehold	0.063	0.13**	0.063	0.13
	(1.25)	(2.11)	(0.47)	(1.05)
same_ind	-0.040	-0.015	-0.040	-0.015
	(-0.82)	(-0.25)	(-0.88)	(-0.26)
friendly	0.21***	0.16**	0.21	0.16
	(3.60)	(2.35)	(1.37)	(1.03)
financial	0.047	-0.013	0.047	-0.013
	(0.49)	(-0.11)	(0.39)	(-0.08)
significant	-0.31***	-0.46***	-0.31***	-0.46***
	(-5.45)	(-6.24)	(-2.79)	(-4.70)
dealsize	0.079***	0.046***	0.079***	0.046***
	(6.96)	(3.15)	(5.23)	(3.22)
ret12_s		-0.018		-0.018**
		(-1.61)		(-2.19)
bm_s		-0.0021		-0.0021
		(-0.45)		(-0.39)
inv_s		-0.33		-0.33
		(-1.47)		(-1.27)
leverage_s		-0.056		-0.056
		(-0.78)		(-0.79)
roa_s		0.015		0.015
		(0.69)		(0.69)
ret12_b		0.0015		0.0015
		(0.20)		(0.53)
bm_b		-0.00052		-0.00052***
		(-0.50)		(-3.40)
inv_b		-0.12		-0.12
		(-0.33)		(-0.36)
leverage_b		-0.026		-0.026
		(-0.17)		(-0.20)
roa_b		0.097		0.097
		(0.64)		(0.58)
Log Likelihood	-2001.2	-1325.4	-2001.2	-1325.4
Chi2	78.9	72.0	76.9	628.8
No. of obs	3936	2496	3936	2496

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix A: Identifying Control Relations

Our empirical analysis relies on the identification of the firm's ultimate owner, on the position of the firm within the entire control structure dominated by its ultimate owner and on the power of control over the firm. We use a method for identifying control relations in complex ownership structures, suggested by Aminadav et al. (2011). By making the simultaneous analysis of both the firm-specific ownership map and the corporate network in which the firm is embedded, this method provides a refined alternative to traditionally used tests, i.e. with more precise and distinctive results for the identification of corporate controller in complex ownership structures. One of these tests is a widely used weakest-link principle (WLP) (Berle and Means, 1932; La Porta et al., 1999; Claessens, 2000; Faccio and Lang, 2002; Almeida et al., 2009). The novel method we use relies on the weighted voting games theoretical framework and the Shapley-Shubik (Shapley and Shubik, 1954) and Banzhaf power indices measures to determine control rights, and on the idea that the level of holdings required to achieve direct control is firm-specific and structure-dependent and cannot be based on a simple 10-20 percent cutoff rule.

The Shapley-Shubik power index is interpreted as a prior estimate of a voter's expected relative share in a fixed prize available to the winning coalition as a measure of voting power. Intuitively, for the calculation of this index, we assume that whenever a vote occurs shareholders join a coalition in a particular order according to their preferences from the strongest supporter to the fiercest objector. A *pivotal* shareholder for a given ordering is the member whose joining turns joining turns a developing coalition from a losing coalition into a winning coalition.

Denote $[q;\ w_1, \dots, w_n]$, where q and $w_1, \dots, w_n$ are nonnegative real numbers satisfying $0 < q \leq \sum_{i \in N} w_i$. We may think of w_i as the fraction of voting rights, or weight, of shareholder i in the set $N \coloneqq \{1, \dots, n\}$ of the direct shareholders in a specific firm, and q as the threshold, or quota, needed for a coalition to win the game by passing the decision they support in that firm. Thus $[q;\ w_1, \dots, w_n]$ represents the simple game v defined by:

$$v(S) = \begin{cases} 1\ (win), & w(S) \geq q \\ 0\ (lose), & w(S) < q \end{cases}$$

where for $S \subseteq N$, $w(S)$ means $\sum_{i \in S} w_i$.

For a game v, the Shapley-Shubik power index of shareholder i is given by:

$$SS_i(v) \coloneqq \frac{Number\ of\ orderings\ in\ which\ player\ i\ is\ pivotal}{n!}$$

$$= \sum_{\substack{S \subseteq N \\ (i \in S)}} \frac{(|S| - 1)!\,(n - |S|)!}{n!} (v(S) - v(S \backslash \{i\}).$$

We use the ownership data from the Bureau van Dijk databases and proceed as follows. We first set the required parameters for the control identification process: the majority quota needed to pass a vote to 50% (a number between 0% and 100%) and the Shapley-Shubik power index control threshold to 75% (a number between 50% and 100%). According to the control identification method we use, a shareholder (or a specific concert of shareholders, as will be explained below) in a firm is said to directly control that firm if given the majority quota of 50% the Shapley-Shubik power index of this shareholder is at least as large as the control threshold of 75%. The power index is calculated for the shareholders of the firm as a player-set in a weighted majority game with weights equal to their fraction of voting rights in the firm. If for a given firm there is no shareholder with direct holdings that fulfills the conditions above, then we say that this firm is not directly controlled, i.e., the firm is widely held.

After determining the direct controllers, for each controlled firm we identify the ultimate owner by searching up the direct control links that lead to that controlled firm. The ultimate owner is defined as a single non-controlled shareholder that directly or indirectly - via other shareholders controls the firm.

Once ultimate owners of all the controlled firms were identified for the first time (first iteration of the method), we extract cases where several shareholders of each firm are directly or indirectly controlled by the same identified ultimate owner. We will refer to each such subset of shareholders in each firm a "concert of shareholders". The set of shareholders of a certain firm may contain several concerts of shareholders. However, given the uniqueness of control relations and of the ultimate owner, these concerts must be disjoint sets.

In the next stage we consider concerts of shareholders as one voter, i.e., a bloc whose weight is equal to the sum of the weights of its members. Thus, for each such bloc (concert) we calculate the power index of the entire bloc rather than the individual index of each member. We perform the Shapley-Shubik power index control test again; find direct controllers, ultimate owners and concerts of shareholders and so on. After repeating the same procedure for a finite number of iterations the outcomes will remain fixed for all subsequent iterations, and the method converge into a final solution. This solution is the set of all control relations, where each controlled firm is linked to its direct controlling concert (or one controlling shareholder) and to its ultimate owner. Furthermore, for each controlled firm we obtain the ultimate owner's direct and indirect ownership stake, the number of control links between the firm and the ultimate owner (the level in a pyramid), and the minimal stake required for control given the ownership stakes of all the other non-controlling shareholders (concerts) and the predetermined majority quota of 50% and control threshold of 75% (by solving the inverse Shapley-Shubik power index problem).