The Effect of Search Frictions in Mergers*

Marc Martos-Vila†
UCLA
Anderson School of Management

Filippos Papakonstantinou‡
Imperial College London
Business School

First Draft: April 25th, 2008
This Draft: March 29th, 2011

Abstract

We empirically study the existence and impact of search frictions in the market for corporate control in order to explain who makes acquisitions. We proxy search frictions with the board's degree of connectedness, and also with measures of geographic proximity and business similarity. Additionally, we take into account measures of market thickness since they amplify the effect of such frictions, and also management incentives, in particular golden parachute provisions. Using data from 1990 to 2006, we find that firms are more likely to be acquirers (targets) when search frictions are low (high), there are more firms available to buy, and a golden parachute is not (is) provided to the firm's manager. These findings are largely consistent with predictions from the recent theoretical literature that models the decision of firms to actively search for potential targets, in a market-with-frictions setting. We alleviate concerns that these results are driven by firm heterogeneity or selection bias, by showing that they are robust to the use of OLS with firm-level fixed effects and instrumental variables estimation. Finally, we find that the provision of golden parachutes increases the average acquirer abnormal return by 2.5% whereas it does not significantly impact target premia; and that search frictions only affect target premia.

Keywords: Mergers & Acquisitions, Search Frictions, Boards of Directors, Golden Parachutes

JEL Classification: G34

*We would like to thank Patrick Bolton, Marc Gabarro, Mark Garmaise, Alexis Leon, Paige Ouimet, Rene Stulz and seminar participants at the 2009 European Finance Association (EFA) Meeting in Bergen and the University of Houston for their comments.

†The Anderson School, UCLA, Los Angeles, CA 90095. Email: marc.martos-vila@anderson.ucla.edu

‡Imperial College Business School, Tanaka Building, South Kensington Campus, London SW7 2AZ, UK, e-mail: fpapakon@imperial.ac.uk, http://www.imperial.ac.uk/people/f.papakonstantinou.

1 Introduction

Recent theoretical studies of the market for corporate control have used search models as a framework for the analysis of M&A phenomena. The basic innovation of this approach is modelling explicitly the decision of firms to actively search for potential targets/synergies in a market-with-frictions setting. In contrast to a centralized market where buyers and sellers immediately see the price and characteristics of the traded good, in a market with frictions it takes time and resources to find a match, therefore a manager faces the choice whether to search for potential targets and synergistic profits or instead to improve the current operational efficiency of the firm. Assuming in addition, as is standard and reasonable, that managers' incentives and shareholders' interests are not perfectly aligned, the theory shows that golden parachute agreements are an optimal incentivization mechanism for managers facing this choice. This theoretical literature shows that managers are more likely to be acquirers when the incentives for searching versus not searching are high; search frictions are low, and the likelihood of finding a match is high.

This paper provides the first (as far as we are aware) empirical study relating to this recent theoretical literature that uses search models to analyze M&As. As such, we focus on issues related to search frictions and on the provision of the optimal contract in this context, i.e., the golden parachute. We measure search frictions in three dimensions: geographic proximity, business relatedness, and board connectedness. The idea is that when firms' headquarters are geographically close, or when there is substantial overlap in terms of the industries in which they operate, or when they enjoy personal connections through their directors, then it is easier to detect the possibility of generating synergies through merging. Our biggest innovation in this regard, is that we use data on firms' boards of directors in order to construct a network such that links between two individuals indicate that they contemporaneously serve on the same board. We calculate various measures of centrality for each director, which are designed to capture, e.g., the speed of information flow through a node or the influence a node has over the spread of information through the network. A measure of market thickness, for which we use the number of firms in one's primary industry, is also inherently tied to search frictions, as it affects the difficulty of locating synergies and potential matches. Finally, we test whether

the provision of golden parachutes increases (decreases) the likelihood of becoming a target (acquirer), as predicted by the theory.

Our empirical results support the idea that search considerations are important in the market for corporate control. We find that low search frictions, as captured by the connectedness of a firm's board, increase (decrease) the probability of being an acquirer (a target). These effects are economically strong and statistically robust both to model specification and to the econometric methodology used. The number of available matches, as measured by the number of firms in one's primary industry, increases the probability of being an acquirer, as predicted, while the effect on the probability of being a target is not robust to specification variation. Finally, the provision of golden parachutes is negatively (positively) related to the likelihood of becoming an acquirer (a target) in a friendly deal, though the finding for acquirers is not as robust to all specifications.

Our secondary set of results relates golden parachutes and measures of search frictions to merger premia, measured as cumulative abnormal returns around the announcement date of a deal. We find that the presence of a golden parachute provision affects acquirer premia more than target gains, both from a statistical and an economic standpoint. A target with golden parachutes increases the acquiring firm's cumulative abnormal returns by around 2.5% on average. For targets, the effect is negative, though statistically indistinguishable from zero and economically very small. We also find that our measures of frictions, i.e., business similarity and geographic proximity, have statistically significant effects on target premia, but completely insignificant effects on acquirer premia. As we explain in Section 2, search models of M&As have implications but not clear-cut predictions regarding the effects of frictions and golden parachutes on merger premia, therefore we do not interpret the mixed results as evidence against these models.

This paper contributes to the literature on M&As by assessing the importance and impact of search frictions, in particular board connectedness and market depth, and management compensation, in particular golden parachutes, in the market for corporate control.

Another departure from previous studies is the use of a different econometric approach, exploiting both the cross-section and time-series dimension of the data to account for unobserved heterogeneity at the firm level. Panel data techniques are becoming more popular

among empirical corporate finance studies, helping to overcome potential biases and to improve the accuracy of the standard errors (see Petersen (2006)). In addition, we identify that there is potential endogeneity for the key variables of interest – the provision of a golden parachute and the board's connectedness – since a firm fearing that it might be targeted might adopt a golden parachute, while a firm intending to search for a target might hire a better-connected board. Another source of endogeneity is the inclusion as a control of the lagged dependent variable – the dummy for being an acquirer or a target – in the firm-level fixed effects specification. To deal with the former source of endogeneity we estimate GMM specifications, where the CEO's salary and the twice-lagged board's connectedness serve as instruments. To deal with the latter source of endogeneity we employ the Arellano and Bond (1991) estimator developed for dynamic panel data. It is reassuring that all the important results are robust to these more sophisticated specifications.

This paper is related to the literature that attempts to explain why certain firms become acquirers or targets. One of the latest examples of such attempts is Maksimovic and Phillips (2001). They find that firm organization and the ex-ante efficiency of buyers and sellers matters. But the studies in this area that are most directly related to our paper are those that estimate the effect of golden parachute adoption on the probability of receiving a takeover bid. Hall and Anderson (1997) find that the adoption of a golden parachute contract does not significantly increase the probability of a firm receiving a takeover bid. In contrast to this, Machlin, Choe, and Miles (1993) find that the adoption of golden parachutes increases the likelihood of a successful takeover. Our results on this point are consistent with the results from the latter studdy. But note that neither of these, nor other studies examine the effect of golden parachute adoption on the probability of becoming an *acquirer*. This is because the prediction that the golden parachute aligns managers' incentives to shareholder interests regarding the decision to search or not is specific to the recent search models of M&As.

Indeed, this paper is more generally related to the large literature that studies the effects of golden parachute provisions on firm value and on the market for corporate control. Lambert and Larcker (1985) analyze the market's reaction to the announcement that firms plan to grant golden parachutes to their top executives, to test the following two hypotheses. On the one hand, the incentive-alignment hypothesis predicts a positive market reaction to the

adoption of golden parachutes, because once a takeover offer is received, shareholder interest is presumably better-protected by management that is compensated for a change in control, hence is less likely to reject good offers from fear of losing its private benefits of control. On the other hand, the wealth-transfer hypothesis espouses the more traditional view that golden parachutes are used by managers to expropriate shareholder value (Manne (1965)), and should yield a negative market reaction. The authors analyze a sample of 57 firms, and find that the market's reaction to the adoption of golden parachutes is positive. They conclude that this evidence supports the incentive-alignment rather than the wealth-transfer hypothesis. Hall and Anderson (1997) also find some support for the incentive-alignment hypothesis: While they do not find a significant relationship between the size of the golden parachute and the market's reaction to its adoption, they do find a significantly positive relationship between the size of the golden parachute scaled by the firm's market value and the market's reaction. While it is outside the scope of our study to present results on event studies of the adoption of golden parachute provisions, the existing empirical evidence is consistent with the ideas that motivate our study: In a search model of the M&A market (e.g., Martos-Vila (2007)), golden parachutes optimally align management's incentives to shareholders' interests regarding the decision to search or not for an M&A target, hence their adoption should increase firm value.[1]

Finally, there is a vast empirical literature that tries to explain abnormal returns from takeover announcements; see, for instance, Schwert (2000) or Moeller, Schlingemann, and Stulz (2005), for some of the more recent evidence. This paper is more directly related to the existing studies of the effect of golden parachutes on target premia. Machlin, Choe, and Miles (1993) estimate that a $1 increase in golden parachutes translates into a $10 increase in the target premium. Lefanowicz, Robinson, and Smith (2000) find that golden parachute adoption has no significant effect on target premia. We do not find any effect of golden parachute provisions on target premia, but we find a strong effect on acquirer premia. We also study the effects of business similarity and geographic proximity on takeover premia, as proxies for search frictions, which to the best of our knowledge have not been studied before.

This paper is also related more generally to the small, but growing, literature on networks

[1]Note that this alignment of incentives differs from the one proposed in the incentive-alignment hypothesis above, where management's incentives are aligned to shareholder interests regarding the decision to accept or not a "good" takeover offer.

in boards of directors. Kramarz and Thesmar (2006) find a very strong correlation between the CEO's network and the network of his directors. In particular, they find that networks of former high-ranking civil servants are very active in determining board composition. Cohen, Frazzini, and Malloy (2008) focus on university connections between fund managers and corporate directors, and find that fund managers invest more heavily and more profitably on firms they are connected to through their network. The authors interpret these results as suggesting that networks are an important mechanism for information flow into asset prices. We contribute to this literature, by showing that network connections in boards play a very important role in the market for corporate control: the more connected a board is the higher (lower) the probability that the firm will become an acquirer (target). We interpret this result as meaning that firms with connected boards have lower search frictions, and are therefore both more likely to search, and also more likely to find a target to acquire.

The remainder of the paper is organized as follows. Section 2 briefly presents the theoretical model that serves as inspiration for our empirical analysis of the M&A market under the prism of search frictions, and then formulates our hypotheses. Section 3 describes the data sources we use. Section 4 explains in detail how we construct our measures for search frictions, as well as the econometric methodology we employ in our estimation. Section 5 presents our empirical results, and finally Section 6 concludes.

2 Model and Hypotheses

Our focus, in this paper, on the importance of search frictions and the provision of the golden parachute, is inspired by the recent theory that analyzes M&As using search models (see Martos-Vila (2007) and Rhodes-Kropf and Robinson (2008)). In a nutshell, the theory proposes that self-interested managers face a decision between maximizing their firm's operating performance or looking for a target firm to acquire. Empire-building motives generally entice managers to neglect their own firm's performance and instead to search for targets. These motives are traded off against search frictions, which make the endeavor less worthwhile, and possibly monetary incentives offered by the firms' shareholders in an attempt to align the manager's incentives with their interests. It can be shown that golden parachutes are the

optimal incentivization mechanism for two reasons: First, its cost is not borne entirely by the target's shareholders, but rather part of it is borne by the acquirer's shareholders; and second, it is an event-contingent payment that is only paid when the firm is in fact successfully targeted, so it more efficiently aligns managers' with shareholders' interests.

Before forming our hypotheses, it is important to note that we do not perform a direct test of these theories' predictions. Understandably, the theories are highly stylized, and make simplifying assumptions such as firm homogeneity, which are both unrealistic and unsuitable for an empirical study. Instead, we use the theories as a starting point to motivate our empirical study of the effects of search frictions and the golden parachute on various aspects of the M&A market, and to inform the interpretation of our results.

First, we form our hypotheses, summarized in the following table, regarding the probability that a firm will become an acquirer or a target:

Figure 1: **Predicted Effects on Acquirer/Target Decision**

	Acquirer	Target
Search Frictions	$-$	$-/+$
Mass of non-merged firms	$+$	$-/+$
Golden Parachute Provision	$-$	$+$

From our preceding brief description of the theory above, it should be clear that a theory of mergers that incorporates search features immediately implies that the probability of becoming an acquirer (a target) is decreasing (increasing) in the importance of search frictions and increasing (decreasing) in the number of potential matches, since search frictions and market depth directly affect the incentives to search for targets. It should also be clear that the theory immediately implies that the probability of becoming an acquirer (a target) is decreasing (increasing) in the golden parachute provision, since the golden parachute aligns the manager's incentives towards being passive, hence exposed to being targeted. However, the theoretical predictions for the effects of search frictions and market depth on the probability of becoming a target are more ambiguous. The effect of search frictions on the probability of becoming a target is twofold: the more difficult it is to find targets/synergies (search frictions are high), the more likely is the firm to choose not to actively search for a target and hence to become a potential target itself, but also the less likely it is to be found by a firm searching

for a target, and hence the less likely it is to become an actual target. Similarly, a deep market (larger number of firms available to merge) means that more firms will opt to search for targets, i.e., be potential acquirers, which in turn means that a firm that is not searching is more likely to be successfully targeted.

In order to test these hypotheses, we need to specify an econometric model suitable to the theoretical predictions. A convenient possibility is a linear specification, i.e., a linear approximation to the potentially complex effects described above. An alternative econometric model, the logistic model, applies a transformation on a linear combination of the explanatory variables, guaranteeing that fitted values will always be between 0 and 1, and is therefore potentially more suitable to our binary dependent variable. We present results from both models since, as we will explain subsequently, each has its own advantages and flaws.

When search frictions are present, they can potentially affect merger gains. However, these merger gains, as captured by the market's reaction to the announcement of a merger, are ambiguously affected by the presence of search frictions, as can be seen from the following figure:

Figure 2: **Predicted Effects on Merger Premia**

	Target	*Acquirer*
Search Frictions	$-/+$	$-/+$
Mass of non-merged firms	$-/+$	$-/+$
Golden Parachute Provision	$+$	$+$

The reason that the predicted effect of search frictions on premia is ambiguous, is that even though frictions might reduce the expected gains from merging (acting as a larger discount rate, similar to a risk premium) they also affect the decision of searching, as argued previously. If more search frictions mean that a firm is more likely to be targeted then the expected gains from merging should increase with such frictions. Second, the size of the pool of firms subject to be bought out (our measure of market depth) also affects the gains, but its effect is again ambiguous, for the same reason.

Finally, one of the key features of the theory is the potential conflict of interest between managers and shareholders regarding acquisitions. As a result, an optimal contract arises that calls for the provision of golden parachutes. This optimality result posits that all firms

should adopt a golden parachute. In relation to this, it is also shown that providing golden parachutes (which are a compensation cost) increases merger gains, precisely because they act as a barrier to merge, allowing only the most profitable deals to go through. In order to test this result we use the fact that not all firms provide GPs, even though the percentage of public firms providing such compensation contracts has increased a lot during the last decade. Given that there are some firms that do not provide GPs a natural test of these results is to compare M&A premia for firms that provide golden parachutes and those who do not. If both propositions hold, we should observe a positive coefficient for the provision dummy. This hypothesis is in contrast with past evidence but also with the negative reactions that golden parachutes have lately received especially from both the media and the political class. We note that it is possible that golden parachutes may provide sufficient incentives to entrenched managers to relinquish their private benefits of control and accept a takeover offer; mergers under these circumstances should on average be more profitable, as they replace more entrenched managers. This prediction is clearly the opposite of the prediction that arises from a pure search models of M&As, and might help explain the disagreement between our hypothesis and past evidence.

3 Data

We use data from 1990 to 2006 from six different sources. First, the starting point for constructing our sample is the Investor Responsibility Research Center (IRRC) database, which publishes information on corporate-governance provisions for individual firms. This data is derived from a variety of public sources, including corporate bylaws and charters, proxy statements, annual reports, as well as 10-K and 10-Q documents filed with the SEC. As we have already noted, corporate governance, and in particular the provision of a golden parachute as an optimal incentivization mechanism in the context of searching for acquisition matches, are particularly important for our study, hence our focus on the universe of firms for which this data is available. Admittedly, these firms are only a subset of all public firms in the U.S., but according to Gompers, Ishii, and Metrick (2003), the IRRC database "covers most of the value-weighted market: even in 1990 [it] tracked more than 93 percent of the total

capitalization of the combined New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and Nasdaq markets."

In particular, we use:

Golden Parachutes, which is a dummy variable for each firm, indicating the presence of severance agreements that provide cash and non-cash compensation to senior executives upon an event such as termination, demotion or resignation, following a change in corporate control.

Governance Index, which is the Gompers, Ishii, and Metrick (2003) Governance Index for each firm, capturing various aspects of a firm's governance, such as takeover defenses, director protection, voting rules, and relevant state laws. Note that since we include a separate dummy for the existence of a golden parachute agreement, we calculate a modified version of the Governance Index, which does not take into account the existence of a golden parachute agreement.

Second, we use IRRC data together with data from the Board Analyst database to gather information on the boards of directors of large firms. As was mentioned in the introduction, we use this data in order to construct, for each year, a network of connections between directors from different firms. Using this network we are able to calculate the average connectedness of a firm's board members in the network, which we use as a measure for search frictions.[2]

Third, we use Compustat's Executive Compensation database for information on management compensation, in particular salary, which as we explain in Section 4.3, we use as an instrument for the provision of a golden parachute in one of our econometric specifications.

Fourth, we identify merger announcements using the Securities Data Company's (SDC) U.S. Mergers and Acquisitions Database. We choose deals where both the target and the acquirer are U.S. public firms (i.e., listed in one of the three U.S. stock exchanges, NYSE, AMEX, and Nasdaq) and the acquisition takes the form of a merger, as opposed to the acquisition of partial interests, remaining interests or assets. We also require the deal value to be at least $1 million. Finally, since the theory that inspires this paper is best suited for friendly mergers, we remove those deals classified as hostile by SDC. In addition to enabling

[2]For details on the construction of these measures, please see Section 4.1.

us to identify M&A deals, the SDC database provides information on the means of payment, which we use as a control; business segment information which we use to construct a business similarity index; and the location of firms' headquarters, which we use to calculate geographic proximity for the acquirer and target of a deal..

Fifth, we use Center for Research in Security Prices (CRSP) data to construct the cumulative abnormal returns (CARs) around the announcement date of M&A deals. We calculate CARs using the standard methodology employed in various event studies (see, for instance, the early contributions by Bradley, Desai, and Kim (1983) and Brown and Warner (1985), among others). In particular, letting date 0 be the date of announcement of a merger deal involving firm i, then we calculate the CAR for firm i in the window $\left[\underline{t}, \bar{t}\right]$ around the announcement date as

$$CAR_i = \sum_{t=\underline{t}}^{\bar{t}} \left(r_{it} - \hat{r}_{it}\right),$$

where r_{it} is the true return for firm i on date t and $\hat{r}_{it}$ is the return for that date as predicted by a factor model estimated using a calendar year's worth of data prior to the start of the window $\left[\underline{t}, \bar{t}\right]$. For robustness, we construct abnormal returns using a short, $[-1, 1]$, medium, $[-30, 10]$, and long, $[-126, 63]$, event window around the announcement date, and we calculate benchmark returns, $\hat{r}_{it}$, using factor models with 1 (market only), 3 (market, size, and value), and 4 (market, size, value, and momentum) factors (see Fama and French (1993) and Carhart (1997)).[3] As a result, we use the CRSP database to obtain daily returns of acquirers and targets for a window of trading days around the announcement date, as well as daily returns for the value-weighted market portfolio, and the long-short portfolios that mimic the size, value, and momentum factors, for the whole sample period.

Finally, to control for observable firm and industry characteristics, we use data from Compustat. The variables we control for, and which have extensively been used in the M&A literature (see, for instance, Rhodes-Kropf, Robinson, and Viswanathan (2005) and Schwert (2000)), are:

Return on Assets (ROA), measured as the ratio of income before extraordinary items avail-

[3]We only report the results corresponding to the short window and the 4−factor model, as is most-commonly done in the literature.

able for common equity (Compustat item 237), over the book value of assets (Compustat item 6).

M/B, measured as the ratio of the market value of equity (Compustat item 24 times Compustat item 25), over its book value (Compustat 60).

Size, measured as the log market value of equity for the prior fiscal year.

Number of firms in the industry, measured as the number of firms in the primary Fama-French industry (out of 48) that the firm belongs to.

4 Methodology

4.1 Measures for Search Frictions

First, we construct measures for search frictions, for each firm for each year. For our first measure, we use data on firms' boards of directors in order to construct a network such that links between two individuals indicate that they currently serve on the same board, the idea being that these business relationships should reduce the difficulty of finding a merger match. We calculate various measures of connectedness for each director, which are designed to capture, e.g., the speed of information flow through a node or the influence a node has over the spread of information through the network.

In particular, representing the network by a graph $G = (V, E)$, where V are the n vertices (directors) and E are the edges (connections) between the vertices (directors), we calculate for each vertex (director) v, and then average over all directors on a firm's board, the following measures which are standard in graph theory:

- *Degree Centrality*, which is simply the number of direct connections a vertex (director) has to other vertices (directors);

- *Betweenness Centrality* defined by

$$C_B(v) = \frac{1}{(n-1)(n-2)} \sum_{s \neq v \neq t \in V, s \neq t} \frac{\sigma_{st}(v)}{\sigma_{st}},$$

where $\sigma_{st}(v)$ is the number of shortest paths from vertices (directors) s to t that pass through vertex (director) v and σ_{st} is the number of shortest paths from s to t;

- *Closeness Centrality* defined by

$$C_C(v) = \left(\sum_{t \in V \setminus v} \frac{1}{d_G(v,t)} \right) / (n-1),$$

where $d_G(v,t)$ is the shortest path between vertices (directors) v and t; and

- *Eigenvector Centrality* defined by

$$C_E(v) = \frac{1}{\lambda} \sum_{t \in M(v)} C_E(t),$$

where $M(v)$ is the set of all vertices (directors) that are connected to vertex (director) v, and λ is the greatest eigenvalue of the adjacency matrix representation of the graph G such that the corresponding eigenvector has Euclidean norm equal to 1.

The interpretation of degree centrality is obvious. Betweenness centrality is thought of as representing the influence that a node has over the spread of information through the network. Closeness centrality is thought of as the speed of information flow through a node. Finally, eigenvector centrality assigns scores based on the idea that connections to important nodes contribute more to the score of the node.

We estimate our models using all four of the centrality measures, and results are qualitatively the same across specifications. As a result, we present here only the results based on the simple measure of degree centrality. Interestingly, we also analyze past and present employment information for each firm's board member, and repeat this analysis on a network that indicates links not only due to contemporaneous tenure on the same board, but also due to contemporaneous and non-contemporaneous employment in the same firm. This alternative network construction serves as an additional robustness check of the results, which remain qualitatively unchanged.

Our second set of measures for search frictions relates to the geographic and business overlap between the merging firms. The former is measured using dummies that indicate if the target's and acquirer's headquarters are in the same city and/or state. The operational similarity is measured using a business segment index. Essentially, for firm j, the index for

industry i is valued at one if firm j operates in that industry. Then, for each industry, we pairwise multiply the acquirer's and the target's indices, and add up these pairwise multiplicative terms. Finally we normalize by the number of total segments. We call this measure the *Business Similarity Index*, and the larger it is, the more business segments the two companies operate commonly. The following figure provides more explicit definitions of these measures:

Figure 3: **Measures for Search Frictions**

Variable		*Definition*
Same City	=	1 if target and acquirer belong to same city, 0 if not.
Same State	=	1 if target and acquirer belong to same state, 0 if not.
Business Similarity Index	=	$\frac{1}{K}\sum_{i=1}^{K} BI_i^{acquirer} * BI_i^{target}$, where $BI_i^j = 1$ if firm j operates in industry i, 0 otherwise.

A measure of market "thickness" is also inherently tied to search frictions, as it affects the difficulty of locating potential matches. To construct our measure, for each firm we identify its primary industry, using the Fama-French classification of all firms in 48 industries, and then we count the number of firms in this industry.[4]

4.2 Controls

We use two important controls in our regressions. First, we acknowledge the fact that past merger decisions might affect the current decision to merge: the existence of the so-called serial or frequent acquirers is well known (for instance, Moeller, Schlingemann, and Stulz (2005) talk about this phenomenon). Not only might the number of completed acquisitions in the past potentially explain in part the decision of acquiring yet again, but in addition, the existence of past hostile and/or withdrawn acquisitions might be indicative of a future acquisition. Finally, if the firm was recently acquired, it seems unlikely that it is going to bid for a target the year after. On the target side the reasoning is similar. One would expect that the probability of becoming a target increases if there is a past withdrawn hostile attempt to

[4] As a robustness check we also use a classification based on the two-digit SIC codes (resulting in 23 industries) and a classification based on the 4-digit NAICS codes (resulting in 103 industries), and results are unchanged.

buy that company, or that given that it was bought recently (in the past year) it is not likely that it is going to be bought anytime soon.

Second, we include the Governance Index of Gompers, Ishii, and Metrick (2003), calculated with data from the IRRC Corporate Governance database; as already mentioned, we calculate a modified index that excludes the golden parachute provision, since we include the latter separately in our estimations. Failing to control for the Governance Index could yield biased estimates of the golden parachute effect, to the extent that the anti-takeover and other governance provisions might be complements or substitutes of the provision of golden parachutes.

Finally, we include some standard controls that have been used in the literature, e.g., return on assets, market capitalization, Tobin's Q, and means of payment for the merger deal.

4.3 Econometric Methodology

The most basic estimations that we perform are Ordinary Least Squares (OLS) regressions and logistic regressions, as well as specifications that include industry-level fixed effects. But whenever possible (see Tables 2 through 5) we also exploit the panel structure of our dataset to account for unobserved heterogeneity at the firm level. Estimating (industry-level) firm-level fixed effects helps overcome potential biases caused by unobserved (industry) firm heterogeneity that is fixed through time, while clustering improves the accuracy of the standard errors by allowing for non-independence of the error term within the cluster.

In addition, we identify that there is potential endogeneity for the key variables of interest – the provision of a golden parachute and the board's connectedness. For example, a firm fearing that it might be targeted, might adopt a golden parachute. Or a firm intending to search for an acquirer might hire a better-connected board. To deal with this source of endogeneity we estimate General Method of Moments (GMM) specifications, where the CEO's salary and the twice-lagged board's connectedness serve as instruments. On the one hand, the CEO's salary should be (and is) related to the provision of a golden parachute, because they are both elements of the compensation scheme agreed upon by the board and the management. However, salary is likely to be exogenous to the error in the estimation of

the probability to be an acquirer or a target, because neither the theory, e.g., Martos-Vila (2007), nor intuition suggest that a CEO's salary should affect the firm's decision to search for a target or not. On the other hand, the twice-lagged board connectedness helps deal with the types of endogeneity mentioned above, e.g., those that arise due to the firm anticipating that it would like to participate in an acquisition. Note that if the firm anticipates far in advance that it will search for targets at some point in the future, then this instrument would not be exogenous, but this seems unlikely, especially given that boards often have staggered and/or multi-year tenures, so there would be quite a bit of lag between deciding to change the composition of the board and actually effecting that change.

Another source of endogeneity is the inclusion as a control of the lagged dependent variable – the dummy for being an acquirer or a target – in the firm-level fixed effects specification. This is the common endogeneity problem in dynamic panels, and to deal with it we employ the Arellano and Bond (1991) estimator developed precisely for this situation.

It is very reassuring that all our results are mostly robust and often even stronger in these more sophisticated specifications.

Our results are also robust to the following alternative specifications which are not presented here for the sake of brevity. First, note that in the specifications we present, whenever we estimate firm-level fixed effects, we cluster standard errors at the firm level to allow for non-independence of the error terms at the firm level. An alternative would be to cluster standard errors at the industry level, to allow for non-independence of the error terms at the industry level. Indeed, it has been suggested that if one wants to perform two-way clustering that is nested and a large sample is available, then it is preferable to cluster at the highest level of aggregation (see Cameron, Gelbach, and Miller (2006)), which in our case is the industry level. However, the consistency of the standard errors requires a large number of clusters, and clearly we have a lot more when we cluster at the firm level, and possibly too few when we cluster at the industry level. Nonetheless, when we do cluster at the industry level, our results remain unchanged.

Second, instead of clustering the standard errors at the firm level, we also estimate specifications in which we cluster at the year level. This estimation allows for non-independence of errors within a year. Again our results remain unchanged. Somewhat related to this variation

is another estimation that we perform, in which we include year dummies instead. All results are as before.

5 Results

5.1 Estimating the Probability of Being an Acquirer or a Target

First, we estimate the probability that a firm becomes an acquirer or a target; the results are presented in Tables 2 through 5. The sample for this estimation consists of all the firm-year combinations in our universe, which is essentially the universe of firms covered in the IRRC database, for the years 1990 through 2006. In Tables 2 and 3 (4 and 5) that present the results from the estimating the probability of a firm being an acquirer (target), the dependent variable is a dummy that equals 1 for firm-year combinations that correspond to a successful friendly M&A deal as an acquirer (target) and 0 otherwise.

In Tables 2 and 4, we estimate probabilities using the linear probability model. Specifications (1), (2), and (3) in each of these tables use OLS without fixed effects, with industry-level fixed effects and clustering, and with firm-level fixed effects and clustering, respectively. Specification (4) is similar to specification (3), i.e., with firm-level fixed effects and clustering, with the difference that in specification (4) we also include board connectedness as an explanatory variable. Specifications (5) and (6) are similar to specifications (3) and (4), but present results from GMM estimation using firm-level fixed effects and the Arellano and Bond (1991) estimator developed to deal with endogeneity in dynamic panel data sets. In specifications (5) and (6), we use CEO's salary as an instrument for golden parachute provision, and in specification (6), which adds board connectedness as an explanatory variable, we also use twice-lagged board connectedness as its instrument.

In Tables 3 and 5, we estimate probabilities using the logistic probability model. It is important to note that while the logistic model has the advantage that the fitted values of the dependent variable are between 0 and 1, as probabilities should be, it has two distinct disadvantages. First, there is no consistent Instrumental Variables (IV) estimator in a logistic regression with fixed effects. This is particularly problematic for our application, given that the choices of the golden parachute provision and the board's connectedness are endogenous,

but also due to the inclusion of the lagged dependent variable in the regressors. Second, estimates based on a logistic regression with fixed effects, even in the absence of endogeneity, are consistent only under the assumption that at least one of the outcomes in each group takes each value, 0 and 1. Unfortunately, this conditional fixed logistic model does not make much economic sense in our application, since it is perfectly possible that firms do not become acquirers or do not become targets in our sample period. As a result, the conditional fixed logistic model constrains our sample often to unacceptable levels, e.g., to 149 observations in specification (5) of Table 5 out of the original $20,604$ we have in specification (1) of the same table. We conclude that, while it is comforting to know that the results in Tables 3 and 5 are qualitatively similar, it is preferable to concentrate on the results from the linear probability models in Tables 2 and 4, . In any case, we note that in Tables 3 and 5, specifications (1), (2), and (3) have no fixed effects, industry-level fixed effects, and firm-level fixed effects, respectively; while specifications (4) and (5) introduce board connectedness as an additional regression, and include industry-level fixed effects and firm-level fixed effects, respectively.[5]

We now highlight the main results from these tables. First, board connectedness has a strong positive effect on the probability of being an acquirer and a negative effect on the probability of being a target. To the extent that low board connectedness is a good measure for search frictions, this verifies the theoretical prediction from the search models of M&As, i.e., that firms for whom it is easy to search become acquirers. For targets, the theoretical prediction is more ambiguous, and this could possibly explain why the effect for targets is not as strong as for acquirers. In particular, the effect of search frictions on the probability to be a target is twofold: the higher the search friction, the more likely is the firm to choose not to actively search for a target and hence to become a potential target itself, but also the less likely it is to be found by a firm searching for a target, and hence the less likely it is to become an actual target. Empirically, we find that higher search frictions have an overall positive effect on the probability of being a target.

Second, the number of firms in one's industry has a strong positive effect on the probability of becoming an acquirer, and an ambiguous effect on the probability of becoming a target. Again, this empirical results verifies the theoretical prediction from search models of the M&A

[5]Note that some controls are dropped in specifications (4) and (5) in Table 5, because they have no variation in the restricted sub-sample for which these specifications are estimated.

market, that firms for whom it is easy to find a match because the market is deep, are not only more likely to search for targets, but also more likely to be successful in doing so. And as with board connectedness, the theoretical prediction for targets is ambiguous, since a deep market means that more firms will opt to search for targets, i.e., be potential acquirers, which in turn means that a firm that is not searching is more likely to be successfully targeted. The fact that market depth works in both directions, might explain why the empirical result is not strong one way or the other: we can see from Tables 4 and 5 that in some specifications the effect of market depth on the probability of becoming a target is statistically significantly positive, while in other specifications it is statistically insignificantly negative.

Our last important result here is that the provision of golden parachutes has a strong positive effect on the likelihood of being targeted, as predicted by the theory, but no consistent effect across specifications on the probability of being an acquirer. One might have reasonably anticipated that the effect of golden parachutes would be stronger for targets than for acquirers, since they not only have an ex ante effect of making managers more likely to be passive members of the market for corporate control, but they also have an ex post effect of making managers more likely to accept merger offers.

Though our results on the controls dealing with past merger decisions are not the focus of this study, they are interesting enough to merit some discussion. We find that the probability of being an acquirer increases if the company has shown a propensity to do acquisitions in the previous year. In particular, we find that having successfully completed a friendly acquisition or having unsuccessfully tried a hostile acquisition in the previous year, both have a strong positive effect on the probability of becoming an acquirer in the current year; the other two dummies seem to have a positive effect, but significance is not retained in all specifications. We note that the sign of the effect of prior friendly acquisitions flips in the firm-level fixed effects OLS regression (see specifications (3) and (4) in Table 2), possibly due to the endogeneity introduced by the lagged dependent variable in the firm-level fixed effects regression. It has the correct sign again in the firm-level fixed effects GMM regression with the Arellano and Bond (1991) estimator, which deals with this endogeneity (see specifications (5) and (6) in Table 2). We do not find similar results for targets, except for weak support for the idea that firms that were unsuccessfully targeted are more likely to be successfully

targeted soon afterwards.

5.2 Evaluating Merger Abnormal Returns

In this section we concentrate on the estimation of merger premia; the results are presented in Tables 7 and 8.

Our first result is that the golden parachute dummy has a positive effect on acquirers' premia, though no effect on targets' premia. For acquirers, the existence of a golden parachute agreement increases the premium by 2.5%, while it has a negative, though statistically and economically insignificant, effect for targets. Indeed, there are several possible explanations why golden parachutes may raise acquirer premia. First, golden parachutes act as barriers to merger deals and hence they preclude less profitable deals from occurring; however, there is no reason to expect that acquirers would be in a better position to expropriate all of the additional value that is present in the deals that do go through conditional on the presence of the golden parachute. Another possible explanation is that a golden parachute provides sufficient incentive to the entrenched manager of a firm that is targeted for acquisition, to agree to the acquisition, since the loss in private benefits arising from entrenchment is balanced by the compensation due to the change in control. But again, though this reasoning would imply that deals involving targets whose manager had a golden parachute should yield higher gains because on average they involve the replacement of a more entrenched manager, there is no reason to expect that these additional gains should accrue to the acquirer rather than the target. Finally, it is possible that golden parachutes reduce the incentive of a manager to take a tough bargaining stance and strike the best possible deal for the target's shareholders. This reasoning would explain both why we find that golden parachutes have a positive effect on acquirer premia, and why they have no effect or even a slightly negative effect on target premia.

Our second result is that the number of firms in the industry, which we interpret as a measure for the depth of the search market for corporate control, has no effect on premia. This is not inconsistent with the theory, which makes no specific prediction regarding the effect that search frictions should have on premia, for reasons explained earlier in Section 2.

Our final result is on the effect of our measures of search frictions on merger premia.

Interestingly, both the business similarity index and our geographic proximity dummies have statistically significant effects on target premia, but completely insignificant effects on acquirer premia. While the Business Similarity Index and the Same City dummy both have positive effects on target gains, the interaction of the two has a negative effect. These results seem to indicate that targets are able to expropriate most of the additional gains created due to business and geographic overlap, unless both of them are present, in which case they are able to expropriate less.

6 Concluding Remarks

This paper contributes to the literature on M&As by using recent theoretical developments to assess the importance and impact of search frictions and golden parachutes, on a firm's role in the market for corporate control and on gains from merging, to both parties. We generally find evidence that is consistent with the idea of treating the M&A market as a market with frictions.

First, we find that high board connectedness, which corresponds to low search frictions, increases (decreases) the probability of a firm becoming an acquirer (target). Second, we find that our measured for market thickness increases the likelihood of becoming an acquirer, while its effect on the likelihood of becoming a target is ambiguous. Third, we find that golden parachutes increase the probability of a firm becoming a target, but have no effect on the probability of a firm becoming an acquirer. All these results are largely consistent with the predictions of the search theory of M&As. Moving on to an attempt to explain merger premia, we mainly find that acquirer premia are positively affected by the existence of a golden parachute provision, and that target premia are positively affected by measures for search frictions, in particular a business similarity and a geographic proximity index.

References

Arellano, M., and S. Bond (1991): "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations," *Review of Economic Studies*, 58, 277–97.

Bradley, M., A. Desai, and E. Kim (1983): "The Rationale Behind Interfirm Tender Offers: Information or Synergy?," *Journal of Financial Economics*, 11, 183–206.

Brown, S., and J. Warner (1985): "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics*, 14, 3–31.

Cameron, A., J. Gelbach, and D. Miller (2006): "Robust Inference with Multi-way Clustering," *Unpublished Working Paper*.

Carhart, M. M. (1997): "On Persistence in Mutual Fund Performance," *Journal of Finance*, 52(1), 57–82.

Cohen, L., A. Frazzini, and C. Malloy (2008): "The small world of investing: Board connections and mutual fund returns," *Journal of Political Economy*, 116, 951–979.

Fama, E., and K. French (1993): "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics*, 33(1), 3–56.

Gompers, P., J. Ishii, and A. Metrick (2003): "Corporate Governance and Equity Prices," *Quarterly Journal of Economics*, 118(1), 107–155.

Hall, P., and D. Anderson (1997): "The Effect of Golden Parachutes on Shareholder Wealth and Takeover Probabilities," *Journal of Business Finance & Accounting*, 24(3), 445–463.

Kramarz, F., and D. Thesmar (2006): "Social Networks in the Boardroom," *IZA Discussion Paper No. 1940*.

Lambert, R., and D. Larcker (1985): "Golden Parachutes, Executive Decision-Making and Shareholder Wealth," *Journal of Accounting and Economics*, 7, 179–203.

Lefanowicz, C., J. Robinson, and R. Smith (2000): "Golden Parachutes and Managerial Incentives in Corporate Acquisitions," *Journal of Corporate Finance*, 6, 215–239.

Machlin, J., H. Choe, and J. Miles (1993): "The Effects of Golden Parachutes on Takeover Activity," *Journal of Law and Economics*, 36, 861–876.

Maksimovic, V., and G. Phillips (2001): "The Market for Corporate Assets: Who Engages in Mergers and Asset Sales and Are There Efficiency Gains?," *The Journal of Finance*, 56(6), 2019–2065.

Manne, H. (1965): "Mergers and the Market for Corporate Control," *Journal of Political Economy*, 73, 110–120.

Martos-Vila, M. (2007): "The Search for Corporate Control," *Ph.D. Dissertation, Princeton University*.

Moeller, S., F. Schlingemann, and R. Stulz (2005): "Wealth Destruction at a Masive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave," *The Journal of Finance*, 60(2), 757–782.

Petersen, M. (2006): "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches," *Mimeo, Northwestern University*.

Rhodes-Kropf, M., and D. Robinson (2008): "The Market for Mergers and the Boundaries of the Firm," *Journal of Finance*, 63(3).

Rhodes-Kropf, M., D. Robinson, and S. Viswanathan (2005): "Valuation Waves and Merger Activity: The Empirical Evidence," *Journal of Financial Economics*, 77, 561–603.

Schwert, G. (2000): "Hostility in Takeovers: In the Eyes of the Beholder?," *Journal of Finance*, 55(6), 2599–2640.

Table 1: **Summary Statistics for Whole Sample**

This table presents summary statistics for our baseline sample, which is used in the estimation of the probability that a firm becomes an acquirer/target. The definitions of the variables are: (1) Acquirer, i.e, a Dummy that equals 1 if the firm was the Acquirer in a completed friendly M&A deal during its fiscal year. (2) Target, i.e., a Dummy that equals 1 if the firm was the Target in a completed friendly M&A deal during its fiscal year. (3) Golden Parachute, i.e., a dummy that equals 0 or 1; (4) G-index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (5) Board Connectedness, i.e., the average Degree of each director in the network of connections between board members of large U.S. firms; (6) Log # Firms in firm's Fama-French Industry; (7) Risk-free Rate; (8) Industry-Adjusted ROA; (9) Average Acquirer Premium, i.e., average Acquirer Cumulative Abnormal Return over the year before the merger; (10) Firm Size, measured as Log of market cap; Dummies for (11) Withdrawn Hostile, (12) Completed Friendly, (13) Withdrawn Friendly, and (14) Withdrawn Hostile Acquisitions in the year before the merger.

	N	Mean	Std. Dev.	Min	Max
Acquirer	20,604	0.048	0.214	0.000	1.000
Target	20,604	0.024	0.153	0.000	1.000
Golden Parachute	20,604	0.606	0.489	0.000	1.000
G-index	20,604	8.610	2.608	1.000	18.000
Board Connectedness	16,613	0.001	0.001	0.000	0.004
Log # Firms in Industry	20,604	5.289	0.917	1.792	6.967
Risk-free Rate	20,604	0.041	0.019	0.013	0.085
ROA	20,604	0.225	0.256	-0.593	0.782
Average Acquirer Premium	20,604	-0.023	0.029	-0.063	0.047
Firm Size	20,604	6.865	1.366	1.025	8.352
Withdrawn H'le Acq	20,604	0.002	0.050	0.000	1.000
Completed F'ly Acq $(t-1)$	20,604	0.052	0.222	0.000	1.000
Withdrawn F'ly Acq $(t-1)$	20,604	0.005	0.069	0.000	1.000
Withdrawn H'le Acq $(t-1)$	20,604	0.003	0.052	0.000	1.000

Table 2: **Linear Models of Acquirer Decision**

The dependent variable is a Dummy that equals 1 if the firm was the Acquirer in a completed friendly M&A deal during its fiscal year. The explanatory variables are: (1) Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Board Connectedness, i.e., the average Degree of each director in the network of connections between board members of large U.S. firms; (4) Log # Firms in firm's Fama-French Industry; (5) Risk-free Rate; (6) Industry-Adjusted ROA; (7) Average Acquirer Premium, i.e., average Acquirer Cumulative Abnormal Return over the year before the merger; (8) Firm Size, measured as Log of market cap; Dummies for (9) Withdrawn Hostile, (10) Completed Friendly, (11) Withdrawn Friendly, and (12) Withdrawn Hostile Acquisitions in the year before the merger. Specifications (1)-(4) present results from linear OLS estimation, while specifications (5) and (6) present results from linear GMM estimation, using the method proposed by Arellano and Bond (1991). t-statistics derived from standard errors clustered at the industry level (specification (2)) or firm level (specifications (3)-(6)) are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	OLS				GMM	
	(1)	(2)	(3)	(4)	(5)	(6)
Golden Parachute	-0.004	-0.004	-0.011*	0.003	-0.134***	-0.062
	(-1.192)	(-1.087)	(-1.883)	(0.276)	(-2.647)	(-0.712)
Governance Index	0.001**	0.001	-0.003	-0.003	0.005**	-0.000
	(2.114)	(1.131)	(-1.515)	(-0.759)	(2.129)	(-0.078)
Board Connectedness				18.615*		75.444***
				(1.815)		(5.229)
Log # Firms in Industry	0.017***	0.029**	0.085***	0.052**	0.017***	0.022***
	(10.267)	(2.560)	(7.568)	(2.189)	(5.375)	(5.423)
Risk-free Rate	0.398***	0.295***	0.011	0.441**	0.150	-0.001
	(4.746)	(2.928)	(0.108)	(2.166)	(0.816)	(-0.003)
ROA	0.012**	-0.014	-0.005	0.002	0.012	0.040***
	(1.994)	(-1.249)	(-0.491)	(0.150)	(1.184)	(2.987)
Average Acquirer Premium	0.096*	0.095**	-0.018	-0.085	0.000	-0.177**
	(1.875)	(2.474)	(-0.359)	(-1.263)	(0.001)	(-2.389)
Firm Size	0.018***	0.019***	0.013***	0.017***	0.018***	0.011**
	(15.999)	(9.604)	(4.488)	(3.568)	(8.799)	(2.409)
Withdrawn H'le Acq	0.123***	0.117**	0.106*	0.126*	0.934	0.043
	(4.276)	(2.231)	(1.805)	(1.673)	(1.561)	(0.088)
Completed F'ly Acq $(t-1)$	0.147***	0.134***	-0.037***	-0.081***	0.078***	0.050**
	(22.125)	(7.485)	(-2.863)	(-5.189)	(4.834)	(2.726)
Withdrawn F'ly Acq $(t-1)$	0.102***	0.099***	0.064*	0.039	0.066	0.078
	(4.842)	(2.867)	(1.653)	(0.768)	(1.222)	(1.380)
Withdrawn H'le Acq $(t-1)$	0.127***	0.122**	0.126**	0.135**	0.072	0.107*
	(4.614)	(2.573)	(2.511)	(2.313)	(1.219)	(1.679)
Firm Dummies			Yes	Yes	Yes	Yes
Industry Dummies		Yes				
N	20,604	20,604	20,604	11,490	14,483	10,330
R^2	0.058	0.046	0.010	0.014		

Table 3: **Logistic Models of Acquirer Decision**

The dependent variable is a Dummy that equals 1 if the firm was the Acquirer in a completed friendly M&A deal during its fiscal year. The explanatory variables are: (1) Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Board Connectedness, i.e., the average Degree of each director in the network of connections between board members of large U.S. firms; (4) Log # Firms in firm's Fama-French Industry; (5) Risk-free Rate; (6) Industry-Adjusted ROA; (7) Average Acquirer Premium, i.e., average Acquirer Cumulative Abnormal Return over the year before the merger; (8) Firm Size, measured as Log of market cap; Dummies for (9) Withdrawn Hostile, (10) Completed Friendly, (11) Withdrawn Friendly, and (12) Withdrawn Hostile Acquisitions in the year before the merger. Specifications (3) and (5) present results from conditional logistic estimation. Robust t-statistics are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	(1)	(2)	(3)	(4)	(5)
Golden Parachute	-0.059	-0.080	-0.050***	0.010	0.003
	(-0.834)	(-1.095)	(-2.788)	(0.116)	(0.625)
G-index	0.032**	0.025*	-0.015**	0.007	0.001
	(2.349)	(1.776)	(-2.392)	(0.435)	(1.005)
Board Connectedness				187.632***	11.469***
				(2.669)	(3.026)
Log # Firms in Industry	0.412***	0.658***	0.279***	0.375*	0.017***
	(10.353)	(3.973)	(8.089)	(1.670)	(6.449)
Risk-free Rate	10.262***	7.542***	0.229	9.661***	0.616***
	(5.101)	(3.554)	(0.710)	(3.514)	(5.130)
ROA	0.401***	-0.358*	-0.029	-0.188	0.023***
	(2.964)	(-1.657)	(-0.838)	(-0.684)	(2.591)
Average Acquirer Premium	1.469	1.305	-0.097	-1.662	-0.091
	(1.244)	(1.076)	(-0.556)	(-1.185)	(-1.424)
Firm Size	0.670***	0.692***	0.056***	0.686***	0.032***
	(16.691)	(16.772)	(5.114)	(11.282)	(10.571)
Withdrawn H'le Acq	1.222***	1.132***	0.161**	1.080**	0.105***
	(3.183)	(2.907)	(2.163)	(2.574)	(2.886)
Completed F'ly Acq $(t-1)$	1.266***	1.088***	-0.047***	0.979***	0.029***
	(14.399)	(12.195)	(-4.024)	(9.462)	(3.958)
Withdrawn F'ly Acq $(t-1)$	1.034***	1.004***	0.097*	0.870**	0.052*
	(3.638)	(3.454)	(1.869)	(2.261)	(1.932)
Withdrawn H'le Acq $(t-1)$	1.218***	1.154***	0.204***	1.033**	0.102***
	(3.456)	(3.200)	(2.747)	(2.491)	(2.872)
Firm Dummies			Yes		Yes
Industry Dummies		Yes		Yes	
N	20,604	20,432	6,172	11,338	3,817

Table 4: **Linear Models of Target Decision**

The dependent variable is a Dummy that equals 1 if the firm was the Target in a completed friendly M&A deal during its fiscal year. The explanatory variables are: (1) Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Board Connectedness, i.e., the average Degree of each director in the network of connections between board members of large U.S. firms; (4) Log # Firms in firm's Fama-French Industry; (5) Risk-free Rate; (6) Industry-Adjusted ROA; (7) Average Target Premium, i.e., average Target Cumulative Abnormal Return over the year before the merger; (8) Firm Size, measured as Log of market cap; Dummies for participation as Target in (9) Withdrawn Hostile, (10) Completed Friendly, (11) Withdrawn Friendly, and (12) Withdrawn Hostile deals in the year before the merger. Specifications (1)-(4) present results from linear OLS estimation, while specifications (5) and (6) present results from linear GMM estimation, using the method proposed by Arellano and Bond (1991). t-statistics derived from standard errors clustered at the industry level (specification (2)) or firm level (specifications (3)-(6)) are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	OLS				GMM	
	(1)	(2)	(3)	(4)	(5)	(6)
Golden Parachute	0.008***	0.008***	0.024***	0.005*	0.102***	0.014
	(3.465)	(3.498)	(5.666)	(1.913)	(3.391)	(1.382)
Governance Index	-0.000	-0.001	0.005***	-0.000	-0.004***	-0.001
	(-1.177)	(-1.437)	(3.271)	(-0.043)	(-2.955)	(-1.643)
Board Connectedness				-4.077*		-3.748*
				(-1.957)		(-1.803)
Log # Firms in Industry	0.009***	0.026***	0.030***	-0.002	0.009***	-0.000
	(7.557)	(4.631)	(4.596)	(-0.642)	(4.935)	(-0.902)
Risk-free Rate	0.272***	0.173***	-0.048	0.060**	0.508***	0.106**
	(4.284)	(3.043)	(-0.772)	(2.081)	(4.007)	(2.019)
ROA	0.001	-0.006	0.000	-0.001	-0.006	-0.002
	(0.144)	(-0.733)	(0.052)	(-0.342)	(-1.002)	(-0.926)
Average Target Premium	-0.001	-0.008	0.013	0.009	0.014	0.005
	(-0.080)	(-0.461)	(0.888)	(1.571)	(0.878)	(0.818)
Firm Size	-0.002**	-0.002*	0.013***	0.001	0.001	0.002**
	(-2.472)	(-1.749)	(7.288)	(1.515)	(0.954)	(2.449)
Withdrawn H'le Tar	0.223***	0.217***	0.187***	0.001	0.212	0.003
	(8.767)	(3.405)	(2.597)	(1.301)	(0.471)	(0.343)
Completed F'ly Tar $(t-1)$	0.009	0.004	-0.230***	-0.078	-0.048	0.062
	(0.724)	(0.218)	(-10.682)	(-0.956)	(-1.363)	(0.877)
Withdrawn F'ly Tar $(t-1)$	0.017	0.013	-0.013	-0.001	-0.060	-0.001
	(0.773)	(0.510)	(-0.369)	(-1.613)	(-0.659)	(-0.866)
Withdrawn H'le Tar $(t-1)$	0.143***	0.139**	0.110*	0.000	0.168	-0.000
	(5.543)	(2.540)	(1.853)	(0.435)	(1.430)	(-0.066)
Firm Dummies			Yes	Yes	Yes	Yes
Industry Dummies		Yes				
N	20,604	20,604	20,604	11,490	14,483	10,330
R^2	0.010	0.008	0.030	0.006		

Table 5: **Logistic Models of Target Decision**

The dependent variable is a Dummy that equals 1 if the firm was the Target in a completed friendly M&A deal during its fiscal year. The explanatory variables are: (1) Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Board Connectedness, i.e., the average Degree of each director in the network of connections between board members of large U.S. firms; (4) Log # Firms in firm's Fama-French Industry; (5) Risk-free Rate; (6) Industry-Adjusted ROA; (7) Average Target Premium, i.e., average Target Cumulative Abnormal Return over the year before the merger; (8) Firm Size, measured as Log of market cap; Dummies for participation as Target in (9) Withdrawn Hostile, (10) Completed Friendly, (11) Withdrawn Friendly, and (12) Withdrawn Hostile deals in the year before the merger. Specifications (3) and (5) present results from conditional logistic estimation. Robust t-statistics are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	(1)	(2)	(3)	(4)	(5)
Golden Parachute	0.007***	0.006***	0.237***	0.952**	0.278
	(3.371)	(3.300)	(6.631)	(1.996)	(1.508)
G-index	-0.001	-0.001	0.095***	-0.075	-0.022
	(-1.164)	(-1.525)	(6.212)	(-0.881)	(-0.475)
Board Connectedness				-385.046	-482.116***
				(-0.953)	(-2.663)
Log # Firms in Industry	0.009***	0.028***	0.306***	-1.353	-0.563
	(7.592)	(5.273)	(3.828)	(-0.902)	(-1.231)
Risk-free Rate	0.252***	0.144**	-1.127*	29.923**	6.706*
	(4.347)	(2.496)	(-1.746)	(2.047)	(1.797)
ROA	0.001	-0.006	0.112*	-1.055	-0.070
	(0.129)	(-1.271)	(1.805)	(-0.845)	(-0.262)
Average Target Premium	-0.001	-0.011	0.082	1.013	1.093**
	(-0.059)	(-0.717)	(0.639)	(0.374)	(2.012)
Firm Size	-0.002**	-0.002**	0.175***	0.382	0.238
	(-2.553)	(-2.665)	(8.037)	(1.607)	(1.394)
Withdrawn H'le Tar	0.201***	0.159***	0.413***		
	(6.446)	(5.847)	(2.993)		
Completed F'ly Tar $(t-1)$	0.007	0.002	-0.166***	2.210*	-0.161
	(0.706)	(0.256)	(-6.267)	(1.906)	(-1.537)
Withdrawn F'ly Tar $(t-1)$	0.007	0.002	-0.038		
	(0.422)	(0.147)	(-0.405)		
Withdrawn H'le Tar $(t-1)$	0.121***	0.101***	0.375**		
	(4.373)	(4.011)	(2.444)		
Firm Dummies			Yes		Yes
Industry Dummies		Yes		Yes	
N	20,604	20,432	2,856	6,110	149

Table 6: **Summary Statistics for Merger Sample**

This table presents summary statistics for our merger sample, which is used in the estimation of merger premia. The definitions of the variables are: (1) Target CAR (2) Acquirer CAR (3) Target Golden Parachute, i.e., a dummy that equals 0 or 1; (4) Target G-index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (5) Acquirer CEO Compensation, i.e., Log of Salary, Bonuses, and other compensation; (6) Log # Firms in Target's Fama-French Industry; (7) Log # Firms in Acquirer's Fama-French Industry; (8) Target and (9) Acquirer Size, measured as Log of market cap; (10) Target and (11) Acquirer ROA, industry-adjusted, for the year before the merger; (12) Target and (13) Acquirer Tobin's Q; (14) Stock Deal Dummy; (15) Risk-free Rate; (16) Business Similarity Index; (17) Same-City Dummy and (18) Same-State Dummy;

	N	Mean	Std. Dev.	Min	Max
Acquirer CAR	270	-0.026	0.075	-0.380	0.406
Target CAR	274	0.224	0.218	-0.277	1.310
Target Golden Parachute	274	0.687	0.464	0.000	1.000
Target G-index	274	8.338	2.568	3.000	15.000
Acquirer CEO Compensation	274	7.525	0.774	4.645	9.706
Log # Firms in Targ's Industry	274	5.337	0.861	2.398	6.923
Log # Firms in Acq's Industry	274	5.238	0.920	1.949	6.940
Target Size	274	6.761	1.113	2.875	8.235
Acquirer Size	274	8.920	1.353	5.471	10.898
Target ROA	274	0.282	0.273	-0.593	0.782
Acquirer ROA	274	0.300	0.263	-0.593	0.782
Target Q	274	3.098	2.223	0.432	9.075
Acquirer Q	274	4.300	2.970	0.723	11.543
Stock Deal Dummy	274	0.367	0.483	0.000	1.000
Risk-free Rate	274	0.041	0.015	0.007	0.069
Business Similarity Index	274	0.048	0.024	0.000	0.174
Same City Dummy	274	0.055	0.228	0.000	1.000
Same State Dummy	274	0.211	0.409	0.000	1.000

Table 7: **Acquirer Abnormal Returns**

The dependent variable is the Cumulative Abnormal Return (CAR) that accrues to the Acquirer in the window (-1,+1) trading days relative to the date of announcement. The CAR is calculated as $CAR_i = \sum_{t=-1}^{1}(r_{it} - \hat{r}_{it})$, where $\hat{r}_{it}$ is as predicted by the Fama-French-Carhart asset-pricing model estimated using daily returns for the window $(-300, -50)$. The explanatory variables are: (1) Target Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Target Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Acquirer CEO Compensation, i.e., Log of Salary, Bonuses, and other compensation; (4) Log # Firms in Acquirer's Fama-French Industry; (5) Target and (6) Acquirer Size, measured as Log of market cap; (7) Target and (8) Acquirer ROA, industry-adjusted, for the year before the merger; (9) Target and (10) Acquirer Tobin's Q; (11) Stock Deal Dummy; (12) Risk-free Rate; (13) Business Similarity Index; (14) Same-City and (15) Same-State Dummies; (16) Similarity · Same City Dummy. All specifications contain fixed effects for the Fama-French industries. t-statistics derived from standard errors clustered at the industry level are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	(1)	(2)	(3)
Target Golden Parachute	0.024***	0.025***	0.025***
	(2.907)	(2.997)	(2.963)
Target Governance Index	-0.002	-0.002	-0.002
	(-1.069)	(-0.973)	(-0.973)
Acquirer CEO Compensation	0.018**	0.019**	0.019**
	(2.394)	(2.425)	(2.352)
Log # Firms in Acq's Industry	-0.014	-0.016	-0.023
	(-0.320)	(-0.365)	(-0.500)
Target Size	-0.023***	-0.023***	-0.024***
	(-3.660)	(-3.594)	(-3.650)
Acquirer Size	0.008	0.008	0.009
	(1.307)	(1.319)	(1.469)
Target ROA	-0.049**	-0.050**	-0.046**
	(-2.546)	(-2.572)	(-2.430)
Acquirer ROA	0.051	0.055	0.053
	(1.254)	(1.267)	(1.294)
Target Q	0.000	0.000	0.001
	(0.060)	(0.115)	(0.251)
Acquirer Q	-0.001	-0.002	-0.001
	(-0.492)	(-0.542)	(-0.527)
Stock Deal Dummy	-0.011	-0.011	-0.011
	(-0.948)	(-0.950)	(-0.961)
Risk-free Rate	0.046	0.030	0.050
	(0.056)	(0.037)	(0.060)
Business Similarity Index	0.194	0.166	0.102
	(1.217)	(1.065)	(0.627)
Same City Dummy		-0.010	-0.089
		(-0.354)	(-1.353)
Same State Dummy		0.008	0.009
		(0.627)	(0.728)
Similarity · Same City			0.064
			(1.379)
N	257	257	257
R^2	0.296	0.297	0.306

Table 8: **Target Abnormal Returns**

The dependent variable is the Cumulative Abnormal Return (CAR) that accrues to the Target in the window (-1,+1) trading days relative to the date of announcement. The CAR is calculated as $CAR_i = \sum_{t=-1}^{1} (r_{it} - \hat{r}_{it})$, where $\hat{r}_{it}$ is as predicted by the Fama-French-Carhart asset-pricing model estimated using daily returns for the window $(-300, -50)$. The explanatory variables are: (1) Target Golden Parachute, i.e., a dummy that equals 0 or 1; (2) Target Governance Index, i.e., the Gompers, Ishii, and Metrick (2003) Governance Index; (3) Acquirer CEO Compensation, i.e., Log of Salary, Bonuses, and other compensation; (4) Log # Firms in Acquirer's Fama-French Industry; (5) Target and (6) Acquirer Size, measured as Log of market cap; (7) Target and (8) Acquirer ROA, industry-adjusted, for the year before the merger; (9) Target and (10) Acquirer Tobin's Q; (11) Stock Deal Dummy; (12) Risk-free Rate; (13) Business Similarity Index; (14) Same-City and (15) Same-State Dummies; (16) Similarity · Same City Dummy. All specifications contain fixed effects for the Fama-French industries. t-statistics derived from standard errors clustered at the industry level are reported in parentheses. */**/*** indicate significance at the 10%/5%/1% levels.

	(1)	(2)	(3)
Target Golden Parachute	-0.007	-0.005	-0.007
	(-0.223)	(-0.163)	(-0.201)
Target Governance Index	-0.000	0.000	0.001
	(-0.063)	(0.060)	(0.126)
Acquirer CEO Compensation	0.006	0.011	0.007
	(0.210)	(0.356)	(0.237)
Log # Firms in Targ's Industry	-0.145	-0.142	-0.142
	(-0.963)	(-0.974)	(-0.984)
Target Size	-0.044**	-0.046**	-0.043**
	(-2.423)	(-2.676)	(-2.478)
Acquirer Size	0.026*	0.026*	0.025*
	(1.727)	(1.733)	(1.726)
Target ROA	-0.166**	-0.156*	-0.170*
	(-2.028)	(-1.866)	(-1.997)
Acquirer ROA	0.005	0.006	0.023
	(0.064)	(0.084)	(0.326)
Target Q	-0.014**	-0.014**	-0.015**
	(-2.169)	(-2.083)	(-2.252)
Acquirer Q	0.011**	0.012**	0.011**
	(2.145)	(2.149)	(2.081)
Stock Deal Dummy	-0.055**	-0.057**	-0.057**
	(-2.228)	(-2.329)	(-2.376)
Risk-free Rate	3.264	3.119	3.176
	(1.119)	(1.112)	(1.141)
Business Similarity Index	1.053**	0.860*	1.207***
	(2.317)	(1.886)	(2.891)
Same City Dummy		0.031	0.316***
		(0.497)	(2.382)
Same State Dummy		0.048	0.046
		(1.415)	(1.414)
Similarity · Same City			-0.240***
			(-2.191)
N	261	261	261
R^2	0.231	0.244	0.267